SWEET FUEL: ETHANOL'S SOCIO-POLITICAL ORIGINS IN RIBEIRÃO PRETO, SÃO PAULO, 1933-1985

By

Jennifer Eaglin

A DISSERTATION

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

History – Doctor of Philosophy

2015

ABSTRACT

SWEET FUEL: ETHANOL'S SOCIO-POLITICAL ORIGINS IN RIBEIRÃO PRETO, SÃO PAULO, 1933-1985

By

Jennifer Eaglin

Today, Brazilian sugarcane ethanol, or alcohol, is the most efficient biofuel on the market, and the industry is the largest biofuel exporter in the world. However, few remember the military driven state-led development program, Proálcool (the National Alcohol Program), from which it emerged in 1975. Policymakers' current commitment to ethanol production often obscures the dramatic political, agricultural, and social transformations behind the program's implementation. This dissertation uncovers the broad impact of the program on what became the largest ethanol-producing region in the country, Ribeirão Preto in the state of São Paulo.

Alcohol production began first as a by-product of sugarcane production in the 1930s and later transformed into a national alternative fuel source in the 1970s. Through the lens of the sugar-alcohol producing family, the Biagis, and their central sugar mill, the Usina Santa Elisa, my work reveals the increasingly important connection between alcohol production and the Ribeirão Preto region. The family led sugarcane modernization efforts in the region during the 1950s. Under the military dictatorship (1964-1985), sugar exports became a critical part of the national development agenda. The Biagis were one of many sugar producers that utilized the government's modernization program to expand both their sugar and alcohol production capacity in the 1970s even before Proálcool took shape.

With the famous OPEC-induced oil shocks of 1973, the Brazilian government, like many other countries, sought ways to reduce their dependence on petroleum imports. Key

military, government officials, and private entrepreneurs supported the expansion of alcohol production as a solution to this problem. Under these conditions, the National Alcohol Program was born in 1975. The Usina Santa Elisa became one of the first projects approved under the new state-led development program.

Government officials debated the feasibility and costs of the program's expansion behind the launch of the alcohol-fueled car over the next decade. Even as alcohol production brought more wealth to the region, the growth of the sugarcane industry and the dramatic expansion of alcohol production in the 1970s and 1980s underscored the absence of rural workers in these and other development models. The disparate effects of the program and the larger development agenda's outcomes came to national attention when temporary sugarcane workers went on strike in protest of a new labor policy in Ribeirão Preto with the Guariba Strikes of 1984. Rural workers' actions reinserted questions about broader social issues related to the program's development agenda, putting the costs of the idealized agricultural energy development plan into sharp relief.

Ethanol's growth draws important questions about the nature of development in Brazil. My work focuses on the modernization of the sugar industry under government tutelage. State intervention was an essential part of the industry's growth. The state, international, and domestic influences interweave in ways that differed from traditional industrial development models. Instead, the sector paved a different path for agroindustrial development in the country with different objectives and outcomes.

Copyright by JENNIFER EAGLIN 2015

ACKNOWLEDGMENTS

There are not enough words to express my gratitude to the many people that have helped me complete this project. I will start with my advisor and my committee. Each of you have pushed me to improve this project at every turn and supported and guided me through my graduate school experience. I thank you. I would like to thank Dr. Peter Beattie particularly for the many drafts revised and meetings held to discuss this project.

While the academic support was invaluable, financing an international research project is ever more difficult. I could not have completed this project without the financial support of Michigan State University, the US State Department's Foreign Language and Area Studies (FLAS) Scholarship and the Fulbright Fellowship, as well as the Mellon Foundation.

In my travels, both domestic and international, I have had the good fortune to find a great deal of support from friends and colleagues without whom I would not have found the archives let alone used them to complete my project. Thank you to my friends in São Paulo, Ribeirão Preto, Barão Geraldo, Rio de Janeiro, New York, and Los Angeles that helped me find my way. This extends from the library to housing to meals to academic connections and support. I'd particularly like to thank Marcos Amatucci for providing more than an academic affiliation at the ESPM (Escola Superior de Marketing) in São Paulo but rather providing an academic community, research network, and interview companion for my research.

Finally, I want to thank my family. Your support through this long journey has been unconditional. I hope you all know how impossible this would have been without you. I love you dearly. This dissertation is for you all.

V

TABLE OF CONTENTS

LIST OF TABLES	viii
LIST OF FIGURES	ix
KEY TO ABBREVIATIONS	x
Introduction: Sugar and Power: The Rise of the Brazilian Ethanol Industry in Ribeirão Preto, São Paulo, 1933-1985	1
Chapter 1: Ribeirão Preto, São Paulo: The Coffee Kingdom and Early Sugar	
Production before 1930	26
Sugar and its Byproducts: Industrial Processing from the First From Coffee to Sugarcane	32 35
Chapter 2: Proálcool's Precedents: Early Federal Intervention in Sugar and Alcohol	
Policy, 1933-1959	40
São Paulo, Coffee, and Early Intervention in Agricultural Economic Planning	42
Ethanol Production before 1933	49
The IAA: Formal State Intervention in Sugar and Alcohol, 1933-1942	56
Sugar and Alcohol under the Estado Novo, 1937-1942	69
The IAA and Paulista Influence, 1942-1959 Conclusions	75 93
Conclusions	75
Chapter 3: Modernization and Development of the Sugar Industry in Ribeirão Preto,	0.4
1959-1975	94
Sugar Exports and the Changing World Market, 1959-1964 Modernization: Domestic Policy and Structural Changes	97 102
Military Dictatorship and Changing Policy Objectives, 1964-1970	102
The Coup	108
Sugar Policy in the Military Dictatorship	115
Sugar Booms and Deeper Modernization, 1970-1974	124
The Policies	126
The Usina Santa Elisa	130
Independent Alcohol Expansion and Funproçucar's Ongoing Funding in 1975	145
Conclusion	150
Chapter 4: Proálcool at Work: The Usina Santa Elisa, 1975-1984	152
The Creation of Proálcool- International Pressures and the Political Response	155
Phase I and the Usina Santa Elisa: 1975-1979	171
Restructuring Proálcool and the Introduction of the Alcohol-Fueled Car	182
Controversial Foreign Financing: The Entry of the World Bank in 1981	192
Phase II and the Usina Santa Elisa: 1979-1984	198
Conclusion	203

Chapter 5: The Rise of the Brazilian California: Rural Labor Changes and Ribeirão	
Preto, 1955-1984	205
São Paulo Rural Labor Mobilization	205
Labor Reforms and the Military Dictatorship: Making the Modern Sugar Worker	209
Ribeirão Preto in the New Sugar Economy	212
The Declining Brazilian Economy, 1980-1984	217
Reapproaching Rural Labor's Importance to Development	219
Chapter 6: Changing the Tide: Proálcool, Caneworkers, and the Guariba Strikes of	
1984	221
Proálcool by 1984: Growing Criticism, 1982-1984	224
Worker Conditions and Everyday Violence	229
"Creating Consciousness": The Catholic Church, the CPT, and Padre Bragheto	237
Sparks Fly: The Seven-Row Policy	244
The Strike	248
Guariba and Critiquing Proálcool	263
Conclusion	272
Conclusion: Assessing Proálcool: Deregulation, the State, and Development	274
APPENDIX	287
BIBLIOGRAPHY	304

LIST OF TABLES

Table 1: Ribeirão Preto Municipality's Population Growth, 1912–1960	29
Table 2: Impact of Coffee Support on São Paulo State and National Debt	44
Table 3: Anhydrous Alcohol Production by Major States (in liters), 1934–1940	64
Table 4: Alcohol Production (in liters)	90
Table 5: World Sugar Trade, 1956–1961 (in metric tons)	100
Table 6: Brazil's Role in Sugar Exports, 1962–1974 (in thousands of metric tons)	104
Table 7: Expected Hydrous Alcohol Production for Phase II of Proálcool	184
Table 8: Alcohol-fueled Car Sales, 1980–1985	190
Table 9: Areas Cultivated for Sugar Production under Proálcool	225
Table 10: Estimated Job Creation Due to Alcohol Production	269
Table 11: Alcohol-Motor Mixture, 1932–1950 (in liters)	289
Table 12: National Alcohol-Motor Production Capacity, 1932–1940 (in liters)	291
Table 13: Sugar and Alcohol Expansion in the Ribeirão Preto Region in the 1950s	292
Table 14: National Growth Rates, 1964–1975	293
Table 15: Brazilian Balance of Payment (in US\$ millions)	296
Table 16: Brazilian Annual Inflation Rate (Average), 1950–1985	297
Table 17: Sugarcane Crushed and Production of Sugar and Alcohol, 1970–1985	298
Table 18: Evolution of Sugar Production, 1975/76–1984/85	299
Table 19: Evolution of Alcohol Production, 1975/76–1984/85 (in cubic meters)	300
Table 20: Brazilian Alcohol Production, 1930/31–1982/83 (in millions of liters)	301

LIST OF FIGURES

Figure 1: Map of Ribeirão Preto	26
Figure 2: The Usina Santa Elisa Directorship in 1996	133
Figure 3: Requested Placard	139
Figure 4: Federal, State, and Private Interests Align	160
Figure 5: The Usina Santa Elisa in 1976	172
Figure 6: The Region of Ribeirão Preto and its Satellite Cities	222
Figure 7: Dona Guiomar	232
Figure 8: The Guariba Strike	250
Figure 9: Caneworkers Burn the Fields	254
Figure 10: Alcohol Production, 1936–1960	288
Figure 11: Monthly World Sugar Prices, 1973–1982	294
Figure 12: World Oil Prices, 1973-1982	295

KEY TO ABBREVIATIONS

Anfavea	National Automobile Producers' Association
BNDE	National Bank of Economic Development
Copersucar	Sugar Owners' Cooperative of the State of São Paulo
CDPA	Commission for the Defense of Sugar Production
СРТ	Pastoral Land Commission
CNAI	National Alcohol Commission
CNP	National Petroleum Council
СТА	Aerospace Technology Center
ELC	The Sugarcane Farming Statute
ETR	Rural Worker Statute
ET	Land Statute
Funproçucar	Support Program for the Sugar Agroindustry
Funproçucar GEAT	Support Program for the Sugar Agroindustry Technical Assistance Group
- /	
GEAT	Technical Assistance Group
GEAT GECEP	Technical Assistance Group Special Group the Control of Project Execution
GEAT GECEP GEAD	Technical Assistance Group Special Group the Control of Project Execution Administrative Assistance Group
GEAT GECEP GEAD II PND	Technical Assistance Group Special Group the Control of Project Execution Administrative Assistance Group Second National Development Plan
GEAT GECEP GEAD II PND IAA	Technical Assistance Group Special Group the Control of Project Execution Administrative Assistance Group Second National Development Plan Institute of Sugar and Alcohol
GEAT GECEP GEAD II PND IAA MIC	Technical Assistance Group Special Group the Control of Project Execution Administrative Assistance Group Second National Development Plan Institute of Sugar and Alcohol Ministry of Industry and Commerce
GEAT GECEP GEAD II PND IAA MIC MME	Technical Assistance Group Special Group the Control of Project Execution Administrative Assistance Group Second National Development Plan Institute of Sugar and Alcohol Ministry of Industry and Commerce Ministry of Mines and Energy

Introduction: Sugar and Power: The Rise of the Brazilian Ethanol Industry in Ribeirão Preto, São Paulo, 1933–1985

At the United Nations Climate Summit in September 2014, US President Barack Obama stated that the "once-distant threat [of climate change] has moved firmly into the present" following more frequent extreme weather as a result of undeniably increasing greenhouse gas emission levels.¹ This statement comes over fifteen years after the Kyoto Protocol first called for collective global efforts to reduce carbon emissions in 1997 to very little success. Given the futility of international climate change agreements over the past two decades, Brazilian sugarcane ethanol still stands as one of the rare examples of an alternative energy program employed on the national level that actually restructured the country's energy matrix in the long-term. As such, it has been and remains a beacon of energy policy possibilities for many countries around the world, particularly agriculture-intensive countries in less developed regions of the world.

Sugar-based ethanol, known as alcohol in Brazil, remains a key piece in the country's diversified "green" energy system because of its lower carbon emissions than petroleum and higher production efficiency than comparative biofuels.² Yet current praise for the Brazilian ethanol industry obscures the contentious origins of the 1975 state-led initiative called Proálcool (the National Alcohol Program) under Brazil's bureaucratic military dictatorship. In fact, the government had to forcefully intervene in the market to successfully integrate ethanol into the

¹ Barack Obama, "Remarks by the President at U.N. Climate Summit," United Nations Headquarters, New York, September 23, 2014, C-SPAN, http://www.c-span.org/video/?321662-1/president-obama-remarks-un-climate-summit.

² This is particularly in comparison to the American corn-based ethanol and palm oil biodiesel. For a comparison of ethanol productivity levels, see Eduardo L. Leão de Sousa and Isaias de Carvalho Macedo, org., *Ethanol and Bioelectricity: Sugarcane in the Future of the Energy Matrix*, trans. Brian Nicholson (São Paulo: Unica, 2011), 194–220.

economy, which had profound environmental, social, and economic consequences. This process began long before Proálcool took official form, beginning with transformative sugar policies that dramatically affected the national industry, particularly in the state of São Paulo. Previous Brazilian state interventions in the market place to stabilize the sugar industry through ethanol production shaped the military government's efforts to develop the ethanol industry in the 1970s and 1980s.³ This makes it an excellent case study to examine the strengths and weaknesses of state-led development projects in relation to contemporary economic theories that have criticized the efficacy of government interventions in the market place and more recent studies that have

This dissertation traces the development of the ethanol industry from its earliest inception under the Institute of Sugar and Alcohol (*Instituto de Açúcar e Alcool-* IAA) in the 1930s to its state-driven zenith in the 1980s under Proálcool. Drawing on Sidney Mintz' classic study, *Sweetness and Power: The Place of Sugar in Modern History*, I "follow the commodity" as

³ This was the case in the mining industry as well. See Gail D. Triner, *Mining and the State in Brazilian Development* (London: Pickering & Chatto, 2011), particularly chapter 6.
⁴ Some of the most popular critiques include: two books by Hernando de Soto— *The Other Path: The Invisible Revolution in the Third World* (New York: Harper & Row Publishers, Inc., 1989); and *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else* (Basic Books: 2000); also, James Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT: Yale University Press, 1998). Within Brazilian historiography, important examples include: Stephen Haber, "The Efficiency Consequences of Institutional Change: Financial Market Regulation and Industrial Productivity Growth in Brazil, 1866-1934," in *Latin America and the World Economy Since 1800*, edited by John H. Coatsworth and Alan M. Taylor (Cambridge, MA: Harvard University Press, 1998); William R. Summerhill, *Order Against Progress: Government, Foreign Investment, and Railroads in Brazil, 1854–1913* (Stanford, CA: Stanford University Press, 2003).

Recently, economic historians have revisited the state's role, noting the positive connection between state-led development and increased industrial productivity that accompied these policies in many Brazilian firms and sectors. Known as the "new institutional economic history," these historians have turned away from the more negative perspective on the state promoted by the "new economic history" circles of the 1990s and early 2000s and cited above. See, for example, also, Triner, *Mining and the State*, 213-214.

alcohol grew into a major product in Ribeirão Preto.⁵ The alcohol industry grew from a subproduct of the sugar industry to a national energy solution in the 1970s and 1980s following extensive government intervention and the important leadership of regional producers who accumulated increasing economic and political influence. These players benefitted from international crises that encouraged high-ranking government officials to pursue a large-scale government program to promote the mandated expansion and consumption of alcohol.

I argue that Proálcool was the result of a powerful and exclusive network of interconnected private business interests that transformed the sugar sector into a modernized industry.⁶ Both domestic and foreign technology drove this industrial transformation prior to the government's state-led development program. These same producers shaped the government's promotion of the program, its expansion, and national discourse around Proálcool. This network allowed a struggling sugar industry to build its close ties to the economic vitality of the nation through a new connection to energy development, reconstructing the image of the sugar industry from a backward, slave-driven sector in the nineteenth century to a model of a uniquely modern Brazilian development as an agro-industry in the late twentieth century.

My project is a history of development through the lens of a micro-history of the region of Ribeirão Preto. Using archival research and oral interviews, my work looks at the way alcohol production transformed a region and how regional entrepreneurs transformed a state-led development program simultaneously. This network of sugar entrepreneurs was able to solidify sugar and alcohol's preferential position within the military's economic development agenda as

⁵ Sidney W. Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (New York: Penguin Books, 1986), xviii–xxi.

⁶ The use of the word modernize is rather weighted. I generally define modernization throughout this work as an effort to mechanize production, expand production capacity, and incorporate technology into production methods as it relates to agricultural modernization.

it connected its economic interests to the military's political interests.⁷ Constructed on available and pliant cheap labor and extensive tracts of land, certain large-scale producers expanded with particularly favorable national financing initiatives under the military dictatorship and proximity to the largest automobile and truck market and industry in the country. Workers, however, inserted themselves into this development discussion with sugarcane workers' strikes in Ribeirão Preto in 1984.

I chose to study the city and surrounding countryside of Ribeirão Preto, São Paulo because it became a national center for ethanol production during the height of the state-led efforts to expand the ethanol industry from 1975 to 1985. My dissertation focuses on the way a specific family in the region of Ribeirão Preto was able to exert a great deal of influence on the national direction of alcohol policy along with other usineiros in the region and the state. The Biagi family, sugar producers since the 1930s, emerged as important individual supporters of alcohol production while the powerful sugar cooperative, Copersucar (Sugar Owners Cooperative of the State of São Paulo), pushed the national expansion of alcohol production at the same time. As this crucial example illustrates, even with the agricultural, economic, and political advantages that positioned Ribeirão Preto to become the major production hub for ethanol, the program required the ongoing cooperation of politicians, private businessmen,

⁷ The means to winning favor and the way to hold on to that financial support differed in the traditional sugar-producing Northeastern states of Pernambuco and Alagoas vs. São Paulo. Amanda Hartzmark's dissertation on the diverging experiences of the two regions under the IAA and culminating with Proalcool does an excellent job of mapping out these varied motivations and different paths. The Northeastern experience is beyond the scope of this project. Amanda Hartzmark, "Businesses, Associations, and Regions in the Brazilian Sugar Industry, 1920–1990," (PhD diss., University of Chicago, 2014). See also, Barbara Nunberg, "State Intervention in the Sugar Sector in Brazil: A Study of the Institute of Sugar and Alcohol," (PhD diss., Stanford University, 1979); Tamás Szmrecsányi, *O planejamento da agroindústria canavieira do Brasil 1930 / 1975* (São Paulo: Edição Hucitec, 1979); Pedro Ramos, *Agroindústria canavieira e propriedade fundiária no Brasil* (São Paulo: Editora Hucitec, 1999).

government agencies, scientists, agronomists, engineers, the automotive industry, farmers, sugar cane distillers, and field workers to successfully build Brazil's alternative energy industry.

Proálcool remains noticeably absent in Brazilian development debates today although Brazilian scholars have increasingly pointed to the car as an important part of Brazilian development and the creation of a modern Brazilian identity. Joel Wolfe's study of cars in Brazilian society highlights the important place that Brazilin car production and consumption had in the Brazilian imagination, stating, "Cars, trucks, and buses became not only the tools for creating the modern Brazilian state but also symbols of hope for its ongoing growth as a modern, developed, and democratic nation."⁸ And yet, his work does not emphasize the Brazilian government's desire to connect this modern domestic industry, established in the 1950s, to a domestic fuel source through the production of sugar-based ethanol. This effort drove nationalist ideas of protective energy consumption since the 1930s, long before the ethanol program took its most iconic form under Proálcool in 1975.

Brazilians' connection between the ideas of development and the car cannot be highlighted enough in the discussion of Proálcool's importance. Political scientist Michael Barzelay makes the connection between the car and modernity more explicit, stating, "the automobile generally became the symbol of the style of production and consumption that the military tried earnestly to foster [during the military dictatorship]."⁹ Michael Barzelay posits that the presence of the automobile industry "perhaps came to mean more to middle and upper-class Brazilians- key supporters of authoritarian rule at least during its first decade- than did the

⁸ Joel Wolfe, *Autos and Progress: The Brazilian Search for Modernity* (Oxford: Oxford University Press, 2010), 12. James Woodard, too, reiterates the importance of the car in Brazilian development ideology. James Woodard, "Inventing Consumerism" (paper presented at the annual meeting for the Brazilian Studies Association, August 20–23rd, 2014).

⁹ Barzelay, *The Politicized Market*, 80.

accomplishment of many earlier developmental feats, such as the implantation of a domestic steel industry in the 1940s or that of Petrobrás in the 1950s.¹⁰ The military government favored a program that tied the maligned sugar industry, in which it had designed its own agricultural development agenda, to the most modern achievement in Brazilian development, the car industry. The history of Brazilian development, which historians have already indicated must include the car, should not pass over the history of the ethanol industry under Proálcool.¹¹

My work reinserts Proálcool in development debates about modernization, technology, and economic growth. The sugar sector dramatically shifted its own objectives between the 1930s and the early 1970s. After the export market collapsed in Great Depression, Getúlio Vargas and his new provisional government created the IAA to aid an ailing sugar industry. New IAA officials encouraged ethanol production as a "release-valve" for chronic sugar overproduction. The government continued support for alcohol production despite oscillating interests in fuel additive's national use through the 1950s, but new opportunities for sugar exports after the US embargo on Cuba reoriented government policy toward sugar exports in the 1960s. To capture the growing sugar demand, government officials refocused economic development on the modernization of the sugar industry.

Following the military coup in April 1964, a new bureaucratic-authoritarian military dictatorship declared its objectives in its motto "national security and development." The new motto was a semantic modernization of the positivist slogan "Order and Progress" emblazoned

¹⁰ Ibid. For more on the connection between cars and modernity in middle class Brazilian values, see Brian Owensby, *Intimate Ironies: Modernity and the Making of Middle-Class Lives in Brazil.* (Stanford: Stanford University Press, 2002).

¹¹ This point is only solidified given the preponderance of flex-fuel cars, introduced on the market in 2003, dominating Brazilian car sales today. Leão de Sousa and de Carvalho Macedo, *Ethanol and Bioelectricity*, 158–187.

on Brazil's national flag.¹² As historian Barbara Nunberg describes it, the new military government embraced a "State-capitalist" development model, applied first in the 1950s and amplified in the 1960s, in which "an alliance of domestic and foreign industrial interests with a technocratic-bureaucratic elite and with the military" dictated the country's economic growth with little regard or accountability for the social outcomes attached to the method.¹³ The sugar industry became a central tool in this development scheme, given these export opportunities and the rising price of sugar on the world market.

Particularly under the military dictatorship in the 1960s and 1970s, government officials connected the increasingly industrial sugar industry with a broader development agenda. As sugar prices rose to dizzying heights in the early 1970s, government officials sought to capitalize on it by financing extensive industrial projects, under the program Funproçucar, to build the country's sugarcane production capacity.

Under these conditions, special interest groups, both individual producers and larger cooperatives, rallied political military leaders around nationalist and development objectives in the 1970s. Following the first oil crisis in November 1973, after which oil prices quadrupled on the international market, these leaders capitalized on a period of economic stress to accelerate the transformation of the sugar industry into a modern agro-industrial complex in which ethanol was a central aspect.

The alternative fuel became an important part of the country's energy matrix with the creation of Proálcool in 1975. It represented the national solution to the ongoing energy crisis in 1979, when the officials expanded the program to support alcohol as a gasoline-replacement

¹² Alfred Stepan, *The Military in Politics: Changing Patterns in Brazil* (Princeton: Princeton University Press, 1971), 174–180.

¹³ Nunberg, "State Intervention," 24.

rather than a substitute with the creation of the alcohol-fueled car. Behind the program, alcohol-fueled cars represented over 80% of all new car sales by 1983 and continued to rise before the program lost public support and financial assistance from the government in the late 1980s. The industry continued thereafter as a private sector sugar and alcohol industry after significant deregulation of the sugar sector beginning in the late 1980s and early 1990s.¹⁴

As sugar and alcohol production expanded, the sugar sector required greater consumption of land and workers to fill its demand. During the first decade of Proálcool, sugarcane production reached 225,539,928 tons due to Proálcool's mandated supply. Ribeirão Preto grew into the largest alcohol production center in the country and one of the richest regions in the country.¹⁵ Technological innovation and importation drove the mechanization of sugarcane processing that largely accounted for this "modernization" process. This process also favored the concentration of production in the hands of single large-scale sugar and alcohol producers. As such, a particular development model emerged in the sugar industry that would accelerate the creation of Proálcool and its expansion between 1975 and 1984.

Brazilian scholars have closely studied unequal international development. In the 1940s and 50s, theorists like the Brazilian economist Celso Furtado blamed a small domestic market, lack of modern technology, entrepreneurship, and capital for Brazil's failure to industrially develop like the US and Europe in the 19th century. Thus, for Furtado and other early

¹⁴ For more on this transition, see Márcia Azanha Ferraz Dias de Moraes, *A desregulamentação do setor sucroalcooleiro do Brasil* (Americana, SP: Caminho Editorial, 2000) and Márcia Azanha Ferraz Dias de Moraes and David Zilberman, *Production of Ethanol from Sugarcane in Brazil: From State Intervention to a Free Market* (Charn: Springer, 2014).

¹⁵ Maurilio Biagi Filho, "O álcool é nosso," *Folha de São Paulo* (May 9th, 1983). Also, Ernesto Paglia, *Rede Globo* (June 1984) in "Boias-frias e o Acordo de Guariba ápos a greve de 1984" (July 24th, 2014), YouTube, <u>https://www.youtube.com/watch?v=9ZiZbF6WYUk</u>. Accessed May 1st, 2015. For statistics on production levels under the program, see Tables 18 and 19 in the Appendix of this dissertation.

structuralists, the state could contest the external forces that challenged development in Brazil.¹⁶ These structuralist arguments supported Latin American import-substitution policies of the 1940s and 1950s, many of which welcomed foreign companies to build partnerships with domestic companies in order to enter the protected national markets.¹⁷

Dependency theorists responded that state policies, namely import-substitution policies, alone could not resolve the unequal development of Latin American economies. Rather, *dependistas* argued that these policies failed because the entire capitalist system structure disadvantaged peripheral countries in a center-periphery structure. Elites in the center and the periphery allied through multinational organizations. However, the multinational organizations that controlled technological transfers to Latin American companies proliferated unequal exchange despite the increased industrialization that these policies produced.¹⁸

Peter Evans famously argued that foreign capital through multinational companies combined with private enterprises and government intervention to form a particular model of Brazilian development called the "tri-pé," or Triple Alliance. His work advanced studies on development beyond the basic dependency model to address the incorporation of multinational

¹⁶ See Raúl Prebisch, "The Economic Development of Latin American and its Principal Problems," United Nations Department of Economic Affairs, 1950. The Argentinian economist Raúl Prebisch first articulated this argument in 1949 at the United Nations conference in Havana. ¹⁷ For example, Celso Furtado, *Formação economica do Brasil* (Rio de Janeiro: Fundo de Cultura, 1959) and *Desenvolvimento e subdesenvolvimento* (Rio de Janeiro: Fundo de Cultura, 1961). For a deeper discussion of Furtado's position, see Joseph Love, *Crafting the Third World : Theorizing Underdevelopment in Rumania and Brazil* (Stanford: Stanford University Press, 1996), chapter 10.

¹⁸ For a discussion of these policies, see Love, *Crafting the Third World*. See also, Ramón Grosfoguel, "Developmentalism, Modernity, and Dependency in Latin America," *Nepantla: Views from South*, vol. 1, no. 2 (2000). For dependency theories, Andre Gunder Frank, *Capitalism and Underdevelopment in Latin America: Historical Studies of Chile and Brazil*, (New York: Monthly Review Press, 1967); Fernando Henrique Cardoso and Faletto Enzo, *Dependency and Development in Latin America* (Berkeley: University of California Press, 1979).

corporations and the continued presence of foreign interests in domestic Brazilian development. This associated dependency was subtler and yet more pervasive than the original dependency models discussed by earlier dependency theorists because it addressed technological transfers' important place in Brazilian development schemes.¹⁹

Michael Barzelay's study of Proálcool closely follows Evan's analysis of development in Brazil. He argues that Proálcool is a classic example of the tri-pé development model driven by the military government's political strategy. Thus, state and multinationals enterprises in the economic sector coupled with weak political institutions "linking social groups, political elites, bureaucrats, and managers of state enterprises" to create a program driven by political-economic motivations for resource allocation.²⁰ Barzelay's detailed study of the national program explores the program's growth after the oil shocks through 1982. Proálcool directed extensive financial support to the sugar sector because of the military's political agenda to support private enterprise.

More recently, Marshall Eakin has claimed that Evans model was incomplete, rather development involved government, multinationals, private business, and an absence of technological innovation.²¹ Eakin's recent work on industrialization in Belo Horizonte argues that Brazil has developed a unique type of "tropical capitalism" driven by a quadruple alliance characterized by strong state intervention, political patronage, clientelism and family networks, and a pronounced *absence* of technological innovation. It would seem that such an assertion begs a reanalysis of Proálcool's development trajectory.

¹⁹ Peter Evans, *Dependent Development: The Alliance of Multinational, State, and Local Capital in Brazil* (Princeton: Princeton University Press, 1979).

²⁰ Barzelay, *The Politicized Market*, 9.

²¹ Marshall Eakin, *Tropical Capitalism: The Industrialization of Belo Horizonte, Brazil*, 1st ed. (New York: Palgrave, 2001), 3.

Similarly, recent economic histories have revised earlier criticisms of the state's involvement in national development instead claiming that the state played a necessary role in Brazilian development. In her study of the Brazilian mining industry, Gail Triner explains that the state's role was particularly important with products identified as public goods, the benefits of which individual producers could not completely capture (market externalities) but which still had broader public importance.²² The state stepped in when private firms were unable to capture these externalities that hindered the development of the larger economy-inhibited sector. In this respect, state-led industries and policies served to facilitate a market that would otherwise have never developed given the individual producer's market behavior. These more recent trends have clear application to the case of Brazilian alcohol production.

I argue that Proálcool does not follow Eakin's quadruple alliance model. Proálcool averted this particular type of development explicitly by involving domestic technological development in alcohol production. The program grew around innovation in alcohol production, both foreign and domestic, but the program took off first and foremost because of the opportunities connected with the development of the alcohol-fueled engine by the Aerospace Technology Center (CTA). The opportunity for a Brazilian made car running on an alcohol-fueled engine developed in Brazil was the height of modernization to government officials in a country where the public considered automobile production to be one of the country's greatest achievements in the 1960s.²³

²² Triner, *Mining and the State*, 5. Triner identifies the larger body of economic histories that are revisiting the state's role, noting the positive connection between state involvement and the industrial production, as the new institutional economic history, turning away from the more negative perspective on the state promoted by the "new economic history" circles of the 1990s and early 2000s. See also, footnote 3 above.

²³ Wolfe, Autos and Progress, 12; Barzelay, The Politicized Market, 80.

Other historians have previously asserted similar arguments about Proálcool although not in response to Eakin's work. Most notably, F. Joseph Demetrius argues that selection of certain technologies drove the program and that domestic innovation was an important factor in these decisions. Demetrius focuses on the politics of the technological choices made in Proálcool, particularly in favor of sugar-based alcohol production rather over other sources, along with the social and economic consequences of this selection.²⁴ He asserts, and I support the argument, that ethanol industry sparked homegrown innovations not only in ethanol production and distribution, but also in the automotive industry with the adaptation of the alcohol-fueled car.

Certainly, domestic alcohol technology was a central part of the program's expansion, but Demetrius' scope is too narrow. I posit that one cannot solely analyze Brazilian alcohol production through the small lens of the national program from 1975 to 1984. Rather, the program's objectives reflect deeper connections between alcohol production, the sugar industry, the state, and the national development agenda that began in the 1930s and intensified under the military dictatorship in the 1960s. In this model, the state increasingly invested in the modernization of the sugar industry to drive export-oriented growth and domestic consumption of alcohol to support the industry given the fluctuations of international sugar prices.

Recent studies within the new neo-institutional economic history school help explain the larger importance of the state in development and better situate my own argument on alcohol's political importance. In alcohol's case, the state reshaped the sector by incentivizing alcohol production despite the contrary market forces seemingly facing individual producers. This began after the Great Depression and continued, despite political disagreement, into the 1960s. However, unlike other sectors, such as Triner's mineral example, the government valued alcohol

²⁴ F. Joseph Demetrius, *Brazil's National Alcohol Program: Technology and Development in an Authoritarian Regime* (New York: Praeger, 1990), 2–4.

production less than private producers in the sugar sector in the late 1960s and early 1970s, who were critical to pushing government policy toward a larger alcohol incentive program.

Eakin and Evans are correct that much of Brazilian development involved technology transfers from foreign countries, and the sugar and alcohol sector are not exempt. Certainly domestic-based multinational companies involved in technology development surrounded the alcohol industry. For example, the second-largest domestic sugar equipment company, Zanini Equipamentos Pesados S/A, (majority owned and run by the Usina Santa Elisa owners, the Biagi family) developed a subsidiary turbine company, AKZ S/A, to produce a key part of advanced mechanized distillation equipment in 1976. The company was the first "tri-pé," multinational company in the interior of São Paulo.²⁵ Founded in collaboration with a German company, the partnership was built on technological transfers from the German to the Brazilian company.

However, my work nuances Eakin's hypothesis that Brazil has industrialized entirely dependent upon the importation of foreign technology. The domestic development of the ethanol technology was a key part of the military government's unwavering commitment to the program despite its costs. Like Triner's example, the larger value of alcohol production, economic in theory even if politically driven, drove government officials' support of the program. Furthermore, domestic producers remained handily in control of the market, which further controverts Evans' assertion about the development path associated with industrial growth in Brazil.

Thus, while Eakin's quadruple alliance does apply to aspects of sugar's development in Brazil, it draws the question – what about *agro-industrial development* in Brazil? Sugar and alcohol's milling and distilling requirements open up distinct industrial qualities. As historian

²⁵ Geraldo Hasse, *Filhos do fogo: memória industrial de Sertãozinho, 1896–1996* (Ribeirão Preto, SP: Editora Céu e Terra, 1996), 156.

John Soluri notes, coffee and sugar have long had more extensive post-harvest processing than other mass export agricultural products like bananas and oranges.²⁶ Certainly, the sugar industry's growth contravenes other international agricultural exports. On the one hand, Brazil deeply diversified its sugarcane uses, expanding its industrial use as a synthetic chemical base in addition to food and beverage processing which were more traditional extensions of sugarcane uses in the US in the 20th century as well. Of these, alcohol for fuel was one of the most innovative uses. At the same time, the Brazilian model differs from other agro-industrial models because of domestic producers control of the industry by the mid-20th century contrary to examples like banana production in Central America where multinational companies like the United Fruit Company controlled banana production.²⁷

Even amongst major sugar producers, the Brazilian model differs from its fellow competitors. The advanced use of alcohol both an industrial input and an alcohol-fuel along with the extensive domestic sugar equipment industries that emerged around the sugar sector varies significantly from the Cuban sugar industry. Until the Cuban Revolution, the country's special relationship with the US favored Cuban sugar exports in ways that did not encourage sugar

²⁶ Soluri notes that coffee requires the removal of the fruit pulp before storing the coffee "bean" and later roasting it while sugarcane requires rapid transport of cut cane to large mills for the rapid extraction of cane juice in order to maximize the sucrose content before later refining cane into white, granular sugar. John Soluri, Banana Cultures: Agriculture, Consumption, and Environmental Change in Honduras and the United States (Austin: University of Texas Press, 2006), 226. See also, Warren Dean, The Industrialization of São Paulo, 1880-1945 (Austin: University of Texas Press, 1969); Peter Eisenberg, The Sugar Industry in Pernambuco: Modernization Without Change, 1840–1910 (Los Angeles: University of California Press, 1974). ²⁷ Piero Gleijeses, Shattered Hope: The Guatemalan Revolution and the United States, 1944– 1954 (Princeton, N.J.: Princeton University Press, 1991); Thomas O'Brien, The Revolutionary Mission: American Enterprise in Latin America, 1900–1945 (Cambridge: Cambridge University Press, 1999); Catherine LeGrand, "Living in Macondo: Economy and Culture in a United Fruit Company Banana Enclave in Colombia," in Close Encounters of Empire: Writing the Cultural History of U.S.-Latin American Relations, ed. Gilbert M. Joseph, Catherine LeGrand, and Ricardo D. Salvatore (Durham: Duke University Press, 1998), 333-368; Soluri, Banana Cultures.

diversification as Brazil's limited hold on sugar exports did in the 1930s and thereafter. After the Cuban Revolution, without a similar growth in car production and domestic processed food production, sugar exports would remain the primary export without industrialization similar to Brazil. Thus, the history of sugar and alcohol production in Brazil explores a particular agro-industrial model not easily followed in other countries.²⁸

This dissertation explores the implications of ethanol production as a unique form of agro-industrialization that developed both agriculture and industrial production in the interior through the lens of Ribeirão Preto. Recent studies on the Brazilian state and development have focused not only on how unique development initiatives are across countries but also in specific regions.²⁹ The conditions that allow for successful economic development exist across regional areas within national borders as much as the international borders traditionally assessed in development studies. In his study of Minas Gerais, Eakin draws attention to secondary markets where state-level government intervention was more important in order to promote industrial growth in smaller, less favored markets.³⁰ My work on Proálcool in Ribeirão Preto presents a sort of tertiary development case in which agricultural industrialization, rather than the typical

²⁸ One should note that neither was São Paulo's agro-industrial model easily replicated within Brazil. The Northeast was the traditional sugar-producing region of Brazil until the mid-20th century. Although tangentially discussed below, the Northeastern sugar industry did not follow the same agro-industrial model that the state of São Paulo did. However, the Northeastern case is beyond the scope of this study.

²⁹ For example, economic historian Wilson Cano has led studies on the regional development, looking at the different paths of development between states within the more developed center south region (São Paulo, Rio de Janeiro, Minas Gerais, Espirito Santo) and a deeper analysis of São Paulo's regional dominance behind its industrial growth. Wilson Cano, *Ensaios sobre a formação econômica regional do Brasil* (Campinas, SP: Editora da UNICAMP, 2002); Cano, *Raízes da concentração industrial em São Paulo* (Campinas: Instituto de Economia, UNICAMP, 1998).

³⁰ Eakin, Tropical Capitalism, 173–175.

industrial processes, takes on unique forms in a secondary region within an already industrialized market.³¹

This dissertation provides an example of the complex development of the sugar industry that led to the National Alcohol Program's development with a focus on the Biagi-owned Santa Elisa mill in Ribeirão Preto. There is already a strong body of literature both on the sugar and the alcohol industry. However, many of the earlier studies have focused on the national politics and policies implemented in the sugar sector.³² Those that have looked at the regional impact of the sugar industry's growth have not followed a specific mill as closely.³³ The few studies that have brought this detailed level of study on the Usina Santa Elisa in Ribeirão Preto have not incorporated the same level of national policy analysis necessary to address the program's intricate national and regional implications.³⁴ A closer examination of the Ribeirão Preto region,

³¹ Barbara Nunberg discusses the unique emergence of the agro-industry with the military government's development model. She notes that, "the increased penetration by capitalist development into agriculture has blurred the traditional divisions between once-autonomous economic sectors typical of the so-called 'dual' economy. Primary, secondary and tertiary sectors tended to merge under the aegis of large agro-business." Nunberg, "State Intervention," 28.

Like Eakin, Gail Triner also explores non-fuel mineral state-development initiatives in Minas Gerais. As such, my study of the sugar sector and its connection to agro-industrial renewable fuel production unique, but Triner's study introduces important themes about state-development that overlap with this study in valuable ways. See Triner, *Mining and the State*, particularly chapter 6.

³² Szmerscányi, *O planejamento*; Nunberg, "State Intervention in the Sugar Sector in Brazil," Maria Helena de Castro Santos. "Alcohol as Fuel in Brazil: An Energy Policy Analysis" (PhD diss., Massachusetts Institute of Technology, 1984). More recently, Dias de Moraes, *A desregulamentação*.

³³ Pedro Ramos focuses on the growth of larger usinas in both Pernambuco and São Paulo, but his analysis does not introduce the detailed account of the Biagi's leadership and the growth of the Usina Santa Elisa that my own work does. Pedro Ramos, *Agroindústria canavieira e propriedade fundiária no Brasil* (São Paulo: Editora Hucitec, 1999).

³⁴ For example, Geraldo Hasse provides a detailed account of the sugar sector's growth in Sertãozinho without the national analysis. Adriano Santos quickly addresses the industrial development of Sertãozinho as well but rather briefly with a greater focus on the 1990s after Proalcool was dismantled. Amanda Hartzmark's work does provide this detailed analysis that connects national policy and regional growth but focuses far more on the corporatist nature of

through a focus on the Usina Santa Elisa, reveals the multiple actors and groups involved in the transformations that occurred in the program's growth. My dissertation moves beyond the national politics of the program's development to analyze the program's direct impact on economic, political, and social relations in the region.

I argue that certain individual and group actors were able to influence the program's growth because of their strategic position in the alcohol industry. For example, paulista sugar and alcohol producers were increasingly aware of the government's commitment to alcohol production due to its technological accolades, which they leveraged into the program's initial development in 1975 and its expansion in 1979. I specifically look at the Biagi family, owners of the Usina Santa Elisa, the largest sugar and alcohol producing sugar-alcohol complexes in the country, and Zanini, the second-largest domestic sugar equipment company in the country. Maurilio Biagi, Maurilio Biagi Filho, and Luiz Lacerda Biagi held important sway in the program's development and were major benefactors of the program's expansion.

At the same time that these producers' reshaped the region around alcohol production, rural laborers were also able to engage the program's national importance to insert their own position on the program into public debate. By strategically leading strikes at the beginning of sugar harvests in 1984 and 1985, I argue that rural workers in the region put pressure on sugar producers and fed growing doubt that the program would be able to meet national production objectives. Their mobilization, known as the Guariba strikes, forcefully reinserted a neglected but critical group of program participants into the development discussion. This position

the IAA and addresses Proálcool in summary of the trends she had already proposed rather than a new intervention in the sugar industry. Additionally, Hartzmark focuses less on Ribeirão Preto than she does Piracicaba's development. Hasse, *Filhos do Fogo*; Adriano Pereira Santos, *A usinagem do capital e o desmonte do trabalho: reestruturação produtiva nos anos de 1990, o caso da Zanini S/A de Sertãozinho-SP* (São Paulo: Editora Expressão Popular, 2010); Hartzmark, "Businesses, Associations, and Regions."

provides an important counterpoint to broader to development debates about international, non-Western state-led development programs.

Scholars have addressed Proálcool's connection to the military dictatorship's own support of capitalist development under the bureaucratic-authoritarian model. Demetrius specifically ties Proálcool to the bureaucratic authoritarian dictatorship model that Guillermo O'Donnell famously presented in 1973. Demetrius argues that his consideration of the regime's technological focus, a key component of O'Donnell's bureaucratic authoritarian dictatorship's development agenda ties the political regime to the program more explicitly than his contemporaries.³⁵ O'Donnell argued that the bureaucratic-authoritarian regime guaranteed political stability to encourage foreign investment for capital growth. Demetrius' structural analysis of the program supports O'Donnell's assumption that the regime successfully diminished internal political and economic divisions within the government as well. However, while the bureaucratic authoritarian military dictatorship focused on development, its internal divisions were far more defined than O'Donnell gave credit in his own summation of the new government structure.³⁶

³⁵ Demetrius, *Brazil's National Alcohol Program*, 4.

³⁶ Guillermo O'Donnell, *Modernization and Bureaucratic-Authoritarianism: Studies in South American Politics* (Berkeley: Berkeley: University of California Institute of International Studies, 1973). Good revisions, expansions, and counterpoints include: David Collier, ed. *The New Authoritarianism in Latin America* (Princeton: Princeton University Press, 1979); Alfred Stepan, *Rethinking Military Politics: Brazil and the Southern Cone* (Princeton: Princeton University Press, 1988) and Thomas E. Skidmore, *The Politics of Military Rule in Brazil, 1964– 1985* (New York: Oxford University Press, 1990). The summation of O'Donnell's argument is based on the condensed version presented by David Collier in "The Bureaucratic-Authoritarian Model," in *The New Authoritarianism in Latin America*, 19–32.

Proálcool became a public battleground for these internal divisions.³⁷ The ethanol program revealed deep divisions between government officials in the shaping of the development program. For example, while some officials remained enthusiastic about the program's nationalist implications, most importantly President Ernesto Geisel himself, others, like IAA President Tavares Carmo and Minister of Mines and Energy Shigeaki Ueki, found the necessary sugar industry's expansion to be more problematic. Representatives from the country's financial institutions also resisted the program's implementation. The program expanded despite these internal political divisions in part because of the strong-hand of President Geisel but also because of the strong position sugarcane producers like the Biagis had in promoting alcohol production in the midst of the first international energy crisis in 1974 and the second oil crisis in late 1979.

While the program rather publicly unveiled divisions within the government about the program's objectives, it was clearly a policy-driven undertaking that grew counter to neoclassical market logic. Indeed, Proálcool was a top-down state-led intervention imposed on the Brazilian market, which was perhaps only possible under a military dictatorship. James Scott famously explored failed top-down development programs of the 20th century. He focuses on high-modernist development schemes meaning state-imposed projects that strongly support the western faith in scientific and technical progress. Following a variety of failed schemes from Russia to Tanzania, Scott argues that these top-down modernization programs were highly unsuccessful because they excluded non-Western cultural knowledge.³⁸ Certainly, Proálcool

³⁷ This is a fundamental point in Barzelay's own argument about the political influence on decision-making that contributed to the program's failure while Santos argues that the fragmented decision-making process in which Proálcool emerged still managed to be successful despite the conflict. Barzelay, *Politicize Market*, 4–7; Santos, "Alcohol as Fuel," 501. ³⁸ James Scott, *Seeing Like a State*, 7. While Scott included the democratically elected Brazilian

President Juscelino Kubitschek's establishment of the new, "modern" capital city of Brasília, he also explored the Russian and Tanzanian agricultural modernization projects. Both of the latter

could fit into this framework at first sight. The authoritarian government was the central force behind the top-down program's implementation. Although the program grew substantially in its first decade but received a great deal of criticism in the late 1980s after the end of the dictatorship. Yet, a booming ethanol industry today indicates that the program was not a complete failure.

My closer look at the program deconstructs general interpretations of the program as a costly failure or a striking success, challenging Scott's simplification of state-led development programs. This perspective contributes to other convincing critiques of Scott's argument, particularly in the case of Latin America.³⁹ In the case of Proálcool, collective sugar producers from the state of São Paulo and individual producers from Ribeirão Preto were able to force the authoritarian government's hand with important political and economic connections as well as the cooptation of the nationalist rhetoric that anchored the program in the 1970s and 1980s. At the same time, sugarcane producers' legalized exploitation of rural workers drove strikes that

were explicit failures in part because the government. The ballooning debt produced by the Brazilian project contributed to the conditions that fomented the Brazilian military's coup in April 1964.

Beyond James Scott's critique in Seeing Like a State, a large anthropological literature has also grown on development projects and the failures of cookie-cutter development projects. For example, see Emery Roe, "Development Narratives, Or Making the Best of Blueprint Development," in The Anthropology of Development and Globalization: From Classical Political Economy to Contemporary Neoliberalism, ed. Marc Edelman and Angelique Haugerud (Malden, Mass: Wiley-Blackwell, 2004), 313-316; Frederick Cooper and Randall Packard, "The History and Politics of Development Knowledge," in The Anthropology of Development and Globalization: From Classical Political Economy to Contemporary Neoliberalism, ed. Marc Edelman and Angelique Haugerud (Malden, Mass: Wiley-Blackwell, 2004). ³⁹ First and foremost, this includes Fernando Coronil, "Smelling Like a Market," *The American* Historical Review 106, 1 (Feb., 2001): 119–129. He fundamentally challenges Scott's implication that all large-scale state programs failed. This was certainly not the case in his example of Venezuela. Much like Venezuela during the oil boom, a unified state did not proctor Proálcool but rather divided interests behind the veil of a unified military government. My work follows Coronil's assertation that the simple explanation of these state programs as successes or failures requires a deeper discussion.

unwound the increasingly weak rhetoric of the program in the face of a growing national economic crisis, which the program was not able to solve. Thus, my work questions single narratives of the program, the national government, development, capitalism, and modernity in this period.

My focus on Ribeirão Preto illustrates many of the messy, on-the-ground details that get left out of analysis of state-development projects. For example, sugar and alcohol production in Ribeirão Preto expanded prior to Proálcool because of individual entrepreneurs like the Biagi family. Their actions shaped government action and the program's growth thereafter. Despite heavy propaganda from these producers throughout the first decade of the program, the costs of the program and its impact continued to draw questions from economic and political analysts. The social issues were most often swept under the rug of job expansion and disregarded.⁴⁰ And yet, the 1984 rural workers' strikes in Ribeirão Preto helped reshape debate about the national program despite government and entrepreneurial propaganda about the need for and success of the ethanol industry.

Proálcool has received a great deal of attention within Brazilian social histories on rural workers. In fact, this literature emerged in tandem with the program's growth in the 1970s. Maria Conceição D'Incao was one of the most important researchers in this field. Her work on temporary workers' living and working conditions began before the Guariba strikes and she was often a special analyst for popular news sources during and after the strikes in 1984.⁴¹ More recently, Maria Aparecida de Moraes Silva has expanded much of the work that D'Incao had

⁴⁰ This argument is not unique. For a point of comparison, Soluri notes the similar multinational companies produced in defense of their banana export industries in Central America as well. Soluri, *Banana Cultures*, 4.

⁴¹ Maria Conceição D'Incao e Mello, *O bóia-fria: acumulação e miséria* (Petrópolis: Editora Vozes, 1975); Interview with Maria Conceição D'Incao, "Despertar do bóia-fria", Emanuel Neri, *Veja* 821 (May 30th, 1984), 3–6.

begun with an even deeper analysis of temporary rural workers' experience in the Ribeirão Preto region from the 1950s through the end of the 20th century.⁴² Clifford Welch's groundbreaking study of rural labor movements in the Ribeirão Preto region addressed the connections between mobilization efforts from 1920 to 1964 before the military dictatorship to the Guariba strikes.⁴³

In my own research, the connection between the formation of the ethanol industry under the military dictatorship, the state of São Paulo, and rural workers is important to understanding the impact of Proálcool on the region of Ribeirão Preto. While other studies have made meaningful contributions to historiography by presenting workers' perspectives on the strikes, my work diverges from this approach. Instead, I focus my analysis on the strikes' impact on the public debate about the program immediately thereafter.

Using limited oral interviews and various print and television news sources, my work attempts to reengage the meaning of the strikes to public debate about the program. Ribeirão Preto became an important national symbol connected to the image of Proálcool's success. The strikes in the heart of the successful sugar and alcohol region had a particularly important influence on public debate given regional producers' importance in the program's execution and promotion. The workers' strikes forced sugar producers to change some employment and work policies immediately, but it had a broader influence on public perception as well.

I build this approach on Oliver Dinius's own interpretation of industrial workers' strikes in Brazil's national steel industry in the 1950s. Dinius' history of the national steel company ties

⁴² Maria Aparecida de Moraes Silva, *Errantes do fim do século* (São Paulo: Fundação Editora da UNESP, 1999).

⁴³ Clifford Welch, *The Seed Was Planted: The São Paulo Roots of Brazil's Rural Labor Movement, 1924–1964* (University Park, Pa.: Penn State University Press, 1999), 1–12. More recently, Welch released his first edition in Portuguese, which extends his analysis of Guariba and rural labor movement. Clifford Andrew Welch, *A semente foi plantada: as raízes paulistas do movimento sindical camponês no Brasil, 1924–1964* 1st edição (São Paulo: Editora Expressão Popular).

the power of labor into the development of the state capitalist industry, highlighting how important the image of the state-led project was to the government as a beacon of the successful advancement of the country's industrialization efforts.⁴⁴ Connecting industrial workers influence to sugarcane field workers strikes for survival and basic wages may seem idyllic. However, their actions had a direct impact on an agro-industrial development program not unlike the developmentalist steel project of the 1940s and 1950s that Dinius addresses. As such, the unique development path followed by the sugar industry, analyzed in this dissertation, gives this parallel credence. Such a perspective makes new contributions to an expanding body of 20th century Brazilian rural labor historiography.

Ribeirão Preto is unique because it combines industrialized agriculture with modern technologies of industrial sugar refining, ethanol distillation, and the automotive industry. Here, agro-industry took a more amplified form around the sugar sector. While Nunberg describes agro-industrial firms as those in which, "Indeed, under the umbrella of agro-industrial firms, it is not uncommon to find activities that deal with cultivation, industrial processing, and commercialization of a given agricultural commodity."⁴⁵ Fields and factories come together in ways that are perhaps not replicated in any other sector: this not only rescues sugar production from the historical narrative of slavery and economic backwardness, but powerfully connects it to the most modern of industries, the automotive, but it also has the, dare one call it postmodern, advantage to align itself with concerns to protect the environment.

 ⁴⁴ Oliver Dinius, *Brazil's Steel City: Developmentalism, Strategic Power, and Industrial Relations in Volta Redonda, 1941–1964* (Stanford University Press, 2010), 1–9.
 ⁴⁵ Nunberg, "State Intervention," 28. Coffee might be the more traditional example, but Soluri introduces bananas as a less processing-intensive agro-industry. Mauricio Font, *Coffee and Transformation in São Paulo, Brazil* (Lanham, Md.: Lexington Books, 2012); Soluri, *Banana Cultures*.

Where scholars once discussed food and fuel debates in the 1970s, recently, scholars have connected the environmental impact of the sugar sector's expansion to more specific social conflicts within the country.⁴⁶ For example, Thomas Rogers' recent study of cane agriculture and repressive labor regimes of the Northeast connects the environment to larger planter and laborer discourses that weave socially constructed power dynamics into their very understanding of the landscape.⁴⁷ These environmental changes, he shows, had important social implications on workers and drove the way that workers' protested exploitative worker legislation with the use of cane burnings, a traditional form of protest used by sugarcane workers in both Brazil and Cuba in the 20th century.⁴⁸

My own work connects the political and economic realities of the Proálcool program's implementation to the environmental transformations of Ribeirão Preto. While debates over Proálcool's longevity increased, workers' strikes reintroduced not only the plight of workers but also the environmental impact of the program into public debate. Some critics, like Fernando Homem de Mello, had been outspoken critics of the program long before the strikes began, but public news sources began to engage these impacts more in television reports thereafter.⁴⁹ As such, like Rogers' example in the Northeast, the environment influenced public discourse in new ways thanks to the Guariba strikes. While I simply address the massive land cooptation involved in Proálcool's expansion, the connection between the environment, policy and industrial

⁴⁶ For example, Lester Brown, "The Future of the Automobile in an Oil-short World," *WorldWatch Paper* 32 (September 1979), and Brown et al, "Food or Fuel: New Competition for the World's Cropland," *WorldWatch Paper* 35 (March 1980), World Watch Institute.
⁴⁷ Thomas D. Rogers, *The Deepest Wounds: A Labor and Environmental History of Sugar in*

Northeast Brazil (The University of North Carolina Press, 2010), 8–13.

⁴⁸ Rogers, *The Deepest Wounds*, 1–8; see also, McGillivray, *Blazing Cane*.

⁴⁹ For example, Fernando Homem de Melo, "O álcool é nosso, mas quem paga o desperdício," *Folha de São Paulo* (May 15th, 1983).

expansion remained an aspect of the program's praise and thus its eventual shift in public perception. Ribeirão Preto's was a central platform for these transformations.

Chapter 1:



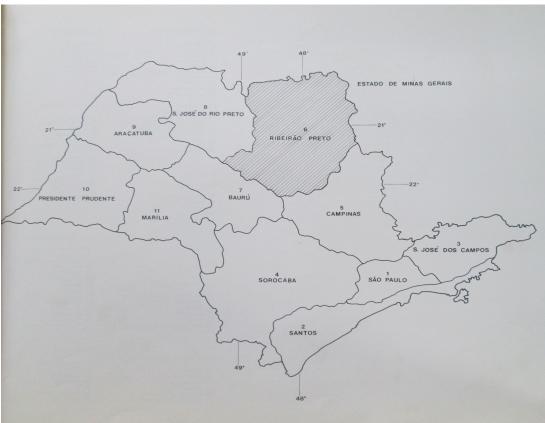


Figure 1: Map of Ribeirão Preto

Source: Secretaria de Economia e Planejamento do Estado de São Paulo, *Plano Regional de Ribeirão Preto, 1978*, trabalho elaborado pela PROPLASA (São Paulo, December 1978).

Once a backwater province in the imperial period, the state of São Paulo's economic and political influence expanded rapidly with the emergence of coffee production in the mid-19th century. The flat high plains and hills and fertile soils leant themselves well to coffee production, processing, and distribution. Coffee plantation owners soon established large coffee estates in São Paulo's vast interior. The city of São Paulo became a railroad hub for coffee from the state's interior on its way to the states major coastal port, Santos. Authorities organized the coffee producing regions of the interior into municipalities in the late 19th century dividing the province into distinct sub-regions.

The Northeastern region of the state emerged as a dominant coffee-producing region after 1860. Located more than 500 km from the port of Santos, the region's first settlers came from the neighboring province of Minas Gerais after the end of the gold mining boom in the early 19th century. Coffee entered the region in the mid-19th century and quickly expanded as word of the regions' infamous red soil spread. The soil is particularly rich in oxides, which give the soil a red color, and these characteristics are well suited to the growth of coffee trees.¹

Once covered by the dominating Atlantic Forest so eloquently described by Warren Dean, the region is a plane of agriculturally blessed land with rolling hills and favorable rainfall. Known for its heat, rarely does it fall below 50 degrees Fahrenheit even on its coldest days and a day in the 90s is quite common. Settlers in the 1800s would have seen dense forest trees covering the Ribeirão Preto region. Prior to the coffee boom, migrants from the neighboring state of Minas Gerais dominated the region's livestock-producing population. However, this tropical environment, with its sundried red soil and warm climate, made for the perfect coffee fields in the 19th century, after Luís Pereira Barreto introduced "bourbon" coffee in the region in 1876.²

Ribeirão Preto quickly became the most productive coffee region in the state, then the country, and finally the world. Also known as the Alta Mogiana because of the planter-financed railroad company that reached the region in 1883, Ribeirão Preto became the "most important coffee-growing area in the world in the late nineteenth century and early twentieth" behind the massive production of "coffee kings" like Henrique Dumont, Francisco Schmidt, and Geremia

¹ Hasse, *Filhos do Fogo*, 25. The red soil is found in only three places in the country: Northeast São Paulo, Northeast Parana, and Northern Tocatins.

² Osmani Emboaba, *História da fundação de Ribeirão Preto* (São Paulo: "IMAG" Gráfica Editora, 1990 (1955)), 15n5.

Lunardelli.³ These three coffee producers contributed to Ribeirão Preto's swift rise. The region accounted for over 40-50% of world coffee production in 1909, while Brazil as a whole accounted for 80% of the world market share.⁴

As the region's fame spread, the municipality transformed. Coffee planters came to rely on immigrant labor over slave labor thanks to the state government of São Paulo's support of imported labor. Predominantly Italian immigrants came as *colonatos*, or indentured field workers, along with new migrants from other regions, expanding the full municipality's population from 3,000 in 1869 to 12,033 in 1890 to 59,195 in 1900.⁵ The municipality of Ribeirão Preto, officially established in 1871, quickly spawned additional municipalities in the region from the coffee plantations that surrounded it. Important municipalities like the Sertãozinho (1896) and Cravinhos (1897) grew around the city, transforming Ribeirão Preto into the region's administrative center.

Coffee production in São Paulo was the foundation of the state's economic dominance under the First Republic, behind which paulista coffee planters won particularly large national political influence. Expanding railroads to appease the growing coffee industry allowed the state

³ James Woodard, *A Place in Politics: São Paulo, Brazil, from Seigneurial Republicanism to Regionalist Revolt* (Duke University Press, 2009), 19–23; Murilo Pinheiro et al, *Ribeirão Preto* (Ribeirão Preto: MIC Editorial Ltda, 1996), 20. See also, Ida Pizzoli Marchesi, *João Marchesi: História de um imigrante* (Ribeirão Preto: Editora Colégio, 1987), 19–20; Luciana Suarez Lopes, *Ribeirão Preto a dinâmica da economia cafeeira de 1870 a 1930* (Ribeirão Preto: Fundação Instituto do Livro, 2011), 7–15. Today the macro-region of Ribeirão Preto includes over 80 municipalities surrounding the city of Ribeirão Preto, which is far more expansive than the Alta Mogiana.

⁴ Steven Topik, *Political Economy of the Brazilian State, 1889–1930*, 1st edition (Austin: University of Texas Press, 1987), 89–92.

⁵ Thomas Walker, "From Coronelismo to Populism: The Evolution of Politics in a Brazilian Municipality, Ribeirão Preto, São Paulo, 1910–1960" (PhD, The University of New Mexico, 1974), 44.

to industrialize at a faster pace with more efficient access from the interior to the capitol and the coast than other regions of the country.

While its agricultural wealth expanded, Ribeirão Preto held the state's electoral seat for the region, expanding the city's political importance during the First Republic (1889-1930). Regional banks emerged for coffee planters to invest their growing wealth in the late 1890s and early 1900s.⁶ Historian Thomas Walker noted that the city's economic boom fed a vibrant nightlife and opulent "cultural sophistication and diversity" earned Ribeirão Preto the reputation as the "petit Paris" of Brazil.⁷

Year	1912	1920	1940	1950	1960
Rural	39,488	Missing	31,766	28,848	13,565
Urban	18,732	Missing	48,017	63,312	116,153
Total People	58,220	68,838	79,793	92,160	129,718

Table 1: Ribeirão Preto Municipality's Population Growth, 1912–1960Source: Walker, "From Coronelismo to Populism," 54. Table 5.

Ribeirão Preto's political and economic importance grew with coffee's success and declined when the boom faded. However, some planters reinvested the wealth from coffee exports in regional industrial development, which helped the local economy better weather hard times. By 1912, the city's population, not to be confused with the larger municipalities' population, had grown to 18,732 inhabitants and was an important center not only for coffee planters but also for *colonatos* to gather, share ideas, and mobilize.⁸ The municipality as a whole

⁶ Anne Hanley, *Native Capital: Financial Institutions and Economic Development in São Paulo, Brazil, 1850–1920* (Stanford: Stanford University Press, 2005), Chapter 6.

⁷ Walker, "From Coronelismo to Populism," 44–46.

⁸ For more on the growth of financial institutions in Ribeirão Preto in the late 19th and early 20th century, see Hanley, *Native Capital*, 164–165; for more on Ribeirão Preto as hub for labor unrest in the 1910s, see Clifford A. Welch, *A semente foi plantada: as raízes paulistas do movimento sindical campones no Brasil, 1924–1964* (São Paulo: Editora Expressão Popular, 2010), 58–64.

reached a population 68,838 by 1920, as "commercial, industrial, and liberal professions" grew around the coffee industry.⁹ The municipality was thus able to transform its economic importance into political influence in state and national politics.

São Paulo was the motor that drove the Brazilian economy with paulista political interests in the driver's seat during the First Republic. Winston Fritsch succinctly notes the connection between paulista coffee interests and national politics, stating, "the Executive [President] always had to be predisposed to support the coffee valorization programs."¹⁰ During the First Republic, most federal finance ministers hailed from São Paulo because of the favored position the state held in the national economy. The republican constitution gave São Paulo a great deal of financial independence, including autonomous control over state tax revenues and the ability to contract foreign loans. Thus, behind its important coffee production, São Paulo

As one would expect, Ribeirãopretano politicians acted aggressively to protect coffee interests, and they were among the most vocal proponents of state and later national coffee support.¹² The First World War had a particularly harsh regional impact as coffee prices dipped. When the hotly contested presidential election of 1929 arrived, Ribeirão Preto unanimously supported the paulista candidate, Júlio Prestes. Ribeiraopretanos, along with other coffee interests, generally believed that Prestes, the former São Paulo governor, would protect paulista coffee interests in the midst of coffee's collapse.

⁹ Walker, "From Coronelismo to Populism," 92.

¹⁰ Winston Fritsch, "Apogeu e crise na Primeira República: 1900–1930," *A ordem do progresso: cem anos de política economica republican, 1889–1989*, org. Marcelo de Paiva Abreu (Rio de Janeiro: Campus, 1989), 32.

¹¹ Joseph L. Love, *São Paulo in the Brazilian Federation*, 1889–1937 (Stanford: Stanford University, 1980), Chapter 8.

¹² Walker, "From Coronelismo to Populism," 81.

Coffee planters believed the 1930 election to be critical to defending their interests.

Prestes, too, had been a governor of São Paulo and his candidacy created a rift in the Coffee with Milk alliance that had rotated the presidential office with some regularity between politicians of Minas Gerais and São Paulo. Paulista coffee interests believed that Prestes' opponent, Getúlio Vargas, who hailed from Brazil's southern-most state Rio Grande do Sul, would not act in favor of their interests. So strong were Ribeiraopretanos' convictions about Prestes' candidacy, that the Ribeirãopretano-native Secretary of the Interior for the State of São Paulo Fábio de Sá Barreto illegally financed his campaign with great support from his constituents.¹³

Paulistas believed the clashing interests involved in this election to be critical to the future of the state's economic and political power, and they were right. In fact, the election dramatically reshaped national politics and São Paulo's political place within that structure for decades to come. During the First Republic, São Paulo and Minas Gerais dominated national politics with the "Politics of the Governors," in which national presidents mostly rotated between mineiro and paulista governors from 1898 to 1929.¹⁴ In 1930, Luís Prestes, a paulista and official candidate of fellow paulista President Washington Luiz, won the election, breaking the political rotation. In response, Getúlio Vargas, the Rio Grande do Sul candidate and the designated non-paulista candidate, mobilized a coalition of armed forces from Paraná, Rio Grande do Sul, and Santa Catarina to march on Rio de Janeiro that unseated Washington Luiz.

After his successful revolt, known as the "Revolution of 1930," Vargas established his new provisional government and substantially restructured the federal government, centralizing power around him. Many of Vargas' former paulista supporters were quickly disappointed with

¹³ Walker, "From Coronelismo to Populism," 113–114.

¹⁴ Marshall Eakin, *Tropical Capitalism*, 27. This "Politics of the Governors" is also known as the "cream and coffee alliance," in reference to coffee production in São Paulo and dairy production in Minas Gerais.

his failure to gain charge of São Paulo politics upon his ascension to power in addition to his focus on the economic crisis over their political interests.¹⁵ These efforts stripped paulistas of the autonomous position they had held under the First Republic. As coffee continued to decline, Vargas' actions further ostracized paulista elites with dramatic outcomes in the 1930s. The region's political power that had been so tied to its political affluence diminished. In coffee's stead, sugarcane interests slowly expanded.

Sugarcane and its Byproducts: Industrial Processing from the First

Before exploring the expansion of sugar interests in Ribeirão Preto, São Paulo, a broader explanation of sugarcane production deserves brief discussion, as it will shape the rest of this study. Introduced into Brazil in the 16th century, sugarcane was the central export earner in the Brazilian colonial era until the 19th century. Sugarcane is a raw material for sugar and multiple sub-products like molasses, alcohol (for fuel), aguardente, fermentation, cellulose, protein for rations, fertilizer, and more.¹⁶

Sugar must be processed upon cutting in order to transform from cane extract into the traditional sugar products to which we are accustomed. The basic process involves a "series of liquid-solid operations," involving heating and cooling to turn granulize the sugar.¹⁷ It requires processing technology with an industrial infrastructure to transform the cane into table sugar for domestic or foreign consumption.¹⁸ In the 19th century, this process required around the clock

¹⁵ Thomas Skidmore, *Politics in Brazil, 1930–1964: An Experiment in Democracy* (New York: Oxford University Press, 1967), 3–7; Love, *São Paulo in the Brazilian Federation*, 119.

¹⁶ Szmrecsányi, *O planejamento*, 41–53.

¹⁷ Mintz, Sugar and Power, 22.

¹⁸ Stuart Schwartz, *Sugar Plantations in the Formation of Brazilian Society: Reconcavo, Bahia, 1550–1835* (Cambridge: Cambridge University Press, 1985), 106. As Schwartz noted of the 19th century sugar industry, "the combination of agriculture and processing necessary to make sugar

work with field tasks performed in the day and mill grinding through the night. However, modern usinas of the 20th century consolidated these processes and increasingly mechanized the milling process. This left the most intense labor for the field tasks, including the clearing of fields, planting, weeding, and cutting the cane.

Planting practices elongate sugar's productivity. In Brazil, there are generally two harvests per year. In the south, the harvest begins in mid-May and ends October or November. Conversely, in the Northeast, the harvest extends from September to April approximately.¹⁹ The North and South have different planting seasons as well. In São Paulo, there are two planting seasons, the first from January through March and the second from September through October.²⁰ Upon planting, sugar generally requires nine to eighteen months to mature.²¹ Sugarcane farmers also use a harvesting method known as rationing to extend harvests. Ratooning leaves the roots and lower parts of the sugarcane stalk uncut, which then produce new ratoon, or stubble, crop that matures earlier in the season. Producers would arrange the planting in the fields in a way that would allow the newly planted and ratoon cane to mature in succession, "thus allowing for consecutive cutting and a steady flow of cane to the rollers of the mill."²² Such planting structures permitted for year-round labor despite the fact that producers needed manual laborers more intensely during the short harvest periods. Furthermore, given the

made each engenho [small mill] a factory in the field and gave the mills a distinctive industrial character. The inputs of capital, technology, and labor made engenhos costly and large estates by contemporary standards, and the complexity of the operations made them peculiarly 'modern.'"

 ¹⁹ Schwartz, Sugar Plantations, 100–104; Léo da Rocha Lima and Aluizio de Abreu Marcondes, Álcool carburante: uma estratégia brasileira (Curitiba: Editora UFPR, 2002), 40.
 ²⁰ Lima and Marcondes, Álcool carburante, 42.

²¹ Mintz, Sweetness and Power, 21.

²² Schwartz, *Sugar Plantations*, 110. Ratooning produces less sucrose than the original planting in each harvest.

climate and rich soil in the Ribeirão Preto region, these seasons often begin even earlier in May and extended well into December.

From cutting to processing, sugarcane has a short shelf life. Cane has to be delivered to sugar mills for processing within days of cutting to capture its sucrose content before it goes bad.²³ This process requires an intense labor force, once slaves and later sharecroppers and wage laborers, to cut and collect cane.²⁴ Field workers cut and remove cane stalks upon maturation. To speed up the process, cane producers employed cane burning, in which they used controlled burns of the stalks before cutting. This does not damage the sucrose content, but producers and workers have to coordinate "the burning, collection, and crushing [of cane] to avoid the deterioration of cane."²⁵

Following the cutting process, the cane arrives at the mill for processing. First, the cane is cleaned to reduce impurities from the field. Thereafter, the juice and excess bagasse (bagaço) are extracted through the crushing of the sugarcane. It is in the period that mill owners have to select which sugar product they will produce, as each has different production requirements. After juice extraction, the juice is concentrated until sucrose crystallization to produce table sugar (white and brown sugar depending on how refined this processing is). The remaining molasses would be left for other sugar byproducts, like alcohol production.

These early processing methods and uses of sugarcane prevailed in both the Northeast and the South into the early 20th century. New modern usinas, with centralized milling processes emerged in the late 19th century and slowly displaced the older smaller sugar mills, or engenhos

²³ Lima and Marcondes, *Álcool carburante*, 64. If producers wish to produce alcohol directly from sugarcane, relatively rare in the 19th and much of the 20th century, it is best to process the cane within 24 hours of cutting the cane.

²⁴ In the modern era, this process has been largely mechanized. Chapter 5 and 6 address this process and its impact on sugarcane field workers in Ribeirão Preto.

²⁵ Lima and Marcondes, *Álcool carburante*, 64.

and bangues, both of which used older milling techniques in the 20th century. By the time sugarcane production in São Paulo began to expand in the 1900s, pressure to mechanize the sugar process transformed the structure of the industry that emerged in the state. In conjunction with an advanced agricultural support system connected to coffee production, a more mechanized and centralized system emerged in São Paulo.

From Coffee to Sugarcane

Even as coffee production dominated the paulista countryside in the mid-19th century, sugar production also existed in pockets since the first settlers came to São Paulo. Farmers fed sugarcane to cattle to fatten them and also used it to distill rum (aguardente) for local consumption in the 19th century.²⁶ As a tropical plant, the Ribeirão Preto's humid climate, extensive sunshine, oxidized soil, and rare frosts were ideal for sugarcane production as well as coffee.²⁷ However, the Northeastern region of the country, particularly Pernambuco and Alagoas, had dominated Brazilian sugar production since the colonial era.

Once the country's major agricultural export, by the turn of the 20th century, sugar accounted for only about 1% of the value of all of Brazil's exports.²⁸ The Northeast, and specifically Pernambuco, dominated sugar-production, exporting sugar abroad and supplying the bulk of domestically consumed sugar, particularly to São Paulo into the 1930s.²⁹ Northeastern refineries shipped sugar to Santos and then it made its way to São Paulo's interior via train. Sugar consumption grew in this period as a vital ingredient in São Paulo's emerging light

 ²⁶ Hasse, *Filhos do Fogo*, 21; Warren Dean, *With Broadax and Firebrand: The Destruction of the Brazilian Atlantic Forest* (Berkeley: University of California Press, 1997), 176–178.
 ²⁷ Temperatures between 70 and 75 degree Fahrenheit at least are ideal for sugar maturation.

Lima and Marcondes, *Álcool carburante*, 41.

²⁸ Eisenberg, *The Sugar Industry in Pernambuco*, 5.

²⁹ Eisenberg, *The Sugar Industry in Pernambuco*, 26–29.

industries in canned and preserved foods that were ultimately redistributed to markets across Brazil. As southeastern agriculture specialized in coffee production, consumers and local industries there came to rely on sugar supplied from the northeast.

Sugar production slowly expanded in the paulista countryside to meet growing local demand, especially during the coffee crises of the 1920s. Some former coffee barons opened sugar mills to supply local demand for table sugar that competed on costs because of their lower transportation expenses; some surplus was diverted to distill cachaca (sugarcane brandy). Take for example, the second "king of coffee" in the Ribeirão Preto region, Francisco Schmidt. Born in Germany, Schmidt immigrated to Brazil with his parents to work the coffee fields in 1858. He worked at a fazenda in Descalvado (SP) before moving to Ribeirão Preto in 1890 and purchasing the Fazenda Monte Alegre. His investments in coffee and land quickly spread. With his holdings, he became the single largest coffee producer in Brazil.³⁰

In 1906, Francisco Schmidt built the Engenho Central de Sertãozinho, which is a small municipality neighboring the city of Ribeirão Preto. This mill introduced large-scale sugarcane production to the region and demonstrated that cane was a viable economic alternative to coffee production. Government officials and local politicians encouraged diversification of agricultural production during coffee's many economic crises. In fact, many future *usineiros*, or industrial sugar refinery owners, would either work as employees or service providers for Schmidt's pioneering mill, including the Biagi family.³¹

³⁰ Marchesi, *João Marchesi*, 59–60. Another important figure in Ribeirão Preto's history, João Marchesi, briefly referenced below, would later buy this property. Shortly after, Marchesi sold land to the State of São Paulo to establish the Escola Prática de Agricultura in 1941. Today, the Universidade de São Paulo-Ribeirão Preto medical school is located on the hillside of the former coffee plantation.

³¹ Pinheiro et al, *Ribeirão Preto*, 20. Hasse, *Filhos do fogo*, 33–37.

Italian immigrants in São Paulo's interior led the transition from coffee to sugar production. For example, Pedro Biagi came to Brazil at the age of seven with his family from Pádova, a poor region in Italy in 1887. He and his parents landed at the major paulista port, Santos, after which they moved to Campinas. He and his family first worked for two years in the Campinas region where his family paid off the costs of their Atlantic passage to Brazil. They then decided to move to Sertãozinho to work the coffee fields as colonatos on the Fazenda Conceição. Biagi worked in the coffee fields, but he also diversified his specialties. Biagi's father purchased a brickyard in 1899, where he worked with his father until it was paid off three years later. Additionally, he worked in rum distilling, likely at Schmidt's central mill, during this period.³² He saved his wages to purchase land in Sertãozinho, slowly expanding his property around Biagi's brickyard business and coffee production. Biagi then diversified his production with sugarcane when he and a partner, Mario Bighetti, purchased the Fazenda Barbacena in 1917. The two began building their own usina in 1918. The Usina Barbacena produced its first harvest in 1922, and they refined 6.4 thousand sacks of sugar.³³ Coffee producers and immigrant families like these would continue to expand sugar production across the state in the 1920s.

Italian immigrants were not the only players in the paulista sugar industry; in fact, the French firm, Société des Sucreries Brésiliennes, emerged as the largest sugar-producing firm in the state in this period. The firm bought up many small central engenhos in São Paulo between 1899 and 1907 and would expand to four usinas by 1930. It was the first firm to invest in sugar production in the region in São Paulo while many domestic fazendeiros remained focused on

 ³² Moacyr Castro, "Pedro Biagi," in *Os desbravadores*, org. Galeno Amorim (Ribeirão Preto: Palavra Mágica, 2001), 128–129.
 ³³ N.: 1

³³ Ibid.

coffee production. Together with the expanding immigrant producers that sprang up across the state, the French firm and local producers etched out there place in the paulista sugar market.³⁴

By 1930, São Paulo producers had solidified a small but expanding place in the Brazilian sugarcane market, but international events dramatically transformed the industry.³⁵ After the world market crash of 1929 and the subsequent collapse of commodity prices, the sugar industry, along with coffee and other export commodities, fell deeply into crisis. Sugar prices plummeted from between 40 to 80 reis per 60kg bag of crystal sugar in 1928 to 16 reis per bag, which was well below the cost of production. Producers had drastically overproduced for the competitive world sugar markets rocked by the depression, and domestic consumption was far too small to take up the slack. The conditions were ruinous for Brazil's sugar industry in the North and the South.

In response to the disastrous economic condition of the industry in the early 1930s, sugar producers, primarily from the Northeast, used their political clout to lobby the federal government for intervention in the market place.³⁶ Given the contentious relationship between the provisional president and paulista statesmen, Vargas' support of sugar was a political tool to

³⁴ Hartzmark, "Businesses, Associations, and Regions," 231–232; see also, Ramos, *Agroindústria canavieira*, 100.

³⁵ See Santos, 46–49n16 and Hartzmark, "Businesses, Associations, and Regions," chapter 1. Mosaic disease hit paulista cane fields in the 1920s. The disease, which turned leaves a spotted yellow, affected the cane yields all over the country. The São Paulo government established the Experimental Station in Piracicaba in the interior of the state, to test resistant cane varieties. This helped São Paulo producers survive the effects of the mosaic disease faster than Northeastern producers. It was a key part of São Paulo solidifying its position in the sugar market by the 1930s.

³⁶ Dr. Gercino de Pontes, of the Club de Engenharia de Pernambuco, "A indústria açucareira no Brasil, depois de 1928–1929," *Brasil Açucareiro* III, Vol. VI (September, 1935), 21. In fact, usineiros and sugar producers in Pernambuco first founded the Institute of the Defense of Sugar in 1926 and similar initiatives with state support expanded from 1926 to 1928 but sugarcane producers themselves requested federal intervention in 1930 following the sugar market's collapse. For more on early state intervention in sugar production in Pernambuco, see Szmrecsányi, *O planejamento*, 163–169.

garner support from the traditional elites of the Northeast. With this pressure, President Vargas would create the Institute of Sugar and Alcohol (IAA), in which domestic producers like the Biagis would emerge as important shapers of the industry's development and growth.

As this chapter has revealed, Ribeirão Preto, once the important coffee producer, would again emerge as an important agricultural producer, this time as a growing sugar producing region. Its position as a coffee producer defined its growth in the 19th century while its new position as a growing sugar producer would define its position in the sugar and alcohol industry beginning in the 1930s.

Chapter 2: Proálcool's Precedents: Early Federal Intervention in Sugar and Alcohol Policy, 1933-1959 "It is one of the rare examples, in our country of an industry created and developed under the tutelage, support, and guidance of the State." Moacyr Soares Pereira, O problema do álcool-motor (1942)¹

Moacyr Soares Pereira's statement reminds us that Brazil's experience with ethanol began long before the military government's state-led development program of the 1970s. The technology for ethanol production was in place by the early 1900s, and Brazil began to formally pursue such research and development around sugar-based ethanol, or alcohol, in the 1930s. Thereafter, sugarcane and alcohol policy have been closely linked under federal management of the sugar industry. Hence, a history of alcohol production is also a history of state intervention in the sugar industry. Following initial interventions in 1931, federal policy, development, and market manipulation intertwined in the sector with the creation of the Institute of Sugar and Alcohol (IAA) in 1933. Federal intervention in sugar and alcohol production oscillated between financial, agricultural, and technological support, which closely tied sugar and alcohol production for the rest of the 20th century.

This chapter reveals how state intervention transformed the sugar industry and gave birth to an alcohol market. This early state intervention in the sugar sector created and sustained the alcohol industry even as it lost political importance and could not be fully sustained in a free market. Government incentives gave regional entrepreneurs the ability to expand sugar and alcohol infrastructure. This perfectly positioned Ribeirão Preto to win out in an expanding sugar market in the 1960s and Proálcool investment in alcohol production in the 1970s. IAA

¹ Moacyr Soares Pereira, *O problema do álcool-motor* (Rio de Janeiro: José Olympio Editora, 1942), 165. Pereira was a member of the Executive Commission of the Institute of Sugar and Alcohol, on which he served as the Delegate of Banguezeiros and Sugarcane Planters in 1941. He later served as the Superintendent of the Alcohol Plan in 1951 and was a long time advocate of alcohol production in Brazil.

policymakers' interest in diversifying sugar products for the sector and federal policies that inconsistently subsidized the fuel supply drove support for the alcohol industry, even though it required state intervention to survive and grow.

This chapter contributes to recent studies on the growing understanding of the role of the state in development. The state intervened to create the alcohol industry where demand did not exist beforehand. How officials executed this market creation under the Institute of Sugar and Alcohol through sugar policy objectives reveals the role of the state under Getúlio Vargas' two regimes and the particular preference he gave to the sugar industry. The new sugar policy supported his economic nationalist goals for a "self-sufficient, modern and industrial domestic economy."² As such, the sugar industry and alcohol interests evoked an important model of state intervention under the Vargas regime that shaped state-capitalist intervention in the 1960s. The sugar and alcohol industry's particular ability to meet Vargas' dual interests and appease Northeastern producers provided the sugar industry with a favorable position compared to other agricultural support programs that proliferated the Vargas era, including the traditional São Paulo-driven export-oriented coffee industry in this period.

Studies on Proálcool almost ubiquitously include a summary of early alcohol production under the IAA. Tamas Szymerscányi and Barbara Nunberg's classic studies on the sugar sector address the evolution of alcohol production as a by-product of the sugar industry's growth, but both focus far more on the evolution of sugar policy and social dynamics within the sector than on alcohol policy reform. Maria Helena de Castro Santos focuses on alcohol policy to reveal the inconsistent place that alcohol held in a poorly planned fuel policy in the 1930s through the 1970s. Michael Barzelay's study of Proálcool condenses the history of alcohol production into a

² Triner, *Mining and the State*, 80.

series of policies that strips producers' of their importance in early sugar and alcohol development. This study builds on these and other studies by focusing on the evolution of sugar and alcohol production in the specific region of Ribeirão Preto through the growth of the Usina Santa Elisa.

Maurilio Biagi, the owner of the usina, transformed the usina and the region into a premiere sugarcane and alcohol producer by capitalizing on the state's continual support of alcohol production and investing in imported new technology to expand his sugar complex into a leading usina in the state. This analysis follows Marshall Eakin's assessment of industrial development in Brazil, illustrating the way sugar producers imported new technology to push the development of the sugar industry. However, it also reveals the way domestic producers shaped sugar and alcohol's industrial growth with their own drive to mechanize and modernize the industry while still successfully pushing out foreign producers in the sector. As such, the sugar and alcohol industry's early development follows a uniquely national agro-industrialization path.

São Paulo, Coffee, and Early Intervention in Agricultural Economic Planning

For many a 20th century Brazilian historian, São Paulo history begins with coffee, and so does this one. Key institutional transformations began in São Paulo that laid the foundation for the burgeoning paulista sugar industry to ascend to national dominance under the IAA. This path began with earlier state interventions in the coffee industry, which was initially successful and later produced extensive state and national debt to finance. These realities influenced the government intervention in the sugar industry in the 1930s in important ways.

Brazilian coffee production outpaced world demand between the 1890–91 and the 1901– 1902 harvests. By this time, coffee accounted for almost 60% of the value of all Brazilian

42

exports.³ It was by far the country's most important agricultural industry, and São Paulo's economic and political affluence depended on it. As such, the government of the state of São Paulo first intervened in the coffee industry in 1906 with the Taubaté Agreement. The Paulista coffee association proposed a valorization program, in which the state government funded purchasing coffee from producers at a set minimum price but withheld coffee reserves from the world market in order to drive world prices back up. This heterodox economic policy buoyed the state's control of the world market. São Paulo's coffee exports accounted for such a large percentage of national production that the state could act as a global coffee cartel in and of itself. The state government's intervention effectively transformed prices in producers' favor.⁴

The initial program was somewhat successful, beginning a long series of state and federal valorization programs for the industry in the 1910s and 1920s.⁵ However, while the program successfully hindered the continued fall in coffee prices through the first decade of the 1900s, the second and third programs in 1917 and 1920 were less successful and more burdensome financially.⁶ São Paulo's government created the Institute for the Permanent Defense of Coffee in 1924, which President Washington Luís Pereira de Sousa, a former Governor of São Paulo, transformed into a federal entity in 1926–1927.⁷ In addition to extensive international marketing, the Coffee Institute regulated coffee prices, production levels, and loans, but it also established an important infrastructure of research and development associated with the industry.

³ Steven Topik, *The Political Economy of the Brazilian State, 1889–1930* (Austin: University of Texas Press, 1987), 70 and 81. Topik notes that by the early 20th century, coffee was responsible for 10–15% of total Brazilian production and over half of all exports (56.9% in 1900–1901 and 59% in 1901–1902) and had important "consumer and fiscal linkages with the prosperous and politically dominant center and south of country [sic], it had a firmer hold on the economy" than did sugar.

⁴ Topik, *The Political Economy*, 71.

⁵ Topik, *The Political Economy*, 77.

⁶ Love, São Paulo and the Brazilian Federation, 119. See also, Table 2.

⁷ Topik, *The Political Economy*, 80.

Year	Coffee debt	Foreign	Combined	Combined	Coffee
	(thousands of	coffee debt	public-coffee	foreign debt	support
	current	(thousands of	debt	as percent of	(thousands of
	contos)	current	(thousands of	federal	current
		contos)	1912 contos)	foreign debt	contos)*
1906	121.3	59.3	231.5	14	5.0
1910	221.6	221.6	468.9	26	2.0
1920	49.2	13.4	194.8	4	-23.9
1930	1667.9	1001.7	1492.5	33	113.3

Table 2: Impact of Coffee Support on São Paulo State and National Debt⁸ Source: Love, *The Brazilian Federation*, 304–305.

The São Paulo coffee valorization programs were important precedents and models for subsequent federal intervention in the production of sugar and alcohol. The Great Depression led to the collapse not only of coffee but all agricultural export prices in 1930. Thereafter, President Vargas and the federal government would more actively intervene in the agricultural sector, extending protection to other agricultural industries, including sugarcane. The federal government, which had been hesitant in the initial coffee valorization schemes, became a central part of economic planning in the sugar industry in the 1930s.⁹

The international crisis that accompanied the Great Depression came to roost just as

dramatic political changes began in Brazil with the presidential election of 1930. The new

⁸ *= The negative number in 1920 illustrates a *positive* net income.

A few notes on this table. Much of the coffee support programs were financed by foreign banks, hence the close connection between coffee debt and foreign coffee debt. The State Bank and the Coffee Institute supported the programs as well, which is accounted for in the coffee debt column and then separated out in the foreign coffee debt column. The most important note pertains to the coffee support numbers. Love notes that inconsistent accounting and possible attempts to hide true costs means that one should approach this column roughly illustrates the cost of coffee support programs overall and their burden on foreign and state debt. See Love, *The Brazilian Federation*, 307–308 for a more comprehensive explanation of his data accumulation.

⁹ Triner, *Mining and the State*, 80. Triner notes the important role that the state played in development of the state-owned enterprises in the mining industry under Vargas' regime as well. Economic planning was not exclusive to the sugar industry, but rather I would contest that it was formative to agro-industrial planning while mining took a different path. However, the similarities are notable, illustrating the importance of the state in development during the Vargas era.

provisional government under Getúlio Vargas took active steps to salvage the struggling sugar industry, employing similar strategies used in the coffee valorization schemes but focused on helping Northeastern producers. Vargas established the first sugar protection legislation, Decree no. 20.401, on September 15th, 1931. It required that usineiros hold 10% of the sugar produced for domestic sale off the market in order to drive prices back up. However, this decree indicated that such storage only applied to the producers in the regions overproducing for their domestic local markets, namely Northeastern producers, which produced for both export and the domestic market. Conversely, the government set a tax of \$5 mil-reis (about \$2.50 USD) per bag on producers who exclusively produced for domestic sale and refused to store their product.¹⁰

São Paulo producers largely financed this national tax. The exceptions favored exporttargeted Northeastern producers. As São Paulo production was exclusively for the local market, many producers refused to comply with the storage mandate and withhold sugar from sale in a growing local market. Furthermore, producers that exported sugar to international markets, namely Northeastern producers, would have the stock requirement pro-rated.¹¹ Thus, the legislation bailed out overproducing and export-oriented Northeastern producers at the expense of the expanding central-southern producers, much to the chagrin of paulista sugar producers.

Shortly after implementing this tax, the provisional government created the Commission of the Defense of Sugar Production (Comissão de Defesa da Produção do Açúcar- CDPA) with

¹⁰ Szmercsányi, *O planejamento*, 172. The Brazilian currency was the real or réis (commonly referenced in the larger value of mil-réis, or 1000 réis) until 1941, when the country switched to the cruzeiro da reforma at a rate of 1000 réis=1 cruzeiro. All conversions to USD (US dollars) are at nominal rates and are based on conversions as listed in *A ordem do progresso: cem anos de política economica republicana, 1889–1989*, org. Marcelo de Paiva Abreu (Rio de Janeiro: Campus, 1989), 387–412.

¹¹ Szmrecsányi, *O planejamento*, 172. Despite the collapse of the international sugar market, São Paulo's sugar demand continued to grow. Thus, the sugar limits imposed by the IAA were far more favorable to the export-oriented Northeastern sugar industry than they were to the region-focused paulista industry.

decree n. 20.761 on December 7th, 1931, creating a framework for greater sugarcane policy intervention. The Commission set up an administrative body including federal government representatives from the Ministry of Labor, Industry and Commerce, from the Bank of Brazil, and the Treasury in addition to delegates from the principal producing states of Pernambuco, Alagoas, Sergipe, Bahia, Rio de Janeiro and São Paulo.¹² Leondro Truda, the representative from the Bank of Brazil, became the President of the Commission.

Leondro Truda was a guiding hand in early sugar intervention. Originally from Rio Grande do Sul like President Vargas, Truda was one of many Rio Grande do Sul natives that rose to national political prominence under Getúlio Vargas in the 1930s. Trained in law, he worked as a journalist at the Rio de Janeiro newspaper, "Diario de Noticias" before becoming a director at the Bank of Brazil. While there, he worked closely with sugar businesses and "came to understand the difficult situation of abandonment on the part of the public power that confronted the culture and industry of sugarcane."¹³ Truda became one of the main advocates of greater sugar intervention and many credit him with the creation of the first Sugar Commission (the CDPA). Later, when leadership of the original CDPA transferred over to the IAA in 1933, Truda would remain the leader and most vocal supporter of sugar interests in the federal government.

The Bank of Brazil was the most important economic entity in Brazilian agricultural economic planning. The bank held a critical financial and political role in the Commission and later the Institute of Sugar and Alcohol. The bank became the primary financier of the agricultural industry and particularly the sugar industry. Originally founded in 1808 to finance the public debt after the royal crown moved to Brazil, the modern Bank of Brazil took from in

 ¹² Szmrecsányi, *O planejamento*, 174n22. The listed states represented on the Commission also indicate the order of production capacity at the time of the Commission's implementation.
 ¹³ "O Banco do Brasil e seu novo presidente," *Brasil Açucareiro* Vol. III (July 1934), 300.

1905. The treasury took control of the formerly private Bank of Brazil, acted as both a public and commercial bank in this period, technically private but increasingly controlled by the Treasury and tied to government policy. The Bank of Brazil became the primary financial entity through which Congress financed the coffee valorization programs of 1906, 1917, and the 1920s.¹⁴ Thereafter, the Bank of Brazil offered unprecedented levels of agricultural credit to large-scale producers, particularly to the sugar industry.¹⁵ The Bank of Brazil did not finance sugar support but rather acted as an intermediary of the tax employed on sugar production and the distributor of those proceeds to the subsidized production.¹⁶ This positioned the bank in the very center of sugar policy, where it would largely remain. In fact, after Truda became the president of the IAA, the Bank of Brazil delegate traditionally received the nomination for President of the IAA

The ongoing domestic disputes between the new federal government and São Paulo only exacerbated the economic struggles of the paulista sugar industry and undercut the CDPA's response. Regional and racial tensions burned between Vargas and the paulista elite as Vargas

¹⁴ Steven Topik, "State Enterprise in a Liberal Regime: The Bank of Brazil, 1905–1930," *Journal of Interamerican Studies and World Affairs* Vol. 22, n. 4, Special Issue: Public Enterprise in Latin America (November 1980), 408–413. In fact, more recent studies have unveiled a far more interventionist role of the state and the Bank of Brazil during the First Republic. Gail Triner's defining work on banking in Brazil during this period moves beyond traditional analysis of the Bank of Brazil as a prop for coffee export support exclusively. See Gail D. Triner, *Banking and Economic Development: Brazil, 1889-1930* (New York: Palgrave, 2000), 8-9. For a specific example of the emergence of regional banking São Paulo and its connection to paulista industrialization in the 19th and early 20th century, see Hanley, *Native Capital*.

¹⁵ Peter Houtzager argues that the Bank of Brazil "as the principal conduit for credit became the state's arm for capital accumulation in rural areas." I address its connections to agricultural financing under the military dictatorship in the next chapter. Peter Houtzager, "State and Unions in the Transformation of the Brazilian Countryside, 1964–1975," *Latin American Research Review*, Vol. 33, No. 2 (1998): 115.

¹⁶ Cf. "Nosso Programa", *Economia e Agricultura*, Ano I Vol. I n. I, 05/12/1932, pp. 1–2 cited in Szmrecsányi, *O planejamento*, 174n22–23. Also note that the magazine, *Economia e Agricultura*, turned into *Brasil Açucareiro* in 1934.

stripped paulistas of their federal powers and appointed João Alberto Lins de Barros, a Pernambucan lieutenant, as his Interventor of São Paulo. The appointment of the "foreign" interventor came along with the reduced federalist control over paulista political and economic decisions that had once been in the control of the state's politicians.¹⁷

Unsurprisingly, political relations between paulista politicians and the federal government quickly became contentious. These issues exploded in July 1932 when the paulista opposition led an armed resistance in the city of São Paulo against the provisional government's efforts to "reconstitutionalize" politics in the Constitutionalist Revolt. The politically savvy Vargas subdued the conflict with important alliances and armed suppression over two months.¹⁸ However, the event forced Vargas to appease paulistas to thwart further separatist rebellions. The event undercut the IAA's new limitation policies as fewer southeastern producers complied with the CDPA regulation to stock 10% of their sugar. If anything, it exposed the already slow and delayed nature of the CDPA's ability to enforce legislation before the revolt.¹⁹ Truda and the CDPA could not enforce the sugar policy on a large-scale initially, lacking the infrastructure to regulate every sugar producer in the country.²⁰

¹⁷ Walker, "From Coronelismo to Populism," 28–30; Love, *São Paulo in the Brazilian Federation*, 119. In an effort to centralize his own power, Vargas established a network of handpicked interventors rather than elected governors to govern state politics. That a Northeasterner would hold São Paulo's position would enflame already established racial and social divisions between formalizing ideas of paulista identity in constrast to Northeastern identity. See also, Barbara Weinstein, *The Color of Modernity: São Paulo and the Making of Race and Nation in Brazil* (Durham: Duke University Press, 2015).

¹⁸ Skidmore, *Politics in Brazil, 1930–1964*, 12–21.

¹⁹ Comissão de Defesa da Produção do Açucar 1932 Report, sent December 8th, 1932 to the Labor, Industry, and Commerce Minister. IAA: National Archives (Rio de Janeiro), Caixa 458.
²⁰ A 1932 Report on the first 6 months of the CDPA indicates that 75% of producers escaped the sugar tax in the 1931–1932 harvest. Large producers still sold large quantities underpriced, undercutting the IAA-established price of \$30 mil-réis per sack. Comissão de Defesa da Produção do Açucar 1932 Report, sent December 8th, 1932 to the Labor, Industry, and Commerce Minister. IAA: National Archives (Rio de Janeiro), Caixa 458.

The CDPA would implement the initial sugar production limitation legislation as part of the envisioned defense of the sugar industry. Still, the expanding sugar policy remained focused on rebalancing the industry, skewing toward reestablishing Northeastern producers' dominance. Compliance with these policies, which started off shaky after the 1932 São Paulo revolt, would continue to draw particular ire from paulista producers throughout the decade. While sugar limitations were an essential part of this defense, the other was redirecting excess sugarcane toward alcohol production for fuel. Although this connection would become more explicit under the IAA, alcohol as fuel had already gained some support amongst some specialists and government officials in the 1920s because of the possibilities it presented for the sugar industry and the country.

Ethanol Production before 1933

The technology behind ethanol production, namely the ability to use alcohol of an agricultural base rather than petroleum to drive internal engines has been around basically as long as the internal combustion engine has. France and Germany all tested the use of alcohol with internal combustion engines in the early 1900s.²¹ Henry Ford, Thomas Edison, and Alexander Bell were all early supporters of ethanol use over oil.²²

Brazilian scientists and engineers began experimenting with alcohol as a combustible energy source in the 1920s. Paulista engineer Eduardo Sabino de Oliveira conducted research on

²¹ Santos. "Alcohol as Fuel in Brazil," 18–21.

²² As the technology for alcohol-based combustion engines emerged with oil-based combustion engines, the question of oil over alcohol was more political than technical. Bill Kovarik makes a compelling argument about the politics of technology decisions in the US energy market, noting that Henry Ford and Charles Kettering of General Motors led a rather lengthy campaign for alcohol over gasoline in the mid-1920s but petroleum interests were able to edge out the ethanol market in favor of oil using biased scientific reports. See Bill Kovarik, "Henry Ford, Charles Kettering and the Fuel of the Future," *Automotive History Review* 32 (Spring 1998), 7–27.

the source in collaboration with the engineer Heraldo de Souza Mattos and Professor Ernesto Lopes da Fonseca Costa at the Escola Politécnica de São Paulo in São Paulo and the National Technology Institute in Rio de Janeiro in the 1920s.²³

While corn and potatoes drove alcohol experiments elsewhere, Brazilian scientists focused on alcohol from sugarcane. As a primary agricultural product, sugar and its derivatives have a long history in Brazil. Traditional uses of sugarcane included processing cane into crystallized sugar (the primary sugar product for export) or *demerara* (the cheaper domestic market based brown sugar). Sugar producers would often process the rest into such byproducts such as *melaço* (molasses), *aguardente* (a white rum more commonly known as *caçhaca*), or alcohol (either for industrial products or as a gasoline additive).

Sugarcane byproducts became an important source of recompense for sugar producers during "recurring crises of excess production" even in the 19th century.²⁴ Molasses was used as a raw material in the pharmaceutical and perfume industry as well as for the production of local rum (aguardente). Rum had its own market, and some producers specialized exclusively in rum production with their distilleries. After these two primary uses, northeastern sugar producers used the remainder, including the wood pulp or *bagaço*, as fuel.

Until the late-20th century, alcohol, the byproduct from which ethanol is derived, was most often produced from other cane byproducts, like molasses, rather than directly from sugarcane. This is in part because of the higher value of other byproducts on the domestic and foreign market until the 1930s. In fact, many producers preferred to use the molasses as animal

²³ Regina Machado Leão, *Álcool: energia verde* (São Paulo: IQUAL, 2002), 89–90. Sabino de Oliveira later published this work in 1930.

²⁴ Santos, "Alcohol as Fuel," 31–32.

fodder or dump it rather than purchase the equipment necessary to process the molasses into sugar alcohol's industrial (hydrous) and fuel (anhydrous) forms.²⁵

The production costs to produce anhydrous alcohol rather than hydrous alcohol are notable. For industrial use, consumers traditionally used hydrated alcohol, of 96% purity. Hydrous (or hydrated) alcohol allows for more impurities in the product. Carburant mixtures of the 1920s and early 30s used hydrated alcohol along with other substances, such as gasoline and kerosene. Conversely, cars ran better on gasoline mixtures using anhydrous alcohol, of 99% purity or higher.²⁶ Anhydrous (dehydrated) alcohol required a more extensive dehydration process to reach such purity levels (99.5% generally). Water in the hydrated version created mixture problems with gasoline and thus impaired the performance of the traditional car engine.²⁷

As automobile ownership grew in the 1920s, drivers drove up demand for petroleum.²⁸ This growing infatuation with cars meant expanding petroleum imports for gasoline and close

²⁵ Santos, "Alcohol as Fuel," 33. Additionally, some producers would reprocess sugar alcohol into rum illegally.

²⁶ For more on sugarcane and its byproducts, see Szmrecsányi, 130–139, and Santos, 32–33 ²⁷ Santos, "Alcohol as Fuel," 55–56. Melo describes the troubles with hydrated alcohol in simpler terms. He states, "The quantity of water contained in drinkable alcohol makes its mixture with gasoline difficult, especially at low temperatures. The acidity and other impurities in this type of alcohol can also cause general damage to engines. As its water content gives it a greater density than gasoline, drinkable alcohol settles at the bottom of the tank, while gasoline remains at the top, and they only really mix after the first movement of the car, or, when the external temperature rises. These inconveniences occur, principally, for mixtures rich in gasoline. In order for a mixture to remain more or less stable, it should be composed of about 80% alcohol and 20% gasoline, and the carburant should be regulated and modified for the mixture to produce good results." Joaquim de Melo, A política do álcool-motor no Brasil (Rio de Janeiro: Instituto de Acúcar e do Álcool, 1942), 25–26 as cited in Santos, "Alcohol as Fuel," 55n20. ²⁸ Wolfe, Autos and Progress, 14. Wolfe argues that the car has been intricately connected to Brazilian images of modernity and nation from its early arrival in the 1900s and the expansion of automobiles in the 1910s and 20s. Wolfe notes that while many economic historians have studied the importance of "the coffee economy in fostering early industrial development, less recognized

behind was an expanding interest in alcohol as a gasoline supplement. In fact, President Epitácio Pessoa, a native of Pernambuco, referenced alcohol's importance in a speech to Congress in 1922, stating, "The importance of the use of alcohol is highlighted by Brazil's colossal gasoline imports. Supporting the use of alcohol would also give a boost to our sugar industry."²⁹ After President Pessoa explicitly connected sugar and alcohol, private organizations, state governments, individuals, and firms expanded various forms of alcohol additives to gasoline. These efforts included research from the Fuels and Minerals Experimental Station under the Ministry of Agriculture in Rio de Janeiro as well as state-level tax exemptions and subsidies to increase alcohol production and consumption for cars in Ceara, Rio Grande do Norte, Paraiba, Alagoas and Rio de Janeiro.³⁰

Alcohol mixtures produced for commercial use on the market were of "various mixtures of alcohol with ether, kerosene, gasoline, and so forth, generically designated *álcool-motor* [my emphasis]."³¹ Probably the most popular of the broader variations of *álcool-motor* were USGA and Azulina brands, produced in Alagoas and Pernambuco since 1928, respectively. However, formal federal efforts to support ethanol began in the 1930s following the collapse of the world market and the subsequent oversupply of sugar.

Following "The Revolution of 1930," economic conditions in the country encouraged Vargas and his close advisors to pursue alcohol production as a means to cut oil imports, stabilize the balance of payments, and help the sugar industry in the early 1930s. Unlike the

is the role of consumerism- particularly but not exclusively elite buying habits- in shaping the Brazilin desire for industrialism." This point is particularly true in relation to the car.

²⁹ Presidential message of 1922 to Congress, President Epitácio Pessoa. Apud. Andrade, 1952:
94 cited in Santos, 39.

³⁰ Nelson Coutinho, "Economia e Indústria Alcooleiras (III)," *Brasil Acucareiro*, Vol. 26, no. 4 (April): 182 in Santos, 39; Szmrecsányi, 178. For more on early alcohol production, see Santos, 32–40.

³¹ Santos, "Alcohol as Fuel," 40.

United States, which had to protect large domestic oil interests, Brazil had long-term incentives to increase alternative options as a non-oil producing country with expanding oil imports.³² At the same time, the country's foreign debt immediately skyrocketed as the diminished coffee prices drove down the amount of foreign exchange the country received. Imports, including oil, quickly created a national deficit that alarmed policymakers.³³

Federal promotion of ethanol began with Decree 19.717 of February 20th, 1931. President Vargas' decree, supported by the Ministry of Agriculture, required that gasoline importers add a minimum of 5% mixture of domestically produced anhydrous alcohol to its commercial gasoline.³⁴ The Decree encouraged *álcool-motor* production for use in standard engines. This fuel was a mixture of regular gasoline and alternative sources. *Carburante nacional*, included gasoline and anhydrous alcohol exclusively, while less official variations included gasoline and less expensive inputs like hydrous alcohol, kerosene and other ingredients.³⁵ The decree allowed importers to add other products to the requisite alcohol and gasoline mixture pending approval by the Ministry of Agriculture for the formula used. All of these mixtures provided gasoline importers with a sales tax exemption on alcohol.³⁶

³² Germany, France, and England also aggressively explored expanding alcohol from an agricultural product in the early 20th century. See Kovarik, "Henry Ford, Charles Kettering and the Fuel of the Future," 7–27. The IAA would continue to publish about other countries' research and experiments in its monthly magazine, *Brasil Açucareiro* as well.

³³ Werner Baer, *The Brazilian Economy*, 35–36; Santos, "Alcohol as Fuel," 54. The national balance of payments was -\$116,100,000 USD in 1930 and quickly recovered to 15,800,000 in 1931. While such economic conditions don't draw attention today, this was a point of concern for policymakers in the 1930s. Abreu, *A ordem do progresso*, 399.

³⁴ Pereira, *O problema do álcool-motor*, 6. For a more detailed account of the government's early efforts to encourage alcohol production from 1931 to 1933, see Santos, "Alcohol as Fuel," 53–64.

³⁵ Melo, *A política do álcool-motor no Brasil*, 22. Beyond Usga and Azulina, other variations included Nog and Motoli in Campos, Motorina in Paraiba, and Cruzeiro do Sul in São Paulo. ³⁶ Santos, "Alcohol as Fuel," 56–57.

In fact, Decree no. 19,717 went to great lengths to incentivize anhydrous alcohol production. This included an increase on the import duty of cylinder heads used in low compression rate engines which ran on gasoline, and a 20% decrease in duty rates for those with better compression rates that could thus run on alcohol, the exemption from import duty for all material and equipment used in the construction of usinas producing anhydrous alcohol and a minimum reduction of 50% in the transport cost of denatured alcohol, or that mixed with other substances, relative to pure gasoline.³⁷ These tax breaks were meant to incentivize production through the market rather than extensive state intervention.

While alcohol variations expanded relatively quickly, these initial government incentives to encourage anhydrous alcohol production generally failed. For example, the provisional government enacted an incentive program with Decree 20.356 on September 1st, 1932, which offered a "prize of 50 million reis to the first plant to manufacture and redistill anhydrous alcohol that is established in each of the states of Rio de Janeiro, Pernambuco, or São Paulo, with the capacity to produce, at minimum, fifteen thousand liters daily of alcohol (anhydrous) by March 31, 1932."³⁸ The competition was open to producers in Rio de Janeiro, Pernambuco, and São Paulo, already indicating the targeted alcohol production markets, given their proximity to the largest consumer markets in the country. Yet, no producer met the deadline.

Contributing to the early incentives' failure, the installation costs far exceeded the incentive thus deterring producers from participating in competition. At 50 million reis (roughly

³⁷ Santos, "Alcohol as Fuel," 58.

³⁸ Pereira, *O problema do álcool-motor*, 8–9. The Brazilian currency, which was the mil-réis until 1941, switched to the cruzeiro da reforma from 1942 to 1966, and the new cruzeiro da reforma from 1967 (equivalent to 1000 cruzeiros in 1942) until 1985. In 1970, the term new cruzeiro was replaced by the cruzeiro. The government changed the currency in an effort to control persistent inflation in Brazil. Marcelo de Paiva Abreu (org), *A ordem do progresso: cem anos de política econômica republicana, 1889–1989* (Rio de Janeiro: Editora Campus, 1990), 413.

\$4,000 USD), the cost of installation rather than continuing with sugar production, even if subsidized by the IAA, was not enough to incentivize the investment necessary, particularly in the short time allotted. Producing alcohol required additional equipment necessary to distill the product, usually a byproduct of sugarcane like molasses, into alcohol. Distillers would have to import expensive equipment to begin distillation and dehydration at the level required for anhydrous alcohol production that exceeded the incentives provided. Instead, paulista producers preferred to dump excess alcohol rather than incur the costs of processing it into fuel alcohol.³⁹

Following the initial decree, President Vargas and the Ministry of Agriculture established the Commission of Studies on Alcohol-Motor (*Comissão de Estudos de Álcool Motor*) and the Combustibles and Minerals Station (*Estação de Combustívies e Mineiros*) in August and September 1931, respectively. The Ministry of Agriculture supervised the two entities, which they established to improve the infrastructure so criticized with the first incentive program. This included a "technical inspection service" to enforce fiscal penalties against violators of the regulations.⁴⁰ Both led research and experiments on optimal levels of alcohol mixture with gasoline.

³⁹ Santos, "Alcohol as Fuel," 57n22 citing Pereira, *O problema do álcool-motor*, 11–12. The distillation process for anhydrous alcohol was somewhat expensive because of the requisite equipment. Alcohol production is at its base the fermentation of sugarcane into alcohol. The process distills molasses leftover after sugar juice extraction using a fermentation process. In this process, the molasses ferments by mixing in yeast and is distilled. Drinking alcohol is distilled to around 74 to 96% purity while hydrated alcohol is distilled to 96% purity (traditionally measured in Gay-Lussac's degrees). Anhydrous alcohol requires dehydration (equal to or higher than 99.5% at 68 degrees Fahrenheit), which cannot be attained simply through distillation. Rather it requires the mixture of an additional dehydrator, most traditionally benzol in Brazil beginning in the 1930s. This additional processing requires more equipment than a sugar mill would have plus the cost of importing benzol, which was not produced in Brazil at the time. Santos, "Alcohol as Fuel," 39a and 116–117.

⁴⁰ de Melo, *A política do álcool-motor no Brasil*, 21; Santos, "Alcohol as Fuel," 58–59.

Like the sugar policies of the early 1930s, these early interventions yielded limited results. As Szmrecsányi notes, these early decrees about alcohol "did not produce practical results until the advent of the IAA, in 1933" because of the "lack of technological infrastructure and [...] the insufficient economic stimuli offered by the Government."⁴¹ Mixtures remained inconsistent in different markets. Distribution depended on large usineiros in primary sugar production markets like Pernambuco, while the primary consumer markets in Rio de Janeiro and São Paulo struggled to expand production quickly. Moreover, there was little penalty for non-compliance, hindering these early efforts.⁴² Nevertheless, the government's role in both sugar and alcohol production in the 1920s and the early 1930s opened the door for more formal intervention in both regulating the sugar industry and constructing an alcohol industry in 1933.

The IAA: Formal State Intervention in Sugar and Alcohol, 1933-1942

On June 6th, 1933 with Decree n. 22.789, Getúlio Vargas and the Provisional Government created the Institute of Sugar and Alcohol (*Instituto de Açúcar e do Álcool-* IAA).⁴³ The IAA, one of many autarchies President Vargas established for agricultural commodities, formalized the federal government's explicit role in sugar and alcohol policy planning.⁴⁴ The IAA adjoined the previously separated Sugar Production Defense Commission (*Commissão da Defesa da*

⁴¹ Szmrecsányi, *O planejamento*, 172.

⁴² Santos, "Alcohol as Fuel," 64.

⁴³ Pereira, *O problema do álcool-motor*, 21.

⁴⁴ These autarchies, including those for coffee and cotton amongst others, were semi-autonomous governmental bodies that were able to exert decisive and somewhat independent control of the related agricultural industry behind Vargas' approval. Their protectionist polices are part of a broader policy of *dirigismo economico*, which was Vargas' own form of import-substitution policies that dominated Brazilian industrialization policies in the 1940s and 50s. Nunberg, "State Intervention," 13–18; Love, *Crafting the Third World*, 147. Amanda Hartzmark provides an interesting analysis of the power of the IAA compared to other autarchies in the period. See Hartzmark, "Businesses, Associations, and Regions," 59–61.

Produção do Açúcar- CDPA) and the Commission of Studies about Alcohol-Motor Commission (*Comissão de Estudos sobre o Álcool-Motor*). The IAA had two objectives: first, to eliminate overproduction and stabilize sugar prices, and second, to construct and/or equip distilleries for the production of anhydrous alcohol.⁴⁵

While the institution garnered a great deal of support from President Vargas, the President of the IAA and the Executive Commission guided sugar policy. Vargas nominated Truda, the CDPA President, to be the first IAA president, which he held jointly with the presidency of the Bank of Brazil until 1938. Within the IAA's power structure, headquartered in Rio de Janeiro, the Executive Commission allowed representatives from each state and various groups within the industry to influence sugar policy. Transferred from the CDPA to direct policy in the IAA, members included the representative from the Bank and Ministries along with nominated representatives for usineiros, planters, and suppliers.⁴⁶

The IAA's first objective was to control sugar production. It would do this first by employing quotas to each producer. Sugar producers were required to register with the IAA. They would receive a production quota based on their land and previous three harvest production cycles. In 1933, the IAA set quotas for sugar production at 200 modernized mills. However, these quotas did not apply to smaller, more traditional sugar production facilities until 1935,

⁴⁵ Szmrecsányi, O planejamento, 180–185.

⁴⁶ The executive commission included: four delegates one each from ministries of finance, agriculture, labor, industry and trade, and the bank to be contracted, namely the Bank of Brazil; four other delegates were chosen by representatives of the usineiros from states whose sugar production exceeded 200,000 sacks of sugar per year (Pernambuco, Alagoas, Rio de Janeiro, and São Paulo). Those usineiros not chosen for the Executive Commission along with planter representatives for those that produce more than 160,000 tons sat on the Advisory Council, which participated in meetings but had no voting rights. Usineiros had formal access the Executive Commission while suppliers were restricted to the Advisory Council. Santos, 81–82.

illustrating the challenges to instituting the sugar limitations the IAA was meant to employ.⁴⁷ Beyond setting production quotas, the IAA controlled the pricing of sugar products, from table sugar to alcohol, and handled the commercialization of these products.⁴⁸

The IAA tied its sugar production objectives to the expansion of ethanol production. Alcohol for combustion addressed both of the IAA's objectives by potentially cutting petroleum imports, thus addressing the ballooning trade deficit, and salvaging the dire situation of the Northeastern-dominated sugar industry. The Institute encouraged ethanol production as an outlet for excessive sugarcane production above the mandated levels. By creating another domestic market for excess sugar production, ethanol production and consumption would protect sugar producers, particularly Northeastern producers, from the unstable world prices and overproduction that plagued the industry.⁴⁹ Rather than dumping excess sugar, which was a strategy employed in coffee valorization efforts, the sugar defense focused on redirecting excess sugar into alcohol production for fuel.⁵⁰ This would ideally create a self-sufficient sugar industry in which sugar profits subsidized the alcohol distilleries, which would absorb excess sugar production to ideally reach a market-regulated equilibrium.⁵¹

⁴⁷ Hartzmark, "Businesses, Associations, and Regions," 67.

⁴⁸ Lima and Marcondes, *Alcool carburante*, 48–49. The IAA set the selling price of anhydrous alcohol delivered to gasoline distributors while the National Petroleum Council (CNP) adjusted alcohol mixture prices based on the IAA's pricing as stipulated in Decree 22,799 of 1933. The CNP usurped the IAA's pricing power in 1966, at which point the CNP set the price of the alcohol mixture and the IAA had to adjust to the price to the distributor accordingly. Santos, "Alcohol as Fuel," 129, 149–150, and 171.

⁴⁹ Pereira. *O problema do álcool-motor*, 16; Dias de Moraes, *A desregulamentação*, 50–53.
⁵⁰ Dr. Gercino de Pontes, "A indústria no Brasil, depois de 1928–1929," *Brasil Açucareiro* III, Vol. VI (September 1935): 21. It is important to note the usage of the term "dumping" in this case. Economically speaking, it meant dumping underpriced products on the world market to manipulate prices. The IAA approved dumping some sugar on the world market to diminish stocks for Northeastern producers by selling under the regulated price in order to manipulate and stabilize prices on the domestic market.

⁵¹ Santos, "Alcohol as Fuel," 67 citing Pereira, O problema do álcool-motor, 18.

The IAA created the Section on Alcohol-Motor within its government infrastructure to control all alcohol research, the reception of alcohol from producers, preparation and delivery to distributors, and sales of the new product.⁵² Although Vargas had already mandated a 5% mixture in 1932, the Alcohol-Motor Section organized the supply and distribution of alcohol-motor based on consumption. Each consumption zone received different alcohol-motor mandated mixtures based on distribution access. The Section set mandates of 20% alcohol and 80% gasoline for the majority of the country.⁵³ Thus, many areas consumed higher levels of alcohol than the mandate. Additionally, the Institute was the sole supplier of anhydrous alcohol to gasoline distributors. In Rio de Janeiro, the IAA mixed the gasoline and distributed the new *álcool-motor* to the gas stations. In Santos, it delivered the mixture to gasoline importers, which they were obligated to purchase. The primary points of distribution, situated near the largest consumer and production markets in the country, were the city of São Paulo, Ponte Nova (MG), Recife (PE), and Campos (RJ).⁵⁴

The new gasoline met mixed reviews with consumers. Engineer Eduardo Sabino de Oliveira led research on the proper mixture levels in the IAA's Technical Section, confirming that anhydrous alcohol could reach as high as 25% without requiring adjustments in high compression motors. Problems were not related to actual car performance as much as aesthetic perceptions. Marketed as "gazolina rosada," or pink gasoline, consumers were wary of the new

⁵² de Melo, *A política do álcool-motor no Brasil*, 69.

⁵³ According to de Melo, Rio de Janeiro, Northern São Paulo, Espirito Santo, Bahia, and Minas Gerais (zone 1), the city of São Paulo (zone 3), and the Northern states of Para, Amazonas, Manhao, Piaui, Ceara, and Acre received mandated mixture rates of 20% alcohol and 80% gasoline while Pernambuco, Paraiba, Rio Grande do Norte, Alagoas, and Sergipe received mandates of 40% alcohol and 60% gasoline. Note that alcohol motor still failed to reach mandated distribution and consumption in certain areas of the country, including the interior of São Paulo, Parana, Santa Catarina, Rio Grande do Sul, Mato Grosso, and Goias. de Melo, *A política do álcool-motor no Brasil*, 69.

⁵⁹

color and unsure of engine's ability to run on the new mixture. Popularity for the mixture grew after distributors removed the additive that colored the product.⁵⁵

Yet, production and distribution fell well short of the mandated demand. Such shortcomings were not because of a lack of raw material in these early years because sugar overproduction continued, but rather a shortage in production capacity and inadequate price incentives for producers.⁵⁶ By 1936, production was not even half of the amount necessary to meet the nationally mandated mixture quota.⁵⁷ Production of alcohol in São Paulo sat around 6.5 million liters when the capital alone would need 7.2 million liters to meet the 10% mixture rate promoted by the IAA.⁵⁸ The failure to reach national production goals encouraged more direct action by Truda and the Executive Commission.

The IAA board established its own distilleries in an aggressive attempt to spur production. Article 4b of the original IAA Decree n. 22.789 states that one of the central goals of the IAA was to "encourage the production of anhydrous alcohol, through the installation of central distilleries in locations most recommended or helping [...] usineiros' cooperative and syndicates [...] to install distilleries individually or to improve their current installations."⁵⁹ As the prohibitive initial cost of early alcohol distillation had limited production, the IAA invested in building its own central distilleries in major production and consumption markets as well as offering substantial financing for additional private distilleries. The Institute financed 50% of the

⁵⁵ de Melo, *A política do álcool-motor no Brasil*, 42–45.

⁵⁶ See Table 12 and Table 13 in the Appendix of this dissertation for alcohol-motor production between 1932 and 1950 as well as production capacity between 1932 and 1940.

⁵⁷ "Gazolina Rosada," *Gazeta de São Paulo* (July 29th, 1936) as republished in *Brasil Açucareiro* Vol. VII, n. 6 (August 1936), 402.

⁵⁸ Ibid. Composed of 90% gasoline and 10% anhydrous alcohol, "gazolina rosada" was the commercialized name of the first official alcohol-motor mixture. Named for its unique pink tint, it was actually less popular because of the coloring and later removed for natural gasoline coloring. See de Melo, *A política do álcool-motor no Brasil*, 46.

⁵⁹ de Melo, *A política do álcool-motor no Brasil*, 30 citing Decree n. 22.789 of June 1st, 1933.

installation costs for six different distilleries. It also completely financed two IAA-owned distilleries, the first opened in Campos, Rio de Janeiro in 1938 and the second, located in Cidade do Cabo, Pernambuco, opened in 1940.⁶⁰ Given that the IAA's role as the sole purchaser of sugar in the country, it directed excess sugar produced in the region from local sugar producers toward the new central distilleries.

While the IAA invested in central distilleries, usineiros in the Association of Usineiros of São Paulo instead directed IAA-financing toward distribution and private firms. The intermediary company, the Paulista Industrial Alcohol Company (*Companhia Industrial Paulista de Álcool*- CIPA), exclusively controlled the state's alcohol distribution in association with the IAA. CIPA, "the corporation constituted by the majority of paulista usineiros," was the first paulista company to receive IAA financing for alcohol production.⁶¹ It received 16,000,000 milreis (roughly \$130,000 USD) for installation and equipment, which it used to equip wagon-tanks for transportation.⁶² The Association sugar producers distributed their alcohol to CIPA, which then distributed the alcohol to gasoline distributors in the state. Their actions and interests ensured São Paulo would not receive a central distillery. Notably, this laid a foundation for greater private investment in alcohol production and distillery development that would transform São Paulo usineiros into leading alcohol producers by the 1970s.

⁶⁰ de Melo, *A política do álcool-motor no Brasil*, 50–53; Santos, "Alcohol as Fuel," 75n36. The six initial distilleries that received 50% of the funding from the IAA for installation were: the Distillaria dos Productores de Pernambuco (Azulina), the Distillaria dos Productores de Pernambuco (nova), Usina Catende, Central Barreiros, Distillaria de Alagoas, and the Cia Industrial Paulista S/A. The first four were located in Pernambuco. The last was a São Paulo distribution company, which worked in association with the IAA. A third IAA-owned and operated distillery, located in Alagoas, opened in 1960.

⁶¹ "A entrega da primeira partida de alcool motor às companhias de gazolina em São Paulo," *Brasil Açucareiro* Vol VI (February 1934), 368–372.

⁶² Ibid. In São Paulo, the first delivery of alcohol was made in January 1934. CIPA delivered alcohol produced at the Usinas Monte Alegre, Piracicaba, Santa Barbara, and Itahiquara.

In the initial years of the IAA, President Truda spent an extensive amount of time

defending the IAA's limitation policy and convincing sugarcane producers to abide by the

policies. For example, at a São Paulo conference in January 1934, President Truda addressed

paulista producers' unhappiness with the production limitations, stressing the national need for

the policy over their own interests. He stated,

"Not only should there not be, in the solution of the [sugar] problem that we face, particular preoccupations with overlapping general conveniences and the ultimate imperatives of the nation, rather that the true solution will be, really, in the reconciliation of these interests during the clear crisis."⁶³

At the same time, he rallied support for alcohol production. For example, he stressed to

Pernambucan usineiros that

"we can now take the first steps toward that which ought to be the definitive solution: the transformations of excess [sugar], [...], into a product that greatly interests the national economy, for which we will have practically limitless application and will alleviate the country greatly from the cost that the urgent demands for our advancement in progress increase yearly. This solution will be *carburante nacional*, álcool-motor."⁶⁴

President Truda worked hard to ease the tensions between São Paulo producers, who felt the IAA

limited their production abilities in the growing southern market, and those in the Northeast, who

felt the expansion of paulista sugar production threatened their hold on the national market.

Truda highlighted the IAA's efforts to address national interests as a whole. Alcohol production

was central to this argument and his early policies.

The importance of the emergence of the state-led alcohol intervention and its disposition

to favor southern producers is significant. In Barbara Weinstein's compelling study of racialized

difference from the Northeast in the creation of a paulista identity, she notes the connections

between ideas of whiteness and progress and modernization in the formation of the exceptional

⁶³ Leonardo Truda, *A defesa da produção açucareira* (Rio de Janeiro: IAA, 1971), 50.

⁶⁴ Truda, A defesa da produção açucareira, 77.

paulista identity in contrast to the Northeast's increasingly impoverished and black image.⁶⁵ The development of the sugar and alcohol industry, though in name supported by the government to bolster the Northeastern economy, contributed to this racialized ideology of regional inequalities in the 20th century. By the 1930s, these ideas were already taking form in paulista identity formation and the sugar industry would be an important platform on which the economic realities and social differences of the two regions would clash for paulista sugar producers.

Indeed, the new sugar policies structurally favored Northeastern producers. The IAA continued the sugar tax program initiated in 1931 under the CDPA, in which producers that did not store 10% of their sugar destined for the internal market (from which those that exported sugar could pro-rate the percentage) would be taxed \$5 mil-reis per bag.⁶⁶ Southeastern producers were particularly adamant about this policy. As southeastern sugar refiners did not produce enough sugar to supply state demand, IAA production limitations kept São Paulo producers from expanding enough to independently supply consumers in the southeast. This aided Northeasterners hold on the sugar market since the more industrialized southern producers already enjoyed cheaper production costs and most importantly lower transportation costs to the major markets in the southeast.

Still, paulista production continued to grow in the south despite the IAA's efforts to balance Northeastern and Southern production. *Fazendeiros*, or coffee plantation owners, transitioned coffee plots into cane fields and new producers entered the market. The opportunities to expand sugar production with the growing regional markets drew many former and current coffee producers into the industry. Sugar quickly established itself as an important

⁶⁵ Barbara Weinstein, *The Color of Modernity: São Paulo and the Making of Race and Nation in Brazil* (Durham: Duke University Press, 2015), 2–5.

⁶⁶ Szmrecsányi, *O planejamento*, 172; See this chapter, 41–42.

part of the state's agricultural production in the 1930s. In the 1930/31 harvest, São Paulo produced 1,108,510 sacks of sugar and that number had doubled by the 1936/37 harvest (2,248,370 sacks).⁶⁷

State	1934	1936	1938	1940
São Paulo	481,400	4,052,248	4,443,053	15,192,588
Pernambuco	22,615	9,035,350	11,830,405	18,008,819
Alagoas	187,722	894,189	2,245,142	4,076,372
Rio de Janeiro	203,158	3,811,279	13,296,884	15,674,733
TOTAL	911,861	18,462,432	31,919,934	53,473,533

 Table 3: Anhydrous Alcohol Production by Major States (in liters), 1934–1940⁶⁸

 Source: de Melo, A política do álcool-motor, appendix.

Many sugar producers that emerged in this period would have an important impact on future sugar and alcohol production in São Paulo. The French owned company Société des Sucreries Brésiliennes dominated early sugar and alcohol production in the state with three usinas in the region and the first anhydrous alcohol distillery in Piracicaba.⁶⁹ By 1933, only one usina in the country produced pure anhydrous alcohol, and it was located in São Paulo. The French-owned Usina Piracicaba produced 100,000 liters of anhydrous alcohol.⁷⁰ Although the the Usina Piracicaba was the first to produce anhydrous alcohol in the state (and the country), other domestic producers from the interior of São Paulo entered the market in the following years.⁷¹

⁶⁷ Gileno Dé Carli, "Geographia economica e social da canna de açucar no Brasil," *Brasil Açucareiro*, Year 6, Vol. X (January, 1938): 391.

⁶⁸ By 1940, eight distilleries produced anhydrous alcohol in Pernambuco, including the IAA's Destilaria Central Presidente Vargas, three in Alagoas, nine in Rio de Janeiro, and twelve in São Paulo. These four states were the largest alcohol producing states in the country.

⁶⁹ The firm owned five usinas altogether, including the Villa Rafard, Porto Feliz and Piracicaba usinas in São Paulo and the two in Rio de Janeiro. "Notas e Comentarias," *Brasil Açucareiro* Vol. III (June 1934), 239. Margarida Cintra Gordinho, *Do álcool ao etanol: trajetória única* (São Paulo: Terceiro NOME/Unica, 2010), 44.

⁷⁰ de Melo, *A política do álcool-motor no Brasil*, annex.

⁷¹ By 1940, twelve private usinas produced anhydrous alcohol in São Paulo. Of these twelve, domestic producers owned nine (Amalia, Ester, Itaiquara, Itaquerê, Junqueira, Monte Alegre, Santa Bárbara, Tamoio, Vassununga, and Iracema) in addition to the three French firms listed

Although the French company dominated early sugar and alcohol production in the region, many immigrant families started sugarcane firms in this period that would eventually surpass the larger international firm. For example, Maurilio Biagi, son of Pedro Biagi (discussed in the previous chapter), purchased the *engenho*, or small sugar mill, Santa Elisa in 1936 with his brothers, Baudílio and Gaudencio Biagi, and their partner João Pagano.⁷² The familial connections between these immigrant families were an important part of the expanding sugar production network in the interior of São Paulo, as the Biagi's cousin, João Marchesi was a major sugarcane producer in São Paulo as well.⁷³

São Paulo producers quickly expanded combustible alcohol production as well, taking

advantage of federal incentives and their access to Brazil's largest consumer market. The usinas

Itaiquara, Monte Alegre, Santa Barbara, Raffard and Vassununga opened distilleries in 1935,

producing a composite 37.500 liters of alcohol in that year alone.⁷⁴ By the 1934/1935 harvest,

São Paulo was the third leading producer of alcohol in the country behind Pernambuco and Rio

above. Together these twelve usinas produced almost 30% of all anhydrous alcohol produced in the country in 1940. See Table 3 for production distribution in comparison to other major usinas in the country. Amanda Hartzmark notes the disappearance of the French firm by the 1960s as standardization and personal connections became more important aspects of the sugar industry behind growing regional associations. Hartzmark, "Businesses, Associations, and Regions," 231–232; see also, Ramos, *Agroindústria canavieira*, 100.

⁷² Moacyr Castro, "Pedro Biagi," 129. In fact, Pedro Biagi had sold his part in the Usina Barbacena in 1929. He then purchased the fazendas Santo Antonio and Retiro Bianconi with his cousin João Marchesi but sold his shares not long after. Marchesi founded the Santa Elisa engenho and named it after his deceased daughter. This is the mill that the brothers would then purchase in 1936 and transform into an usina.

⁷³ Pedro Ramos' work on land and ownership and the sugar industry in 20th century highlights the importance of these familial connections to the expansion of the sugar industry in Piracicaba, São Paulo, particularly for the influential Ometto family, which owned 9 usinas in the Piracicaba region by 1950. Even though the largest usina in São Paulo in the early 20th century was located in the Ribeirão Preto region (the Usina Junqueira in Igarapava, São Paulo), Piracicaba had the largest concentration of usinas in the state from the late 19th century until the 1950s, after which Ribeirão Preto producers' emerged as a more dominant region. Pedro Ramos, *Agroindústria canavieira*, 86–89.

⁷⁴ de Melo, *A política do álcool-motor no Brasil*, 49–53.

de Janeiro.⁷⁵ However, it transformed a larger percentage of sugarcane directly to alcohol (47.8%) than Pernambucano producers (40.8%). By mid-1937, nine anhydrous alcohol distilleries were in operation and three more were under construction in São Paulo.⁷⁶ As President Truda noted at the first Conference on Álcool-Motor hosted in São Paulo, "In no other state, however, has the particular initiative been more active than in São Paulo; no region outweighs this region [São Paulo] in the speed and efficiency of the [sugar] solution[.]"⁷⁷ Indeed, within the state of São Paulo, the Ribeirão Preto usineiros began investing in alcohol production as well. The Usina Santa Elisa began producing alcohol in 1939, which was only three years after Maurilio and his brothers purchased the usina.⁷⁸

Given the short period allotted between cutting and processing sugar, producers' selection of sugarcane products for the harvest were closely monitored and often predetermined. Producers could technically decide upon collection how to distribute the sugarcane toward each byproduct, but the IAA provided quotas for sugar production with tight mandates for byproducts as well. While it might logically seem that producers could easily redirect excess sugarcane away from table sugar and toward another byproduct, this was not always the case. Necessary equipment, restrictive quotas on byproducts like aguardente, and a higher price for sugar than

⁷⁵ Dr. C. Boucher, "Algumas deducções tiradas das estatisticas publicadas no 'annuario açucareiro,'" *Brasil Açucareiro* Vol. VI (September 1935), 15–18.

⁷⁶ This was significantly more than the four distilleries in Pernambuco, one each in Paraiba, Alagoas, and Minas Gerais, and even more than the seven in operation in Rio de Janeiro, including the IAA's own central distillery in Campos.

⁷⁷ Leonardo Truda, "A Victoria do Álcool," *Brasil Açucareiro* Vol. X, n. 2 (October 1937), 93– 105. As the largest consumer market and the dominant car market, the city of São Paulo was an important hub for alcohol promotion. President Truda nominated the city of São Paulo to host the "Alcohol-Motor Week" and the first Conference on Alcool-Motor as part of the Week in October 1937. The week hosted a series of public demonstrations, some of which were held on the popular Avenida Brasil, to commercialize the viability of alcool-motor and the IAA's efforts around alcohol research and production.

⁷⁸ Hasse, *Filhos do fogo*, 90. The Usina Santa Elisa's first harvest produced 18,781 sacks of sugar.

alcohol often left sugar producers reticent or unable to redirect sugarcane toward other byproducts.

Nevertheless, government policies that limited paulista sugarcane production incentivized some local entrepreneurs to favor increased alcohol distillation. While the Executive Commission denied most petitions to expand sugarcane production, petitions that linked a request to expand production to produce more alcohol sometimes succeeded.⁷⁹ Take the case of Gonçalves Coelho, a producer from Ponte Nova, Minas Gerais who requested leniency on his IAA-mandated sugar quota in 1941.⁸⁰ Like many cane growers, Coelho failed to follow the strict sugar quotas put in place by the IAA because he could not make enough profit from limited production. Coelho claimed that he had planted cane for a far larger harvest than his requisite quota permitted prior to receiving his restrictions. Unlike many other requests for a quota extension, Coelho offered a solution to his overproduction. He requested that the IAA allow him to open an alcohol distillery where he could produce anhydrous alcohol from his excess production. The IAA approved the expanded production.⁸¹

The IAA practiced leniency in Coelho's case because he exploited the IAA's predilection to favor ethanol production objectives. The IAA was also a major financier of a central distillery

⁷⁹ Files of cases exist at the National Archives. A few examples include, Senhor Joao Alves Nunes, requested extension March 22nd, 1941; Srs. Benjamin Duarte da Silva, Vicente Voltoline, Antonio Andreoli, etc., Tijuca, March 27, 1941. Extension requests and the Executive Commissions decisions were often issued in the beginning of Brasil Açucareiro issues in the 1930s and 1940s. Some examples of rejected requests published in the monthly magazine include, "Usina Junqueira," *Brasil Açucareiro* Vol. IX (March 1937), 6.

 ⁸⁰ Correspondence letter from Gonçalves Coelho of Ponte Nova, Minas Gerais sent to the IAA on May 8th, 1941. *National Archives:* Instituto do Açúcar e do Álcool, LAPA 459, Dept. 508.
 ⁸¹ IAA correspondence no. 103 of October 18th, 1941, response to Gonçalves Coelho of Ponte Nova, Minas Gerais; the Official Cabinet approves of the IAA's approval on October 29th, 1941. *National Archives:* Instituto do Açúcar e do Álcool, LAPA 459, Dept. 508.

in Ponte Nova in 1941.⁸² As such, Coelho's expressed interest in expanding alcohol production would have been particularly favorable in a market that the IAA had already invested additional funds to promote alcohol production. However, this is but one example of various requests that redirected petitions for quota expansions toward incentivizing anhydrous alcohol production instead.⁸³ It would seem the IAA was far more lenient when producers aligned their own interests with those of the federal government's.⁸⁴ This is yet another reason southeastern producers were able to expand -- or at least evade quota limitations on -- their sugarcane fields despite increased IAA restrictions.

In São Paulo, the Société de Sucreries Bresiliennes enjoyed similar relief from excess sugar penalties in the 1940/1941 harvest. The firm first requested to transform the alcohol remaining from the current 1940 harvest above their usinas' quota into alcohol. The Executive Commission discussed the case at the July 4th session and decided on the following conditions to permit alcohol production. First, the Societe's three usinas could process the excess 34,354 sacks of sugar (2,061.24 metric tons of sugar) from the 1940 harvest into anhydrous alcohol exclusively. However, upon verification by the Institute of the firms' compliance in 1940, the IAA would reduce the quotas of the three usinas in the 1941/42 harvest by the equivalent 34,354 sacks of sugar processed in the 1940/41 harvest.

The Commission considered the arrangement a "favorable solution, because of the urgent necessity of alcohol, for the maintenance of the mixture in São Paulo. The immediate production of anhydrous alcohol, in the indicated conditions, will equal the supply of more than 1 million liters [of alcohol], which will be able to maintain the [gasoline-

⁸² "Política Açucareira," Brasil Açucareiro, Vol. XVIII, n. 3 (September 1941), 3-4.

⁸³ This is based on my review of a limited number of cases from the LAPA 459, Dept. 508, 1941 at the National Archives.

⁸⁴ Pereira, *O problema do álcool-motor*, 51–52. Pereira notes that sugar producers remained reticent given price differentials between alcohol production and sugar production, in addition to equipment limitations, instead preferring to try to export or hold sugar stocks in hopes of possible relief from production limitations.

alcohol] mixture, until the definitive beginning of the production of alcohol in all the distilleries in the state."⁸⁵
Under such conditions, the IAA approved the request. Even so, the commission required that the producer still have to pay the defense of sugar tax on the excess sacks even though it would ultimately end up as alcohol on the market.

Nevertheless, the important position that alcohol held in the IAA's sugar defense policy, and particularly the paulista consumer market, drew the state's attention and sympathy in a way that the personal requests could not. While the smaller requests like Sr. Coelho's connected to a region where alcohol production was expanding, the the Socieite's success with its larger request was in part because of the size of its production capabilities and its access to such an important consumer's market. These individual cases highlight the IAA's efforts to encourage the expansion of private distilleries, and yet, the Institute's hardline commitment to enforcing production limitations at the heart of its policies in this period.

Sugar and Alcohol under the Estado Novo, 1937-1942

The IAA consolidated sugar policy in the late 1930s. President Getúlio Vargas ended his constitutional presidency and began his dictatorship, known as the Estado Novo, on November 10th, 1937. After the declaration of the Estado Novo, the IAA reported that "happily, for the well being and prosperity of the laborious and honored sugar classes, the new constitution does not alter, rather it consolidates and increases the policy of the defense of sugar production."⁸⁶ In fact, the political change offered more power to the IAA, of which Vargas always was a strong supporter. Behind this additional political power, the new IAA President, Alexandre José de

⁸⁵ "Diversas Notas," *Brasil Açucareiro*, Vol. XVIII, n. 3 (September 1941), 6.

⁸⁶ "Á Nação," Brasil Açucareiro Vol. X (November 1937), 175.

Barbosa Lima Sobrinho led the Institute's regulatory power.⁸⁷ Trained as a lawyer, the Pernambucan Barbosa Lima Sobrinho was also a journalist, published 70 books, and became a member of Brazil's Academy of Letters in 1937. As IAA President, he sought to limit the expansion of São Paulo production by tightening sugar limitation enforcement. While this may have been his intention, the results were far from favorable to Pernambucans, supporting continued ire amongst Northeasterners toward usineiros in the southeast to this day.

In 1939, the IAA started strongly enforcing limitations in the southeastern region, exacerbating a brewing confrontation between the expanding São Paulo producers and the IAA. Usineiros and fornecedores, or cane suppliers, responded through numerous appeals for leniency to basically whoever would listen. This included numerous complaints through the local government, lobbying the IAA's Executive Commission, and letters directly to President Vargas. The following examples illustrate larger trends that accompanied important policy changes of the late 1930s and early 1940s.

In written complaints, smaller usineiros and cane suppliers from various sugar regions in the country often cited personal struggles to evoke sympathy to win quota expansions. The troubled usineiro José Bruno da Silveira wrote the IAA in 1941 from his remote sugar plantation in Minas Gerais of his "desperate situation … overloaded by bills, with children to educate, and a family to take care of." He emphasized his family's "precarious and anguished situation," because he had "the burden to educate and maintain 12 children, [and to] house more than 400 souls [agricultural laborers and their families]" on his rural property.⁸⁸ These types of requests

 ⁸⁷ President Truda stepped down from the IAA presidency and the Bank of Brazil presidency at the same time. While Andrade de Queiroz, Truda's vice-president in the IAA, took over briefly, Vargas, at the suggestion of Truda, nominated Barbosa Lima Sobrinho to succeed Truda in 1938.
 ⁸⁸ Excerpts of various denied requests submitted to the IAA in 1941. *National Archives:* Instituto

do Açúcar e do Álcool, LAPA 459, Dept. 508.

were very common in producers' petitions for government assistance. Federal authorities, however, rarely softened enforcement of quotas when producers claimed personal hardships in contrast to those that expressed interest in expanding alcohol production.

In 1941, the IAA passed important legislation that restructured the relationship between sugar producing classes, further exasperating disdain for its production quotas. Much debated within the Executive Commission and the Advisory Council, the Sugarcane Farming Statute (Estatuto de Lavoura Canavieira-ELC) was the product of more than five years of debate amongst bureaucrats within the IAA, usineiros, and cane suppliers. Since the inception of the IAA, large usineiros increasingly supplied their own cane rather than purchase cane from smaller independent growers. The stabilization of high sugar prices removed large usineiros' incentive to rely on outsourced suppliers (*fornecedores*), instead spurring usineiros to cut out middlemen and provide their own cane. Their large usineiros' expansion pushed out small plantation owners that grew and milled their own cane and fornecedores that supplied sugarcane to large centralized usinas out of the market.⁸⁹ The ELC enforced new quota restrictions that required usineiros to

Unsurprisingly, petitions sent by *lavradores* seem to have won far less sympathy than usineiros' requests. Class divisions certainly favored usineiros and *fornecedores* that were former *senhores de engenho*, and thus still of a higher class within the larger *lavoura*, or sugarcane industry.

Many studies have highlighted the personal relationship urban and agricultural workers felt toward President Vargas, also known as the "Father of Poor," because of his rhetorical position in support of labor in order to garner public support in this era. Cliff Welch's study of rural labor movements in the Ribeirão Preto region also points to this connection between agricultural rural laborers and Vargas. Brodwyn Fischer's study of citizenship rights and the urban poor in Rio highlights the important role Vargas played in the imagination of poor people. See Brodwyn Fischer, *A Poverty of Rights: Citizenship and Inequality in Twentieth-Century Rio de Janeiro* (Stanford: Stanford University Press, 2008) and Welch, *The Seed Was Planted*, 68. ⁸⁹ Nunberg, "State Intervention," 60–61. Nunberg notes by the beginning of the 20th century, centralized usinas were replacing outdated engenhos. Many senhores de engenhos turned into fornecedores that supplied the larger centralized usinas that had replaced their engenhos' production. Lavradores worked the land on engenhos and/or usinas. In São Paulo, salaried workers dominated the fields under the colonato system.

provide suppliers 40% of their cane quotas to fornecedores along with stipulations on how much usineiros had to pay laborers in the cane fields and the establishment of a court to resolve disputes between labor and capital under the control of the IAA.

The ELC had less impact on paulista caneworkers than their northeastern counterparts. Largely identified as sugarcane colonos, paulista sugarcane workers were paid based on a percentage of the value of the cane market price that they collected.⁹⁰ Paulista usineiros fought hard to maintain workers' status as colonos, rather than sugarcane workers, known as *lavradores* in the the Northeast, because the system allowed landowners to maintain a constant labor force at minimal cost, evading the ELC's new labor and pay requirements for suppliers and field laborers. This low cost centered on workers living on land that they worked, giving landowners "an extraordinary flexibility" by adjusting to price variations through salary reductions, knowing that "the colonos would continue residing on the land, available for work, at a reduced price."⁹¹ The ELC sought to break the increasingly exploitative consolidation of large sugar complexes that was pushing out smaller producers by the 1940s.

The ELC was a far deeper intervention into the sugarcane industry than had initially begun in the 1930s, but it was on par with the degree of state control involved in the alcohol industry. The new IAA President Lima Sobrinho strongly supported the ELC as part of his drive

⁹⁰ Welch, *A semente foi plantada*, 283n75. The *colonato* was a family-based labor system that dominated agricultural labor until the late 1950s. It is best known for its connection to coffee production in São Paulo. The system collapsed in the 1950s, and temporary workers, or *bóias-frias*, would emerge as the primary cane laborers in the region and the industry. For more on the changing labor system, see Verena Stolcke, *Coffee Planters, Workers, and Wives: Class Conflict and Gender Relations on São Paulo Plantations, 1850–1980* (New York: St. Martin's Press, 1988). Bóias-frias are also the topic of chapter 6 in this dissertation.

⁹¹ Welch, *A semente foi plantada*, 284. Although paulista usineiros successfully won the differentiation between colonos and other caneworkers in the Northeast, an amendment to ELC in 1944 would actually grant colonos the same rights imparted on other sugarcane workers in the 1941 statute. Welch, *A semente foi plantada*, 299; see also, Ramos, *Agroindustria canavieira*, 104–105.

to defend not only the economic but also the social structure of the sugar industry. The handpicked Pernambucan successor to President Truda, Lima Sobrinho believed that the unstable position of cane suppliers was a central conflict in the sugar industry that the IAA should address as part of a larger agrarian reform with the sugar sector. He viewed the ELC as a means to prevent deeper chaos within the sector if producers' expanding power rendered independent suppliers extinct. The Statute expanded the IAA's power to regulate social relations between large-scale mill owners, or usineiros, and small-scale cane suppliers.⁹²

When the bill leaked to the press in May 1941, the issue expanded to a national debate. In response, some producers used the opportunity to expand their complaints of the hardship endured due to quota restrictions by invoking the topic of ethanol production. For example, the Sugar Industry Unions of São Paulo, Minas Gerais, Rio de Janeiro, and Pernambuco expressed their concerns about the quotas in a letter sent directly to President Vargas. They claimed that the compulsory production quotas would have an "altering and disorganizing" effect on the industry that would "inevitably increase various regions' shortage of raw materials within the country, and also affect ethanol production, which is of vital interest to the nation."⁹³ The usineiros' lobbying organizations purposely referenced the potentially negative impact these quotas might have on ethanol production, knowing that Vargas' national commitment to ethanol production might draw a more favorable response to their complaint. Their reference to national objectives tries to diminish the IAA's other central objective: the control of domestic sugarcane production.

⁹² Nunberg, "State Intervention," 59–60, 64; Hartzmark, "Businesses, Associations, and Regions," 82. In fact, former IAA Vice-President Alberto de Andrade Queiroz shortly served as the interim president of the IAA from December 1937 to May 1938. Hugo Paulo de Oliveira, *Os presidentes do I.A.A.*, Coleção Canavieira n. 19 (Rio de Janeiro: MIC/IAA, 1975).

⁹³ Correspondence letter from the Sindicato da Indústria do Açúcar de São Paulo, Minas Gerais, Rio de Janeiro, and Pernambuco to the IAA regarding Protocolo do IAA n. 964, sent November 11th, 1941. *National Archives:* Instituto do Açúcar e do Álcool, LAPA 459, Dept. 508.

The producers' unions tried, and failed, to exploit this interest in order to win support against the social reforms associated with the ELC.

The multiple Sugar Industry Unions' unified complaint was one of sugar interests' many approaches to undercutting the IAA's authority. The IAA quickly dismissed their complaint, noting that all sugarcane unions had approved the quota implementation, thus undermining the basis of their complaint.⁹⁴ This action reestablished the IAA's position as the final authority on sugarcane policy. Although individual petitions directed to the President were common, the united front of the producers contested the IAA's power. Indeed, these large producers had moderate success in diminishing some of the original social goals in the final draft, but they failed to block the passage of the statute altogether. The IAA repeatedly drew on its past success in salvaging the industry from collapse in the 1930s to assert its position. However, the letter reveals the tensions enforcement of new federal intervention created.

In the first decade after the creation of the IAA, alcohol policy successfully supported the expansion of alcohol production. Maria de Castro Santos argues that the state "penetrated into the alcohol sector to fill the void left by the private sector, which did not come forward in sufficient numbers."⁹⁵ From the construction of its own central distilleries to the IAA's financing for private distilleries and its lenience toward producers redirecting sugar production into alcohol, the IAA successfully intervened in the sugar market to create an alcohol market. In fact, alcohol use increased in the 1940s with a new threat to Brazilian energy access.

⁹⁴ Correspondence letter from the IAA to President Vargas and the Sindicato da Industria do Açúcar de São Paulo, Minas Gerais, Rio de Janeiro, and Pernambuco sent November 14th, 1941 in response to November 11th letter. *National Archives:* Instituto do Açúcar e do Álcool, LAPA 459, Dept. 508.

⁹⁵ Santos, "Alcohol as Fuel," 79.

The IAA and Paulista Influence, 1942-1959

When German submarines attacked Brazilian commercial vessels in 1942, it gave Vargas a *casus belli* to declare war on the axis powers. Brazilians joined the Allies. However, the threat of additional attacks cut off transportation routes for shipping Northeastern sugar to the Southern market. The World War and German submarines also limited gasoline imports into the country, driving up the demand for alcohol in response.

Sugar shortages in the Southeast, particularly São Paulo, forced IAA President Barbosa Lima and the Executive Commission to relax sugar quotas for regional producers, most notably the potent São Paulo producers. First, Barbosa Lima authorized the construction of new usinas and freed quotas, suspending restrictions for production of unrefined sugar and freeing the installation of small sugar plants in "insufficiently supplied states."⁹⁶ Historian Pedro Ramos notes that the IAA tried to control the subsequent São Paulo expansion because of the IAA's intention to protect Northeastern producers by only authorizing small production quotas of 400 sacks of sugar per year to new engenhos with Portaria n. 49/43. However, the initial release began a virtual scramble among paulistas to register production quotas. While the IAA had used quotas to restrict entry into the sugar sector in the 1930s, the new policy allowed new producers to break into the industry even though the expansion of paulista production slowed down between 1940 and 1944.⁹⁷

After Brazil entered World War II in support of the Allies, efforts to promote alcohol production expanded due to diminished sugar exports and gasoline shortages. One of the most

⁹⁶ Ramos, *Agroindústria canavieira*, 107. São Paulo, Rio de Janeiro, and Minas Gerais were insufficient producers, but the most important had been São Paulo, whose imports had secured the Northeastern producers' foothold in the industry.

⁹⁷ Ramos, *Agroindústria canavieira*, 108–109. Ramos states that São Paulo production grew by 132% (11% per year) between 1932 and 1940, while it grew by an annual rate of 7.2% between 1940–1944.

successful and influential moves made by the IAA was the establishment of price parity between alcohol and sugar in 1942 to encourage alcohol production. The lower price previously offered for alcohol production compared to sugar production had hurt producers' willingness to invest in sugar production. Parity resolved this issue. It provided an important incentive given sugar's rising price on the world market during the war and the government's favorable interests in expanding alcohol production.⁹⁸ However, a shortage of benzol, a key dehydration ingredient in the production of anhydrous alcohol, hindered alcohol's expansion beginning in 1943.⁹⁹ Given this shortage, very few of the wartime measures lasted long, but this new legislation led to greater ethanol production at war's end.¹⁰⁰

President Vargas and sugar policymakers refocused on alcohol production's political importance during the Second World War. As Political Scientist Maria de Castro Santos points out, the war connected the industry and alcohol production to issues of national security for the first time. In late 1941, President Vargas established the National Commission for Fuels and Lubricants with Decree 3.755 in response to the wartime fuel shortage. Led by the Secretary General of the National Security Council, the Commission included the president of the National Petroleum Council, the IAA, a representative from the National Gas Commission, and a representative from the Mines and Metals Council; military ministers also participated in the

⁹⁸ See Santos, "Alcohol as Fuel," 112–123. In fact, the IAA launched what Santos colloquially calls the "alcohol war package" intended to promote greater alcohol production. These policies met limited success, particularly for anhydrous alcohol given the benzol shortage due to difficulties importing the product during the war. Santos gives a thorough analysis of the package and policy outcomes.

⁹⁹ See Santos, "Alcohol as Fuel," 113–117. This shortage encouraged a larger proportion of hydrated alcohol production, which did not require the same dehydration process. Hydrated alcohol, primarily used in industrial products, would continue to grow steadily while anhydrous alcohol production diminished until the 1970s. See Table 20 for a view of overall alcohol production from 1930 to 1982.

¹⁰⁰ Dias de Moraes, A desregulamentação, 49.

Commission. This made alcohol production more than the solution to the sugar problem of the 1930s but also a part of national security concerns because of its role in the reduction of gasoline imports.¹⁰¹

The political transformations of the post-war period influenced sugar and alcohol policy. Civilian opposition against ongoing dictatorial rule pushed the forceful end of Vargas' dictatorship with the pivotal support of the military and a return to democratic elections.¹⁰² The former War Minister General Eurico Gaspar Dutra won the first democratic presidential elections in Brazil since the fated 1930 campaign and took office in 1946. Heavily influenced by liberal economic ideology, the new government moved away from the interventionist directed economic policies of the first Vargas era. Instead, Dutra focused on a liberal economic model, embracing a return to high imports in a less restricted economy. In fact, these initial policies quickly drove the balance of payments back into a precarious situation, forcing the Dutra government to readjust its policies by 1948.¹⁰³

War's end also changed the sugarcane producers' and politicians' sentiment toward the IAA and its protectionist policies. São Paulo producers led an onslaught on President Barbosa Lima Sobrinho and the IAA itself. For example, the editors of *Brasil Açucareiro* dedicated multiple articles to the defense of the IAA and its policies in the monthly magazine in 1945. Newspapers attacked the efficacy of the IAA and its leadership.¹⁰⁴ The debate over the IAA and its very existence reached the newly formed Senate, where the former paulista Executive Commission representative Paulo Nogueira was one of the many vehement supporters of the

¹⁰¹ Santos, "Alcohol as Fuel," 113–117.

¹⁰² Skidmore, *Politics in Brazil, 1930–1964*, 48-54.

¹⁰³ Skidmore, *Politics in Brazil*, 1930–1964, 69.

¹⁰⁴ The IAA's monthly magazine republished numerous articles and excerpts from the *Correia de Manhã*, *Diario Carioca*, and other newspapers to rebut their claims in the January and February 1946 editions amongst others.

dissolution of the Institute.¹⁰⁵ These battles continued through 1948, as the IAA Executive Commission repeatedly defended itself against efforts to replace the entity first with a Rural Bank under the Ministry of Finance and then under the Agricultural Ministry.¹⁰⁶

Amidst these political battles, the IAA policy extended the more liberal wartime policies established by formally separating national production quotas by state. This freed São Paulo producers alone to expand capacity enough to provide for the largest consumer market in the country where they had previously shared that market with numerous other states, most notably Pernambuco. Decree 9,827 of September 10th, 1946 set production quota levels per state based on regional consumption rather than national quotas for a unified national market.¹⁰⁷ The state quotas allowed São Paulo producers to expand production to exclusively meet São Paulo demand. With the largest consumer market in the country and having been a net importer of Pernambucan sugar, the decree untethered paulista production from Northeastern production. As the Southern market expanded in response to higher sugar and alcohol consumption around the major consumer markets, the Northeast's hold on sugar production and influence in the IAA diminished.¹⁰⁸

It is worth noting that the shift toward São Paulo in the IAA reflects a broader trend on the national scale in the same period. While São Paulo and its other southern neighbors, particularly Rio Grande do Sul and Minas Gerais, had dominated politics throughout most of the

¹⁰⁵ "Em defesa do Instituto do Açucar e do Alcool," *Brasil Açucareiro* Vol. XXVII, n. 4 (April 1946), 336–340.

 ¹⁰⁶ Szmrecsányi, *O planejamento*, 213n84. For more on the heated battle to end the IAA, paulistas producers' role in the battle, and the IAA's defense, see Santos, 125–126.
 ¹⁰⁷ Szmrecsányi, *O planejamento*, 214.

¹⁰⁸ For a detailed explanation of what happens to Northeastern sugar production and analysis of why the Southern and Northeastern paths diverged so substantially, see Ramos, *Agroindústria canavieira*, 115-139. See also, Hartzmark, "Businesses, Associations, and Regions," chapters 3 and 5. The Northeastern case is beyond the scope of this study.

First Republic (1889-1930), the Northeast had remained a political and economic block that had to be appeased. However, as its sugar influence diminished, its primary economic engine lost steam and the southern economic and political interests won greater influence. As noted above, this enflamed long existing disdain between Northeasterners and Southeasterners. In São Paulo, a steady stream of migrants to both rural regions and the city promoted a particularly negative image of Northeasterners that was racially and economically driven.¹⁰⁹ Barbara Weinstein explores the construction of the modern paulista in contrast to the racialized image of the poor, uneducated Northeasterner. Paulistas' political dominance, connected to a growing population, its increasingly industrialized economy, and newly created identities of whiteness, stood in contrast to the still predominantly black, rural Northeast.

As the IAA loosened its regulation of sugar quotas, its control over alcohol production transformed as well. Yet, alcohol maintained an important position in the expansion of sugar production in the southeast after the war. São Paulo producers quickly entered the sugar market to meet the large São Paulo demand. In fact, the number of usinas in São Paulo grew from 42 in 1946 to 71 in 1947 to more than 90 by 1956.¹¹⁰ A larger alcohol capacity accompanied the construction of new usinas where distilling grew from 43,083,152 liters in 1946 to 51,172,271 liters in 1951.

¹⁰⁹ See note above for more on the sugar division, but for a deeper analysis of the social implications of the Northeastern and Southeastern divide, see Odair da Cruz Paiva, *Caminhos cruzados: migração e construção do Brasil moderno (1930–1950)* (Bauru: EDUSC, 2004); Paulo de Martino Jannuzzi, *Migração e mobilidade social: migrantes no mercado de trabalho paulista* (Campinas: FAPESP, 2000); and most recently, Barbara Weinstein's work on the construction of the Northeasterner as a racialized other in São Paulo based on economic differences in the country, see Weinstein, *The Color of Modernity: São Paulo and the Making of Race and Nation in Brazil.*

¹¹⁰ Dias de Moraes, *A desregulamentação*, 50–51; Ramos, 138.

Alcohol production grew disproportionately in hydrated alcohol rather than the IAA preferred fuel supplement anhydrous alcohol.¹¹¹ This was partially related to the difficulty of importing the necessary dehydration components during the war, but the IAA continued to incentivize anhydrous alcohol through various promotional projects and legislative incentives as it did in the 1930s. For example, the IAA Executive Commission financed another incentive program in 1945 for construction of an usina and distillery similar to the initial 1931 distillery competition. Exclusively directed toward the construction of three usinas and attached distilleries in western São Paulo, the program required that the distillery have a production capacity of a minimum of 15 liters of alcohol per 60kg sack of sugar. To participate, producers had to have a requisite IAA sugar production quota of 30,000 sacks or more, meaning that minimum alcohol production capacity would be 450,000 liters per year. The quota requirement thus excluded many of the smaller new usinas, engenhos, and other sugar production mills that sprang up under the expansionary policies of the Second World War and instead favored larger producers.¹¹²

Key legislation pushed dramatic alcohol expansion. First, President Dutra's Decree n. 25,174A of July 3rd, 1948 reasserted alcohol's national importance, committing the Institute to increasing stocks of molasses and alcohol and improving transportation from regional producers to mixture locations and distribution to consumers. These goals were not new to alcohol policy, but the Decree also established price parity between sugar and direct alcohol (alcohol produced directly from the cane), and it added additional bonuses for those that produced alcohol along with sugar.¹¹³ Additionally, the IAA established the Anhydrous Alcohol Fund (Resolution n. 210/48), which funded the additional costs of production for installation and maintenance of

¹¹¹ IAA, *Anuario Açucareiro Ano XVI- 1950/51* (Rio de Janeiro: IAA), 74. Over 90% of the 1950/51 harvest's alcohol was hydrated rather than anhydrous.

¹¹² "Editais do IAA", *Brasil Açucareiro* Vol. XXVI, no. 1 (January 1946), 36.

¹¹³ Santos, "Alcohol as Fuel," 130. Lower grade alcohol from reprocessing had lower prices.

anhydrous facilities. Finally, the IAA set the goal to produce 114 million liters of anhydrous alcohol nationally.¹¹⁴

The war-driven expansion in the paulista sugar and alcohol industry incentivized more entrepreneurs in the Ribeirão Preto region to invest in the sugar industry with the release of sugar production limitations. Take for example Antonio Paschoal, one of the first metallurgy business owners in Sertãozinho. A mechanic by trade, Antonio worked in metallurgy offices in Ribeirão Preto and Piracicaba before taking over his father's company with his brother Braz, in 1928, which they renamed B. Paschoal & Irmão. Antonio worked closely with the Engenho Central in Sertãozinho. His trade focused on producing and fixing mill equipment like boilers and other pieces. In the 1940s, he won a license to produce the alternative gasoline option, gasogene, to great success.¹¹⁵ Paschoal used these profits to build and invest in various new usinas in the region, including the Usina Santa Lúcia in 1947 and the Usina São Francisco in 1946. Other usinas that opened in this period include the Usina Santo Antonio (owned by the Balbo family) and the Usina São Geraldo (owned by the Simioni family) in 1946.¹¹⁶

The Biagi's Usina Santa Elisa continued to grow as well. Pedro Biagi divested his shares in the company to his three sons, Gaudencio, Baudilio, and Maurilio in 1941 because of fears that his status as an Italian migrant might create problems during the war. Maurilio was the real leader of the Usina, transforming the usina "in his image and semblance" as historian Geraldo Hasse states. Maurilio Biagi was the seventh of Pedro's twelve sons. He studied accounting at the Salesiano Lyceum in Campinas but was known for working closely with his father and his

¹¹⁴ Szmrecsányi, O planejamento, 221.

¹¹⁵ Gasogene was an apparatus that attached to the back of an automobile and burned wood, charcoal, peat and other combustibles for fuel. It became a popular option during the fuel shortages of the wartime era. Wolfe, *Auto and Progress*, 107.

¹¹⁶ Hasse, Filhos do Fogo, 69–70, 102–105; Marchesi, João Marchesi, 22.

brothers at their nearby usina in Serrana, the Usina da Pedra, before purchasing the Usina Santa Elisa in December 1936. Maurilio Biagi was deeply interested in technical experimentation to improve cane cultivation and the use of sugarcane alcohol for combustion. He was an important part of the region embracing both industries.¹¹⁷

Reforms particular to the Usina Santa Elisa in the late 1940s defined it as a premiere "modern," industrialized usina. Biagi's son, Maurilio Biagi Filho recounts that Biagi "started to import new equipment and test the national prototypes, copied from foreigners. New cane varieties and planting techniques were installed."¹¹⁸ For example, Biagi modernized his farming techniques in the late 1940s by incorporating tractors in 1945 and 1946. In the 1950s, Santa Elisa began burning cane to speed up cane collection, which still relied on manual laborers, mules, and wagons to transport cane from the fields to the usina. In 1948, after a destructive fire threatened the usina's harvest in 1947, the usineiro began a mixed transportation system that utilized both trucks and wagons to deliver the harvested cane to the usina more efficiently. Maurilio Biagi continued to import tractors and expand the mechanized transportation system, turning the usina into "a reference point" in regard to its cultivation and transportation methods. Other usinas emulated Biagi's methods, improving mechanized production methods for numerous producers as a result.¹¹⁹

Maurilio Biagi invested not only in sugar and alcohol production but also the agricultural equipment necessary for sugar production. Most importantly, Maurilio partnered with Ettore

¹¹⁷ Hasse, *Filhos do fogo*, 94–95; "Assim nasceu Santa Elisa," *A Revista Santa Elisa: Uma Historia de Trabalho e Desenvolvimento*, (Ribeirão Preto: MIC Editorial Ltda, 1996), 15. ¹¹⁸ "Assim nasceu a Santa Elisa," 15.

¹¹⁹ Hasse, *Filhos do fogo*, 111–114. For example, the Luiz Antonio Ribeiro Pinto, director of the Usina Santa Lydia located in Ribeirão Preto proper, helped adapt the hydraulic winches used on the tractors for production, which gave birth to the cane harvest equipment industry Santal in 1960. The winch that Pinto adapted became the most used type in the Brazilian sugar industry.

Zanini, a local mechanic, in August 1950 to found the Oficina Zanini Ltda. The metallurgy company grew into the largest equipment company in the region. Biagi founded the industry to compete with the dominant Dedini metallurgy industry. Based in Piracicaba, Mario Dedini founded the company that would become the only large producer of major industrial equipment for the Brazilian sugar industry.¹²⁰ Zanini Ltd. transformed the Ribeirão Preto region into a center for cane equipment and technology. The close collaboration between the Usina and the equipment company fostered more advanced distillation and cane cultivation methods that benefitted not only the Usina Santa Elisa but also neighboring usinas.¹²¹

These technological improvements distinguished the Usina Santa Elisa, establishing an image as a national leader in modernization of the sugar industry, which would have an important influence on Santa Elisa's growth through the next decades until the alcohol program in the 1970s.¹²² Biagi's investment in this early technology pushed the Usina Santa Elisa into a leading position in sugar production, defining the direction of the sugar industry in the region. Amanda Hartzmark's illustrates the way usineiros in the south were able to use familial and interpersonal connections to capture the sugar market, which occurred in textile and pharmaceutical industries as well according to Peter Evans.¹²³ While true, this work illustrates

¹²⁰ Hasse, *Filhos do fogo*, 146.

¹²¹ Hasse, *Filhos do fogo*, 150–152. As historian Geraldo Hasse described it, the Usina Santa Elisa and Zanini would have a somewhat symbiotic relationship, in which the two grew together with the Usina serving as a test site for Zanini products in the usinas development and the companies' growth. Although majority ownership changed hands early in the first decade of Zanini's existence, Biagi would remain the guiding force of the company's growth in the 1950s. ¹²² Wolfe, *Autos and Progress*, 137. Joel Wolfe notes that "the promises of industrialism and modernity came to fruition on farms producing for export" because agriculture, truck, and car consumption were key parts of a transforming image of modernity in the country. This connection would become even clearer through the sugar industry's modernization efforts in the 1960s, as discussed in the next chapter.

¹²³ Hartzmark, "Businesses, Associations, and Regions," 232; Evans, *Dependent Development*, 281.

the way one family constructed these connections to shape sugarcane's industrial expansion in the years to come. First establishing its prominence in the region with new technology in its production process, the Biagis would use self-financed technological imports to expand their hold of the market in the 1960s and 1970s. These early connections to modernization techniques, domestic and foreign, were critical steps to industrializing sugarcane production.

As a collective, paulista sugar production expanded dramatically in the 1950s while alcohol's importance as a contributor to the national oil supply diminished in the 1950s. The IAA continued to support alcohol production within the sugar industry, but its national importance diminished because expanding car and steel industries targeted oil consumption and international petroleum prices dropped well below alcohol production prices. Before explaining the important changes in sugar and alcohol production and consumption that occurred in the 1950s, one must understand the broader political and economic transformations afoot in Brazil.

President Dutra's economic policies in the late 1940s encouraged a wave of industrialization in Brazil that would explode in the 1950s. President Dutra's policies limited imports with import licensing restrictions and simultaneously maintained a high currency valuation. These conditions made investing in domestic industries more economically viable than importing because of the high prices that taxes and the currency exchange imposed on imported industrial goods.¹²⁴ This directly encouraged the expansion of agricultural and industrial companies like the sugarcane-processing equipment company, Biagi-owned Zanini.

By the beginning of the 1950s, a new focus on developmentalist-nationalism took hold of Brazilian economic policies and national politics even though it had been present in government policies for the previous two decades. Vargas had created the IAA in support of an economic

¹²⁴ Skidmore, Politics in Brazil, 1930–1964, 70.

nationalist agenda focused on self-sufficiency in the 1930s, and his support for state-led industrialization as a form of economic nationalism as a key part of the Estado Novo. Import substitution policies followed Vargas' early initiatives. Theory followed policy in the 1940s, as economic theorists and public opinion alike fostered a growing sense that Brazil could only become an important power if it developed into a modern industrial economy.¹²⁵ This sentiment gained greater attention through Vargas' populist campaign for the presidency, run on the promise of the creation of a domestic oil industry. After his victory in 1951, Vargas created the new national oil company, Petrobrás, in 1953, which shifted all oil drilling and refining to the state-owned company monopoly.¹²⁶ Vargas' campaign made petroleum a symbol of national autonomy and security, which displaced alcohol's importance in these arenas.¹²⁷

Following President Vargas' dramatic suicide in 1954, the developmentalist-nationalist agenda, driven in both the private and the public sectors, expanded. President Juscelino Kubitschek's promotion of Brazil's automotive industry is the best expression of this accelerating agenda. The Minas Gerais native was trained as a physician before entering politics.

¹²⁵ Triner, *Mining and the State*, 108–109; Love, *Crafting the Third World*, 120; Skidmore, *Politics in Brazil*, 86–89.

¹²⁶ Vargas ran his populist campaign, "O Petróleo é Nosso," in his return to power based on his promise to nationalize domestic oil exploration and refining. This campaign led to the founding of the Brazilian National Oil Company, Petrobras, in 1953. For more detail on the campaign, see Maria Augusta Tibiriça Miranda, *O petroleo é nosso: a luta contra o "entreguismo' pelo monopolio estatal, 1947–1953* (Petrópolis: Vozes, 1983); James Wirth, *The Politics of Brazilian Development, 1930–1954* (Stanford: Stanford University Press, 1970), Chapters 8 and 9; Laura Randall, *The Political Economy of Brazilian Oil* (Westport, CT: Praeger, 1993), 9–12.

¹²⁷ Triner, *Mining and the State*, 115. Many scholars have pointed to Petrobrás and petroleum as the key strategic industry developed under Vargas' his economic nationalist agenda, but both Triner and Dinius' work on state intervention in the mining sector and the creation of the iron ore and steel state-owned industries reveal the far-reaching influence of Vargas' state-led interventionism during the 1940s and 1950s. My work on alcohol contributes to these studies, highlighting Vargas' reach into agro-industrial state-led development as well. For classic interpretations, see Skidmore, *Politics in Brazil*. For newer analyzes of other state-led development projects, see Triner, *Mining and the State*, chapter 7; See also, Dinius, *Brazil's Steel City*.

He rose through the state's political system before winning the governorship in 1945.¹²⁸ Known most for his economic achievements during his presidency, the former Governor of Minas Gerais, "embraced the idea of using the state to plan the development of the nation."¹²⁹ His vision of a modern Brazil, embodied in his campaign slogan "Fifty Years of Progress in Five," centered on an industrial Brazil.

During his presidency, the popular Kubitschek won the image of the developmentalist president with the establishment of Brazil's automotive industry side by side with the construction of the new federal capital in Brasília in the interior of the state of Goiais.¹³⁰ Both were symbols of modernity and progress. His developmentalist agenda was put in peril as international financial institutions, namely the International Monetary Fund, tried to force Kubitschek to reign in spending to secure a loan. His refusal won him even more fame. For Kubitschek, the establishment of a domestic car industry was the key to a modern country.

Joel Wolfe highlights the importance that cars and the domestic production of cars held in the idea of Brazilian modernity and nationalist pride. For example, Volkwagen and Willys-Overland Motors began manufacturing trucks and cars in Brazil using an increasing amount of Brazilian manufactured inputs in 1954 and 1957, respectively. Wolfe indicates that Brazilians connected these achievements to the idea of reaching a tangible level of development.¹³¹ However, this modernity came to rely more on standard oil consumption rather than the

¹²⁸ Skidmore, *Politics in Brazil*, 163–164.

¹²⁹ Wolfe, Autos and Progress, 115.

¹³⁰ Wolfe, Autos and Progress, 137.

¹³¹ Wolfe, Autos and Progress, 119–121.

alternative alcohol product that policymakers had supported so aggressively over the previous thirty years.¹³²

Kubitschek's industrialization efforts in the 1950s drove an increasing focus on oil for industrial use and diminished alcohol's place in the national energy and development scheme. The oil-based fuel economy expanded with the growth of the domestic steel company and car production. The low international oil prices of the 1950s, officially cheaper than alcohol liter to liter, diminished demand for alcohol. In fact, the National Petroleum Commission reduced the national alcohol mixture rate from the previous 10% nationally between 1938 and 1940 to 5% in the 1950s. It would seem that the government's diminished commitment to alcohol in favor of an oil-based fuel economy in the country in the 1950s would have doomed the alcohol industry.¹³³

Yet, within the industry, sugar production expanded dramatically behind new agroindustrial expansion while alcohol production also expanded with less national attention. The current IAA President Fernando Pessoa de Queiroz and the Executive Commission released its new plan for sugar and alcohol production in Resolution 501 on February 1st, 1951. This called for an increase in production of over ten million sacks of sugar (from 23,220,794 sacks of sugar to 33,364,158 sacks in the 1956/57 harvest). The commission justified their action due to the expected domestic consumption growth rate of about 6% per harvest. Even when the commission revised this expansion expectation down to 4.87% per year, the expected domestic sugar

¹³² Wolfe, *Autos and Progress*, 234n63. Wolfe's own dismissal of the important role ethanol had played in the Brazilian energy matrix prior to the 1950s highlights the detrimental effect this obsession with industrialization in the 1950s had on alcohol's place in the national economy as an oil supplement and substitute. After citing the IAA's creation in the 1940s rather than the 1930s, he claims that the gasogene alternative had a far greater impact on the national energy economy while alcohol production only "slightly diminished fuel shortages" in the war era. He makes no other mention of the alcohol mixture before the oil crisis of 1973.

¹³³ Santos, "Alcohol as Fuel," 107–108, 154. With the exception of 1958 and 1959, at which point the requirement increased to 7 and 7.5% respectively.

consumption for the 1956/57 harvest was 30,331,053 sacks of sugar, which fell into the margin of error for the projected expansion. This policy reform had larger implications on a changing Brazilian sugar industry.¹³⁴

The creation of agro-industrial complexes across the paulista countryside drove the expanding production capacity in the 1950s. Despite the IAA's attempts to contain paulista expansion, usineiros, like the Biagis with the Usina Santa Elisa, consolidated the agricultural production of their sugarcane, the processing of that cane, and even the development of the equipment for processing in one large complex. This became increasingly common in the paulista countryside amongst the largest producers in the state in the 1960s. These complexes included expanding alcohol production capacity.

The 1951 Resolution reflects the IAA's diminishing control over sugar production limitations in the face of these structural changes. *Brasil Açucareiro* noted that the IAA response showed a solid sugar policy that had "a handle on crises and upheavals that in the past have put in check the stability of the sugar agro-industry repeatedly."¹³⁵ Yet, it would seem that the IAA really continued to expand quotas to reclaim control over sugar production that it had lost after releasing quotas in the 1940s.¹³⁶ Following Resolution 501 in 1951, paulista sugar and alcohol production dramatically increased. Nationally, sugar production expanded from 23.4 million

¹³⁴ "Politica Açucareira," Vol. XXXVII (March 1951), 3, 10–19. The IAA's Executive Commission began issuing separate Sugar Crop Plans and Alcohol Plans each year in 1939. The Plans delineated the quotas for the year. Beginning in the 1946, production consistently overshot mandated levels, forcing the IAA to revise and expand these production mandates. See Ramos, *Agroindústria canavieira*, 120. The new plan called for the expansion of national sugar production from 23,220,794 sacks of sugar per year to 33,364,158 sacks by the 1956/57 harvest. The additional 10,143,364 sacks were to be divided between established usinas and new usinas (9,264,217 for old usinas based on the production level from 1946 and 879,147 for new usinas). ¹³⁵ "Política Açucareira," Vol. XXXVII (March 1951), 4.

¹³⁶ Ramos, *Agroindústria canavieira*, 120. The IAA would again readjust quotas to account for sugar overproduction in 1952, 1957, and 1963.

sacks in 1950 to 55.2 million sacks of sugar in 1960. Meanwhile, São Paulo's portion reached 23.97 million sacks alone in the 1960/1961 harvest.¹³⁷ As the IAA struggled to grab control over the sugar policy, it continued to press alcohol production as an alternative in the 1950s.

Despite its diminishing returns in the 1950s, the IAA continued to support alcohol production. For example, Resolution 501 also encouraged additional alcohol production, illustrating the still important place the alcohol held within sugar policy and regulation. It required all usinas to direct 10% of their overall sugar production to alcohol production.¹³⁸ This requirement indicated that usinas capable of establishing distillation facilities must do so without IAA financing. It stipulated alternatives to those usinas unable to install such capacity, including an option to produce different variations of sugar byproducts. Additionally, the Resolution guaranteed bonuses to all producers that produced anhydrous or hydrous variations of alcohol.

Even as demand for alcohol production declined, national production continued to expand, as illustrated in the graph below. This is particularly true in São Paulo. In 1952, the state produced 64,447,332 liters of alcohol. By 1955, that amount had more than doubled.¹³⁹ After the resolution, São Paulo particularly expanded production of anhydrous alcohol, which was used for the alcohol fuel mixture.

¹³⁷ Santos, "Alcohol as Fuel," 135; Anuario Açucareiro, 1960/61–65/66, 32.

¹³⁸ There were a number of stipulations attached to the Resolution on this topic. First, the usina had to process the alcohol directly from sugar rather than from another byproduct, like molasses, into alcohol. Additionally this alcohol did not necessarily have to be alcohol for carburant mixture. Rather it could be alcohol for industrial use or rum (aguardente).

¹³⁹ IAA, *Anuario Açucareiro* Ano XVIII- 1953–56 (IAA: Rio de Janeiro), 40. Importantly, for the first time anhydrous alcohol surpassed hydrated alcohol in paulista production that year. As Santos points out, the stockpiles of alcohol that the IAA accrued from São Paulo until 1975 positioned paulista producers to take advantage of Proálcool immediately. I will address this theme more in the next chapter. See Santos, "Alcohol as Fuel," 178.

	1950/51	1951/52	1952/53	1953/54	1954/55
São Paulo	51,172,271	63,621,395	84,202,142	128,567,498	170,159,827
National	140,094,857	170,362,503	229,542,853	274,039,309	306,246,596
Percentage	36.5%	37.3%	36.7%	46.9%	55.6%
Anhydrous	4,947,962	5,117,200	12,613,402	50,011,200	80,658,684

Table 4: Alcohol Production (in liters)

Source: IAA, Anuario Açucareiro.

The IAA supported continued to support alcohol production for two apparent reasons. First, it still offered an alternative use for sugarcane as initially set out by the IAA in the 1930s. Second, the oil shortages during the war years had proven alcohol's value as an alternative to imported petroleum. As these agro-industrial complexes expanded in the countryside, sugar producers still needed alternative markets for sugar that exceeded domestic demand and export capabilities. Agro-industrialization expanded in the largest usinas in the country, bringing with it a larger capacity for alcohol production and continued limitations on the export market, as discussed in the next chapter, incentivized producers to continue diverting excess sugar production to alcohol among other regulated by-products.

The government support for alcohol came in many different forms. The IAA continued to guarantee parity price with sugar, offered bonuses for alcohol producers, and reestablished sugar limits, all of which pushed greater alcohol production at greater expense to the IAA. As the required buyer of alcohol, the IAA purchased and stored all excess alcohol. São Paulo became the leading producer of all alcohol types in 1954. Thus, the state usurped Pernambuco in alcohol production after unseating it in sugar production in 1951.¹⁴⁰

¹⁴⁰ IAA, *Anuario Açucareiro* Ano XVIII- 1953–56 (IAA: Rio de Janeiro), xiii. São Paulo produced 8,105,401 sacks of sugar compared to Pernambuco's 7,903,501 sacks in 1950. Paulista producers would remain the dominant sugar producing state in Brazil thereafter.

Individual producers in São Paulo made big gains in sugar and alcohol production in this period behind modernization efforts and consolidating business practices. Like many other usinas across the state, the Usina Santa Elisa not only improved its production methods, but it expanded its capacity in the 1950s. Maurilio and the Biagi Group incorporated smaller usinas into the Usina Santa Elisa to expand its own production capabilities like the Usina Santa Lúcia owned by the metallurgy businessman, Antonio Paschoal.¹⁴¹ By 1953, the usina produced 111,000 tons of sugar (200,000 sacks of sugar) and 1.2 million liters of alcohol.¹⁴²

At the same time, the Usina Santa Elisa's management participated in cane cultivation studies in connection with the Agronomic Institute of Campinas (*Instituto Agronomico de Campinas*) that would contribute to the advancement of superior cane varieties for the various soil types across the state. The IAC was founded in 1887 and fell under the state of São Paulo's governance in 1892. Its Sugarcane Divisions established a series of studies on cane varieties in 1953. The agronomists set up experimental studies at six different usinas in the state, including the Usina Santa Elisa.¹⁴³ This further involved the Usina Santa Elisa leadership and

Regarding the expanding alcohol production, anhydrous alcohol production, used in the alcohol-gasoline mixture, took longer to expand in the decade, as the higher production costs delayed usineiros' entry into the industry. However, by the beginning of the 1960s, many usinas, including all the neighboring usinas listed below, were producing more anhydrous alcohol than hydrous. Thus, the increased incentives provided by the IAA successfully transformed producers' behavior in favor of anhydrous alcohol over the cheaper, and previously more voluminous, hydrous alcohol by the early 1960s.

¹⁴¹ Hasse, *Filhos do fogo*, 70. The Usina would go on to incorporate the Engenho Central (1964), and the Usinas Anhumas and Barbacena (1984).

¹⁴² "Parceiros e Colaboradores," *A Revista Santa Elisa: Uma História de Trabalho e Desenvolvimento*, (Ribeirão Preto: MIC Editorial Ltda, 1996), 21.

¹⁴³ The other five usinas sat in different regions across the state. They were the usinas Tamoio (in Araraquara), Porto Feliz (near Sorocaba), Itaiquara (in Campinas), Santa Barbara (Santa Barbara do Oeste), and Monte Alegre (Piracicaba). Agro-engineers reported their findings in a series of articles published in the Agronomic Institute of Campinas' technical bulletin, *Bragantia*. For example, A.L. Segalla and R. Alvarez, "Variedades de cana-de-açúcar: II, Série de ensaios realizado no período de 1953–1956," *Bragantia* Vol. 17 (1958): 45–79.

administration in the development of more advanced cane production methods, following Maurilio Biagi's vision. Thus, Biagi led early public-private collaboration in the technological development of the industry. However, unlike the equipment imports that characterized the Usina Santa Elisa's industrial growth, state intervention focused on the development of new agricultural technology.

While sugar production technology expanded and the IAA's control over sugar limits diminished, regional producers established early cooperatives to diminish collective commercial and distribution costs and take a stronger hold of the sugar sector's development. In 1953, fourteen usineiros in the Ribeirão Preto region formed Copereste (the Cooperative of Mill Owners of Western São Paulo). The group, replicated in the sugar region of Piracicaba in the same year, was an important precursor to usineiros lobbying for paulista sugar interests in the 1960s.¹⁴⁴

Within Copereste, Maurilio Biagi, owner of the Usina Santa Elisa, was a leading member along with Arnaldo Ribeiro Pinto and Alexandre Balbo, two other leading usineiros in the greater Ribeirão Preto region. As president, Pinto focused the cooperatives efforts on increasing the industrial and agricultural production with technological tools and scientific information for increased efficiency.¹⁴⁵ Copereste focused its efforts on research and distribution of better cane seeds for the region and the use of machinery in agricultural processes for member fields. These were activities Biagi had already implemented at the Usina Santa Elisa, reiterating his important position in the industry both as an innovator and a businessman.

¹⁴⁴ Copira, the Piracaba cooperative, included the important Ometto and Dedini families. These two families represented the largest portion of sugar production in the state and agro-industrial equipment production in the country. Amanda Hartzmark provides an excellent account of the early activities of the two regional cooperatives. See Hartzmark, "Businesses, Associations, and Regions," chapter 6, particularly 233–245.

¹⁴⁵ Hartzmark, "Businesses, Associations, and Regions," 234.

Overall, sugar production expanded in Ribeirão Preto, particularly, while alcohol production sputtered and slowly expanded as seen in the tables below. In the 1950/1951 harvest, the Usina Santa Elisa produced 123,400 sacks of sugar, and by the 1960/61 harvest, it produced 483,562 sacks of sugar, almost tripling its production in that single decade. At the same time, the region expanded its alcohol production as well. For example, the Biagi owned Usina da Pedra began producing anhydrous alcohol in 1953. Conversely, the Usina Santa Elisa expanded its hydrous alcohol production throughout the 1950s, producing 1,681,320 liters of alcohol in 1955.¹⁴⁶

Conclusions

Early alcohol production, by way of federal intervention in the sugar industry, influenced the way in which Proálcool took shape. The IAA first imposed alcohol production under the IAA in the 1930s as a means of limiting sugarcane production to improve the balance of trade. Policy changes in the 1940s and 50s continued to expand production as the industry shifted from the Northeast to the Central southern regions.

The sugar and alcohol industry expanded in the Ribeirão Preto region behind the leadership of Maurilio Biagi and the Usina Santa Elisa. The connections they fostered allowed the Usina Santa Elisa grow into an advanced sugar and alcohol-producing complex in the region by the end of the 1950s. The Biagi family would expand its sugar and alcohol investments, leading the region into a new era of sugar and alcohol development, as the IAA modernized the industry in response to new export opportunities on the world market and the military dictatorship's development agenda.

¹⁴⁶ IAA, *Anuario Açucareiro*, 1950, 53–56, and 60/61–65/66 editions.

Chapter 3: Modernization and Development of the Sugar Industry in Ribeirão Preto, 1959-1975 "The essential goal of my government can be summarized in one word: development." President Emílio Garrastazu Médici President of the Republic, 1969–1973¹

By 1959, São Paulo's sugarcane producers had already surpassed the sugar and alcohol production of all other sugar-producing states. As Pedro Ramos summarizes in his study of the sugar industry in the Northeast and the Center-south, paulista sugar producers built their control over the sugar industry on private financing, advantageous access to large consumer markets in the southeast, and increasingly industrial sugar and alcohol complexes with superior agricultural and processing equipment to eclipse rival producers in Alagoas and Pernambuco.² The paulista share of Brazil's sugar and alcohol industries would only increase over the next two decades thanks to a turbulent but expanding international sugar market and a series of new federal development policies.

This chapter explores the important changes that allowed agroindustry in São Paulo to win an important place in the development agenda employed during the dictatorship and the place that sugar and alcohol held in that model. Alcohol production remained subordinate to domestic sugar consumption and sugar exports, but paulista usineiros' own economic interests in fostering alcohol production resulted in its continued expansion. Ribeirão Preto producers won

¹ President Emílio Garrastazu Médici in a speech on the Palácio do Itamaraty, in Brasília, April 20th, 1970, as published in *A verdadeira paz* (Brasília: Departamento de Imprensa Nacional, 1971), 29.

² While the first chapter explored São Paulo's advantages, it is worth noting that all these qualifications stand in direct contrast to the conditions in the Northeast, whose lack of access to easy financing, good agricultural conditions, equipment, and most importantly the large domestic consumer market of São Paulo sent the industry in a very different direction. Szmrecsányi, *O planejamento*, 218n94 citing Helio Pina, *A agroindústria açucareira e sua legislação* (Rio de Janeiro: APEC, 1972), 41. See also, Ramos, *Agroindústria canavieira* and Hartzmark, "Businesses, Associations, and Regions."

greater fame as their sugar production began to eclipse that of parts of the state thanks to directed industrial expansion around the sugar industry. Eventually, a new development agenda drove a more frenzied expansion of sugar and alcohol production in the region, particularly through the IAA's Support Program for the Sugar Agroindustry (henceforth Funproçucar/Proçucar) in the early 1970s.³

As illustrated in the previous chapter, Ribeirão Preto producers had already emerged as the ascendant sugar and alcohol producers within São Paulo and thus the country. These usinas, notably the Usina Santa Elisa, were an important part of the growing political and economic power behind the paulista sugar industry. Their expanding production capacity gave paulista sugar producers greater political influence within the IAA and more generally in the national development scheme of the 1960s.

By 1970, the Biagi family, owners of both the Usina Santa Elisa and the Usina da Pedra, would be the 9th largest producer of sugar in the state, accounting for over 3% of all paulista sugar production between 1946 and 1970.⁴ While its sugar production expanded, the Biagis' empire became increasingly intertwined with alcohol production. The family's leadership in the expansion of alcohol in the early 1970s positioned their holdings, and particularly the Usina Santa Elisa, to become one of the premiere alcohol distilleries in the country. This chapter shows

³ This sugar expansion significantly transformed the economic, social, and environmental landscape of the region. To note the massive economic transformations occurring in the region thanks to a new agro-industrial development scheme is to understate the incredible destruction that accompanied sugar and alcohol's expansion as well. See chapter 5 of this dissertation, particularly 219-220.

⁴ Ramos, *Agroindustria canavieira*, 138. According to Ramos, the Biagi Company held 3.3% of all sugar production in the state from 1946–1950, which expanded to a 3.5% share between 1966–1970. This was far inferior to the Ometto family holdings, which also reside in the Ribeirão Preto region. The Ometto family held 13.3% of all sugar production in the state.

how the Biagis, as a leading distiller, influenced and shaped the development of Proálcool in 1975.

Scholars of the Brazilian sugar industry agree that Funproçucar transformed the sugar sector. Both Nunberg and Szmercsányi focus their analysis on São Paulo's production growth in comparison to the Northeast's, illustrating the diverging paths of each region and the growing influence of paulista producers. Maria Castro Santos studies the alcohol policy in this period in a similar national context. More recently, Pedro Ramos and Amanda Hartzmark have studied mills during under these expansionary programs to light in order to illustrate the land consolidation involved in these modernization programs and the shifting power behind the IAA policy process.

While earlier studies have addressed Funproçucar as a part of the sugar industry's modernization process under the IAA, many historians have summarized the program's objectives without detailing with its actual impact on specific usinas. Támas Szmercsányi's detailed history of the sugarcane industry closely explains the program's creation but gives no example of how the program affected specific usinas. While Barbara Nunberg goes into more detail, she, too does not examine the experiences of specific distilleries. Maria Castro Santos and Pedro Ramos closely document the modernization of the sugar industry.

This chapter provides a closer look at how the IAA, the government, and individual usineiros managed the modernization efforts in the 1970s is still less explored for how specific distilleries responded to new opportunities.⁵ In this process, domestic sugar producers introduced more foreign technology to expand their industrial growth. At the same time, domestic producers

⁵ Szmrecsányi, *O planejamento*, chapter 4; Pedro Ramos, "Um estudo da evolução e da estrutura da agroindústria canavieira do estado de São Paulo (1930–1982)," (Master's Thesis, EAESP-FGV, 1983), chapter 4.

maintained control of the sugar market, continuing an agro-industrial development path already initiated in the 1940s and 1950s.

Although IAA modernization initiatives focused on the expansion of industrial production capacity in the 1960s, usineiros also used Proçucar to extend their alcohol production capacity. This fundamentally restructured the sugar industry's growth, transforming it into a truly industrialized agricultural sector. Along with this transformation, alcohol industrial production capacity expanded thanks to certain private businessmen, like the Biagis, who ultimately anticipated and shaped a national alcohol initiative in the mid 1970s. This example lays out the crucial steps that allowed the government to rely on domestic producers over international producers under Proálcool in the 1970s and 1980s. Somethings get repeated several times in this introduction. You might streamline the language.

Sugar Exports and the Changing World Market, 1959-1964

Dramatic changes in the international market encouraged greater domestic investment in the Brazilian sugar industry in the 1960s. One must understand the world sugar market and Brazil's position within it before to the 1960s to contextualize the significant changes that promoted these transformations.

The world sugar market has long been a highly competitive and, at the same time, closely protected industry but this was particularly so in the mid-20th century. The largest sugar consuming countries created protective blocks in which they favored "preferential" partners.⁶ For example, the world free market only represented 41% of the entire net global market while 59%

⁶ Many European nations protected their markets to favor current and former sugar-producing colonies.

went to the preferential trade partners of the US and the UK alone.⁷ The four largest protected consumer markets were the US, the United Kingdom, France, and the USSR.

Of these protected markets, the US was the largest and most desired, and Cuba dominated its preferential imports. From 1934 to 1974, the US defined its sugar policy with the Sugar Acts. In these Acts, the US Department of Agriculture established domestic consumption levels and divided the market for sugar between domestic producers and foreign countries, assigning a quota to import at agreed privileged prices.⁸ As of 1955, Cuba and to a far smaller degree the Philippines accounted for nearly 94% of all US' foreign sugar imports.⁹

Brazil's hold on the world market had diminished substantially in the early 20th century. Following the Great Depression, it found itself on the outside of many of these preferential markets. Brazilian sugar exports had difficulty competing because of transportation costs and protectionism that rigged the global sugar market. In response, the IAA had focused on stabilizing the sugar industry by emphasizing domestic consumption and promoting alcohol production in the face of the country's diminished exports.

Brazil had a minimal hold on the international sugar market throughout the first half of the 20th century. Brazil held less than 1% of the world sugar market at the beginning of the twentieth century, and this percentage only decreased in the face of increased competition from Cuba and Puerto Rico.¹⁰ By 1930s, Brazil was no longer considered a major sugar exporting

⁷ Szmrecsányi, *O planejamento*, 245–250, A C Hannah and Donald Spence, *The International Sugar Trade* (New York: John Wiley & Sons, Inc., 1997), 23 and 93–95, citing the International Sugar Organization statistics.

⁸ Ralph Ives and John Hurley, "United State Sugar Policy: An Analysis," International Trade Administration, US Department of Commerce, (April 1988).

⁹ Hannah and Spence, *The International Sugar Trade*, 94–95.

¹⁰ Eisenberg, *The Sugar Industry in Pernambuco*, 20; Rogers, *The Deepest Wounds*, 75. Brazil held .8% of the world sugar market between 1901 and 1905 and .3% by 1910.

country.¹¹ During the 1930s and 1940s, Brazil exported sugar in sporadic numbers to South American neighbors like Argentina, Bolivia, Chile and Uruguay and some European countries intermittently, in particular France. This situation changed very little in the early 1950s. In the second International Sugar Agreement of 1953, Brazil received a quota of 175,000 tons (about 158,757 metric tons), while Cuba received a quota of 2.4 million metric tons, and the Dominican Republic and the Philippines received quotas of 651,000 metric tons each. In the third agreement of 1958, Brazilian sugar garnered an annual quota of 550,000 tons on the world free market.

The dramatic growth of domestic Brazilian sugar production during and after World War II led IAA policy-makers to look to the export market to absorb the excess sugar produced in the 1950s. As the IAA's control of the domestic production diminished, it was not long before usineiros began to produce more sugar than domestic consumers could purchase. Government negotiators won an even larger quota for Brazil's sugar exports on the world market in 1955, but exporters had little access to the coveted US market, which accounted for the lion's share of annual world sugar consumption.¹² To illustrate this point, Brazil exported only 3300 tons of sugar to the US between 1946 and 1950, while the US purchased over 2.3 million tons of sugar

¹¹ United States Cuban Sugar Council, *Sugar: Facts and Figures* (New York: United States Sugar Council, 1948), 25. The top ten net exporters based on the criteria of net exports of 75,000 tons or more between 1935 and 1939. Szmrecsányi qualifies Brazil as a "marginal exporter of sugar" by the 1930s. Brazil exported 12,235 tons of sugar in 1931. Tamás Szmrecsányi, "Growth and Crisis of the Brazilian Sugar Industry, 1914-1939" in *The World Sugar Economy in War and Depression, 1914–1940*, ed. Bill Albert and Adrian Graves (New York: Routledge, 1988), 59–60.

¹² Szmrecsányi, *O planejamento*, 245–250; Hannah and Spence, 23 and 93–95, citing the International Sugar Organization statistics. As of 1955, the US was the leading importer of sugar in the world, importing 3.66 million tonnes of sugar that year alone, while the United Kingdom, the second largest preferential market, imported 1.55 million tonnes, respectively. These numbers do not account for the USSR's sugar consumption, which was largely self-sufficient until incorporating Cuban sugar imports into the bloc in the 1960s.

from Cuba in 1946 alone.¹³ Still, an expansion into the English and Japanese markets contributed to the country's overall sugar export growth in the mid-1950s.¹⁴ This encouraged IAA executives to begin lobbying for a portion of the US's preferential trade market in the late 1950s. For example, IAA President Manoel Gomes Maranhão and the Executive commission agreed to send a "strong delegation" to London to lobby for a larger international quota in the upcoming international sugar agreement as other countries, like Cuba, did the same.¹⁵

Year	Cuba exports to closed markets	Sugar exports of all countries	Brazil total Production	Brazil total exports	Brazil exports to the US
1956	2,813,000	14,160,000	2,335,000	184,000	0
1957	2,785,000	14,730,000	2,385,000	328,000	0
1958	3,241,000	15,045,000	2,817,000	566,000	0
1959	2,937,000	15,057,000	3,319,000	717,000	12,000
1960	4,229,000	17,002,000	3,229,000	854,000	114,000
1961	4,825,000	19,619,000	3,438,000	783,000	293,000

 Table 5: World Sugar Trade, 1956–1961 (in metric tons)¹⁶

Source: Heinrich Brunner, *Cuban Sugar Policy from 1963 to 1970* (Pittsburgh: University of Pittsburgh Press, 1977), 20; US Department of Agriculture, Statistical Bulletin No. 562, October 1976, "Sugar: World Supply and Distribution," 1954/55–1973/74, p. 12

The break in US-Cuban relations dramatically reshaped the world sugar market, which

profoundly affected the Brazil's fortunes. Cuban sugar dominated the protected US market until

¹³ IAA, *Anuário Açucareiro*, Ano XVI- 1950–1951 (Rio de Janeiro), 87–97; US Cuban Sugar Council, *Sugar: Facts and Figures*, (New York: US Cuban Sugar Council, 1948), 100. Brazil exported 50,000 sacks of sugar at 60kgs per sack.

¹⁴ IAA, Anuário Açucareiro. Ano XVIII- 1953-1956 (Rio de Janeiro), 53-56.

¹⁵ 79th Ordinary Session of July 23rd, 1959, "Atas da Comissão Executiva do IAA," *Brasil Açucareiro* Vol. LVI, n. 1, (July 1960), 26.

¹⁶* Closed markets= US, UK, Communauté (France), and the USSR. For these numbers, see Heinrich Brunner, *Cuban Sugar Policy from 1963 to 1970* (Pittsburgh: University of Pittsburgh Press, 1977), 20. All other statistics from US Department of Agriculture, Statistical Bulletin No. 562, October 1976, "Sugar: World Supply and Distribution," 1954/55–1973/74, p. 12 as cited in Nunberg, "State Intervention," 134.

the Revolution of 1959. Thereafter, negotiations with the new Fidel Castro-led Cuban administration deteriorated in 1960 and with it, the Cuban sugar quota. The US sugar market, which accounted for over 87% of all Cuban exports, became the central tool through which the American government sought to tame the new communist Cuban administration. Thereafter, the US Congress and President Dwight Eisenhower swiftly reduced Cuba's sugar quota to zero in 1960.¹⁷ With this new embargo on Cuban sugar, other sugar partners in the Western Hemisphere benefitted substantially, including Brazil.

Eisenhower's decision allowed Brazilian sugar to fill a large part of the void left from the embargo of Cuban sugar. The US Department of Agriculture allocated to Brazil one tenth of the 1,000,000 tons quota previously allotted to Cuba in 1960, and Brazil won a permanent protected quota to the US in 1962, representing 6.4% of the total US quota.¹⁸ The US Congress added another amendment to the new Sugar Act of 1961, giving special quota consideration to Western Hemisphere countries and those purchasing US commodities. Brazil and the US quickly solidified their sugar relationship, in which Brazil won a larger portion of the new US sugar quota in connection to Brazil's own importation of American wheat exports.¹⁹ Between 1961 and 1965, Brazil exported over 1.5 million tons of sugar to the US with an average rate just under

¹⁷ Gail M. Hollander, *Raising Cane in the 'Glades': The Global Sugar Trade and the Transformation of Florida* (Chicago: University of Chicago Press, 2008), 168–169; 284–287, Appendix B.

¹⁸¹⁹Welch, *A semente foi plantada*, 297; Information from M. Golodetz & Co., "Mercado Internacional do Açúcar," *Brasil Açucareiro* Vol. 56, n. 2 (August 1960), 105–106. These statistics are in short tons. One should note the use of the term ton, short ton, tonnes, and metric tons. A ton in the US, known as the short ton internationally, is 2000 pounds or 907.2 kilograms, roughly. A British tonne, or the long ton, is 2240 pounds or roughly 1016 kilograms. A metric ton is equal to 2000 kilograms or 2204 lbs. The metric ton is also more formally referenced as the tonne. Brazilian statistics are often reported in metric tons and sacks of sugar. One sack is the equivalent to 60kg of sugar. Thus, one metric ton is equal to about 16.75 sacks of sugar. For the most part, my statistics work in short tons. Otherwise, I delineate if using metric tons or sacks. ¹⁹ Hollander, *Raising Cane*, 287; Szmrecsányi, *O planejamento*, 260n139; Nunberg, "State Intervention," 101–105.

26.5 thousand tons per year, turning the US into the largest Brazilian export market by a lofty margin. By 1967, the Brazilian total exports (including the US and the world market) was just over 2 million tons a year.²⁰ The newly acquired export market triggered important changes in Brazilian sugar policy that stimulated modernization to meet the growing international demand. *Modernization: Domestic Policy and Structural Changes*

Within Brazil, expanding demand for sugar supported a push to modernize sugar production infrastructure across the country. Although focused on the Northeast initially, it would come to benefit paulista producers most. Development of light industrial food production, like jellies, sodas, and other such products, again concentrated in São Paulo, buoyed this growth as well. In fact, the Biagi family led the growth of sodas, opening the first Coca-Cola factory as a shareholder in Refrescos Ipiranga in the 1960s.²¹

Important structural changes facilitated the sugar industry's expansion. President Jânio Quadros passed Provision n. 1/61 on April 7th, 1961 encouraging the "centralization and coordination of export activities."²² In coordination with this provision, the IAA President Ambassador Edmundo Penna Barbosa da Silva and the Executive Commission created the Export Division within the IAA two months later under Decree no. 50,818 on June 22nd, 1961. The new division encouraged the export of sugar, molasses, and other sugar derivatives while also maintaining important connections with the government organs connected to foreign

²⁰ IAA, *Anuário Açucareiro, Safras de 1960/61–1965/66* (Rio de Janeiro: IAA, 1967), 54–56 and Szmerscányi, *O planejamento*, 254n127. In this period, Japan was the only other country to receive over 1 million sacks (about 66,138 tons) of sugar from Brazil in any one year, and that was only in 1961. Conversions to US tons are my own.

²¹ Truthfully, the company, founded in 1948, was a bust in the first decade, not turning a profit until 1960. However, in this period, Maurilio Biagi became the majority shareholder. The company would become a crucial part of the Biagi Empire. Other soda and beer producers opened factories in Ribeirão Preto, including the popular domestic company, Antarctica. Hasse, *Filhos do fogo*, 123–124.

²² Szmrecsányi, O planejamento, 256.

commerce. In this transformation, alcohol received less attention than other more profitable sugar derivatives although the IAA did pursue opportunities to export alcohol. This task was all the easier when President Quadros made the IAA subordinate to Ministry of Industry and Commerce in 1962.²³

These important structural changes allowed the IAA to restructure primary and secondary sugar interests. That is to say, sugar exports became the most important secondary market for sugar production after the domestic sugar market. This relegated alcohol to the third most important market for domestic sugarcane producers. After 1961, supplying the booming export market became the IAA's primary objective (See Table 5). Facilitating this process involved financing extensive modernization projects, first in the Northeast but increasingly in the São Paulo interior.

This early modernization process focused on mechanizing the sugar production process with increased industrial equipment and expanding production capacity through the consolidation of mills to improve efficiency and quality. The IAA encouraged expanding industrial inputs for greater production capacity and yield by making low interest credit available to usineiros, planters, and cooperatives. Domestic equipment producers grew with the IAA's modernization initiatives. Much of the modernization projects involved expanding industrial technology with both international technology and a growing domestic specialization. The modernization efforts further centralized sugar production, particularly in São Paulo.

²³ "Notas e Comentários," Brasil Açucareiro, Vol. LIX, n. 1-2 (Jan./Feb. 1962), 3-5.

Year	Sugar Exports of All Countries	Brazil Total Production	Brazil Total Exports	Share of World Exports (%)	Brazil Exports to U.S.
1962	18439	3568	645	3.4	361
1963	16785	3243	527	3.1	417
1964	17419	3400	453	2.6	162
1965	19793	4000	710	3.5	323
1966	18756	4200	1005	5.6	492
1967	20406	4360	1001	4.9	591
1968	20887	4464	1026	4.9	615
1969	19999	4357	1099	5.5	652
1970	22315	4593	1075	4.8	607
1971	21692	5117	1191	5.5	598
1972	21285	5648	1854	8.7	621
1973	22345	6163	2177	9.7	446
1974	24433	6959	2879	11.8	700

 Table 6: Brazil's Role in Sugar Exports, 1962–1974 (in thousands of metric tons)

 Source: Nunberg, "State Intervention," 134.

These modernization initiatives were, in part, a result of the IAA's ongoing efforts to revive the Northeastern sugar industry. As paulista production expanded, Northeastern producers' lost their hold on the national market. Even as the Northeast, primarily Recife, remained the primary port of embarkation for sugar exports because of its greater proximity to US and European markets, Northeastern producers' distance from the growing southern markets of São Paulo and Rio de Janeiro far outweighed this advantage.²⁴ While scholars have explored the Northeastern case in great detail elsewhere, it is important to note the role the region had in directing national sugar policy in the 1960s.²⁵ For example, to aid the ailing Northeast's sugar industry, the IAA created the Fund for the Recuperation of the Sugar Industry in August 1961 under Decree 51,104. The IAA used funds earned from Brazilian exports to the US to provide financial assistance and credit to northeastern sugar producers.²⁶ IAA officials led a massive modernization effort to improve Northeastern producers, particularly in São Paulo.

Even as the IAA targeted Northeastern producers in the early 1960s with various modernization initiatives, São Paulo sugar and alcohol production continued to expand. For example, President Quadros issued Decree n. 79 on October 26th, 1961, creating the Executive Group for Rationalization of the Coffee Industry. The group worked with the Institute of Brazilian Coffee to transform old coffee plantations into cane fields and build usinas on the land to mill the new sugar fields. Poor coffee harvests in 1962 and 1963 and increased international competition in the world coffee market drove down coffee prices and encouraged more coffee

²⁴ Nunberg, "State Intervention," 108.

²⁵ Pedro Ramos and Amanda Hartzmark give particularly detailed account of the diverging paths of the Northeastern industry and the Southeastern, namely paulista, industry in her work. See Pedro Ramos, *Agroindústria canavieira* and Hartzmark, "Businesses, Associations, and Regions."

²⁶ Santos. "Alcohol as Fuel," 161–162.

planters and producers to transition to the expanding export-oriented sugar industry.²⁷ As the dominant coffee-producing state in the country, this initiative naturally favored paulista expansion.

At the same time, consolidation efforts to concentrate sugarcane producers for largerscale production capacity accelerated, particularly in São Paulo. The IAA passed a series of decrees between 1961 an 1964 that made definitive steps toward consolidating usinas and cane production under larger, modernized usinas. After establishing the Fund for the Recuperation of the Sugar Industry, the IAA President and the Executive Commission created the Fund for the Consolidation and Support of the Sugar Agroindustry in November 1961. The new fund, largely financed by new export profits to the US and a Cr\$50 tax on each sack of sugar, provided substantial financial support to improve production and expand exports.²⁸

The legislative support for sugar's expansion continued. In 1962, IAA President Ambassador Barbosa da Silva established the Plan for the Expansion of the National Sugar Industry, formalizing clearer modernization efforts. Setting the bold goal of producing 100 million sacks of sugar by the 1970/1971 harvest, the plan encouraged a massive restructuring of sugar production in the country around large usinas with large economies of scale to support such lofty goals.²⁹ Thereafter, the IAA Executive Commission passed Resolution n. 1761 and n.

²⁷ Additionally, the new rural labor legislation, the 1963 Estatuto do Trabalhador Rural, drew more producers to the sugar industry, which had less manual labor requirements than coffee production. Szmrecsányi, *O planejamento*, 273n154. See also, Chapter 5 of this dissertation.
²⁸ The Brazilian currency, then the cruzeiro da reforma, switched to the new cruzeiro da reforma in 1967 (equivalent to 1000 cruzeiros in 1942) until 1985. In 1970, the term new cruzeiro was replaced by the cruzeiro. The government changed the currency in an effort to control persistent inflation in Brazil. Marcelo de Paiva Abreu (org), *A ordem do progresso: cem anos de política econômica republican, 1889–1989* (Rio de Janeiro: Editora Campus, 1990), 413.

²⁹ Szmerscanyi, *O planejamento*, 256–263. This was only a year before Cuba set the goal of producing 10 million tons of sugar in a single harvest by 1970. The Cuban endeavor failed disastrously, primarily because of the additional technology improvements necessary to meet the

1762 on December 12th, 1963, which first set new quotas with dramatically expanded quotas for São Paulo and second authorized the construction of 50 new usinas. Thus began another wave of expansion in the sugar industry in early 1964.³⁰ The IAA continued to fund the expansion of usinas, but the largest proportion went to São Paulo and Paraná under the New Usinas Commission formed in January 1964.

Alcohol production substantially expanded in this period even as the IAA redirected policy toward sugar exports. In fact, the greatest challenge to alcohol production in this period was an expanding petroleum-focused policy from the National Petroleum Council. The Council, which previously shared control of alcohol pricing with the IAA until receiving full control in the 1960s, diminished the mandated amount of alcohol mixed in the national gasoline supply to 5% in 1950s.³¹ As a result anhydrous alcohol production, which the government officially used in the gasoline mixture, dropped to 5% of total alcohol production in the 1950s and remained at that level in the 1960s. The IAA still aggressively promoted the expansion of hydrated alcohol for industrial use. Producers in the Northeast, for example, used alcohol as a prime material for

goal with a higher agricultural yield, such as new cane varieties, the expansion of irrigation, and increased use of fertilizers and insecticides. These were all things that the Brazilian modernization effort successfully implemented. Moreno Fraginals and Teresita Pedraza Moreno, "The Ten Million Ton Sugar Harvest," unpublished article. Accessed April 20th, 2015 at http://faculty.mdc.edu/tpedraza/MMF-Ten%20Million%20Ton%20Harvest.htm

³⁰ The President and the Executive Commission created the first with Decree n. 51.104 on August 1st, 1961 and the second on November 17th, 1961 under Decreen. 156. Szmrecsányi, *O planejamento*, 265–267.

³¹ Santos, "Alcohol as Fuel," 149–152. As Santos notes, while the mixture rate had been set at 5% legally, the country had extended the mixture above this level throughout the 1940s. When the National Petroleum Council (CNP) took over control of setting the mixture rate from the IAA in 1948, setting the mixture rate became a yearly battle that the IAA lost. The CNP cited the limited legal documentation on the mixture rate despite the common practice to set it above 5% since the 1930s.

synthetic rubber production.³² Although the IAA pursued opportunities to export alcohol, it never found a substantial international market while cheap petroleum limited demand for anhydrous alcohol thus leading to a dramatic oversupply of anhydrous alcohol stocks.³³

Thus, expanding sugar exports drove continued modernization while alcohol production temporarily took a backseat in the sugar sector. This new export-oriented sugar policy took more formal shape as a key element in a new domestic political arena in the late 1960s when sugar became an important part of a new Brazilian development model under the new military dictatorship. This made São Paulo's producers even more prominent in national politics.

Military Dictatorship and Changing Policy Objectives, 1964-1970

The Coup

Although Brazil had important international incentives to transform substantially in the early 1960s, changing domestic factors also restructured the sugar industry. A new political regime redefined sugar's already shifting place in the national economy. Sugarcane became a modernizing industry connected to the dictatorship's image of development. São Paulo producers sat squarely in the center of this redefinition.

Brazil's economic situation had eroded by the beginning of the 1960s. While sugar exports were booming, the rest of the economy entered into a dangerously unstable economic

³² Santos, "Alcohol as Fuel," 174. The Companhia Pernambucana de Borracha Sintética (COPERBO) was under construction in Recife in the early 1960s. This provided an alternative use for alcohol in the Northeast but was not a major option in São Paulo. Ultimately, the synthetic rubber industry using alcohol failed as sugar prices increased and Northeastern producers had to meet anhydrous alcohol demands for the gasoline mixture. Additionally, molasses, from which Northeastern producers derived residual alcohol, was a more profitable export by the late 1960s with an increasingly profitable market as a foodstuff for farming animals. Szmrecsányi, *O planejamento*, 268–269n149.

³³ Santos, "Alcohol as Fuel," 145. In fact, Santos notes that: "By 1959, São Paulo was virtually drowning in alcohol."

slump. The prices for exported coffee fell precipitously, thus encouraging the Executive Group for Rationalization of the Coffee Industry efforts to encourage producers to shift to sugarcane production. At the same time, the balance of payments deficit grew due to former President Kubitschek's nationalist development investments financed largely with foreign loans. These large-scale projects, best embodied in the establishment of the Brazilian auto industry and the building of the new "modern" capital, Brasília, had been incredibly popular. However, government debt and Kubitschek's refusal to cooperate with international financial institution's pressure to adhere to an economic stabilization program left the national economy in tatters.³⁴

At the same time, the Cold War heated up in Latin America. After the Cuban Revolution, fear of another Cuban-style communist revolution permeated US-Latin American relations. Latin America development became a central hotbed of US-Soviet intervention in promotion of each superpower's ideological visions of modernity and development.³⁵ In Washington, Domino Theory shaped communist containment policies, and after the Cuban revolution, Brazil became Latin America's biggest domino because it bordered every South American nation save for two. The Cuban Revolution strengthened US interest in imposing its Cold War ideology on the country and the entire Latin American region, allowing right-wing elites to reclaim control of the state and violently maintain oppressive power often with the assistance of the United States.

In Brazil, the US presence in development models increased through the military. Close military ties between the US and Brazil began in World War II and grew in the notable Superior War College (*Escola Superior de Guerra*). Founded by General Cordeiro de Farias and other

³⁴ Wolfe, *Autos and Progress*, 133. Joel Wolfe argues that the creation of the auto industry in Brazil was seen as the epitome of modernity. This was probably symbolically even more popular than the famed construction of Brasília.

³⁵ Odd Arne Westad, *The Global Cold War: Third World Interventions and the Making of Our Times* (New York: Cambridge University Press, 2007), 2.

high-ranking Brazilian military officials with the collaboration of US military officials in 1949, the school was structured after US military schools. Many of the officials that studied and taught at the school would go on to hold high ranking positions within the Brazilian military and the federal government. The US's influence in the school and its pervasive importance in the Brazilian military leadership contributed to the Brazilian military's own growing anti-communist obsession.³⁶

Economic troubles and Cold War politics drove dramatic changes in Brazilian politics in the early 1960s. When President Juscelino Kubitschek ended his highly successful nationalistdevelopment focused presidency in 1961, he left his successors ballooning debt and creeping inflation. The mercurial Jânio Quadros succeeded him. Inconsistently supporting populist reforms and heterodox anti-inflationary economic policies, Quadros suddenly stepped down after only seven months in the presidency. His puzzling exit left a political vacuum that exasperated already contentious disagreements about the political direction of the nation.³⁷ Vice-President João Goulart succeeded the former president but his association with Vargas' state-centered development model and left-wing political activism made right-wing politicians and military officers suspicious of Goulart's intentions.

The socialist-democratic politician irked many conservative forces within the country, most notably high-ranking military officials.³⁸ The Rio Grande do Sul native entered Brazilian politics in the 1950s under the tutelage of Getúlio Vargas. He rose to national prominence in the

³⁶ Stepan, *The Military in Politics*, chapter 8; See also, Maria Helena Moreira Alves, *State and Opposition in Military Brazil* (Austin: University of Texas Press, 1985), 14–23.

³⁷ For a detailed overview of the short yet polarizing presidency of President Jânio Quadros, see Skidmore, *Politics in Brazil*, chapter 6.

³⁸ Alfred Stepan extensively documents the military leadership considered a coup upon the controversial ascension of then Vice-President Goulart to the presidency. For more on military leaders' diverging opinions and the coup that never was, see Stepan, *The Military in Politics*, 19 and chapter 5.

Brazilian Labor Party (*Partido Trabalhista Brasileiro*) before entering the state assembly in the 1940s. In 1953, Vargas appointed Goulart the new Minister of Labor. Viewed as the "heir-apparent" of the Vargas era, military officials forced Goulart's dismissal upon Vargas' death. However, closely connected with labor unions, he had earned a reputation for working with communists and socialists, stoking military leaders' fears after his rocky ascension to the presidency in 1961.³⁹

Right wing and even many moderate politicians, military officers, and business owners feared the new president might lead or unwittingly promote a socialist revolution in Brazil. With an increasingly professionalized military, its influence expanded in various government positions and economic industries in the 1960s. Their infiltration into economically powerful civilian positions drove the military's expanding power. One of the most important was the former president of the domestic oil refining industry, Petrobrás, General Ernesto Geisel.

Geisel is an excellent example of the increasingly technocratic military officials that defined this period. Although Geisel had served in previous administrations, he held important political positions following Quadros' resignation in 1961. Originally from Rio Grande do Sul, Geisel attended the influential General Staff School (*Escola de Comando e Estado Maior do Exército*) and was later a permanent staff member at the influential Superior War College. Following his time there, he became an administrator at Petrobrás, where he was able to "sharpen his skills as a military technocrat."⁴⁰ In the early 1960s, he served in the national government under the War Minister Odílio Denis, where he was nominated as head of Presidential Military Staff, a position he would hold again in the future, under the temporary president Ranieri Mazzilli before Goulart returned to the country from China to be sworn in as

³⁹ Skidmore, *Politics in Brazil*, 114, 204, and 215.

⁴⁰ Skidmore, *Politics in Brazil*, 160–161.

the next President. In fact, the moderate Geisel was one of the military leaders that supported Goulart's ascension to the presidency when more hard-line military officials opposed it in 1961.

At the same time that the military's political influence expanded, social unrest simmered both in the Northeast and in the Center-south. In Pernambuco, cane workers, led by Francisco Julião, formed the famous Peasant Leagues to call for the redistribution of land to workers and contest state labor policies. These leagues were in many ways the manifestation of the failures of the social and economic programs employed by the IAA since the passing of the Sugar Statute (*Estatuto de Lavoura Canavieira-* ELC) in 1941. The Northeastern sugar industry slumped while paulista production boomed. This downturn hit northeastern cane workers especially hard. Inflation, stagnant wages, lack of employment, and unsafe work conditions damaged already tenuous relationships between workers, planters, and usineiros. The Leagues organized strikes and occupied plantations that soon spread across Pernambuco and Alagoas, and then leaped to distant Mato Grosso.⁴¹ By the early 1960s, rural unrest spread in the south as well.

Although historians have been quick to point to the Northeastern conflicts as the heart of social unrest, historian Clifford Welch closely documents the important influence worker mobilization in the Ribeirão Preto region had on agrarian elites' support for the 1964 military coup.⁴² After the creation of the Superintendency for Agrarian Reform (*Superintendencia de*

⁴¹ The Peasant Leagues emerged between 1955 and the military abolished them after the coup in April 1964. For more on the Peasant Leagues and the modernization of agricultural production in the Northeast, see Anthony Pereira, *The End of the Peasantry: The Rural Labor Movement in Northeast Brazil, 1961–1988* (Pittsburgh: University of Pittsburgh Press, 1997), particularly Chapter 2 for a history pre-military dictatorship. See chapter 5 of this dissertation for more on emergence of these temporary workers in São Paulo and their impact on the Ribeirão Preto sugar industry.

⁴² This commentary is based on Clifford Welch's extensive work on rural labor mobilization in the Ribeirão Preto region before the coup. See Cliff Welch, "Rivalry and Unification: Mobilising Rural Workers in São Paulo on the Eve of the Brazilian Golpe of 1964," *Journal of Latin American Studies* 27, no. 1 (February 1995): 161–187.

Reforma Agrária) in 1962, agrarian elites not only feared land reform but also the unification of the previously disjointed rural peasant movements across the country that might lead to a full Cuban-style revolution. As Cliff Welch convincingly argues, these fears were not entirely unfounded, as Communist and Catholic leadership led, albeit mostly peaceful, rural peasant protests in the Ribeirão Preto region in the late 1950s and early 1960s. However, agricultural elites, and particularly coffee landowners, overemphasized their broader threat to the national socio-political structure.⁴³ However, President Goulart's populist concessions to rural labor workers and the push for significant land reform incited these agrarian elites' fears of a Cuban-style rural labor uprising, encouraging their support of dramatic military action.⁴⁴

By 1964, these economic and social pressures converged to ostracize Brazil's elites. Increasing demands on the federal government further strained the country's stability. Expanded social programming, employment, and other forms of federal expenditures contributed to rising inflation rates. In 1960 inflation rose to 39.5% and reached 140% in early 1964. Prices skyrocketed. The federal deficit expanded. Goulart's attempt to employ a radical nationalist agenda left the country on a collision course to unilaterally default on its \$3 billion foreign debt. Elites on the right and the left disliked the state of the economy and President Goulart's populist policies became unpopular for many Brazilians.⁴⁵

⁴³ The *Estatuto de Trabalhador Rural* (ETR) specifically addressed the rights of colonatos, which were key to the coffee labor system. However, the complicated structure of the sugar sector, in which cane suppliers and cane cutters held different positions, allowed mill owners to circumvent the new law and maintain the sugarcane sector's economic structure. The legislation is addressed in more detail in chapter 5 of this dissertation.

⁴⁴ Welch, "Rivalry and Unification," 161. The concession that most incited these fears was Goulart passing the 1963 Rural Labor Statute that granted rural laborers state protection as industrial workers had already received in the 1940s.

⁴⁵ For a more detailed account of the factors and events leading up to the coup, see Thomas Skidmore, *The Politics of Military Rule*, 3–17. Also, for an economic analysis, see Stepan, *The Military in Politics*, 139–142.

Most importantly, Goulart's populist agenda had united the divisive interests of the Brazilian military factions. Moderates and extremist right-wing, or hard-line, factions within the military agreed that Goulart's leadership endangered the future of the country.⁴⁶ Overblown fears of communist infiltration into the Goulart administration rallied both moderate and hard-line military officials on an anti-communist mission against potential threats to national security. Thus, a united military-civilian coalition led a coup on March 31st, 1964, after which Goulart quickly fled the capital.

Within days, a military-civilian alliance elected General Carlos Castello Branco, leader of the conspiracy, to the presidency. He thus became the first military president in the new dictatorship.⁴⁷ Castello Branco was a leader of the moderate, pro-constitutional military faction, henceforth known as the castelistas. A native of Ceará in the Northeast, Castello Branco served in the Brazilian force sent to World War II and, like General Geisel biographed above, he was a disciple of the ESG. He had served as Goulart's Chief of Military Staff prior to the coup. Under his presidency, Castello Branco supported a pro-development agenda with the support of foreign investment and close alliances with the civilian technocrats and businessmen to encourage industrialization.

Castello Branco passed the National Security Law (*Lei de Segurança Nacional*) on March 13th, 1967. The Law, based on the National Security and Development Doctrine most succinctly disseminated at the ESG in the 1950s and 1960s, formalized the military's development ideology into the mid-1970s.⁴⁸ The ideology promoted a close connection between

⁴⁶ Skidmore, *Politics in Brazil*, 303–304.

⁴⁷ Skidmore, *The Politics of Military Rule*, 161.

⁴⁸ Stepan, *The Military in Politics*, 178. Stepan notes the connection the school made between national development and security in its teachings, stating, "national security for the Escola Superior da Guerra was seen to a great extent as a function of rationally maximizing the output

development and national security, which permeated the military officer corps in the 1960s. The new 1967 law articulated the military's primary objectives. Reworking the Brazilian national motto, "order and progress," the military's new mission was "national security and development." In this context, the military would fight the communist threat with economic development and repression of subversives.⁴⁹ This new development benefitted the sugar industry significantly, as the previously discussed changes in the international market increased incentives to reform and expand the industry.

Sugar Policy in the Military Dictatorship

Initially, sugar policy continued along much the same lines as it had before the coup. The IAA continued its modernization schemes. While international sugar prices soared to \$190USD/ton on the world market in 1963, inciting additional expansion in the sugar industry, they quickly fell to \$40USD/ton in the 1965/66 harvest.⁵⁰ However, producers had expanded sugarcane planting in 1964 because they anticipated high international prices. Their record yields saturated the market, creating a dramatic overproduction crisis for cane growers when

of the economy and minimizing all sources of cleavage and disunity within the country, consequently great stress was put on the need for strong government and military planning." ⁴⁹ Alves, *State and Opposition*, 14–23. The suppression of these subversives really manifest as the repression of broader popular sectors, political and otherwise. Much as O'Donnell discusses in his bureaucratic-authoritarian model. He claims that Latin American bureaucratic-authoritarian governments, particularly Brazil and Argentina, followed a standard model in which they suppressed popular conflict, looked to technocratic policies to solve social problems, and proliferated capitalist relations in industries with a notably transnational bend. Although Brazil's strength as an example weakened with the rise of popular sectors in the 1980s, certainly the model applies to Castello Branco's administration, in which he promoted the expansion of foreign capital in private businesses. This would change in the late 1960s under hard-line president, de Médici, discussed below. O'Donnell, *Modernization and Bureaucratic-Authoritarianism*, 2–4; Collier, "The Bureaucratic-Authoritarian Model," in *The New Authoritarianism in Latin America*, 26–27.

⁵⁰ Alberico Leite, former IAA Director of Exports in published speeches from *Encontro nacional dos produtores de açúcar* (Campos: Coperflu, 1974), 77.

international sugar prices unexpectedly fell. Excess sugar led the military government to reconsider alcohol production to absorb crop excess and provide an alternative energy option. Copersucar, a São Paulo-based sugar cooperative organization founded in 1959, strongly pushed government officials to reconsider its alcohol policy.

Copersucar (*Cooperativa Central de Produtores do Açúcar e do Álcool do Estado de São Paulo*) combined two earlier cooperatives in the two major sugar-producing regions of São Paulo: Copereste (the Cooperative of Mill Owners of Western São Paulo) and Copira (the Cooperative of Mill Owners of Piracicaba). Copersucar combined the interests of leading sugarcane producers in both regions to market and distribute sugarcane as well as lead research on improving cane production methods.

Copersucar would unite all of these earlier features and create a lobbying cartel that heavily influenced and at times directed sugar and alcohol policy by the early 1970s. Copersucar's primary functions were to "receive, finance and sell the sugar and alcohol products of the associated firms in order to maximize the profit and welfare of the members, defending at the same time their overall economic and social interests."⁵¹ The cooperative combined the original members of Copereste, including the Biagis, and Copira with nine other usinas and refineries in the state.⁵² The cooperative handled producers' dealings with the IAA and local government, provided credit and technical assistance to its members, and led its own research experiments on cane varieties for its members. It would also become a major alcohol refinery

⁵¹ Nunberg, "State Intervention," 174.

⁵² Outside of Copereste and Copira's members, the nine additional usinas to join the state cooperative were: Cia. Açucareira Barbacena S.A., Cia. Industrial e Agrícola Santa Barbara, Cia. Itaquerê Industrial e Agrícola, Cia. Usina Vassununga, E. Marchesi e Irmão, Refinadora Paulista S.A., Usina Açucareira Ester S.A., Usina Albertina Ltda., Usina Itaiquara de Açúcar e Álcool S.A., and the Usina Santa Clara S.A. Hartzmark, "Businesses, Associations, and Regions," 247n55.

operator, processing 33 million liters of alcohol a year from raw material gathered from associated usinas.⁵³

In fact, Copersucar would play an important role in reasserting alcohol's importance in Brazilian sugar policy even as sugar had lost favor in national policy in the late 1960s with its growing importance for sugar producers in São Paulo. Copersucar "blended agricultural, industrial, and commercial activities; packaged and distributed its own brands of sugar and alcohol and operated a large alcohol refinery."⁵⁴ following another overproduction crisis of the 1966/67 harvest, paulista members increasingly relied on Copersucar for distribution and protection from the harsh realities of excess production.⁵⁵

Amidst this new crisis period, Jorge Wolney Atalla, a prominent paulista usineiro, would rise to power within Copersucar. Atalla was the son of a Lebanese immigrant family, but he was more unusual because he was the first Brazilian to receive his engineering degree in oil technology from the University of Tulsa, Oklahoma in the early 1950s.⁵⁶ He worked as technical assistant at Pétrobras' President Bernardes Refinery from 1951 to 1958, where he "prepared the technical documents that ended up convincing the government of the need to invest more in the carburant mixture [alcohol and gasoline]."⁵⁷ Through his ties to Petrobrás, Atalla built a close professional and personal relationship with the eventual Petrobrás president and future military

⁵³ Nunberg, "State Intervention," 176–178.

⁵⁴ Barbara Nunberg, "Structural Change and State Policy: The Politics of Sugar in Brazil since 1964," *Latin American Research Review*, Vol. 21, n. 2 (1986): 63–64. This refinery processed nearly 33 million liters a year by 1977.

⁵⁵ Regina Machado Curi, "Os barões do açúcar" Veja 411 (July 21st, 1976), 78.

⁵⁶ Jorge Wolney Atalla, *Reflexões e sugestões para o desenvolvimento brasileiro* (Brasília: Confederação Nacional da Agricultura, 1979), 75; Nunberg, "State Intervention," 189; "Morre Jorge Wolney Atalla," (August 4th, 2009) *Unica (Uniao da industria de cana-de-acucar)* (São Paulo), accessed January 28th, 2015,

< http://www.unica.com.br/noticia/15975202920334743692/morre-jorge-wolney-atalla/>. ⁵⁷ Curi, "Os barões do açucar", 78.

president, Ernesto Geisel. Atalla entered the sugar industry after his coffee farming family acquired the Usina Varjão in Brotas, São Paulo in 1956. He became the secretary of Copersucar in 1966, just as the sugar industry was buffeted by the overproduction crisis.

Atalla was an avid supporter of expanding alcohol production in the state and the country. He saw a great opportunity for sugar producers to expand production and profits through the alcohol sector. Atalla's rise to power in Copersucar was closely connected to his support of alcohol production as a means to dissipate the ailing sugar crisis in the mid-1960s much as it had been under earlier IAA policy. As a major coffee and sugar producer, his support of alcohol's expansion certainly involved expanding his own economic and political power in Copersucar, however he often cited nationalist interests in expanding the sugar sector and diminishing oil imports for such support.⁵⁸ As the Copersucar leader looked toward alcohol as a greater solution, this helped turn government attention back toward alcohol as a fuel option again.

Under Atalla's leadership, Copersucar's influence expanded, defining what Atalla claimed to be the "Brazilian model of agroindustrial expansion [sic]."⁵⁹ This included a focus on private producer-driven manufacturing and distribution of sugar, coffee, and other agricultural products. Wolney Atalla won international fame when he turned Copersucar into the first Brazilian multinational firm with Copersucar's takeover of the American coffee distributor, Hills Brothers' Coffee Inc., in the June 1976.⁶⁰ His promotion of this type of agro-industrial development would shape his own contributions to the National Alcohol Programs'

⁵⁸ For example, see Jorge Wolney Atalla, "Álcool é pouco e irregular na gasolina," *O Estado de São Paulo* (November 5th, 1972), 57.

⁵⁹ Jorge Wolney Atalla as cited in Nunberg, "Structural Change and State Policy," 64.
⁶⁰ Arthur M. Louis, "Brazil's Coffee (with Sugar) Billionaire," *Fortune* 96 (July 1977): 82–88; Nunberg, "State Intervention," 177.

implementation in 1975. Given Copersucar and Atalla's expanding influence, his consistent defense of private interests, first to support expanded alcohol production, and then against the nationalization of alcohol production in 1975, shaped the unique agro-industrial development model followed by Proálcool.

By 1960, São Paulo was the largest producer of alcohol in the country. The IAA lost the power to set alcohol prices in 1960 along with other institutional transformations, leaving policy interests in sugar far lower than the financial interests of sugar producers in the region. Due to inconsistent international sugar prices, many usineiros' alcohol production grew the most in the crisis years. For example, São Paulo produced 352,568,838 liters of alcohol (almost 2 million in anhydrous alcohol and a little over 1.5 million liters of hydrous alcohol) in 1965. This was over 1.5 million liters more than it produced the year before. Hydrated alcohol levels remained about the same. The expansion was almost entirely in anhydrous alcohol production, which contributed not only to the alcohol-fuel mixture but also other emerging industries in the south, like the growing processed food and beverages industry.⁶¹

Nationally required alcohol mixture rates in gasoline remained at 5% during the 1960s. As the primary use for anhydrous alcohol was as a gasoline supplement, this low mixture rate made the expanding alcohol supply problematic. Initially, anhydrous production dropped significantly in the early 1960s when sugar export opportunities opened up for the Brazilian industry. However, the overproduction crises in 1964, 1965 and 1967 encouraged increased alcohol production with no relief for the IAA from an increased mixture mandate. This was

⁶¹ Szmrecsányi, O planejamento, 107–108; Anuário Açucareiro, Safras de 1960/61–1965/66, 40.

particularly true in São Paulo. For example, over 70% of all anhydrous alcohol produced in the country came from São Paulo in the 1965/66 harvest.⁶²

With Atalla and more broadly Copersucar's support, paulista sugar and alcohol producers won an important supporter that counteracted the diminishing role of the IAA in setting alcohol policy. Atalla became Copersucar's first Director-President in 1968 after which he was able to lobby for improved sugar and alcohol policy. Beyond alcohol promotion, Atalla used his important connections to government officials to win support for favorable sugar policies for paulista producers. First and foremost, Atalla consolidated Copersucar's role as interlocutor and spokesperson for São Paulo producers in policy debates within and outside of the IAA. His close relationship with President Geisel and other government officials allowed him to often sidestep the IAA to win favorable policies, particularly in price policy, expanding quotas, and legal amendments for and in favor of paulista producers. For example, Nunberg notes that Copersucar was particularly successful in winning faster sugar price adjustments that followed the minidevaluations of the currency on behalf of usineiros. This protected usineiros from inflationary impact on production costs in the 1970s.⁶³

In conjunction with Atalla's influence, Copersucar members' sugar and alcohol production aggressively expanded. By 1975, Copersucar members produced 56 million sacks of sugar and 377 million liters of alcohol, representing 91% and 92% of all paulista production. This near monopolistic representation of the sugar and alcohol industry reflects Copersucar's support of alcohol production. With such lop-sided representation in both parts of the sugar industry, Atalla could use Copersucar's hold of the market to push policymakers to support a

⁶² Santos, "Alcohol as Fuel," 177.

⁶³ Nunberg, "State Intervention," 180–182. For a more detailed account of Atalla, his connections to the military dictatorship, and the political influence he yielded over national sugar policy, see Nunberg, "State Intervention," chapter 8.

large-scale increase of alcohol in the gasoline mixture. The ready stock of alcohol available in the organization alone could provide for the large consumer-driven market of São Paulo.⁶⁴

As paulista sugar producers consolidated their ties to and influence within Brazil's military government, the hard-line Marshal Artur Costa e Silva succeeded the moderate, foreign interests-oriented President Castelo Branco in March 1967. Originally from Rio Grande do Sul, Costa e Silva was the former commander of the Fourth Army in the Northeast at the height of the rural labor protests in 1961-1962 before self-appointing himself Minister of War after the coup in 1964. As president, Costa e Silva shifted the country's economic development model dramatically to focus on agricultural exports to generate revenue to drive industrial growth in the country.

Antonio Delfim Netto led his new economic team. A middleclass paulista native, the young University of São Paulo-trained economist would have an important influence on not only the Costa e Silva policy but would emerge as one of the most powerful technocrats of the bureaucratic-military era. After serving as Minister of Finance of the state of São Paulo in the mid-1960s, Costa e Silva invited Delfim Neto to lead the federal economic planning under his administration. Given the reigns to strategize the federal policy after tepid economic results under Castello Branco's Octavio Bulhões-led policy team, he quickly restructured economic policy toward a new national development model built on export-focused agricultural production. By extending export incentives and providing easily accessible credit at favorable rates, the national agriculture growth rate quickly jumped to 7.1% in 1967 while the total national GDP growth rate decreased to 4.2% in the same year. Most importantly, this new policy

⁶⁴ Santos, "Alcohol as Fuel," 145 and Curi, "Os barões do açucar," 78.

focused on sugar, rather than coffee, as the means to expand agricultural export earnings, given sugar exports favorable hold on the international market and the slumping coffee market.⁶⁵

General Emílio Garrastazu Médici solidified Costa e Silva's national economic development agenda after he ascended to the presidency in October 1969, following Costa e Silva's stroke a few months earlier. Originally from Rio Grande do Sul, Médici served as the chief of the National Intelligence Service (*Serviço Nacional de Informações*) under his close friend and fellow hard-liner, President Costa e Silva. Under the new constitution of 1967, the Service became a crucial part of an increasingly centralized federal government structure behind the President and strategically placed military officials within every ministry. Upon succeeding President Costa e Silva in 1969, General Médici continued to tighten authoritarian control over decision-making, amending the 1967 constitution to expand the executive's powers to protect national security.⁶⁶ This opened the door for the implementation of a more intense national development agenda with a more authoritarian control of divisive issues like agrarian reform. Médici rallied domestic nationalism around the growing success of the economic development agenda while implementing a new wave of repression to control political and social opposition.

Under his presidency (1969–1974), Médici continued Costa e Silva's economic policies, led by Treasury Minister Delfim Neto and Economic Planning Minister Reis Velloso, with important implications for the sugar industry. Most pertinent to the sugar industry, these policies loosened export taxes and provided credit incentives to encourage a sustainable export economy

⁶⁵ Skidmore, *The Politics of Military Rule*, 66–71 and 89–90; Baer, *Brazilian Economy*, 462. National GDP had been 6.7% in 1966. Thus, the increased agricultural growth rate in 1967 preempted the Brazilian Miracle that began in 1968. See Table 16 in the Appendix of this dissertation.

⁶⁶ Skidmore, *The Politics of Military Rule*, 56–57; 109. Alfred Stepan posits that General Médici was chosen to succeed Costa e Silva only because of his close relationship with the former president and his ability to control an increasingly divided military. Stepan, *The Military in Politics*, 264–265n23.

while also setting a "crawling peg" exchange rate that regularly devalued the currency in small increments to control inflation and help exports on the international market.⁶⁷ Notably, the new President focused on increasing export revenue by more than 10% a year in manufactured goods and non-traditional agricultural products, moving away from the traditional dependence on coffee exports to drive growth.⁶⁸ These policies resulted in a period of unprecedented sustained growth known as the "Brazilian Miracle" in which national GDP growth rates averaged above 10% per annum from 1968 until 1974.

The sugar industry's growth illustrates the close connections fostered between the military, private businessmen, and civilian technocrats under the dictatorship in the name of development. The military focused on industrialization as a means to development, giving certain civilians close access to high-level officials with similar interests in developing private industries. Copersucar President Atalla's close connection to numerous ministers, particularly General Geisel, reiterates this. Ministers like Delfim Neto targeted agricultural export expansion to finance this industrial growth. Hence, military, technocrats, and private businessmen's interests aligned to drive industrial expansion, particularly in the sugar industry.

Thus, while the government focused on import-substitution policies in the industrial sector, President Médici connected exports in the agricultural sector to the military's national security objectives. Médici's administration promoted an export-oriented agricultural model that was central to his specific goal, as noted above, to simply "develop" with extensive industrial

⁶⁷ Skidmore, *The Politics of Military Rule*, 91 and 138–144. Neto identifies the minidevalorizations as the key to igniting the economic growth of the late 1960s, benefitting both small and large agricultural producers. Weceslau Gonçalves Neto, *Estado e agricultura no Brasil: política agrícola e modernização economica brasileira, 1960–1980* (São Paulo: Editora Hucitec, 1997), 155.

⁶⁸ Federative Republic of Brazil, *First National Development Plan 1972–1974* (Brasília, 1971), xii and 17–18.

growth in the sugar sector.⁶⁹ The modernization programs that emerged in the 1970s focused on domestic industrial production of sugarcane and sugar-related capital goods to capitalize on skyrocketing international sugar prices. As discussed in the next section, the Biagi family was a central actor in this agro-industrial development path, as owners of both the Usina Santa Elisa and the heavy agro-industrial equipment company, Zanini S/A. The next section looks at how deeper modernization policies in the early 1970s manufactured a unique development plan based on Médici's policies through the lens of modernization projects at the Usina Santa Elisa in the early 1970s.

Sugar Booms and Deeper Modernization, 1970-1974

At the same time that the President focused the agricultural sector's development on exports, international sugar prices surged in the early 1970s. While prices began at USD 3.06¢ per lb. (USD\$61.20 per short ton) in January 1970, thanks to failed crops in other sugar markets, prices spiked to USD 56.14¢ (USD\$1122.80) by November 1974.⁷⁰ Such a dramatic rise in prices drove an increased interest in modernization of the sugar industry. The military government's deeper modernization efforts explicitly focused on the consolidation of production facilitations, quotas, and land for larger production capabilities concentrated in the hands of fewer large-scale producers that manifest in the IAA program, Funproçucar, discussed below.

⁶⁹ Stepan, *The Military in Politics*, 236. In fact, Médici's own vision of development was an extension of his predecessor, and fellow non-ESG affiliate, Costa e Silva. Unlike Castello Branco's support of foreign investment, Costa e Silva believed "that it was possible to overcome foreign exchange shortages by increasing exports and that development should be financed by domestic resources."

⁷⁰ Note that prices are given in USD cents per lb. Given the different metrics used in the US, the UK, and Europe for tons (short ton, long ton, and metric ton), this is a clearer valuation than tons. See Figure 11 in the Appendix of this dissertation for a detailed graph of sugar prices.

Funproçucar accelerated agricultural industrial development the sugar sector, which differs from the development path of traditional industrial goods. Evans famously critiques the Brazilian development model of the 1970s for its heavy use of multinational investment to create a form of dependent development in which the country still relied on foreign goods to support its own intermediate industrialization. He claims that "As industry moves toward more capital intensive, technologically based production, the differentiation of capital will leave local capital increasingly marginalized" in favor of larger and more powerful multinational firms.⁷¹ While true for pharmaceuticals and automobiles, this was not exactly the case in the sugar industry.

Instead, the sugar sector remained under the control of domestic producers while deepening industrialization under Médici's development strategy. Not only did domestic producers control the sugar industry but domestic companies also controlled the industrial equipment industries supporting the sugar sector. Brazilian sugar producers like Maurilio Biagi imported foreign technology with local and national funding to drive expansion and the growth of domestic equipment production just as they had in the 1950s. This is more in line with Eakin's assertion that foreign technology was a fourth prong in Brazilian development models.⁷²

Importantly, these companies' hold on the domestic market is critical to the different development path followed by Proálcool in the late 1970s and 1980s. By expanding their holdings and investing in foreign technology behind equipment production in the 1960s, the Brazilian sugar industry had domestic companies capable of providing technology with greater

⁷¹ Evans, *Dependent Development*, 120–121. This is to say that foreign firms dominated durable consumer goods industries (like transportation equipment, rubber goods, chemicals, machinery and electrical machinery) while intermediate goods and nondurable consumer goods sectors (like textiles, food and beverages, wood and some metal production) received more national private capital to develop.

⁷² Eakin, Tropical Capitalism, 3

specialization than international companies could provide at the prospect of a national alcohol expansion in 1975.⁷³

The Policies

The modernization policies employed between 1970 and early 1974 were less a coherent, articulated plan and more a confluence of various policies that streamlined financial support to large usineiros while minimizing labor costs to maximize cost-efficient production expansion.⁷⁴ These policies intensified the early modernization efforts of the 1960s and further separated the advantages the government bestowed upon larger usinas over smaller producers. Focused on usineiros' productivity, the increasingly centralized policy-makers closely monitored the implementation of an improved sugar agroindustry that would exacerbate "traditional distortions" in the industry.⁷⁵ As these producers gained greater support through the new national development strategy, paulista producers' took advantage of increased government-based financial resources. The Usina Santa Elisa's own experience with government support in the early 1970s best illustrates this phenomenon.

 ⁷³ Hasse, *Filhos do fogo*, 155–156. For example, Zanini imported the Atlas turbine and recreated it for sale in the sugar industry. The company paid Cr\$50,000 in royalties for the technology.
 ⁷⁴ See chapter 5 and 6 of this dissertation for the impact of these modernization policies on laborers in the sugarcane industry and particularly within Ribeirão Preto.

⁷⁵ Wilson Carneiro, "Comentário econômico- cotas de produção," *Brasil Açucareiro*, 39, vol. 77, n. 6 (June, 1971), 17–20. President Médici's Minister of Planning João dos Reis Velloso confirms this point, noting the direct involvement and oversight Médici had in economic planning. Additionally, the new administrative structure within the IAA included a greater number of government bureaucrats on the newly structured Deliberative Council, which replaced the Executive Commission of the earlier IAA administration in 1967. Among the changes to this new council, the reform reduced the number of usineiros on the council and increased the government bureaucrats on the council, including a representative from the Ministry of Planning. Szmrecsányi, *O planejamento*, 289.

Pedro Ramos highlights Decree law n. 1.186 of 1971 and 1.266 of 1973 in summary of the modernization efforts of this period.⁷⁶ The military government's political party, the Alliance for National Renewal (*Aliança da Renovação Nacional*), passed Decree n. 1.186, which enacted the Rationalization of the Sugar Agroindustry Program (*Programa de racionalização da agroindústria açúcareira*). The program stipulated that only usinas with quotas above 400,000 sacks of cane per harvest could receive absorb quotas transferred from smaller producers ingested into larger usinas and relocate usinas to more favorable land at the discretion of the usineiros. Financial support for this program targeted the "fusion, incorporation, and relocation" of usinas to maximize large-scale productivity.⁷⁷ This policy allowed large usinas to grow and excluded smaller and medium sized sugar producers from these consolidation benefits.

In fact, Barbara Nunberg discusses the aggressive efforts that usineiros in São Paulo made to acquire smaller usinas, land for cane farming, and medium-sized usineiros quotas for their own cane complexes. Nunberg recounts a report from a local interviewee, José Maria Azambuja Rolim, director of the Agricultural Association of Mogi-Murim in Campinas, published in the national economic newspaper, *A Gazeta Mercantil*, stating:

"According to José Maria Azambuja Rolim, director of the Agricultural Association of Mogi-Murim in Campinas [another dominant sugar producing region in the interior of São Paulo], most of the cultivatable land in that region is worth, on the average [sic], a maximum of 100,000 cruzeiros per hectare. The sugar usinas which are intent on acquiring more land for cane cultivation are offering to pay as much as 200,000 per hectare, however. Indeed, it has also been rumored that although small land owners are officially registering sales of their property at a price of 100,000 cruzeiros per hectare, the actual payment received from sugar usineiros is considerably higher."⁷⁸

⁷⁶ Ramos, Agroindústria canavieira, 159.

⁷⁷ Szmrecsányi, O planejamento, 298.

⁷⁸ A Gazeta Mercantil (November 16, 1976) cited in Nunberg, "State Intervention," 160–161.

Such demand would also push smaller producers out of the industry, favoring larger usineiros that could make such offers with government loans. Thus, the government supported a very different form of land reform than the peasant leagues had envisioned in the early 1960s.

After the IAA instituted the program in 1971, the Vice President of the IAA created special groups to oversee the program's administration. The Technical Assistance Group (*Grupo especial de assessoramento tecnico*- GEAT) and the Administrative Assistance Group (*Grupo especial de assessoramento administrativo*- GEAD) allocated the financial and technical assistance provided through the program. Funding for the program came from the IAA's Special Export Fund.⁷⁹ These funds financed the modernization program's projects.

Later allocation of the Special Export Funds intensified the IAA's modernization efforts in the 1970s. President Médici formalized the use of the Special Export Funds with Decree law n. 1.266 on March 26th, 1973 and act 19 of April 4th, 1973.⁸⁰ The law, which officially renamed the program the Support Program for the Sugar Agroindustry (*Programa de apoio a agroindústria acucareira-* Funproçucar/ Proçucar), explicitly dictated where the IAA could apply funds from the Special Export Fund. Among other objectives, this included: financing the fusion, incorporation, and relocation of industrial units and planter quotas; the reduction of capital costs to finance the sugarcane subsector (such as alcohol); the rationalization of industrial sugar complexes; the financing the acquisition of agricultural machines, vehicles and other

⁷⁹ First created in December 1965, the Special Export Fund acquired the profits from generated from the difference between prices paid to domestic producers for sugarcane and prices collected in sugar exports. It did not have a positive balance until 1968, but as international prices began to rise, the fund accumulated a great deal of money, which officials then redistributed into the sugar industry to finance development and support for producers and workers. Szmrecsányi, *O planejamento*, 303.

⁸⁰ Santa Elisa GEAT form of 23/08/1973. IAA Collection, A6.06 Box 0393, National Archives, Rio de Janeiro.

goods; and the promotion of better quality cane and through the new research program, the National Program for the Improvement of Sugarcane (Planalsucar).⁸¹

Proçucar and Planalsucar best embody President Médici's commitment to the overall expansion of the sugar industry as a part of his administration's development plan. In the President's first national strategy document, "Targets and Foundations for Government Action, 1970-1973," he and his advisors reiterated the importance of technology in the expansion of agricultural production for export.⁸² Proçucar and Planalsucar research and development would be critical to allowing the industry to meet this goal. His overall agricultural development policy focused on three major means to meeting this goal: first, expanding "fiscal and financial incentives for production increase, investments, marketing and technological innovation in the agriculture sector;" second, expanding "the use of modern input materials;" and third, continuing "large scale agricultural research."⁸³ Planalsucar was an important part of reaching this goal.⁸⁴ In the 1972 National Development Plan, I PND, Médici set the lofty goal of a 7% annual agricultural growth rate.

⁸¹ Szmrecsányi, O planejamento, 304.

⁸² Neto, *Estado e agricultura no Brasil*, 132; Presidencia da República, *Metas e bases para a ação de governo: síntese* (Brasília, September 1970). This was a more general outline of the goals while the I PND, discussed above, laid out goals by sector.

⁸³ Neto, *Estado e agricultura no Brasil*, 133; Médici, I PND, 18.

⁸⁴ Rogers, *The Deepest Wounds*, 180–181, 199, and 260n12. Planalsucar has drawn more attention in the historiography. Thomas Roger's work on sugarcane workers in the 1960s and 1970s, closely notes the important role Planalsucar played in the national modernization efforts for the Pernambucan sugar industry. Planalsucar most succinctly connects Brazilian modernization efforts to the "Green Revolution," which focused on expanding agricultural yields with agricultural technology like man-made fertilizers and cane varieties. Rogers notes the scant studies on the impact of the Green Revolution on Brazil even today. However, the focus on increasing the industrial yield of sugarcane, associated with Planalsucar's primary goal of improving cane yields, had varying outcomes between regions. While more successful in São Paulo, even then, it was largely unsuccessful in increasing the industrial yield per hectare in both regions. Rather, it encouraged the expansion of sugarcane production onto land inappropriate for cane production.

Proçucar-financing shaped the expansion of the industry in the 1970s, providing the capacity necessary for Proálcool to become a viable option in 1975. Proçúcar's focus on increasing production capacity extended to alcohol production as well as the incorporation of sugarcane lands under concentrated sugar complexes. Many usinas used the funds gained from Proçúcar to build, expand, or improve their sugar holdings as well as their ethanol distilleries within their industrial complexes. Their project approvals passed through the IAA after which the Bank of Brazil released the funds for their specified modernization efforts. The Usina Santa Elisa is an important example of the benefits that Proçucar bestowed on participant usinas and particularly usinas that already had a relatively modernized industrial outfit.

The Usina Santa Elisa

By 1970, the Usina Santa Elisa had transformed gradually into a premiere usina in Ribeirão Preto. Founded and led by Maurilio Biagi in the 1930s, the entrepreneur had integrated his sons into his expanding holdings in the 1960s. Biagi's eldest son, Maurilio Biagi Filho, joined him as a key part of the Usina Santa Elisa's administration while his second son, Luiz Lacerda Biagi would work in their metallurgy holding, Zanini (discussed below). The Biagis' investment in ethanol production under Proçucar, improving equipment for both sugar and alcohol production, was a risk that they felt was sure to pay off even if the government had not yet explicitly supported a nationally-driven alcohol program.

Biagi Filho grew up working at the Usina and studied business in Ribeirão Preto. His father trained his eldest son to succeed him at the Usina, where Biagi Filho began as an agricultural manager at age 20 in 1962.⁸⁵ He would assume the superintendent position under his father by 1970. Biagi Filho stated that after he moved into the superintendent position, Biagi Sr.

⁸⁵ "De pai para filho," *A Revista Santa Elisa: Uma Historia de Trabalho e Desenvolvimento*, (Ribeirão Preto: MIC Editorial Ltda, 1996), 23.

"never contracted anyone without talking with me beforehand."⁸⁶ The two worked together closely to drive the expansion of the Usina Santa Elisa and alcohol production in the 1960s and 1970s.

Not all usineiros were enamored with Copersucar's leadership, and many broke from the cooperative as a result. The Usina Santa Elisa was one of these many, breaking all ties with the cooperative in 1973.⁸⁷ The Usina Santa Elisa was the biggest usina to break away from Copersucar in the state of São Paulo. As such, the Biagis emerged as sugar and alcohol industry leaders outside of the umbrella of Jorge Wolney Atalla and Copersucar's own actions.

Outside of Copersucar's access to preferential lobbying access (provided primarily by Atalla, as discussed above), the Biagis found another means to lobby the military directly: hiring Coronel Milton Camara Senna as director at the Usina Santa Elisa. Prior to joining the Usina, the Rio de Janeiro native served as the former Chief of the 7th Military Region and the Superintendent of the Amazonian development program (*Superintendencia do Desenvolvimento da Amazonia*). At the Superintendent program, he had been tasked with recruiting southern businessmen to invest in development programs in the Amazon region.⁸⁸ Although unclear, this may have been where the Biagis first connected with Senna. Regardless, such experience would make Senna invaluable in the Biagi's own development. Not coincidentally, Senna joined the Usina in 1974, only a year after the Biagis broke from Copersucar and the same year that they

⁸⁶ "De pai para filho," 24; Hasse, *Filhos do fogo*, 193-194. Biagi Sr. and Biagi Filho would work closely until Biagi's sudden death in February 1978. Thereafter, the family matriarch and widow, Edilah Lacerda Biagi became the acting president, giving full control of the family's sugaralcohol business to Biagi Filho while Lacerda Biagi continued in the metal-mechanic company, Zanini, with José Rossi Jr.

⁸⁷ Santos, "Alcohol as Fuel," 380. In fact, these producers founded SOPRAL in 1975 as an alternative cooperative to the aggressive Atalla and the dominant Copersucar. For the case of the Usina Santa Elisa, see Hasse, 194.

⁸⁸ Houtzager, "State and Unions," 116n30.

applied for Funproçucar-financing.⁸⁹ Senna's presence reiterates the important role that lobbying played in applications winning funding and usineiros successfully travailing the difficult Brazilian bureaucratic bottlenecks.

Father and son applied for Funproçucar-financing only months after the program began. Economist Roberto de Oliveira first reviewed the Usina Santa Elisa's financial capability to participate in Funproçucar in October 1973. Project approval involved an extensive review of the Usina's financial situation over the previous three years as well as its board of directors in order to assess its ability to repay the Funproçucar loans. A demand like this, while logical for the Bank of Brazil as an investor, would have been a key step in weeding out smaller usinas that were less financially capable of incurring such large loans.

IAA President General Álvaro Tavares Carmo approved Santa Elisa's application for Funproçúcar funding on April 4th, 1974. It approved Cr\$18,501,100 (\$2,720,750 USD in 1974 terms) to improve industrial capacity with the "acquisition of industrial equipment, installations, consignments, and civil projects."⁹⁰ As with all the projects, Funproçucar did not finance 100% of the project, rather the respective usina directorate was also expected to incur some costs for the modernization project. In the case of the Usina Santa Elisa, the IAA allocated Cr\$976,600 (\$143,617 USD), or less than 5%, of the funding to the owners themselves.⁹¹ As a large usina in

⁸⁹ In fact, Senna signed off on all of the Usina Santa Elisa's first Proálcool applications. Usina Santa Elisa Proálcool Application, CNAl n. SP06/76. IAA collection, A6.16 Box 0443, National Archives, Rio de Janeiro; Hasse, 170.

 ⁹⁰ Funproçúcar approval letter from General Tavares Carmo to the Usina Santa Elisa on April 4th, 1974. GPCt 515/74, IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.
 ⁹¹ Internal economic report with the Santa Elisa Funproçucar application by Economist Roberto de Oliveira and approved by the Economic Advisor Carlos Alfredo Hiss for the Secretary Executive of GEAT in Rio de Janeiro on October 23rd, 1973. A6.06 Box 0393, IAA Collection, National Archives: Rio de Janeiro.

the region and the state, the government's additional financial assistance provided to the usina solidified its position as a leading usina in the country.



Figure 2: The Usina Santa Elisa Directorship in 1996⁹² Source: *A Revista Santa Elisa: Uma Historia de Trabalho e Desenvolvimento*, (Ribeirão Preto: MIC Editorial Ltda, 1996), 27.

The Bank of Brazil, the official financial institution through which the IAA distributed government funds, provided the credit on a 10-year repayment plan including three years of forbearance and a 12% interest rate. While the Usina Santa Elisa had outstanding loans to other regional banks, the Bank of Brazil's position as the primary lender in Funproçucar was an important illustration of the federal government's commitment to the program.⁹³ The Bank of

⁹² Pictured in the middle and to the center-right are Edilah Lacerda Biagi and Maurilio Biagi Filho, in the photograph in the middle is the patriarch, Maurilio Biagi. When Biagi Sr. died in 1978, Maurilio Biagi Filho took over all sugar-alcohol family operations, including the Usina Santa Elisa, for which he had been Superintendent for years.

⁹³ Santa Elisa GEAT form of 23/08/1973. IAA Collection, A6.06 Box 0393, National Archives, Rio de Janeiro; See also Santa Lydia and Nossa Senhora da Aparecida Usinas' applications for

Brazil had become the primary arm of the federal government's agenda for agricultural development. Conveniently situated between commercial and federal lender until the late 1960s, the Bank of Brazil remained the most important symbol of federal support in agricultural financing.

Federal financing provided was well below market rates for other regional banks. Funproçúcar provided interest rates fixed at 12% in the Center-south and 10% in the North and Northeast. As a point of comparison, according to the presentation given at the local Ribeirão Preto Commerce and Industry Association by São Paulo State Development Bank President Dr. Álvaro Coutinho, small and medium sized companies received loans with a notable 22% interest rate in 1974.⁹⁴ While interest rates varied between regions (Northeast and Center-south), given Brazil's history of rampant inflation, the guaranteed 12% interest rate with no monetary correction for inflation was more than a deal; it was a steal.⁹⁵ In a presentation to the Federal Senate on October 25th, 1973, IAA President General Álvaro Tavares Carmo stated in regard to the financial conditions of the program, "I believe that no other credit establishment could offer financing under these conditions."⁹⁶ With such varying interest rates and chronic inflation, there was great incentive both for the state to intervene with and for producers to participate in the national program.

more examples. GEAT form of 23/08/1973 of A6.06 Box 0395 and GEAT form 12/10/1973 of A6.03 Caixa 0378.

⁹⁴ President of the State BADESP President Alvaro Coutinho, "The Role of State Banks," Presentation to the ACI-RP on 19/04/74. Caixa 187, ACIRP Archive, Ribeirão Preto, SP.
⁹⁵ In fact, this would be the case as the program continued. In 1973, the average inflation rate was sat between 17% and 22%. However, by 1981, when the majority of the loan should have been repaid, inflation sat at 99.7%. Skidmore, *The Politics of Military Rule*, 139, 254, and 356n129.

⁹⁶ "Conjuntura açucareira é analisada pelo President do IAA no Senado Federal," *Brasil Açucareiro*, Year 40, Vol. 83, n. 1 (Jan., 1974), 18 as cited in Ramos, *Agroindústria canavieira*, 160–161.

The Bank calculated annually payments based on the usina's authorized production in alignment with the IAA's Harvest Plan. Thus, usineiros still had to apply for new quotas despite increasing their production capacity under the program. For some usinas, this production limitation may have been a mere formality by the 1970s, as exports were such a central part of the national agenda and the IAA's own policy structure. However, the IAA explicitly noted that the IAA's financing for the modernization and capacity expansion through Funprocucar "did not constitute a right to a new official production guota."97

While the project was beneficial to any usineiro that could corral financial support from the IAA, it was all the more beneficial to the Biagi family as they were able to purchase the majority of the new industrial equipment from their own company, Zanini S/A.⁹⁸ This included: rollers and electric winches for cane reception, a cane feeder table, a rotating filter, evaporation boxes, centrifuges for sugar processing, multi-jet vacuums, turbo-generators, regulators, and water boilers among other equipment.

The Usina Santa Elisa was one of many usinas to purchase distillery equipment as well as other agro-industrial equipment first under Funproçucar and then more extensively under Proálcool. Thus, as agro-industrial complexes expanded first in the region and then in the country, the Biagi's two industries were able to expand their economic power and prowess both in the Ribeirão Preto and the country. Zanini's expansion, driven by Funproçucar's preferential use of domestic companies, transformed the important sugarcane region into an agro-industrial capital.

⁹⁷ Funprocúcar approval letter from General Tavares Carmo to the Usina Santa Elisa on April 4th, 1974. GPCt 515/74. IAA Collection. A6.16 Box 0443. National Archives. Rio de Janeiro. ⁹⁸ See also, Santos, "Alcohol as Fuel," 255; Barzelay, *Politicized Market*, 183.

While Biagi's eldest son ran the Usina Santa Elisa alongside his father, the second son, Luiz Lacerda Biagi, developed the family's equipment production company, Zanini. From a young age, Lacerda Biagi's interests had always favored the technical side of the family's metallurgy company. Trained in economics at the Mackenzie University in São Paulo, Lacerda Biagi set up the Zanini office in the capital city in the 1960s, as Biagi Sr. and his partners restructured the company.⁹⁹

Maurilio Biagi, Ettore Zanini and Arnaldo Bonini incorporated Zanini in 1961, shifting its production scope from the 14 usinas in the Ribeirão Preto region to a national agro-industrial equipment company. Founded to compete with the first major domestic agricultural equipment company, Dedini S/A, in 1950, Biagi Sr. wanted to expand its production capacity beyond regional rum and sugar mills to other custom industrial equipment outside the sugar sector in the agricultural industry in the 1960s. In 1970, Biagi Sr. and the other shareholders decided to expand Zanini with increased international partnerships to acquire foreign technology in order to win more contracts in Brazil. They reconstructed the company, and Luiz Lacerda Biagi assumed the vice-presidency prior to the company going public.¹⁰⁰ With Funproçucar, and more importantly Proálcool in the late 1970s, Zanini became the second largest sugar mill and distillery producer in the country after the domestic company, Dedini S/A.¹⁰¹

⁹⁹ Maurilio Biagi owned 44% of the company, while Arnaldo Bonini and José Rossi Jr., an engineer that joined Zanini in 1961, owned 20% and the founder, Ettore Zanini, held 16%. Hasse, *Filhos do fogo*, 146–148.

¹⁰⁰ The partner and engineer, José Rossi Jr., took the presidency, but Lacerda Biagi would remain the talking-piece of the Zanini operations from 1970-1985. Maurilio Biagi continued as the president of the company's advisory council until his death. Hasse, *Filhos do fogo*, 162–163 and 168.

¹⁰¹ Together, the two companies produced 70% of all related equipment in the country by 1979. For a more detailed history of the Zanini company and its impact on the region, see Santos, *A* usinagem do capital, 33-47.

Zanini's growth alongside the Usina Santa Elisa captures the way domestic producers were able to maintain control of the sugar industry using national and domestic private funds to keep foreign capital out of the sector's development. Exports not only fueled interest in Proçucar, but they also funded the projects, initially. The government redirected these funds into the sugar industry in the early 1970s, in order to increase "capital intensive, technologically-based production," to quote Evans again. While multinational investment drove other industry's development, Medici's sugar development agenda was largely driven by domestic funds and domestic industries when possible. The domestic companies contracted to execute the modernization programs at the Usina Santa Elisa reiterate this point.

The Usina Santa Elisa used Proçucar funding to expand its ethanol production capacity substantially along with its sugarcane production under this modernization program. While the various pieces of equipment listed above accounted for the larger portion of the overall credit, the largest single equipment piece went to the usina's distillery. Proçucar financed a distillation, rectification, and dehydration apparatus that would produce 70,000 liters per day. At the same time, the IAA financed buildings for cane deposits, a warehouse, technical and mechanical offices, the expansion of the boiling room, the transformation of old cane crushing buildings into sugar depositories, and the distillery.¹⁰²

The project employed three different companies to construct, expand, and lay down the modernization projects. The IAA approved the local Ribeirão Preto-based construction company, Hélio Fóz Jordão Ltda., to do the civil construction projects, including the building in which the

¹⁰² Funproçúcar approval letter from General Tavares Carmo to the Bank of Brazil President Dr. Ángelo Calmon de Sá on April 4th, 1974. GPO 324/74, IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro; Cedula de Credito Industrial contract between the Bank of Brazil and the Santa Elisa shareholders, Maurilio Biagi Sr. (Director), Maurílio Biagi Filho (Superintendent Director), Edilah Lacerda Biagi, and Luiz Lacerda Biagi on May 6th, 1974 and the annexed equipment budget of May 3rd, 1974.

distillery would go. The IAA contracted the Piracicaba-based company, Metalúrgica Conger S/A for the construction of the actual distillery. Finally, the project employed the Biagi's majority share-owned and regional agro-industrial equipment company, Zanini S/A, for the sugar cane processing equipment like the turbines and centrifuges, and other electric energy equipment pieces.¹⁰³

The Usina Santa Elisa drew particular attention for the remodeling financed by the IAA. In a letter to Santa Elisa's Director-President, the Special Group the Control of Project Execution (*Grupo Especial de Controle da Execução*- GECEP), which was the administrative organ of the Technical Assistance Group (GEAT), requested that the Usina clearly display a placard, pictured below, indicating the Usina's part in the Funproçucar program.¹⁰⁴ While a simple identifier, its implications are notable. First, it highlights the important role that visibility held in the program's execution. Modernization was not just about efficiency but it was also a show of greater technical prowess. Funproçucar captured the essence of President Médici's clear goal, as stated earlier, to simply "develop." The nebulous term was best captured through extensive mechanization, international competition, and efficiency for Médici and his team. Funproçucar reflected this idea. Industrial capacity in the Brazilian countryside was equally important to an idealized version of spreading development. The placard was a part of this effort.

¹⁰³ Ibid. In fact, GECEP initially approved a fourth company, Balanças Chialvo, in addition to the Usina Santa Elisa itself to be involved in the project's expansion, but no mention was made of the company again in the record so it is possible that its obligations were small (only having been allocated Cr\$110,900 compared to the other larger projects employed by the other companies) or they were transferred to another company. Letter to the Usina Santa Elisa from GEAT/GECEP Coordinator Augusto Cezar da Fonseca on June 10th, 1974. GECEP Processo 533/74, IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

¹⁰⁴ GECEP- 544/74 of April 16, 1974. IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

Second, such earmarking highlights the exclusive number of usinas that were able to win Proçucar funding. With a required minimum production quota of 400,000 sacks of sugar a year, many usinas would not be eligible for the program's financing.¹⁰⁵ Entry into this small group of usineiros was exclusive and beneficial. Not only did it open up access to greater expansion, but it also tagged the usina for greater government investment under the following sugar-related development program, Proálcool in 1975.



Figure 3: Requested Placard

Source: GECEP- 544/74 of April 16, 1974. IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

Quickly after the GEAT approved the Usina's financing, Maurilio Biagi Filho, the

Director Superintendent of the Usina and advisor to the usina's transportation section, submitted

a request to IAA President Tavares Carmo to restructure the financial distribution allotted to the

¹⁰⁵ According to the neighboring Usina Santo Antonio's application, 115 other usinas received funding under the program across the country by May 1975. Presumably, this was a good portion of the usinas with a 400,000 sack production base. However, that is simply speculation on the part of this author. GEAT-III-86/74, Report on the Usina Santo Antonio- SP, A6.07, Box 0397. IAA Collection, National Archives: Rio de Janeiro.

new equipment.¹⁰⁶ In particular, Biagi Filho proposed changes to the allocated Zanini S/A's equipment production. He states, "With the evolution of the approved Plan's application, there arose, as is normal, more convenient alternatives, not only for more modern and more consistent equipment quality with the purpose [of Proçucar] in mind, but also the said equipment will be more adequate for the projected systems, better attending to the focus on economy."¹⁰⁷ These economized changes included a reduction in turbo generators and Zanini and Woodward speed regulators for the turbines, which were part of the electric energy equipment outfit, and a complete replacement of the cane feeding equipment for a new unloading system. Additionally, Biagi Filho requested the expansion of the "sulfitation ensemble" (which includes new ovens, compressors, and other accessories for cane processing) based on the outcome of the 1973/74 harvest.¹⁰⁸

These changes shifted the financing of the project as well, for which Biagi Filho proposed that the IAA approve redirecting the funds saved from the unnecessary equipment to the distillery's financing. The excess funds (Cr\$412,500) after the subtracting the canceled equipment and the additional equipment, would instead go to the approved financed equipment for the expansion of the distillery. Originally, the distillery had an allotted production capacity of 70,000 liters per day. Correspondence with details of the new distillery reveals that the new distillery was to be equipped for both hydrous and anhydrous alcohol production, using benzol as its primary dehydrating ingredient. These additional funds would allow the Biagi Filho to expand

¹⁰⁶ Letter from Maurilio Biagi Filho to General Tavares Carmo on June 16th, 1974, IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

 ¹⁰⁷ Funds request letter from Maurilio Biagi Filho to IAA President General Alvaro Tavares
 Carmo on June 17th, 1974. IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.
 ¹⁰⁸ Ibid.

the Usina Santa Elisa's distillery production capacity from the projected 70,000 liters/day to 240,000 liters/day.¹⁰⁹

The distillery seems to have been Biagi's primary focus for these changes. Biagi Filho explains his interest in expanding the distillery in relation to his own interest in alcohol as a gasoline additive. He states, "Given the global oil crisis, the Usina Santa Elisa believes that the production of ANHYRDROUS ALCOHOL (sic) will be of great importance for the national economy."¹¹⁰ In this application, Biagi Filho reasserts his position on the need to promote further use of alcohol through the request for the Usina Santa Elisa. The unprompted mention of alcohol's connection to the national economy reflects broader ruminations on the importance of alcohol within the sector and even within the government during this period.

Biagi Filho's request was timely. Between the expansion of a sugar research program, Planalsucar, in 1970 and Funproçucar in 1971 and early 1973, the federal government and the IAA subsequently had invested extensive money into the sugar industry to maximize sugar profits on the international market. However, sugar prices began to dip in 1974 after the first oil shock in 1973 shook the Brazilian financial scheme and development agenda.

Following the OPEC-induced oil shock of 1973, oil prices precipitously increased in 1974.¹¹¹ As Laura Randall noted, the first oil shock did not damage the Brazilian economy the same way it did other countries, like the US, because of its more protected oil production structure. Following the creation of Petrobrás in 1953, Brazilian oil production was significantly

 ¹⁰⁹ Funds request letter from Maurilio Biagi Filho to IAA President General Alvaro Tavares
 Carmo on June 17th, 1974. IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.
 ¹¹⁰ Ibid.

¹¹¹ See Figures 11 and 12 in the Appendix of this dissertation. The comparison shows the change in oil prices in dollars per barrel. For a more detailed account of the OPEC (Organization of Oil Exporting Countries) embargo on the US and the related increase in global oil prices, see Francisco Parra, *Oil Politics: A Modern History of Petroleum* (New York: I.B. Tauris, 2004), 175–188.

more costly than other countries' as it developed the infrastructure and training for its employees. Thus, the oil price increases did not adversely affect the slowly diminishing price of production that occurred with Petrobrás' development.¹¹² Thus, Maria Helena Castro Santos summarizes the first oil shock in 1973 as more of a "warning signal" for Brazil than an immediate emergency even though the balance of payments quickly national balance of payments.¹¹³

Yet, less known is the significant shift in sugar prices the next year. The poor international harvests that had driven prices up in the early 1970s rebounded by late 1974. Along with an expanded beet sugar market, prices plummeted. Additionally, untimely droughts and cold spells in São Paulo hurt Brazilian production. With these successive events, the military's massive investment in the sugar industry, which already sat around Cr\$10 billion (almost USD\$1.5 billion) by 1975, was in trouble. The decreasing sugar prices endangered a significant industry in the development agenda that had been so successful (and costly) under the Médici administration.

Biagi Filho and his father Maurilio Biagi Sr., director of the Usina Santa Elisa, were very vocal about their interest in the expansion of alcohol production to decrease dependence on oil imports. For example, the two invoked the national implications for larger alcohol production in their June 1974 Funproçucar request. This was likely an intentional plug in support of concurrent debates in public forums initiated by Maurilio Biagi Sr.'s April 1974 anonymous report

¹¹² Randall, *The Political Economy of Brazilian Oil*, 15. Randall notes that between 1954 and 1973, Brazil actually paid 3.7 billion dollars more for its domestic oil than it would have with imports because of related bureaucratic red tape and the high cost of inexperience in oil production within Brazil.

¹¹³ Santos, "Alcohol as Fuel," 195–196. As Santos concisely illustrates, oil imports accounted for 11% of the value of total imports but jumped to 22% and rising in 1974, while the current accounts deficit grew by 320% in one year, expanding from 1.7 billion dollars in 1973 to 7.1 billion dollars in 1974.

proposing a large-scale alcohol program to the National Petroleum Council.¹¹⁴ As Biagi Filho revealed in an interview I conducted with him,

"In 1974, we [Biagi Filho, his father, and other specialists in the industry] sent a report to the President of the Republic, during the General Geisel era, which was titled 'Photosynthesis as Energy.' The report [proposed] subsidies for the government to create the 'National Alcohol Program' or 'Proálcool. When the agent delivered the report to the government, [it] was coordinated by Dr. Lamartine Navarro Junior, then vice-president of Associgas, a gas association[.] Thus it was an oil man that made the alcohol [program] work [...] with the collaboration of my father, Maurilio Biagi."¹¹⁵

Indeed, the 1974 report directly influenced subsequent policy. It proposed two different programs that would promote the expansion of alcohol production in São Paulo and the country. The first program supported financing the construction of autonomous distilleries for direct alcohol production and expanding the idle capacity of annexed distilleries, like that on the Usina Santa Elisa. In fact, IAA President Tavares Carmo and the Deliberative Council of the IAA approved the construction of new autonomous distilleries under restrictive conditions in Resolution n. 2081 on May 13th, 1974.¹¹⁶ Thus, Biagi Filho's Funproçucar request was far from coincidental. Rather, it was consistent with outside efforts to push greater alcohol production on the national level, in which the Biagis were actually important leaders.

The Usina Santa Elisa was not the only usina to use Proçucar funding to enhance its alcohol production capacity. For example, the Usina Santa Lydia was a prominent usina in Ribeirão Preto owned by Arnaldo Ribeiro Pinto. Unlike the Usina Santa Elisa, the Usina Santa Lydia began as a cachaça distillery and transitioned to a fully equipped sugarcane and anhydrous

¹¹⁴ Szmrecsányi, *O planejamento*, 310. In fact, the authors of the report were unknown at the time of its distribution in 1974 but broadly considered to be related to Copersucar usineiros. Maurílio Biagi Sr. was one collaborator to later claim authorship.

¹¹⁵ Interview with Maurilio Biagi Filho, May 20th, 2013, Ribeirão Preto, São Paulo.

¹¹⁶ Szmrecsányi, *O planejamento*, 310–311. The IAA had to approve autonomous distilleries directly and could not directly compete with sugar for other usinas. Also, these autonomous distilleries had to have a minimum production capacity of 60,000 liters per day, predominantly produce anhydrous alcohol for the fuel supply, and could produce alcohol from sugar directly or from a residual source, like molasses.

alcohol usina in 1946.¹¹⁷ Between the 1969 and 1972 harvests, the Usina Santa Lydia increased its alcohol production from 2,976,000 liters to 3,291,000 liters while its sugar production actually decreased from 391,000 sacks of crystallized sugar (processed) to 363,000 sacks. In the original bid for Funproçucar funding, the GEAT only approved financing for crystallized sugar equipment. However, upon a reassessment approved in July 1974, the GEAT committee approved additional financing for a new distillery apparatus, new alcohol storage tanks, and the construction of a building to house the distillery much like the Usina Santa Elisa.¹¹⁸ Santa Lydia's financing highlights the important role increased alcohol production held in the IAA's modernization efforts beyond the Usina Santa Elisa's own interests, benefitting regional producers. Also, purchasing distillery equipment from the Biagi-owned Zanini further benefitted the Biagis' leadership in the sugar and alcohol industry.

In the case of the Usina Santa Elisa, IAA President Tavares Carmo denied Maurilio Biagi Filho's request to redirect funds and streamline the bureaucratic process. He accepted the requested changes to the equipment, replacing the two turbines for the one Stork-Toshiba turbine and canceling the cane-crushing table. However, the IAA did not support Biagi Filho's request to replace previously approved equipment based on the program's financial limitations. Instead, GECEP informed the Usina Santa Elisa that the Bank of Brazil, the financier of the projects, would recollect the funds that had been distributed to Zanini for those pieces. Furthermore, the

¹¹⁷ Hasse, *Filhos do fogo*, 127.

¹¹⁸ GEAT Processo III-22/73, Usina Santa Lydia Credit Supplement, signed by Chemical Engineer Manoel M. de M. Correia on June 2nd, 1975. IAA Collection, A6.06 Box 0395, *National Archives*: Rio de Janeiro.

Usina Santa Elisa would have to cover the additional costs of the new imported Stork-Toshiba turbine, which exceeded the previously approved domestically produced turbine's cost.¹¹⁹

While the IAA would not comply with Biagi Filho's request, it did approve the Usina Santa Elisa's own financing of the requested expansion. As such, the Usina Santa Elisa benefitted from the Proçucar program but was able to execute its own modernization agenda, namely the expansion of its distillery, beyond the federal path laid out by the program. Biagi Filho's desire to expand the Usina Santa Elisa's distillery capacity and improve its production equipment despite the resistance of administrators in the IAA like President Tavares Carmo and the GECEP bureaucracy allowed the Biagis and the Usina to shape future alcohol production initiatives in the region and the country. Instead, the Biagis increased alcohol production of their own volition and financing, driving the region's involvement in the future alcohol program more broadly, as will be discussed in the next chapter.

Independent Alcohol Expansion and Funproçucar's Ongoing Funding in 1975

By 1975, the Usina Santa Elisa had already completed its Funproçucar construction, and the Biagis looked to further expand the usina's distillery capacity. The Proçucar funding (GECEP 533/74) approved in April 1974, "optimized the process for a capacity of cane crushing of 5,500 TCD [tons of cane per day] and allows [the Usina] to produce up to 1,500,000 sacks of sugar with a an industrial yield of 110kg ton of cane."¹²⁰

On February 21st 1975, Biagi Filho received approval from the IAA (GPCt 89/75) for the expansion of its distillery to 180,000 liters per day, which the Usina Santa Elisa would have to

¹¹⁹ GPCt/GECEP- 67/74, Letter to the Usina Santa Elisa on July 30th, 1974. IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

¹²⁰ As stated in the Usina Santa Elisa's Proálcool application, "Justificativa do Projeto." Maurilio Biagi Filho to IAA President Tavares Carmo on February 13th, 1976. National Alcohol Commission, Division of Assistance for Production N. SP06/76, February 12th, 1976. A6.16 Box 443, National Archives: Rio de Janeiro.

finance with its own resources. Thus, in addition to the new 60,000 liter per day distillery financed by Funproçucar, the Usina Santa Elisa built a second distillery with a capacity of 120,000 liter per day.¹²¹ The Biagis successfully financed the Usina's own expansion, which was still under construction in 1976 when the producers applied for Proálcool funding.

Biagi Filho anticipated and shaped the trend toward increased alcohol production to salvage the energy sector and the sugar industry. First with Biagi Sr.'s participation in early alcohol expansion proposals in 1974 and then with the self-financed expansion of the Usina Santa Elisa in 1975, the Biagis placed the Usina Santa Elisa a step ahead of many other usinas in alcohol production. Such a position further illustrates the assertive position Biagi Filho took toward expanding alcohol production even where the IAA had failed to do so in the years leading up to Proálcool. Despite the IAA's hesitance, other indicators, particularly the 1973 oil shock, and some early policy's supporting increased alcohol mixtures in the fuel source, the Biagis took a risk investing in alcohol's expansion so early.¹²² As Biagi Filho noted in the Usina Santa Elisa Proálcool application, "we were certain, us and the IAA, even in 1974, of the opportunity for the increase in national production of alcohol to contribute."¹²³ This certainty placed the Usina in a particularly favorable position to win early project approval under the new program in 1976.

While the Biagis' independent expansion of the Usina Santa Elisa's distillery capacity pushed the creation of a national alcohol program with its alleged preparation for a national response to the oil shocks, the Biagis' actions also illustrate the way producers forced the

 ¹²¹ Usina Santa Elisa Proálcool Application, Maurilio Biagi Filho to IAA President Tavares Carmo on February 13th, 1976. National Alcohol Commission, Division of Assistance for Production N. SP06/76, February 12th, 1976. A6.16 Box 443, National Archives: Rio de Janeiro.
 ¹²² See chapter 4 of this dissertation, 155-157.

¹²³ Usina Santa Elisa Proálcool Application, Maurilio Biagi Filho to IAA President Tavares Carmo on February 13th, 1976. National Alcohol Commission, Division of Assistance for Production N. SP06/76, February 12th, 1976. A6.16 Box 443, National Archives: Rio de Janeiro.

government's hand in the midst of sugar's falling international prices and slumping harvests in the region in 1975. As discussed above and illustrated in Figure 11 (see the Appendix of this dissertation), sugar prices collapsed in 1975. While world market prices began at USD 38.31¢ per lb. (USD\$766.20 per ton) in January 1975, then dropped to USD 13.65¢ per lb. (USD\$273 per ton) by June. At the same time, unseasonable frosts and a prolonged drought swept across the state of São Paulo in the 1975. These "adverse conditions" cut deeply into the state of São Paulo's sugar production.¹²⁴ In a report submitted to Director of the Usina Santa Elisa and the Companhia Agricola Sertãozinho, the incorporated agricultural holdings of the Biagi family, Agricultural Superintendent Gabriel Rabelo de Oliveira Neto reported that the corporation's sugar holdings were producing almost half of what they had produced per hectare the year before. While in September 1974, their holdings had produced 104,357 tons of sugar per hectare, they only produced 62,589 tons per hectare by the same time the next year. At this time, world market sugar prices sat at a paltry USD 18.61¢ per lb., seriously endangering sugar producers' financial solvency for the harvest.

Consequently, usineiros looked to the IAA for help. Biagi Filho submitted a request to suspend the Usina's Bank of Brazil interest payments for Funproçucar-financing on September 25th, 1975.¹²⁵ The GEAT/GECEP Coordinator Augusto Cezar da Fonseca and IAA President Tavares Carmo deferred the interest payments for the Usina Santa Elisa along with nine other usinas (including another Biagi holding, the Usina da Pedra) in November 1975.¹²⁶ At the same

A6.16 Box 0443, National Archives, Rio de Janeiro.

 ¹²⁴ In 1975, extensive frosts caused São Paulo to produce only 47.2 million sugar sacks of the anticipated 60 million. MIC/IAA, *Relatório 75* (Rio de Janeiro: IAA), no page numbers.
 ¹²⁵ Letter to the IAA from Maurilio Biagi Filho sent September 15th, 1975. IAA Collection,

¹²⁶ GECEP letter to IAA November 6th, 1975. IAA President Tavares Carmo approved the proposal on November 7th, 1975. IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro. The other Proçucar-funded usinas (and their respective regions) that received this

time that the Usina received assistance for the poor 1975 harvest, the IAA continued to release Funproçucar funds for the Usina Santa Elisa's modernization project. The IAA, via GECEP, allowed the Bank of Brazil to release the remainder of the Cr\$18,501,000 in funding for the Usina's modernization in April of that year.¹²⁷

Ultimately, the IAA used the Special Export Fund to extend credit via the suspension of interest payments to the tune of over Cr\$51,500,000 (USD\$6,296,296) to usineiros in the state of São Paulo alone in 1975.¹²⁸ Upon deferring the payments, the IAA explicitly noted that they would not accrue additional interest nor should the delayed payments be subject to any monetary correction for inflation. Given the rising inflation rate (an average of 29.4% in 1975), with no monetary adjustment and in real terms, the required payments were progressively cheaper each year, giving usineiros additional financial support through the program.¹²⁹

The government's commitment to sugar producers reached "non-retractable," or "too big to fail," levels by the end of 1975. Through the Special Export Fund, the IAA had released over Cr\$13.5 billion (USD\$1.6 billion) of a committed Cr\$18.3 billion (USD\$2.2 billion) in modernization projects, consumer price subsidies, interest subsidies, support for cooperatives,

financial extension were the Usina São Geraldo (Sertãozinho) the Usina Barra Grande (Lençóis Paulista), Catanduva (Catanduva), São Carlos, São Domingos, São Jose (Macatuba), and Santa Bárbara (Santa Bárbara D'Oeste). The payments were suspended for the 1975/76 harvest and forwarded to the 1976/77 harvest. This list would expand to other Copersucar member Proçucar participants by the next week, including the Usina Bonfim (Jaboticabal) and Cresciumal (Leme). Letter from GECEP Executive Secretary Ricardo Rico Gomes on November 14th, 1975, GECEP 91/75, IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

¹²⁷ GECEP release approval of April 24th, 1975. Parecer n. 307/75. A6.16 Box 0443, *National Archives*: Rio de Janeiro.

¹²⁸ Minas Gerais, Paraná, and Rio de Janeiro also received interest rate suspensions accounting for a little over Cr\$52,558,000 collectively. MIC/IAA, *Relatório* 75 (Rio de Janeiro: IAA), no page numbers.

¹²⁹ Letter from President Tavares Carmo to the Manager of the Bank of Brazil- Ribeirão Preto Branch on November 7th, 1975. GPCt- 604 and GPCt- 590, IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

start-up capital for cooperatives and cane-suppliers, export infrastructural work, and Planalsucar for the sugar industry nationally. This does not include the nearly Cr\$1.7 billion (over USD\$200 million) in assistance to usineiros and cane suppliers for climate troubles nationally.¹³⁰

The weak harvest in 1975 and diminished international sugar prices, linked to recovering beet sugar and international sugarcane markets, increased the government's already ample support for the sugar industry. By 1975, the IAA had granted nearly Cr\$3.5 billion (USD\$432,098,765) in funding to 111 usinas through the Funproçucar program. The program benefitted São Paulo more than another other state, but Ribeirão Preto usineiros particularly won big. Of the 111 projects approved for Funproçucar funding by May 1975, São Paulo received nearly half of the projects (52), of which 12 were located in the Greater Ribeirão Preto region.¹³¹ The concentrated number of usinas financed in São Paulo drove the program.

With these staggering numbers, many historians of the program call the original National Alcohol Program (*Programa Nacional do Álcool*- Proálcool) a sugar bailout initiative. Barzelay is one of the more adamant voices regarding Proálcool's bailout foundations.¹³² Even with

¹³⁰ MIC/IAA, Relatório 75.

¹³¹ Santa Lydia GEAT Processo III-22/73, Letter from Economist Terezinha Florencio to Economic Advisor Carlos Alfredo Hiss on May 27th, 1975. IAA Collection, A6.06 Box 0395, *National Archives*: Rio de Janeiro. The 12 projects in the Ribeirão Preto region included: the Usinas Amália, Da Pedra, Santa Lydia (all within Ribeirão Preto), Bela Vista, Nossa Senhora Aparecida, Santa Elisa, Santo Antonio, São Geraldo (all in Sertãozinho), Bonfim, Santa Adélia, São Carlos and São Martinho (all in Jaboticabal). This is my assessment of the filed projects, based on the Bank of Brazil branches used for the respective projects as issued by Pedro Cabral da Silva, Director of the Department of Modernization of Sugar Agroindustry in the attachment to Of. DMA- 207/80 of June 17, 1980. A6.23 Box 0480. These included the usinas that used branches in Ribeirão Preto, Sertãozinho, and Jaboticabal. Another usina in Ribeirão Preto, the Usina Martinopolis would receive funding after the December 1974 and before June 1980. More generally, of the 111 approved projects by January 1st, 1975, 21 were in Pernambuco, 17 in Alagoas, 9 in Rio de Janeiro, 5 in Minas Gerais, and the rest were individually dispersed between 6 other states.

¹³² See Barzelay, *Politicized Market*, chapter 5, "From Sugar Industry Bailout to Energy Strategy," 129-153. He notes that the political environment of 1975 and the military

Demetrius' more idealized view of the program, he agrees.¹³³ Conversely, Castro Santos claims that the program did not focus on a sugar bailout until later in the program.¹³⁴ In part, I would agree with all three of them. The government had invested so much money in the sugar industry, which pushed government officials' hand in the matter. However, the program was more than that. The alcohol initiative, driven by special interest groups and producers alike, was considered a viable economic option because of the technical and economic development of the sugar industry, in the 1960s and early 1970s.

The Biagis' leadership in alcohol expansion through the Usina Santa Elisa best illustrates this active role producers had in shaping the government's response to the economic crisis in 1975. Biagi Filho's aggressive negotiation for increased alcohol production under Funproçucar solidified the Usina and the Biagi family as important leaders in alcohol policy and production. This position encouraged the Biagis to fund their own alcohol expansion during Proçucar and placed the Usina Santa Elisa in the front of the line for Proálcool funding in 1976.

Conclusion

By 1975, the government had already tied its agricultural development and modernization interests to the sugarcane industry, as illustrated first through an increased focus on sugar exports in the 1960s and followed by extensive government investment in the early 1970s under Proçucar. The modernization programs facilitated the expansion of the sugar industry largely at

dictatorship's failing macro-political strategy were losing private capital, representatives of the national bourgeoisie that had been so critical to the military's political legitimacy throughout the dictatorship. Barzelay, *Politicized Market*, 149.

¹³³ Demetrius, Brazil's National Alcohol Program, 10–11.

¹³⁴ Santos, "Alcohol as Fuel," 321–322n44. Santos claims that it became a sugar bailout in 1977 when President Geisel ordered the purchase of 15 million sacks of excess sugar for alcohol conversion given the dire state of the international sugar prices over the previous three years.

the cost of the federal government through the IAA and the Bank of Brazil. The modernized usinas that received Funproçucar-financing would become the first Proálcool projects, requiring less risky investments than large-scale investment to new producers. Under Funproçúcar, the Biagis became independent leaders in alcohol production in the region. The Usina Santa Elisa and the broader Biagi holdings were particularly positioned to win this extended financing once alcohol production became an explicit focus of the government as they had already shaped the government's agenda through their own actions in the 1970s.

Proálcool, created in 1975, increased the importance of the sugarcane industry for the country broadly but for the military government's own economic development model, specifically. Funproçucar, its precursor, was the height of the military's intense federal investment and financial assistance directed toward the sugar industry in the early 1970s. Funproçúcar would continue to finance and aid other sugarcane and ethanol producers even as Proálcool expanded in the 1970s and 1980s. However, the Usina Santa Elisa's alcohol expansion would grow under Proálcool in 1976.

Chapter 4: Proálcool at Work: The Usina Santa Elisa, 1975-1984

"Alcohol is ours." Maurilio Biagi Filho Folha de São Paulo, May 9th, 1983¹

By mid-1975, President Geisel and his administration were making definitive moves toward developing an alcohol expansion program. Modernization efforts centered on the sugar industry of the early 1970s maximized an increasingly profitable international sugar market. In 1974, sugar was the top earning Brazilian export for the first time in over a century.² Yet, the prices quickly declined in late 1974. At the same time, the government faced the effects of an ongoing oil crisis, which began in 1973 and exacerbated bigger problems with declining economic growth after the effects of the "Economic Miracle" faded. Finally, individual usineiros, like the Biagi family of Ribeirão Preto, and larger interest groups, like Copersucar, also aggressively promoted and lobbied government officials and policymakers on alcohol production's importance to national security. These issues created the necessary incentives for a large-scale government response that incited nationalist sentiments similar to Biagi's comment above.

¹ In a nod to the famous Brazilian motto for the nationalization of the petroleum industry in the 1950s, Maurilio Biagi Filho penned an article on the nationalist implications of Proálcool, so entitled, on May 9th 1983. Maurilio Biagi Filho, "O álcool é nosso," *A Folha de São Paulo* (May 9th, 1983).

² Coffee held the top spot since the 1840s. Barbara Nunberg notes, "By 1972, sugar earned U.S. \$403.5 million for a volume of 2,640,000 tons, making it the second most important export next to coffee. [...] [In 1974,] the revenues earned by Brazilian exports were U.S. \$1.26 billion, an increase of 127 percent over the previous year." See Barbara Nunberg, State Intervention in the Sugar Sector in Brazil: A Study of the Institute of Sugar and Alcohol," Stanford University, Doctoral Dissertation, 1979: 135. Fernando Homem de Mello cites exports valuation to be USD\$1.322 billion in 1974. Fernando Homem de Mello, *Proálcool, energia e transportes* (São Paulo: Enio Matheus Guazzelli & Cia. Ltda., 1981), 17.

On November 11th, 1975, President Ernest Geisel instituted the National Alcohol Program (Programa Nacional do Alcool, PNA, or Proálcool) with Decree n. 76.593. The new alcohol program would attend to "the necessities of the internal and external market and to the policy of automotive gasoline."³ The program was one of several alternative fuel efforts the government pursued to diminish dependence on the unstable petroleum market, on which Brazil depended for over 80% of its oil consumption by 1975. Proálcool became a big part of the government's national development agenda under the final two military presidents during major energy crises in the 1970s and early 1980s.⁴

Traditional analyzes of the Proálcool have focused on the government's response to the oil shocks and sugar interests through a national lens. For example, Maria Helena Castro Santos' classic study unveils the important factors that led to the program's development and its impact from a national policy perspective. Conversely, Michael Barzelay and F. Joseph Demetrius study the political and technological impact of the program. More recently, Márcia Azanha Ferraz Dias de Moraes addresses Proálcool's regulatory structure and the deregulation of the sugar and alcohol industry thereafter.⁵

My case study brings into focus for the first time how individual producers responded to government incentives in order to provide detailed examples of the local impact the program had on specific producers and also the impact that these producers had on the development of the program. This chapter makes an intervention into this body of literature by giving a detailed

³ *Diario Oficial*, November 14th, 1975. Decree n. 76.593 of November 14th, 1975. Other alternative energy sources pursued included nuclear and hydroelectric energy, among others. ⁴ Homem de Mello, *Proálcool, energia e transportes*, 1; Baer, *The Brazilian Economy*, 77 and 87.

⁵ Santos, "Alcohol as Fuel"; Barzelay, *Politicized Market*; Demetrius, *Brazil's National Alcohol Program*; Maria Helena de Castro Santos, *Política e políticas de uma energia alternativa: o caso do Proálcool* (Rio de Janeiro: Notrya, 1993); Dias de Moraes, *A desregulamentação*; Dias de Moraes and Zilberman, *Production of Ethanol from Sugarcane in Brazil.*

account of Proálcool's implementation at the Usina Santa Elisa, owned by the prominent sugar and alcohol producing family, the Biagis. The Usina Santa Elisa was the first usina to receive approved financing from the Proálcool project to expand its distillery capacity and production. As such, it illuminates the way the program's implementation in a specific rather than national context. Led by the Biagis multiple sugar and alcohol industrial holdings, Proálcool dramatically promoted Ribeirão Preto into the forefront of national sugar and alcohol production.

Large-scale producers played an important role in shaping the at times rocky implementation of Proálcool. Domestic producers like the Biagis were important promoters of alcohol production expansion before the program, but they were equally important and vocal actors in the promotion of ethanol fuel consumption under the national program.

As such, this case study of the Usina Santa Elisa addresses the unique form of development that Proálcool followed. National sugar-alcohol and equipment producers paved a different development path than that followed in more traditional development models of this period. Barzelay asserts that Proálcool is the quintessential example of Peter Evans' triple alliance. However, I argue that Proálcool deviated from the traditional tri-pé model by maintaining domestic producers' control of production, without the entry of foreign producers even if foreign capital did pervade equipment production. It also deviates from Eakins' quadruple alliance by promoting a distinctly domestic technology- the alcohol-fueled engine. Producers and politicians sought to protect domestic interests more aggressively and successfully in the program's implementation partially because of the pervasive nature of the tri-pé model by the 1980s.⁶

⁶ My interpretation of the Proálcool falls more in line with that expounded by F. Joseph Demetrius. Unlike his contemporary, Michael Barzelay, Demetrius argues, "In the case of Proálcool, it is clear that the policies pursued by Brazilian technocrats represent a conscious and

Thus, this case is a valuable counterpoint to traditional development studies in Brazilian history. It is not the nationalist intentions of the program that subvert traditional analyses of Brazilian development of the era, but rather the way in which domestic sugar and alcohol producers remained central to the program's implementation that is unique. Thus, this chapter reinserts the importance of Proálcool as a definitively alternative Brazilian development model, not only because of its fuel source but also because of its application.

The Creation of Proálcool-International Pressures and the Political Response

The oil shock of 1973 initiated early expansion in alcohol production. Thanks to new OPEC policies, international oil prices quadrupled between November 1973 and January 1974.⁷ The impact of the shocks cannot be overstated. The country relied on petroleum imports for over 80% of its oil consumption, thus more than doubling Brazil's total import bill between 1973 and 1974 (\$6.2 billion USD to \$12.6 billion USD in 1974).⁸ Given the high growth rates that had established the "Brazilian Miracle" and the military governemnt's commitment to development with economic growth, the oil shocks presented a serious threat to policy outlooks at the end of 1973 and beginning of 1974.

The shocks encouraged quick, incremental changes to the alcohol policy. The Minister of Industry and Commerce Marcus Vinícius Pratini de Moraes first called for more alcohol in the gasoline mixture in December 1973, supporting increased alcohol production in response to the

consistent effort to fortify national groups while excluding international capital." Demetrius, *Brazil's National Alcohol Program*, 100; Barzelay, *Politicized Market*, 195. I would also argue that Marcia Azanha Ferraz Dias de Moraes' work on the deregulation of the sugar industry in the late 1980s and 1990s reiterates this point by following the unique deregulation of the industry in the 1980s and 1990s. Dias de Moraes, *A desregulamentação*, 15–18.

⁷ Baer, *The Brazilian Economy*, 87.

⁸ Werner Baer, *The Brazilian Economy: Growth and Development* 6th ed. (Boulder: Lynne Rienner, 2008), 79.

initial price hikes. Thereafter, Brazilian officials began to expand alcohol policy to stave off the dependence on foreign energy and to help the newly endangered balance of payments recover.⁹

The most interested and important actor in the propagation of the National Alcohol Program was President Ernesto Geisel himself. The idea of investing in a large-scale alcohol as fuel initiative intrigued the former Petrobrás President. In a speech in September 1974, President Geisel acknowledged the multiple challenges facing the economy in the formation of his national development plan (II PND). These included:

"the international monetary system, the energy and essential raw materials, the epidemic inflation, the foreign trade which deteriorates the balance of payments, the crisis of confidence in future stability which foments social unrest and eruptions of irrational and destructive violence."¹⁰

As his statement reiterates, in the eyes of politicians, one could not disaggregate the energy crisis and the government's response from the compounding economic issues that faced the economy. Furthermore, the new national development plan was the new president's opportunity to assertively respond to the oil shocks.¹¹ The interest in alternative energy sources was a function of all of these factors together. President Geisel vowed to expand "new sources of energy" with a "realistic policy of import substitution, favored by the availability of resources and by the new levels of international prices which offer us concrete perspectives of competitive advantage even

⁹ "Pratini vê maior uso de álcool na gasolina," *Jornal do Brasil* (December 11th, 1973), 20; see also, "MIC estimula produção de álcool combustível," *Gazeta Mercantil* (December 11th, 1973). In fact, the Minister approved an increase in the planting of cane beginning in January 1974 in order to support this objective. In Santos' study of Proálcool, she identifies this as the moment that the National Alcohol Program truly began. Santos, "Alcohol as Fuel," 232. As illustrated in Table 15 in the Appendix of this dissertation, the country's balance of payment was a positive US\$2178.6 million in 1973 and negative 936.3 million in 1974 in large part due to the ballooning oil bill.

¹⁰ President Ernesto Geisel statement at the Meeting of Ministers on September 10th, 1974 in Federative Republic of Brazil, *Second National Development Plan- II PND (1975–1979)* (Brasília, 1974), 3.

¹¹ Baer, *The Brazilian Economy* 6th ed., 79.

in foreign markets."¹² These new sources of energy included a the expansion in alcohol production

The Second National Development Plan illustrates Geisel's commitment to alternative energy development even before an expanded alcohol program to drive a larger consumption of alcohol-gasoline mixture on the national level was a possibility. For example, II PND focuses first and foremost on the oil shortage and the need for a new energy policy to address the global oil crisis. He notes that,

"every effort will be made to reduce the consumption of oil to a minimum, particularly in transport: a pricing policy for gasoline without any subsidy (the increase in the price this year- 1974- has already been over 100 per cent), creation of systems of mass public transport, the electrification of railways, the addition of alcohol to gasoline and the elimination of waste "13

In fact, beyond this recognition, President Geisel made very little mention of alcohol production in relation to a growing energy policy and instead gave hydroelectricity and nuclear energy far more attention.¹⁴ While the addition of alcohol to gasoline was one tool to address the oil price increase, it was far from the only one.

In his assessment of the massive investment programs initiated by Geisel under IIPND, economic historian Werner Baer notes that these programs' investments were largely "undertaken by state enterprises (in energy, steel), whereas others (especially capital goods) were carried out by the private sector, with massive financial support by the National Bank of Economic Development (BNDE)."¹⁵ While state enterprises formed in the steel industry, to compliment the iron ore and oil industries already in place, the initial modernization programs under the IAA, Funprocucar, which emerged in its most formal state in 1973, did not mirror such

¹² President Ernesto Geisel statement at the Meeting of Ministers on September 10th, 1974 in II PND, 3–4.

¹³ II PND, 17.

¹⁴ II PND, 81–83; see also Santos, "Alcohol as Fuel," 218–221.
¹⁵ Baer, *The Brazilian Economy* 6th ed., 79–80.

financial support avenues in its creation. Rather, the IAA financed the intensified modernization programs in the midst of the first oil shocks with the Special Export Fund, which booming exports financed. A national program focused on alcohol production still was not a formal idea for consideration during the formation of II PND.

Still, sugar remained a major part of the President's development agenda. The sugar industry received substantial support from the government through the IAA. II PND states that the Geisel administration would promote the "expansion of agro-industry (particularly sugar and other tropical products), taking into account its role as a center or the diffusion of new technologies in agricultural production."¹⁶ Sugar and alcohol led the field in this development. Under Planalsucar, founded in 1971, the industry produced new cane varieties while industrial sugar complexes increasingly incorporated new mechanical equipment. It is in this way that Geisel's administration implicitly committed to expanding alcohol as a fuel for future alcohol-fueled cars.

Beyond initial policy mandates to support the expansion of alcohol production in the MIC, Geisel was also particularly interested in the technological aspect of an expanded alcohol presence in the fuel supply. On June 28th, 1975, President Geisel visited the Technical Aerospace Center (Centro Técnico Aeroespacial- CTA) to learn more about the research that the government-financed center had developed on internal combustion engines propelled by alcohol.¹⁷ Located in São José dos Campos in the interior of the state of São Paulo, the renowned

¹⁶ II PND, 44.

¹⁷ "CTA revela a Geisel pesquisa sobre álcool," *O Estado de São Paulo* (June 18th, 1975), 14.

government research center had been involved in research on domestic-developed alcohol-fueled engines since the arrival of the influential engineer, Urbano Ernesto Stumpf in 1972.¹⁸

The Rio Grande do Sul native, Stumpf, first worked as a mechanic in the Brazilian Air Force. He was a student of the first class at the Aeronautical Technology Institute in 1950. There, he continued his post-graduate studies in Motors and Reaction, Turbomachines, Turbines and Vapor, and Motor and Combustion Foundations. He served as a professor thereafter. He published early results on his research on alcohol-driven motors in 1952 in various journals and magazines, including the Institute of Sugar and Alcohol's *Brasil Açucareiro* and at the Aeronautical Technology Institute amongst others.¹⁹ He would leave the Aeronatuical Institute to teach at the University of São Paulo-São Carlos and the University of Brasília before returning to the CTA to direct research on the adoption of ethanol as a combustible source. As a director at the CTA, he was a regular spokesman for the alcohol program and the alcohol-fueled engine's technology amongst sugar and alcohol interest groups.²⁰

Stumpf led the visit with President Geisel at the CTA to great success in mid-1975. According to a report in the daily newspaper, *Estado de São Paulo*, Geisel worried about the use of sugar as the base input in the renewable source because of the higher price that sugar still earned as an export on the international market.²¹ Stumpf and his team of engineers responded

¹⁸ The CTA was affiliated with the Aeronautical Technology Institute, which is an aviation engineering school created in 1946 by a group of aviation military officials and civilian professors led by Coronel and engineer Casimiro Montenegro Filho.

¹⁹ Ozires Silva and Decio Fischetti, *Etanol: A revolução verde e amarela* (Bizz Communicação e Produções: São Paulo, 2008), 47–51. For a broader biography of Stumpf's published works and influence on later engineers that worked in the field, see Idem, Chapter 4.

²⁰ Ibid. For example, Urbano E. Stumpf, "Álcool carburante em mistura de combustível," *Açúcar e álcool: o grande projeto para a economia do Brasil*, proceedings of III Encontro Nacional dos Produtores de Açúcar, Campos, 1975 (Rio de Janeiro, APEC, 1976), 155–170.
²¹ "CTA revela a Geisel pesquisa sobre álcool," *O Estado de São Paulo* (June 18th, 1975), 14; Silva and Fischetti, *Etanol*, 75.

that other bases were just as viable, including manioc. One account of the event indicates that the President remained at the center hours longer than initially planned for the ceremonial visit and was particularly taken with the technological work behind the development of the engine to run on alcohol.²²



Figure 4: Federal, State, and Private Interests Align²³

Source: Matthew V. Veazey, "Brazil's 'Father of Ethanol' Sees Bounty for Biofuel," (February 8th, 2012).

<http://www.downstreamtoday.com/News/ArticlePrint.aspx?aid=35449&AspxAutoDetectCooki eSupport=1>.

São Paulo's public and private interests held important sway in Geisel's thoughts on the

formation of an alcohol expansion initiative. Within the government, important paulista officials

²² Allen L. Hammond, "Alcohol: A Brazilian Answer to the Energy Crisis," *Science* (11 February 1977): 564, as cited in Barzelay, *Politicized Market Economy*, 139.

²³ Pictured above are (from left to right): Governor Egydio Martins, President Ernesto Geisel, and Anfavea (Associação Nacional dos Fabricantes de Veículos Automorores- Car Producers'Association) President Mário Garnero (driving). While some credit Mário Garnero as the "godfather of ethanol," this duo (Martins and Geisel) was critical to facilitating Proálcool along with the car industry leader, Mário Garnero, whose role would expand in the program in the late 1970s.

had the President's ear. For example, another important attendee to this private visit was the current governor of São Paulo, Paulo Egydio Martins.²⁴ Martins had previously served as the Minister of Industry and Commerce (MIC) under the first military president, Castelo Branco, from 1966 to 1967. During his tenure as minister, sugar and alcohol policy went through an intense crisis. It was in this time that Copersucar president, Jorge Wolney Atalla, became an increasingly vocal alcohol promoter. President Geisel nominated Martins for the São Paulo governorship in 1974 (pictured in Figure 4 above).²⁵ Martins' close ties to President Geisel and his position as governor of the most economically powerful state in Brazil likely gave paulista sugar and alcohol interests another important advocate for a national alcohol program.

One illustration of the important paulista influence in the new program's formation would be the very selection of sugarcane as the material base for expanded alcohol production. Stumpf and his engineers highlighted that sugarcane was but one possible raw material source for the alcohol-fueled engine. In fact, many studies indicated that manioc would be a better source, given sugar's importance as an export.²⁶ However, sugarcane would win the vast majority of the attention, with officials quickly dismissing most other sources. Certainly the paulista sugar interests, like the heavily campaigning Copersucar, would have been of particular import to Martins and other paulista government officials. Policymakers ultimately favored sugarcane

²⁴ Other attendees included Minister of Aviation Araripe Macedo and General Hugo Abreu, Chief of the Military Cabinet, and General Antonio Jorge Correa, Chief of the Armed Forces.
"CTA revela a Geisel pesquisa sobre álcool," *O Estado de São Paulo* (June 18th, 1975), 14.
²⁵ Szmerscányi, *O planejamento*, 277; Skidmore, *The Politics of Military Rule*, 171.

²⁶ The implications of this decision were far greater than just paulista interests. The decision connects to larger debates on the use of an agricultural source as food versus fuel. Economically, the use of an agricultural source as fuel put pressure on consumers to pay the costs of the program with the increased cost of food while the use of sugar reduced export earnings and export taxes. These issues remain critical in the American corn-based ethanol program. Food concerns seem to have been less central issues in the selection of cane over manioc in the Brazilian case but rather infrastructure and upfront costs seem to have dominated public debate.

because of the well-developed infrastructure already established within the national sugar industry, first built under the IAA in the 1930s, and the advanced technology available from Brazilian sugar equipment producers, like the Ribeirão Preto-based equipment company, Zanini S/A Equipamentos Pesados, discussed in the previous two chapters.

Despite a national alcohol program seeming far-fetched at the construction of IIPND in November 1974, it quickly became a certainty less than a year later. President Geisel announced the impending program on October 9th, 1975, committing the country to a 20% mandated alcohol in the alcohol-gasoline mixture along with a series of other measures to address the rising oil prices and its effect on the current balance of payments.²⁷ After President Geisel's announcement, politicians and interest groups continued to debate the structure and control of the program over the next month. According to Castro Santos, the IAA, MIC, Ministry of Mines and Energy, and Petrobrás all disputed over control of the expanding alcohol program.²⁸ Proposed drafts of the program emerged from both Minister of Industry and Commerce (MIC) Severo Fagundes Gomes and the influential Minister of Mines and Energy (MME) Shigeaki Ueki, vying for greater influence in the program, while the IAA President Tavares do Carmo proposed an opposing program draft.

²⁷ Santos, "Alcohol as Fuel," 244–249; "Geisel autoriza contratos de risco, aumenta barreiras para importações, a passa gasolina comum a Cr\$3,19,"*Jornal do Brasil* Vol. 85, n. 185, (Rio de Janeiro, October 10th, 1975), 1. These other measures included the authorization of expanded domestic oil exploration, a 25% increase in the price of gasoline and a 10% increase in diesel oil prices. The Petrobrás agreement authorized the state company to employ risk contracts with foreign companies to expand domestic petroleum exploration, inciting questions about the continued status of the industry's state monopoly on petroleum in the country. See "Geisel a Adalberto: Estou vivendo numa roda-viva," and "Um discurso histórico de 44 minutos," in *Jornal do Brasil* Vol. 85, n. 185, (Rio de Janeiro, October 10th, 1975), 12–13.

²⁸ Santos closely documents each ministry's diverging and converging interests in her own assessment of the fragmented political decision-making process involved in the implementation and application of Proálcool. For Santos, she argues that this fragmented structure worked for the program and that it was a success, while others, like Barzelay, argue this fragmented structure hindered the program' development.

Even if the program was guaranteed to happen, its administrative and financial structure, leadership, and purpose were still under great debate, as these diverging government officials illustrated. Gomes led the Ministry of Industry and Commerce (MIC) during the pivotal initial phase of Proálcool from 1974 to 1977. The paulista businessman first served as the Minister of Agriculture during Castello Branco's administration and "earned the reputation of an economic nationalist" during his service.²⁹ Scientist and politician José Walter Bautista Vidal claims that national technology development reached its zenith during the Gomes' term at the MIC.³⁰ During his tenure, the MIC supervised the development of the alcohol-fueled engine with the STI, the CTA under the Aeronautics Ministry, and the auto industry (discussed below). Gomes reasserted the importance of alcohol as a "high priority" project that would ensure that Brazil be "an independent nation."³¹ Under Gomes, the Ministry of Industry and Commerce vied for control of Proálcool. For the most part, the MIC won, beating out other interested parties like Petrobrás and the Ministry of Energy and Mines.

Ueki was an opposing force in the program's expansion. Trained as a lawyer, the São Paulo native Ueki first entered government administration as an advisor to Egydio Martins during the latter's tenure as Minister of Industry of Commerce and Industry in Castello Branco's administration. There, he formed close ties with General Geisel while he served as Chief of the Military Presidential Staff to President Branco. This connection drew Geisel to appoint Ueki to become Commercial and Financial Director under his own presidency at Petrobrás in 1969.

²⁹ Skidmore, *The Politics of Military Rule*, 162.

³⁰ J.W. (José Walter) Bautista Vidal, *O esfacelamento da nação* (Petrópolis: Editora Vozes Ltda, 1994), 50.

³¹ "Para Severo, prioridades são álcool e metalurgia," (October 12th, 1976), 43. Vidal reiterates this point in his book, *Poder dos Tropicos*, as well. Gilberto Felisberto Vasconcellos and J.W. Bautista Vidal, *Poder dos Tropicos: meditação sobre a alienação energetica na cultura brasileira* (São Paulo: Casa Amarela, 1998), 32.

When Geisel accepted the presidency in 1974, he invited Ueki to be Minister of Mines and Energy.³²

As Minister of Mines and Energy, Ueki used his experience in petrochemicals at Petrobrás to promote the use of alcohol as a petrochemical replacement during Proálcool's implementation. At Petrobrás, Ueki had pushed to replace the common gasoline additive, lead, with alcohol.³³ He then pushed the same policy as MME Minister, particularly with the expansion of Proálcool. However, this position became increasingly controversial given other politicians' interests in using alcohol as a gasoline substitute or even replacement rather than a petrochemical replacement, particularly those in the IAA.³⁴

Accordingly, IAA President Carmo's interests diverged from the MIC and MME leaders because of the implications the expansion of alcohol would have on sugar production. As sugarcane exports remained the IAA's primary concern, President Carmo proposed that the government invest in standalone, or autonomous, distilleries in areas away from the most dominant sugar-producing regions so as not to interfere with the existing sugar agro-industrial complexes. These autonomous distilleries would convert cane to alcohol directly rather than the

³² Silva and Fischetti, *Etanol*, 67–70.

³³ Ibid. In fact, this was a common additive used to diminish corrosion and boost combustion energy not only in all car fuel at this time. The US, too, began replacing lead in its car fuel with its own ethanol program in the 1970s. However, the US ended up using MTBE (methyl tertiary buthyl ether) as its primary booster replacement. American ethanol would only replace MTBE in 2005. Marcos Jank, "Perspectives for Hemispheric Cooperation in Agro-energy," Seminar "Energy Cooperation in the Americas" presented December 11, 2006 in Rio de Janeiro, Brazil to the CSIS-CEBRI). See also, the US Environmental Protection Agency, "Methyl Tertiary Buthyl Ether (MTBE)," Web Archive, Last updated on November 15, 2014, accessed on April 7th, 2015, http://www.epa.gov/mtbe/gas.htm.

³⁴ Ueki remained a staunch advocate for the smaller version of Proálcool that embodied the first phase of the program rather than the massive expansion demanded of the second phase. For examples, see "Ueki e Calmon: d ois destinos para o álcool," *Diário Comércio e Indústria* (December 14th, 1978) and "Ueki nega ter mudado prioridade para álcool," *Estado de São Paulo* (December 14th, 1978), as cited in Barzelay, *Politicized Market*, 178.

intermediary process used on the current sugar-alcohol complexes, in which producers processed sugarcane into molasses and then reprocessed this derivative into alcohol.³⁵

In fact, the ongoing dispute between these factions took on a very public nature thanks in part to the assertive role of private business interests in the debate.³⁶ After a draft of the forthcoming decree leaked to the press on October 31st, Atalla used Copersucar to remain a vocal and aggressive lobbyist for the private sector in the formation of the alcohol initiative. He objected to the IAA's proposal to disaggregate alcohol distilleries from the existing sugaralcohol complexes as their connection favored the already concentrated number of sugar producers in the São Paulo, many of whom already had alcohol distillation capacity. He voiced his criticisms of government action by placing Proálcool in the center of a growing debate on the presence of the state in Brazilian development. Atalla argued that it was "incomprehensible psychology" to tell the sugar-alcohol agro-industry "go to the battle, but you will win none of the spoils for yourselves" in the national emergency of the energy crisis.³⁷

Atalla's comments highlight the important role of the state in alcohol's development. As Triner highlights in her study of the Brazilian mining industry, state intervention accounts for public goods that our outside the producers' individual interests. The Brazilian alcohol industry followed similar difficulties presented in the mining industries state intervention. As Triner states, "Conflict over the public provision of a good or service is often fraught with political competititon. Strong interest groups identify externalities that they have no incentive to provide, or cannot capture, and they attempt to influence the state to provide for the collective

³⁵ Santos, "Alcohol as Fuel," 259.

³⁶ Szmerscányi, *O planejamento*, 314-315; Santos, "Alcohol as Fuel," 277. "Disputa atrasa a divulgação do texto do álcool" *Folha de São Paulo* (November 13th, 1975) as cited in Santos, "Alcohol as Fuel," 277.

³⁷ Jorge Wolney Atalla, "O perigo da estatização da comercialização do álcool" *O Estado de São Paulo* (November 6th, 1975), 5.

creation."³⁸ Certainly, Proálcool's formation involved this public conflict, but Atalla's response was not to push a state-owned industry, as emerged in the iron ore and steel industries, but rather to encourage more state support of private businessmen.

Atalla, as a representative of the powerful sugar interest group, Copersucar, pushed government intervention to support increased alcohol production without the creation of a stateowned enterprise. He claimed that government monopolization of alcohol production would be a "confiscation against business, businessmen, and agricultural workers- genuinely national- to which the country owes a substantial part of its incredible export figures." By structuring his argument around the need to support private-public collaboration to reward national businesses, Atalla was able to influence the way government officials shaped Proálcool.³⁹

Individual producers also privately pushed policymakers to expand sugarcane alcohol in fuel as well. As discussed below, the Biagis would be important promoters of the program. Barzelay notes that equipment producers, including the Biagi-led Zanini, supported Atalla's position on the dangers of nationalization of the program for their own benefit. Given that the Usina Santa Elisa had broken ties with Copersucar, and thus Atalla, in 1973, their own lobbying of the government took different forms. The Biagi's relied on Coronel Senna's close ties to the military government to lobby for their interests.⁴⁰ Although it is unclear how common this was, it was certainly effective for the Biagis.

³⁸ Triner, *Mining and the State*, 5.

³⁹ Ibid. See also, Atalla, "Considerações economicas da COPERSUCAR sobre o Plano Nacional do Álcool" *O Estado de São Paulo* (November 6th, 1975), 11. Copersucar took out add space to publish these articles in all major newspapers. Szmrescányi, *O planejamento*, 315. Broader debate about the "statization" of the national economy emerged in this era as government-led companies, like telephones, water, and other services, dominated economic development of the era. Barzelay, *Politicized Market*, 92–93; Szmerscányi, *O planejamento*, 314.

⁴⁰ See chapter 3 of this dissertation, 131–132. See also, Barzelay, *Politicized Market*, 195n70.

President Geisel ultimately instituted the National Alcohol Program (Programa Nacional do Alcool, PNA, or Proálcool) with decree n. 76.593 on November 14th, 1975. The program was not exclusive to alcohol from sugarcane, rather it included manioc and "whatever other ingredient will be an incentive through the offer of the expansion of primary resource materials," as specified in article 1. However, the program focused on the expansion of sugarcane. Much like its predecessor, Proçucar, Proálcool provided "special emphasis on the increase of agricultural productivity, on modernization and amplification of existing distilleries and of the installation of new production units, connected to usinas or autonomous, and on storage units."⁴¹

An Exposition of Motives *(Exposição de Motivos)* attached to the decree explicitly enumerated the program's goals. It states that the program would: economize foreign currency through the substitution of imports for combustibles and primary materials derived from petroleum; reduce regional and individual income disparities; increase internal income through the expansion of domestic jobs; and expand the production of capital goods through "highly nationalized" equipment contracts, going toward the expansion, modernization, and implantation of distilleries.⁴²

To support these ends, Proálcool would finance industrial and agricultural investments. Unlike other investment programs developed under IIPND that received support as a formal state enterprise or through BNDE, financing for Proálcool came from the Central Bank. These funds were allocated through a series of different government-related banks although the Bank of

⁴¹ Ibid, article 1 and 2. Manioc-based alcohol production never received the same focus that sugarcane did. However, it did continue at low levels throughout the program.

⁴² "Meta: equilibrar o balanço," *Estado de São Paulo* (November 15th, 1975), 30; Tamás Szmrecsányi, *O planejamento*, 436–437.

Brazil was the primary bank.⁴³ Proálcool offered financing at interest rates of 17% over a 12-year period with a three-year grace period for industrial equipment. This included the physical implantation of distilleries and the necessary equipment involved in the establishment of the distillery.⁴⁴ For agricultural equipment, interest rates were 7% with a maximum time frame of five years to repay and a two-year grace period.⁴⁵ The reader should recall that Funproçucar, the previous modernization program financed by the IAA, offered producers' financing with an interest rate of 12% in São Paulo (and the rest of the Center-south) and 10% in the North/Northeast. National nominal interest rates averaged above 40% through the end of the 1970s and exponentially rose in the 1980s.⁴⁶ These comparative numbers reiterate the favorable conditions offered to producers through Proálcool. This huge transfer of public finance to private

⁴³ Commissão Executivo Nacional do Alcool (CENAL), *Proálcool: Informações Basicas para Empresarios* (Rio de Janeiro: BNDE, 1980), 21. This is an important distinction with other stateled programs. Private businessmen had to secure banking support from a number of different institutions as described by the Commissão Executivo Nacional do Álcool (CENAL) in 1980. These institutions were divided between industrial credit and agricultural credit. All agricultural credit ame through banks related to the Sistema Nacional de Crédito Rural, which included the Bank of Brazil. Industrial credit financiers included the following institutions (in the order listed): Banco Nacional do Desenvolvimento Economico- BNDE, Banco do Brasil, Banco da Amazonia, Banco do Nordeste do Brasil, Banco Nacional de Crédito Cooperativo, state and regional development banks, and official state banks where there are no state development banks. Despite the long-list of possible bank financiers, the vast majority of successful projects were tied to the Bank of Brazil. Few of the applications reviewed noted BNDE or state banks as primary financiers, but this may have been unique to cases in São Paulo and is subject to further review.

⁴⁴ CENAL, *Proálcool*, 17–19. Until 1977, Proálcool financed 100% of total industrial investments. After this, that percentage diminished to 70% for annexed distilleries, or those connected to sugar production complexes, and 80% for independent, stand-alone distilleries. Confúcio Pamplona, *Proálcool: Technical-Economic and Social Impact of the Program in Brazil* (Belo Horizonte: Ministry of Industry and Commerce/The Sugar and Alcohol Institute, 1984), 20.

⁴⁵ "Meta: equilibrar o balanço," *Estado de São Paulo* (November 15th, 1975), 30.

⁴⁶ Baer, *The Brazilian Economy*, Statistical Appendix, Table A5. By 1984, nominal interest rates averaged 242.8% with a national inflation rate of 224%.

firms incentivized producers to invest in the alcohol industry, accounting for the market externalities that had discouraged producers to enter the market previously.

President Geisel created an interministerial commission, the National Alcohol Commission (Commissão Nacional de Álcool- CNAI) to administer the program.⁴⁷ Representatives from the Ministry of the Interior, Agriculture, Mines and Energy, Industry and Commerce, the Interior, and the Secretariat of Planning made up the new entity, over which the General Secretary of the Ministry of Industry and Commerce Paulo Vieira Belotti presided. Its responsibilities included defining the role of each government sector involved from the IAA to Petrobrás.

The Commission allocated control of the alcohol policy largely to the National Petroleum Council (CNP). It received the power to set prices and quotas for alcohol production through its control over the quotas of alcohol-gasoline mixture for distribution companies. Additionally, the CNP received control of the amount of alcohol directed to chemical industries to substitute for petroleum-based production.⁴⁸ In the process, the Commission further stripped the IAA of its primary control over sugar and alcohol policy, whose new role centered on the processing of applications submitted to the IAA for economic and agricultural review. Projects would remain private endeavors, which Proálcool would help finance, thus quieting growing complaints amongst private businessmen of excessive nationalization efforts by the state. However, the state became the exclusive purchaser of alcohol. Petrobrás would continue to vie for more control of the program although it largely controlled the distribution of alcohol.

⁴⁷ The Economic Development Council included high-level ministers over which the President of the Republic presided. Santos notes that this is another way in which President Geisel repeatedly intervened with executive authority to ensure Proálcool successfully got off the ground. Santos, "Alcohol as Fuel," 520.

⁴⁸ "O plano, afinal", *Veja* 376 (November 19th, 1975), 120–121. See also, "Sai, enfim, o programa do álcool," *O Estado de São Paulo* (November 15th, 1975), 30.

In its initial phase, from 1975 to 1979, the government set the conservative goal to produce 3 billion liters of alcohol by 1980.⁴⁹ The requisite distillery capacity to meet this goal was well within reach given the extensive idle capacity available in paulista distilleries alone. However, the actual agricultural capacity to produce enough sugarcane to meet alcohol's demand remained the greater question. Specialists and government officials, including the IAA President Tavares Carmo, expressed doubt regarding the necessary cane expansion needed to successfully meet the program's objectives upon its formation.⁵⁰

Ultimately, Ribeirão Preto was an ideal region for project expansion. Already a major sugar-producing region, the presence of the second largest domestic equipment industry in the country, Zanini, alongside the concentration of 14 other usinas in the region was advantageous. Its relative proximity to São Paulo and other large paulista markets were even more important. As São Paulo consumed the vast majority of Brazilian fuel, markets near the major center were preferable. Despite the program's alleged interest in redistributing regional wealth, the lower transportation costs and established agricultural and industrial capacity in Ribeirão Preto were prime for the program's initial projects. As such, it is unsurprising that the Usina Santa Elisa would receive this accolade. As one of the first projects approved under Proálcool, the case of the Usina Santa Elisa illustrates the development path followed through Proálcool's

⁴⁹ CENAL, *Proálcool*, 5.

⁵⁰ "Sai, enfim, o programa do álcool," *O Estado de São Paulo* (November 15th, 1975), 30. As of 1975, the majority of alcohol in the country was produced from residual sugar production, where a 60 kg sack of sugar produced about 7 liters of alcohol. Carmo noted that, given these numbers, "we have a current production of 800 million liters. Perhaps, with residual alcohol as the source of production, we can never reach the goals of the National Alcohol Program, set around 4 million liters by 1980, which is what is necessary to be added to all gasoline consumed [to meet Geisel's alcohol-gasoline mixture goal] at the proportion of 20%." See also, Szmerscányi, *O planejamento*, 440.

implementation and the way producers, particularly the Biagi family, were able to influence this path in the process.

Phase I and the Usina Santa Elisa: 1975–1979

The first phase of Proálcool explicitly favored existing producers with established alcohol and sugar capacity in the southeast to get it off the ground. The Usina Santa Elisa had expanded its distillery capacity first with Proçucar financing in 1974 and then again with its own financing in 1975. As such, it was already a major sugar and alcohol producer in the well-positioned Ribeirão Preto. Thus, a close examination of the project's execution at the Usina Santa Elisa provides valuable insight into the influence of usineiros on the program and its immediate impact on the region.

The National Alcohol Commission (CNAI) approved its first three projects in December 1975. All three of these projects were for sugarcane-based autonomous distilleries.⁵¹ However, this was an anomaly for the first phase of the program, which focused far more on expanding the production capacity for sugar-based annexed distilleries. Early projects, like the Usina Santa Elisa, focused on annexed distilleries because they were less risky and relied on mills that already had the infrastructure and technology to support them. Of these, the Usina Santa Elisa was the first project, and it was the first completed project.

⁵¹ Szmerscányi, O planejamento, 316.



Figure 5: The Usina Santa Elisa in 1976

Source: Usina Santa Elisa Proálcool Application, CNAl n. SP06/76. IAA collection, A6.16 Box 0443, National Archives, Rio de Janeiro

CNAl was responsible for clarifying the roles of each of the ministries involved in Proálcool's administration and determining project locations, as discussed above, but the Commission also defined the steps for approval and distribution of funds for projects. In Resolution n. 3/76 of January 27th, 1976, the Commission laid out this very process. Usineiros had 180 days, starting on the day of proposal submission to the program, to secure a contract with a financial agency. As was the case with most government financing in agricultural projects, the Bank of Brazil was Proálcool's primary financier.⁵² If usineiros could not find a financier

⁵² The Central Bank and the National Monetary Council split control of the financing. While the National monetary council formulated the financial policy, the Central Bank controlled financial

capable of providing the loan within the next 90 days, CNAl would automatically cancel the project.⁵³

Following the laid out application process, Maurilio Biagi Filho, superintendent director of the Usina Santa Elisa, submitted an application for the expansion of the usina's distillery capacity to the IAA on February 13th, 1976.⁵⁴ As set out in the application, Biagi Filho requested a two-step expansion of the Usina's distillery capacity. First, he requested the addition of another 120,000 liters per day distillery. Together with the Funproçucar-financed 60,000 liters distillery and the additional 120,000 liters per day of the Usina's second distillery, the additional Proálcool distillery expansion would increase the Usina's total alcohol production capacity to 300,000 liters per day under Proálcool.⁵⁵

Biagi Filho also requested financing for the installation of an additional treatment unit for the distilled sugar syrup, which would allow the usina to process vinhasse (*vinhaça*), a hazardous alcohol by-product, into a fertilizer to diminish the run-off water pollution at the Usina. Although no more mention is made of the request in the project's financing, the Biagis were already one of the first usinas to use this by-product as a fertilizer. Whether financed or not, this practice would grow as their production capacity expanded. It became standard in the industry in the 1980s,

implementation. As the Bank of Brazil was the usual financier, the process would go as follows: a financial agent approved the project, then set up a contract with a local Bank of Brazil branch. Thereafter, the Bank of Brazil financed the project to be reimbursed by the Central Bank upon the Central Bank's approval. Thus, the Central Bank really had the final word despite approval from the initial financial institution. Santos, "Alcohol as Fuel," 323–325.

⁵³ CNAl- Act n. 30. Letter to the Director of the Usina Santa Elisa S.A. on April 1st, 1976. IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

⁵⁴ Usina Santa Elisa Proálcool Application, CNAl n. SP06/76. IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

⁵⁵ The second distillery, financed independently by the Biagis, was still under construction at the time of the application and was expected to begin production beginning in the 1976/77 harvest.

diminishing a major pollution issue with the early program. This agro-innovation illustrates the Biagis' leading role in the shaping of Proálcool and the sugar and alcohol industry at large.⁵⁶

Regarding the primary request for the distillery expansion, the Usina Santa Elisa would need a larger sugar quota to use its expanded distillery capacity. Biagi Filho addressed the necessary quota expansion in his Proálcool application. The Usina Santa Elisa first obtained approval for the expansion of its industrial distillery capacity through Funprocuar in 1974 but did not receive an additional sugar production quota expansion.⁵⁷ The Usina Santa Elisa did, however, receive a new quota for the 1977 harvest, which included an additional 900,000 tons of crushed cane. This would be added to the previous sugar production quota of 1,300,000 sacks of sugar (approximately 7,1650 tons) in 1975. Biagi Filho thus proposed that with the new quota, the Usina Santa Elisa could produce 1,500,000 sacks of sugar (9,9208 tons) and 294,500 liters of alcohol per day over a 150-day harvest schedule.⁵⁸ This proposal touched on one of the key fears surrounding the program, that of sugarcane production diminishing at the expense of alcohol expansion. To the contrary, the Usina proposed to expand both.

The Commission approved the Usina Santa Elisa as a pre-project on March 31st, 1976.⁵⁹ CNAl president Belotti notified Biagi Filho of the project's approval on April 1st, following CNAl decree n. 30 of the same date. The IAA approved the expansion of Santa Elisa's distillery from 180,000 liters of alcohol a day, which included the expanded distillery capacity from

⁵⁶ Usina Santa Elisa Proálcool Application, CNAl n. SP06/76. IAA collection, A6.16 Box 0443, National Archives, Rio de Janeiro. Confúcio Pamplona calls this a "widespread practice" in São Paulo by 1984. Pamplona, *Proálcool*, 44.

⁵⁷ Usina Santa Elisa Proálcool Application, CNAl n. SP06/76. IAA collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

⁵⁸ Project Summary in the Usina Santa Elisa Proálcool Application, CNAl n. SP06/76. IAA collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

⁵⁹ CNAl Report n.100/80, Processo CNAl/SP-06/76. IAA collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

Funproçucar's modernization, to 300,000 liters of alcohol a day, as had been requested in the application.⁶⁰ Original funding for the project included an approved initial loan of Cr\$119,075,000 (approximately USD\$11,128,505) plus interest of Cr\$13,440,000 (USD\$1,256,075). Distillery equipment accounted for the vast majority of the loan (Cr\$116,023,000). The usina would put up Cr\$56,586,000 (USD\$5,288,411) of its own resources and generate Cr\$42,250,000 in third party investments.⁶¹

The inflation rate and interest rates connected to these loans are important to assessing the program's real value. According to Werner Baer's study of the Brazilian economy, nominal interest rates were valued at 41.15% in 1976 but their real rate was -3.63%.⁶² Additionally, the average inflation rate was 47% in 1976 and rising.⁶³ On the one hand, the preferential interest rates offered for Proálcool (17% in São Paulo) were incredibly low with real values below zero. In fact, the program's interest rates made the loans a rather substantial money transfer more than

⁶⁰ The application's approval included minor revisions such as the storage tank capacity used on site. Following the review of the application provided by IAA officials over the course of the previous month, the IAA required that the Usina adjust the volume of its tank from the proposed 21.6 million liters to 27 million liters of alcohol to "assure the gradual flow of production at its full capacity." See IAA Industrial Sector Review by Cláudio Hartkopf Lopes on March 11th, 1976; CNAI- Act n. 30. Letter to the Director of the Usina Santa Elisa S.A. on April 1st, 1976. IAA Collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

⁶¹ Letter from the Bank of Brazil to the Commissão Nacional do Alcool (CNAl) of July 14th, 1978. IAA Collection, A6.16 Caixa 443, National Archives, Rio de Janeiro.

⁶² A brief explanation of nominal and real rates is necessary for non-economic readers. Money has a nominal value, meaning its everyday listed value, which changes quite regularly based on inflation, the amount of printed money circulating in the economy by the government, etc. Thus, nominal rates are subjective. This applies to interest rates as well. Real values indicate the value of the currency (or interest rates) in comparison to stable values that take into account the regular fluctuations of nominal currency values. In a country with such a high inflation rate, the nominal value of a currency one month may change dramatically with inflation increases the next month. Therefore, economists prefer to discuss money and interest rates in real terms to account for these discrepancies with relative values.

⁶³ Baer, *The Brazilian Economy*, Statistical Appendix, table A5, 392–393.

a loan.⁶⁴ At the same time, the value of the loans was inferior to the amount needed to actually complete project construction and installation because of the rising inflation. Hence, projects' costs, including the Usina Santa Elisa, often needed increased finances to account for the inflationary realities of the economy. This would be a key complaint among project participants and applicants into the program's second phase when the government agreed to index projects to inflation, making them even more profitable for individual businessmen.

After traversing the approval process, securing financing was difficult. The program was a very divisive topic amongst government ministries, as discussed above. While officials like Minister Ueki were somewhat vocal about the direction of the program, the Bank of Brazil and the Central Monetary Bank of Brazil used delay tactics to express their own worries about the financial burden of the program.⁶⁵

The key topic on which the Bank of Brazil and the Central Bank objected to Proálcool was the burden of financial risk absorbed by financial investors, and thus the Bank of Brazil as the primary lender. The Bank of Brazil had already served as the primary financial investor in the sugar industry's modernization program, Funproçucar. Many of these rather extensive loans remained outstanding at the beginning of Proálcool, including the loan to the Usina Santa Elisa.

After the Usina received approval from the National Alcohol Commission (CNAl) in April, Biagi Filho requested to move the credit line provided by the Bank of Brazil for the

⁶⁴ See J.G. Baccarin, "O papel do estado no Proálcool," *Ciencia Agronomica- Jaboticabal*, 3(2), 1988: 17–18. Baccarin describes the economics of this process in more detail in his 1988 study. However, essentially the rampant inflation characterizing the Brazilian economy in this period made fixed low interest rates incredibly valuable because they were not subject to inflation. A low interest rate matched with a high inflation rate meant that, for example, nominal money in 1970 would actually be equal to that nominal amount plus the adjusted amount accounting for inflation. If interest rates did not account for inflation, the loans were worth more than the low interest payments, ever cheaper in real terms with inflation rising, every year.

⁶⁵ Barzelay, *Politicized Market*, 12.

Funproçucar project to second lender behind a Proálcool loan, which included not only different interest rates within the Bank of Brazil's financing structure but also third party lenders like the Antonio Queiroz Bank.⁶⁶ Such an action would have subordinated the long-term financing provided by the Bank of Brazil at such preferential terms for Funproçucar projects to the Proálcool financier's shorter-term private financing. Most importantly, the new loans required a substantial overall financial commitment on the part of the Bank of Brazil to the program with little guarantee that businesses would be able to repay the loan if the program was unsuccessful. This became a point of contention for the Bank of Brazil and the Central Bank, which delayed the release of funds in response to their conflict of interests throughout much of 1976.⁶⁷

In the case of the Usina Santa Elisa, the IAA went to great lengths to push project financing even as the Bank of Brazil dragged its feet. The IAA overrode the Bank of Brazil's preference to keep the funds separate and subordinate to the original Funproçucar funding by waiving fees accumulated on the original Funproçucar loan in its grace period. IAA President Tavares Carmo sent a letter to the Usina Santa Elisa on July 7th, 1976, indicating:

"Seeing that funding conceded to this Usina, by this Institute, is in the grace period, with the new development in the construction phase, [...] I authorize the Bank of Brazil to suspend the collection of interest due on the 1976 to 1977 harvest, concerning the [Proçucar] funding EII-74/6, as well as to repay the corresponding deductions possibly already made."⁶⁸

Indeed, it even required the Bank of Brazil to return previous interest payments made by the

Usina related to that loan.

⁶⁶ Letter from Maurilio Biagi Filho to IAA President General Alvaro Tavares Carmo of June 28th, 1976. A6.16 Box 443, IAA Collection, *National Archives*: Rio de Janeiro.

⁶⁷ Santos notes, "Usina equipment was mortgaged to the IAA as collateral for credit authorized from the Special Export Fund. However, the Bank of Brazil was unwilling to become a second creditor, claiming that its risk would be far greater than those of the Institute." Santos, "Alcohol as Fuel," 326-327; See also, "Como Conter as dificuldades?" *Veja* 426 (November 3rd, 1976), 74–75; "Plano de alcool um ano depois, poucos resultados," *Visão* (November 22nd, 1976).

⁶⁸ Letter from IAA President Tavares Carmo to the Usina Santa Elisa S/A. GPCt- 205/76, A6.16 Box 443, IAA Collection.

The IAA was not the only entity to force the Bank of Brazil's hand. As a *Veja* report stated in November 1976, a full year after the program's promulgation, government officials sought a "scapegoat (*um bode expiatório*)" to blame the lack of progress made on the program over its first year. Basically, the Economic Development Council placed blame on the Central Bank that finally "approved a credit mechanism for the installation of distilleries, and the Bank of Brazil, which pushed difficulties for the approval of financing."⁶⁹ In response, President Geisel recommended that the Bank ease the loan guarantees (collateral requirements) demanded of interested businessmen.

Project financing clearly separated Proálcool financeable items from non-eligible items. Certain aspects of the project were not financeable. Civil construction, equipment and installation, assembly and transportation, as well as interest during the construction period were all financeable parts of a project. Non-financeables included: imported equipment, expected readjustment costs, and additional start-up capital. The program would account for 80% of a given project's financeable parts while the private businessmen accounted for the other 20% of the project plus non-financeable objects.⁷⁰

In the case of the Usina Santa Elisa, early project financing quickly changed as the Commission, and then the Bank, reassessed the project's costs. In the proposed project, the Usina Santa Elisa had estimated that industrial equipment would cost Cr\$116,023 but separated the cost of civil construction from the project financing. Following the proposed budget of

⁶⁹ "Como conter as dificuldades?" *Veja* 426 (November 3rd, 1976), 75.

⁷⁰ CENAL, *Proálcool*, 15–20.

Cr\$116,023,000, the IAA approved that the Bank finance Cr\$92,818,000 (80% of the initial financeable cost) and the Usina Santa Elisa provided Cr\$23,205,000 (20%) of their own funds.⁷¹

Santa Elisa management contracted many of the same companies to construct the new distillery on the Usina that is had during Funproçucar. For example, the Usina contracted Hélio Fóz Jordão S/A to do building construction as it had under Funproçucar previously. However, the Usina construction's largest contracts went to the Piracicaba-based metallurgy company, Conger, and the Biagi-owned, Zanini S/A. At the beginning of Proálcool, Zanini still did not have the technology to construct its won distilleries. Thus, Conger and Zanini would create a partnership in the first phase of Proálcool in which "Zanini, the mill and boiler manufacturer, would absorb Conger, the distillery manufacturer."⁷² Though short-lived, the partnership allowed Zanini to enter the distillery market, after which the company would begin producing its own distillation equipment. The two domestic companies combined to compete with the larger Dedini-CODISTIL distillery production company.

The Usina Santa Elisa also contracted Brazilian companies like Arno S/A, KSB S/A, Siemens S/A for hydraulic tanks, ventilators, pumps, electric motors, and other necessary industrial equipment. These companies, many of the tri-pé nature explained by Evans, reiterate the ways that the sugar industry was able to remain a domestic industry with the purchase of technical equipment from domestic companies that had joint-venture agreements to purchase new technology.⁷³ Yet, these domestic-based companies did not penetrate the actual sugar mills

⁷¹ CENAL Report n.100/80, Processo CENAL/SP-06/76. IAA collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

⁷² CENAL Report n.100/80, Processo CENAL/SP-06/76. IAA collection, A6.16 Box 0443, National Archives, Rio de Janeiro. In fact, Zanini itself set up a subsidiary company to produce turbines in with the German company, AEG Kanis in 1976. Hasse, *Filhos do fogo*, 171.

⁷³ In fact, Zanini S/A set up the first triple alliance business in the interior of São Paulo with the establishment of AKZ with AEG Kanis in 1976 to produce turbines. Hasse, *Filhos do fogo*, 156.

and distillery structure, meaning foreign interests did not control the market. Rather, they remained suppliers to domestic-owned mills unlike other industries. Proálcool maintained this separation as the equipment companies, like Zanini, grew around the sugar mills and distilleries.

Only four months after construction began, the Bank of Brazil reported to CNAI that, in fact, the project would need greater financing in order to complete construction. Rather than the original Cr\$116,023,000 for equipment the project proposed in the Usina Santa Elisa's application, the Bank assessed that the Usina would need Cr\$231,356,000 (USD\$21,622,056) for distillery completion. This included Cr\$157,045,000 (USD\$92,379,412) for technical expenditures (civil construction, industrial equipment and installation, as well as assembly and transport), Cr\$16,806,000 (USD\$1,570,654) for interest in the construction period, and Cr\$57,505,000 (USD\$5,374,299) for start-up capital.⁷⁴ Although the Bank blamed the Usina's application for inappropriately excluding civil construction expenses in financeable objects, the ever-increasing inflation rate, running somewhere in the 40% range during the project's implementation, was also to blame.⁷⁵ The Bank of Brazil thus authorized an expanded financing of Cr\$132,520,000 (or 80% of the financeable parts of the project) on September 27th, 1976, six months after the initial project financing approval.⁷⁶

⁷⁴ Letter to Dr. Getúlio Valverde de Lacerda of CNAl from Bank of Brazil Financial Manager José Vasquez Rodriguez on July 14th, 1978. Ref.: GERFI/GEPRO-78/268. A6.16 Box 443, IAA Collection, National Archives: Rio de Janeiro.

⁷⁵ Santos, "Alcohol as Fuel," 330.

⁷⁶ CENAL Report n.100/80, Processo CENAL/SP-06/76; Letter from the Bank of Brazil to the Commissão Nacional do Alcool (CNAl), July 14th, 1978. A6.16 Box 0443, IAA collection, National Archives: Rio de Janeiro. While the two entities signed the contract outside the requisite 180 days stipulated by CNAl, it was quite normal in the notoriously delayed process. Azanha Ferraz notes that it typically took an average of 7-12 months for a project to sign a contract with a financial agency after receiving project approval. In fact, the Central Bank tried to tighten project support in July 1978, refinancing only Cr\$122,042,800 of the project, which the Bank of Brazil contested and expanded in 1980. See Dias de Moraes, *A desregulamentação*, 71.

One should also note the small percentage of imported goods used in the Usina Santa Elisa's project. Of the Bank approved budget, imported equipment accounted for only Cr\$1,408,000 of the entire budget (less than 1%).⁷⁷ Such a small percentage reiterates how the program focused on domestic suppliers for domestic producers almost exclusively. The fact that much of the domestic equipment was the product of the tri-pé model, including the Biagi's Zanini, supports Evans and even Eakins assertion about general Brazilian development. However, the small amount of direct foreign capital involved in Proálcool equipment illuminates the alcohol industry's different development path.

Even as disputes over the financing of the project and delays continued, Proálcool distillery construction began on the Usina Santa Elisa in April 1976. The new distillery was up and running by June 1977.⁷⁸ The Minister of Industry and Commerce Dr. Ángelo Calmon de Sá, who took over the position earlier that year, and IAA President Tavares Carmo attended the inauguration on June 11th, 1977. In a letter to IAA President Tavares Carmo, Biagi Filho notes the significant impact the Proálcool-financing had on the Usina's position in the country, stating,

"[...] as a result of this support, we already produced, in the 1977 harvest, 50,007,000 liters of alcohol, which, compared to 8,712,000 liters in 1976, truly represents a significant increase and positions us as the 3^{rd} largest producer of alcohol in the Country and the 1^{st} in relation to sugar/alcohol."⁷⁹

⁷⁷ Letter to Dr. Getúlio Valverde de Lacerda of CNAl from Bank of Brazil Financial Manager José Vasquez Rodriguez on July 14th, 1978. Ref.: GERFI/GEPRO-78/268. A6.16 Box 443, IAA Collection, National Archives: Rio de Janeiro.

⁷⁸ Biagi Filho response to oficio OF/CNAl n. 84 of April 18th, 1978 sent to the General Secretary of the Ministry of Industry and Commerce on May 3rd, 1978. A6.16 Box 443, IAA Collection, National Archives: Rio de Janeiro.

⁷⁹ Letter from Maurilio Biagi Filho to IAA President Tavares Carmo on March 7th, 1978. A6.16 Caixa 443, National Archives, Rio de Janeiro. Biagi notes that the inauguration was also a symbolic inauguration of the Cia. Açucareira Vale do Rosário and Irmãos Biagi S.A. Açúcar e Alcool, which also received support and financing from Proálcool. Both companies are affiliated with the Usina Santa Elisa and owned by other members of the Biagi family. In fact, Biagi notes that together the three units accounted for 10% of all alcohol production in the state of São Paulo in the 1976/77 harvest.

These accolades highlight the premiere position the Biagi family and the Usina Santa Elisa held in alcohol production by 1978. As such, the Biagis were most committed to seeing the program grow along with national alcohol consumption.

Maurilio Biagi Filho aggressively pushed to expand alcohol production despite the bureaucratic delays around Proálcool financing. Even when the program's financing was under fire, the Usina Santa Elisa continued to expand. The Biagis' commitment would be critical to traversing difficult periods in the program's development over the next several years.

Restructuring Proálcool and the Introduction of the Alcohol-Fueled Car

No single event solidified the government's commitment to the national alcohol program and consumers' interest in expanded ethanol consumption more than the second oil shock of 1979. The beginning of the Iranian Revolution in December 1978 sparked a 14.5% increase in OPEC prices in December alone. Iran, as the second largest Brazilian oil supplier, left Brazilians particularly vulnerable to the new crisis.⁸⁰ The new Iranian government cut oil production by 2.7 million barrels/day, after which oil prices nearly doubled from around USD\$12.85 in October 1978 to US\$24 by the end of 1979.⁸¹ While the first oil shock had justifiably caused alarm, the second shock dramatically reshaped mentalities on the energy, establishing a new reality in which consumers knew they could no longer count low energy prices as they had before. With this shift, the fragile balance of payments, which had recovered from the last oil shock in 1973, quickly turned negative, and the Brazilian government found itself in crisis anew.

The new oil shock came at a pivotal period in national politics as Proálcool's most important supporter, President Geisel, was leaving office and the new President João Batista de

⁸⁰ Barzelay, *Politicized Market*, 174.

⁸¹ Santos, "Alcohol as Fuel," 360.

Oliveira Figueiredo entered in 1979. Born to a military family, General Figueiredo had played an important role in the military during the dictatorship. He served under the head of the National Security Council, General Golbery, before the coup of 1964, in which he was key conspirator. Figueiredo then began his political career under President Médici as Chief Minister of the Military Presidential Staff before serving as the head of the National Intelligence Service (Serviço Nacional de Informações) under President Geisel.⁸² Partially because of his ties to both the hard-line Médici and the moderate Geisel administration, President Geisel nominated his former National Intelligence Service head for the presidency in November 1978. The oil crisis intensified only a month later, and Figueiredo's administration began in March 1979.

Addressing the energy crisis became a central part of President Figueiredo's new development agenda, in which Proálcool was a major piece. He stated in an interview with *Veja* reporter, Paulo Sotero,

"Alcohol is the Brazilian response to the energy crisis. More than a solution for external contingencies, [the crisis] is the great challenge of the 1980s that the entire nation- the people and the government- will have to confront and overcome."⁸³

President Figueiredo and the Economic Development Council raised the target production for the alcohol program to 10.7 billion liters by 1985.

President Figueiredo's Third National Development Plan for 1980 to 1985 supported his earlier assertion. The Plan identifies the acceleration of the National Alcohol Program to be a central part of national energy policy, "through the development of research in the program's areas of production, transport, conservation and application, [and] to incorporate the respective

⁸² Skidmore, *The Politics of Military Rule*, 162 and 210.

⁸³ Paulo Sotero, "Figueiredo e o desafio dos anos 80," *Veja* 562 (June 13th, 1979), 93.

technological progress."⁸⁴ While President Geisel had indirectly addressed alcohol as an option in II PND, alcohol production received particular attention in the new administration's agenda.

The Ministry of Mines' Energy Report laid out alcohol's importance in more detail in its 1979 Energy Report. It reasserted the goal of 10.7 billion liters of alcohol by 1985 set for the second phase of Proálcool. Having reached the program's original goal of 3 billion liters of anhydrous alcohol production in 1979, there was less focus on the expansion of anhydrous alcohol and a greater focus on the expansion of hydrous alcohol for car use while expanding hydrous use for industrial use as well.⁸⁵ Of the 10.7 billion liter goal, the Report marked 6.1 billion liters toward hydrous alcohol for alcohol cars, 3.1 billion for the alcohol-gasoline mixture, and 1.5 billion liters for industrial use.⁸⁶

Expected production (in billions)	1980	1981	1982	1983	1984	1985
Industrial Alcohol	.3	.6	.8	1	1.2	1.5
Hydrous Alcohol for Cars	.4	.9	1.5	2.5	4.1	6.1

Table 7: Expected Hydrous Alcohol Production for Phase II of ProálcoolSource: Ministry of Mines, O modelo energético brasileiro (Brasília: Ministry of Mines andEnergy, 1979), 38–42.

The second phase's alcohol expansion required the resolution of important problems with

the program's early implementation. Castro Santos identifies the major problems facing the

⁸⁴ Secretaria do Planejamento, *Brazil's III National Development Plan 1980–1985* (Brasília: Presidencia da República, 1979), 44.

⁸⁵ In fact, the government only reached President Geisel's original goal of a 20% alcohol mixture in some states by 1977 and nationally in 1983. In the interim, this mixture rate diminished with the expansion of hydrous alcohol in the second phase to attend to the new alcohol-fueled car demand. Santos, "Alcohol as Fuel," 250.

⁸⁶ CENAL, *Proálcool*, 8; Ministry of Mines, *O modelo energético brasileiro* (Brasília: Ministry of Mines and Energy, 1979), 38–42.

program in 1979 to be: poor distribution and storage infrastructure, delayed approval process connected to a poor administrative structure, complaints about alcohol pricing, and limited resources to finance expansion.⁸⁷ The government sought to address many of these issues with the greater incorporation of private businesses. Key steps in this process included: incorporating Petrobrás, facilitating new project approvals, and introducing the car industry into the program.

Barzelay describes a structure in which various government organs and private companies bought into the program in 1979 and 1980 in ways their diverging interests had previously resisted.⁸⁸ For example, in response to the continual battle for control over the program, President Figueiredo and his Economic Development Council created the new entities to simplify the application process and streamline the program's administration.⁸⁹ Led by the new Minister of Industry and Commerce João Camila Penna after he replaced Ángelo Calmon de Sá in March 1979, the new administrative structure was an important step toward facilitating the expansion of the program in the 1980s.⁹⁰ As Penna stated to the weekly magazine, *Veja*, following the program's restructure:

"The success of Proálcool is linked to the national effort. It depends on the action of the new National Alcohol Council, on the government as one united entity, on the businessmen that want to take part in the program, on the automobile industry, on Petrobras, on the National Congress, on all Brazilians, in total. And the government is committed."⁹¹

⁸⁷ Santos, "Alcohol as Fuel," 381–383.

⁸⁸ Barzelay, Politicized Market, 198.

⁸⁹ With Decree 83.700 of July 5th, 1979, the President Figueiredo created the National Alcohol Council (CNAL) and the National Executive Commission on Alcohol (Commissão Executivo Nacional de Alcool- CENAL) to replace the original National Commission on Alcohol (CNAl). *Diario Oficial*, July 5th, 1979. Decree n. 83.700 of July 5th, 1979. A6.06 Caixa 0392, National Archives: Rio de Janeiro.

⁹⁰ Penna would hold the position until August 1984, which was through the duration of the Program's expansion.

⁹¹ "O petróleo da cana" Veja 562 (June 13th, 1979), 97.

Additionally, Petrobrás acquired primary control over the distribution of alcohol in the second phase of the program through its distribution companies in 1980, which resolved ongoing transportation issues.⁹² The National Petroleum Company guaranteed the additional infrastructure at gas stations if the government guaranteed distribution and demand.⁹³ These inter-governmental steps facilitated the advancement of the program, while the car industry's involvement expanded with the new alcohol-fueled car.

The use of alcohol as a replacement for gasoline with the alcohol-fueled car drove the second phase's expansion. Technological research for the car had intensified in the early years of the Proálcool. Brazilian engineers at the CTA were the first to develop the new engine technology. Professor Stumpf and his team at the CTA were only a small group of the many engineers involved in the adaptation of the internal combustion engine to run completely on alcohol rather than a gasoline-alcohol mixture as promoted initially under Proálcool. The new engine ran on hydrous alcohol rather than the anhydrous alcohol, which had been and remained the base for the alcohol-gasoline mixture since the 1930s.⁹⁴

The CTA developed the alcohol-fueled engine in conjunction with the newly formed Industrial Technology Secretariat, led by its first Secretary José Walter Bautista Vidal under the Ministry of Commerce and Industry (MIC). Originally from Bahia, he received his bachelors from the University of Santiago and his doctorate in physics from Stanford University. Vidal

⁹² Santos, "Alcohol as Fuel," 406–410. This also diminished divisions on the federal level, as the industry stopped vying for complete control of the program against the MIC.

⁹³ General Oziel Almeida Costa, President of the National Petroleum Council (CNP), pledged the installation of the hydrous alcohol pumps at gasoline stations in the regions with sufficient alcohol for consumption and a fleet of alcohol-driven cars. He said, "On the day that the National Alcohol Commission says that there is enough alcohol and cars for the use of the combustible, we will be quick to activate the distribution system, which is pretty easy." See, "Álcool: CNP já tem plano de distribuição," *O Estado de S. Paulo* (February 7th, 1979), 29.

⁹⁴ For a good summary of the development of the technology for the car, see Santos, "Alcohol as Fuel," 413–416.

served as the first Secretary of Industrial Technology under the MIC, upon invitation from the new Minister of Industry and Commerce Severo Gomes in 1974.⁹⁵ The MIC created the Secretariat to trace the country's industrial technology policy and to supervise and coordinate the related organs under the ministry, but in practice it was created "almost exclusively for the research of alcohol as an energy source."⁹⁶ As the former IAA President Barbosa Lima Sobrinho noted, Vidal was known for his "passion and combative defense" of Proálcool; however, Barzelay claims that Vidal "chose to promote the program so ardently that he gained a reputation among auto producers as a clown."⁹⁷ Regardless, his fervent support remained an important piece in pushing the early expansion of alcohol-fueled cars before his dismissal in 1979.⁹⁸

Fears of the new oil crisis accelerated the launch of the alcohol-fueled car for national production. In fact, The CTA launched the first fleet of experimental alcohol-fueled cars in 1977. Although most of the test fleet cars in 1977 had been with the Dans model Volkwagens, the car companies remained hesitant.⁹⁹ Government agencies used the new cars across the country, as the ministries debated the appropriate level of multinational involvement if the initiative expanded to national car distribution.¹⁰⁰

A new phase based on the alcohol-car required the cooperation of the multinational car companies. The four major car companies in Brazil (Fiat, Volkwagen, Ford, and General Motors) were hesitant to commit to the program without guarantees from the government that it would supply and distribute enough alcohol to make the car a worthwhile endeavor. Fiat was the

⁹⁵ Vidal, *O esfacelamento da nação*, 42.

⁹⁶ "O petroleo da cana", *Veja* 562 (June 13th, 1979), 94.

⁹⁷ Vidal, O esfacelamento da nação, 10; Barzelay, Politicized Market, 175.

⁹⁸ Vasconcellos and Vidal, *Poder dos tropicos*, 82.

⁹⁹ "500 veículos andam apenas com álcool," *Jornal do Brasil* (May 29th,1978), 15

¹⁰⁰ "CTA diz que pode utilizar o Programa Álcool-Motor no país," and "500 veículos andam apenas com álcool," *Jornal do Brasil* (May 29th,1978), 15.

first to commit after launching its first alcohol car in 1978. The US companies lagged behind. Of the four, Volkwagen, the country's largest auto producer, took the biggest step forward when it announced that it would accelerate the development of the alcohol-fueled car in February 1979, setting a target roll out date for November of the same year.¹⁰¹

Mário Garnero, the president of the National Automobile Producers' Association (ANFAVEA- Associação Nacional dos Fabricantes de Veículos Automotores), played a critical role in negotiating the car industry's participation. Trained as a lawyer, the young paulista was a close friend of Juscelino Kubitschek, entering politics in 1961 as a manager for a 1965 Kubitschek campaign that never materialized thanks to the military coup in 1964. Returning to corporate work after the military government began, he became a director at Volkswagen do Brasil in the early 1970s, during which time he assumed the presidency of ANFAVEA.¹⁰²

Garnero was one of the only businessmen invited to join the National Energy Commission.¹⁰³ As such, he had an important voice in the collaboration of Proálcool and the car industry as well as direct access to the President in energy policy formation. Garnero recalls the situation facing the car industry with the second oil shock in an interview I did with him,

¹⁰¹ Pedro Lobato, "Pronto o Fiat-Álcool," *Gazeta Mercantil* (September 4th, 1978); Barzelay, *Politicized Market*, 179; Interview with Mário Garnero by Jennifer Eaglin on December 11th, 2013 in São Paulo; Hasse, *Filhos do fogo*, 195.

¹⁰² Mário Garnero, *JK: a coragem da ambição* (Campinas, SP: Editora MM, 2011), 13-24 and 29.

¹⁰³ After the new oil shock, President Figueiredo formed a new National Energy Commission in July. The Commission, presided by Vice-President Aureliano Chaves, combined high-ranking officials in the MME, finance, agriculture, transportation, industry and commerce, planning, and social communications to centralize national energy policy. Garnero asserts that Minister of Mines and Energy César Cals was the first to suggest the creation of the National Energy Commission to President Figueiredo. The other two private representatives on the Commission were Professor Eduardo Celestino Rodrigues and engineer Ney Webster de Araújo, both of which technical specialists. Mário Garnero, *Energia: o future é hoje*, 52–53 and 81. See also, "Figueiredo prepara a economia de guerra," *Jornal do Brasil* (July 5th, 1979), 1.

"with the oil crisis which elevated the price of petroleum, we [car producers] had a choice, which was rationing [gasoline] or creating something new, and from this choice arose, objectively, our work to coordinate with the car industry, the government, and with producers and distributors, in this case Petrobrás, [to expand Proálcool.]"¹⁰⁴ Indeed, Garnero would remain an outspoken supporter of the alcohol program, winning the

image of the "Father of Ethanol" to some today for his involvement in the industry's

collaboration.¹⁰⁵

One of the major victories for Brazilian nationalist interests, from the military to private businessmen to government officials, was winning the royalties to the alcohol-fueled engine. As discussed above, Brazilian researchers at the CTA under the Aernonautics Ministry conducted alcohol-fueled engine research before Proálcool began. Upon the commitment of the car industries, the foreign companies filed for royalties on the technology as they had been developing privately as well. The CTA strongly opposed this position. Lieutenant Coronel Sergio Ferolla, Director of the Institute of Research and Development at the CTA noted that Brazil already had the alcohol motor patented, claiming that the country "will talk on equal footing with international manufacturers."¹⁰⁶ Ultimately, the foreign companies desisted, giving Brazil full rights to the alcohol-fueled engine.

Brazilian ownership of the alcohol-fueled engine is an important deviation from Evans' and Eakins' assessments of Brazilian development. The alcohol-fueled engine established Brazilian technology in the quintessential model of modernity to Brazilian consumers: the car. Joel Wolfe highlights the importance of the car in 20th century Brazil, stating "Cars, trucks, and buses became not only the tools for creating the modern Brazilian state but also symbols of hope

¹⁰⁴ Interview with Mário Garnero by Jennifer Eaglin on December 11th, 2013 in São Paulo.
¹⁰⁵ Veazey, "Brazil's 'Father of Ethanol' Sees Bounty for Biofuel."

¹⁰⁶ João Batista Olivi, "CTA ditará padrões para motor a álcool," *O Estado de São Paulo* (April 27th, 1979), 30; See also, "INPI não aceita royalty sobre motor a álcool," *O Globo* (April 24th, 1979) as cited in Santos, "Alcohol as Fuel," 416.

for its ongoing growth as modern, developed, and democratic nation.¹⁰⁷ Although not yet democratic, the government's ability to connect energy, technology, the economy, and the car through Proálcool held greater importance than just the royalties. It represented a type of modernity that held currency for government officials. Despite this victory, the roll out of the car was not without its troubles. As discussed below, sugar producers would embrace the meaning of the new car technology and become major promoters of the program in the 1980s.

	1980	1981	1982	1983	1984	1985
Expected alcohol- driven cars*	330,000	717,000	1160,000	1598,000	2032,000	2461,000
Alcohol car sales	254,015	128,828	237,585	592,984	560,492	642,147
Total Car Sales**	873,721	516,329	619,984	689,897	601,929	687,360

Table 8: Alcohol-fueled Car Sales, 1980–1985¹⁰⁸

See Ministry of Mines, O modelo energético brasileiro (Brasília: Ministry of Mines and Energy, 1979), 41 and Anfavea 2015 Annual Report.

Behind the fears of the continued oil price increases, the public commitment to the

alcohol initiative expanded as well. This was most visible through alcohol-fuel car purchases in

late 1979 and early 1980. President Figueiredo and ANFAVEA President Garnero signed an

agreement setting the car industry's production commitment to the program for the first year of

¹⁰⁷ Wolfe, Autos and Progress, 12.

¹⁰⁸ This table illustrates the Ministry of Mines expected alcohol-driven car numbers projected in 1979, real alcohol fueled car sales from 1980 to 1985, and the estimates of actual alcohol-fueled cars on the road over the same period. One should note that the government's first estimate is based on a combination of new alcohol fueled car sales and gasoline car conversions.
*The government approved the legal conversion of gasoline cars at certified auto shops in February 1980. However, this practice began before and continued after this law without certification.

^{**} This does not include light commercial trucks, trucks, or buses.

production at 250,000 in September 1979.¹⁰⁹ Combined with the expected conversion of gasoline cars to alcohol cars, the Ministry of Mines estimated alcohol car production from 1980 to 1985, as displayed in Table 8.¹¹⁰

Even as consumer preference leaned toward the new alcohol-fuel car, technical difficulties with the car challenged their support. *Veja* reported problems with starting the cars in cold weather and strong exhaust odors in 1979, but in fact, deeper problems persisted. First and foremost, the engines were difficult to start at temperatures around or below 15 degrees Celsius (about 60 degrees Fahrenheit). However, problems with corrosion also challenged the cars' efficiency. Also, another notable issue for consumers was that the cars burned through alcohol at a faster rate than gasoline, thus requiring more refills than gasoline cars.¹¹¹

Additionally, steelworker's strikes in early 1980 slowed alcohol car production, further challenging the alcohol-car roll out. Led by Inácio Lula da Silva, a Volkwagen metalworker and future president of Brazil, union workers of the famous ABC municipalities in São Paulo (Santo André, São Bernardo, and São Caetano) began striking 1979 amid a declining economy. Some supporters argued that the alcohol car would buoy car production and thus steelworkers' jobs as Brazilian car production declined during the growing economic crisis. Ultimately, steel workers were able to assert their own influence on the program through their strikes. As Barzelay notes, "The 41-day strike of metallurgical workers in the São Paulo area during April and May 1980,

¹⁰⁹ "Um acordo com as fábricas para a produção de carros a álcool," *Gazeta Mercantil* (September 11th, 1979) as cited in *Politicized Market*, 212n47.

¹¹⁰ Ministry of Mines, *O modelo energético brasileiro*, 40.

¹¹¹ "O petróleo da cana," Veja 562 (June 13th, 1979), 95; Santos, "Alcohol as Fuel," 417–418.

however, caused the [alcohol-fueled car production] target to be revised downward by 50,000 units."¹¹²

This strike significantly affected the roll out of the alcohol car, but alcohol-fueled car sales rebounded in late 1980 due to external international affairs. The Iran-Iraq War began in September 1980. This drove consumer fears of increased oil shortages and gasoline rationing, pushing sales back up for the next six months. In fact, this bump allowed producers to exceed the original 250,000 cars for the year.¹¹³ However, sales continued to drop in 1981, as noted in Table 8 above, as financial struggles further challenged public support for the program.

Controversial Foreign Financing: The Entry of the World Bank in 1981

While resolving the administrative issues and promoting the alcohol-fueled car were important steps taken by the government to support Proálcool, the most controversial was the acquisition of foreign financing to support the program's expansion in 1980. Former Minister of Mines and Energy Shigeaki Ueki proposed the incorporation of foreign financing to form a "tripod model" for the program's expansion based on private domestic, state, and foreign capital for production projects. Ultimately, Minister of Mines and Energy Cesar Cals vetoed the suggestion along with other private business owners, including the vocal Zanini Vice-President and Usina Santa Elisa shareholder, Luiz Lacerda Biagi.¹¹⁴

¹¹² Barzelay, *Politicized Market*, 212–213. See also, "Anunciada a redução na meta de carros a álcool," *O Estado de São Paulo* (May 16th, 1980), 25.

¹¹³ Barzelay, *Politicized Market*, 31; Santos, "Alcohol as Fuel," 201. See also, S. Stefani,
"Álcool: o susto da guerra provocou o 'boom'," *Relatório da Gazeta Mercantil*, (November 28th, 1980).

¹¹⁴ Ueki's model positioned Petrobras in control of state representation in the projects. See "Cals veta o plano tripartite," *Gazeta Mercantil* (March 19th, 1980); Luiz A. Turíbio, "Plano triplica o Proálcool," *Gazeta Mercantil* (March 21st, 1980), "Para Setúbal, Petrobrás não deve produzir álcool," *O Globo* (March 21st, 1980) as cited in Santos, "Alcohol as Fuel," 402–403.

However, financing for the program slowed project approval to a complete halt in June 1981. While sugar exports, federal budget allocations, and the sale of alcohol-gasoline had supported the program until 1979, these financial bases had been stretched thin by 1980. For the program to continue on the scale to which the government had expanded it in 1980, foreign capital was the only option. Despite dismissing Ueki's plan, the costly Proálcool needed additional funding to support its expansion. Additionally, the expanding alternative fuel initiatives driven by the government, including nuclear, coal, and hydro-energy, began to pick from the same federal budget in 1980, further diminishing available capital for the program's expansion.¹¹⁵

Proposals, issued in numerous national newspapers, for the incorporation of foreign financing incited a public debate amongst private entrepreneurs and public officials involved in Proálcool. Amongst the most outspoken public officials were General Ernani Ayrosa, Chief of the General Staff of the Army, and General Antonio Carlos de Andrada Serpa, Chief of the Military Personnel Department. General Ayrosa claimed, "prudence shows that the energy problems ought to be solved within our own country, without foreign dependence."¹¹⁶ Similarly, General Serpa specifically raised concerns of foreign inclusion as a threat to national security, particularly in comparison to the pharmaceutical industry, which he described as "a sector where wild capitalism developed in the country."¹¹⁷ That both of these detractors of foreign influence were from the military certainly reminded the public of the program's national security implications, but it also highlights a deeper desire to avert the standard development model of the

¹¹⁵ Santos, "Alcohol as Fuel," 422–423.

¹¹⁶ As cited in "O nacionalismo e o Proálcool," *O Estado de São Paulo* (April 9th, 1980), 3.
¹¹⁷ "Serpa prega 'correção de rumo' em quarto setores," *O Estado de São Paulo* (April 16th, 1980), 5; See also, "Serpa condena presença das multis na política energetica brasileira" *A Folha de São Paulo* (February 14th, 1980) as cited in Santos, "Alcohol as Fuel," 426; "Capital externo fora do Proálcool na distribuição," *O Estado de São Paulo* (April 9th, 1980), 29;

era, specifically invoking the famed pharmaceutical example. Thus, the problematic entry of foreign capital in other industries remained present in the public response to foreign capital in the alcohol program. However, the military officials' position also fired up private interests anti-state monopoly (statization) movement.

Proálcool remained wrapped in trepidations and anxiety around previous state and private industry development problems. Those against state intervention in the market place, known as the anti-statization movement, claimed that the exclusion of foreign capital was not worth the failure of the entire program with rather vitriol rhetoric, invoking the failures of the state-led oil industry, Petrobás, to push for foreign entry.¹¹⁸ Private businessmen also weighed in on the topic. For example, ANFAVEA President Mario Garnero noted his conditional support of foreign financing so long as domestic capital outweighed foreign capital interests. Such nuanced support illustrates the divisive nature of the World Bank's entry brought to the fore.¹¹⁹ Still, the most adamant proponent of the foreign financing was Minister of Planning Delfim Neto.

Minister of Planning Antonio Delfim Neto was one of the strongest and most influential supporters of the new financing. As former Minister of Finance under Médici's administration, he employed strict orthodox policies and was considered the manufacturer of the Brazilian "Economic Miracle" of the late 1960s.¹²⁰ Already known for his focus on controlling inflation during the Médici years, he took over as Minister of Planning of Figueiredo's new administration in August 1979. With decisive control over economic policy, he focused his economic campaign

¹¹⁸ In a *Estado de São Paulo* commentary article, "O nacionalismo e o Proálcool," a critic of the state claimed that the exclusion of foreign capital would lead to the same disaster as the creation of Petrobrás, "a state within a state" whose inefficiencies had led to Brazil's failed oil industry. "Nacionalismo e o Proálcool," *O Estado de São Paulo* (April 9th, 1980), 3; "Debatido o interesse do capital externo no álcool," *O Estado de São Paulo* (May 27th, 1981), 24.

¹¹⁹ "Debatido o interesse do capital externo no álcool," *O Estado de São Paulo* (May 21st, 1981),
24.

¹²⁰ Skidmore, *The Politics of Military Rule*, 67.

on Proálcool in late 1980. He stressed the connection between Proálcool and the rising inflation rate, noting that it cut into agricultural exports while only exchanging one fuel for another rather than diminishing fuel consumption, thus not cutting actual energy costs.¹²¹ He employed an anti-inflationary policy, which led to the program's financial suspension in June 1981. Thus, when the topic of foreign financing entering the program arose, Delfim Neto argued that foreign financing.¹²²

After the testy debate, international financial intervention would not come to fruition until 1981. The government approved the World Bank's financial incorporation into Proálcool under very stringent conditions. The World Bank gave Proálcool a credit of US\$250 million. The contract required an "international bidding for distillery equipment for industrial projects to be supported by the Bank; reduction and eventual elimination of interest rate subsidies on Proálcool loans; an alcohol pricing policy that would maintain the ex-distillery alcohol prices paid to producers at levels that would adequately remunerate them, implying a constant adjustment according to the rate of inflation."¹²³

While World Bank financing introduced foreign capital into the program, domestic entrepreneurs still dominated the alcohol program. These producers and businessmen had a say in the policy debates waged around the new World Bank loan. Additionally, a 15% preference margin in bidding prices virtually guaranteed that domestic industries would win all the bidding,

¹²¹ "O Proálcool, inflacionário," *O Estado de São Paulo* (January 6th, 1981), 24; Barzelay, *Politicized Market*, 221–222.

¹²² Santos, "Alcohol as Fuel," 430 and 463. Also, see Table 15 in the Appendix of this dissertation for the state of the Brazilian balance of payment.

¹²³ Santos, "Alcohol as Fuel," 430–431. The contract demarked how the funds were to be distributed, with the vast majority (US\$281.5 million) for alcohol producing units, including agricultural projects between 1981 and 1983. In fact, given the budget cuts, the World Bank loan provided all the funding for projects approved in 1982 and by 1984, about 75% of Proálcool's funds came from the World Bank. Santos, "Alcohol as Fuel," 430–436; Demetrius, *Brazil's National Alcohol Program*, 100.

which they did.¹²⁴ Thus, even when foreign financing was allowed into the program, government officials structured the financing to still heavily favor domestic producers.

Furthermore, the technological innovation involved in the program, and distinctly denied in Eakin's assessment of traditional Brazilian development programs, further asserts the Proálcool's unique development path. The program heavily favored domestic producers, but protection of domestic technology remained central to the program. This was a point on which politicians were unwilling to compromise, as patent negotiations with the car industry over the alcohol-fueled engine revealed in 1979.¹²⁵ Equipment producers proliferated the tri-pé model of development to acquire more technology, following Eakin's assessment of Brazilian development.¹²⁶ However, the alcohol engine defied this model, and sugar and alcohol production remained in the control of domestic producers. Thus, the level of international influence that slowly eroded domestic presence in the pharmaceutical industry for Evans and the steel industry for Eakins did not occur under Proálcool despite the late entry of foreign capital.

The government removed the freeze on program expansion in August 1981, but public support required more coaxing.¹²⁷ Alcohol car sales did not recover from the 1981 collapse until the government intervened with additional alcohol car incentives in 1982. At the pressure of interest groups like ANFAVEA, the National Energy Commission expanded alcohol-fueled car

¹²⁴ See Santos, "Alcohol as Fuel," 433–436 for a detailed account of the bidding process. Through 1982, no foreign companies won any bids. In fact, the Biagi's Zanini S/A won the largest share of projects after the World Bank entered the program because it cut prices even further below CENAL requirements. This practice, among others, would wreak havoc on the company's financial structure in the mid-1980s when Proálcool financing dried up. See below in this dissertation, 201n140.

¹²⁵ See above, p. 189–190.

¹²⁶ Eakin, *Tropical Capitalism*, 59. Eakin states, "rather than moving toward continual technological innovation- a true sign of self-sustaining and dynamic industrialization- the Brazilians continue to rely on others for technological advances and innovation."

¹²⁷ "O impasse do álcool," Veja 677 (August 26th, 1981), 84–86.

incentives to reignite sales. Incentives included: a guarantee that alcohol prices would not surpass 59% of the price of gasoline (per liter); a lowerering of the IPI (industrial product tax) for alcohol cars to 28% (from 32% previously) while increasing gasoline cars' IPI to 33% (32% previously); a reduction in the price of the alcohol car to 2% below the gasoline car despite the fact that its production costs exceeded the gasoline car; and longer lease terms for new alcohol cars.¹²⁸

Thus, government intervention and foreign finance salvaged Proálcool's most important indicator: alcohol car sales. These events, including additional OPEC cuts in 1982, and the government's subsequent measures solidified the Brazilian alcohol car boom, which had begun in late 1980.¹²⁹ Certainly, it led to the expansion of alcohol consumption and production. Still, the car's adaptation was far from seamless. In fact, as Castro Santos asserts, private alcohol equipment producers were critical to pushing public opinion in favor of the program and alcohol-fueled cars in periods of waning support over the next few years.¹³⁰ In this case, the Usina Santa Elisa and Zanini were one in the same. Proálcool and the success of the alcohol-fueled car united the equipment production sector's interests most explicitly with its sugar holdings in this period. Both Luiz Lacerda Biagi and Maurilio Biagi Filho's combined efforts would be essential to the program's growth in Ribeirão Preto.

¹²⁸ "A subida da montanha," *Veja* 708 (March 31st, 1982), 100–101; "Produtores de álcool acusam as montadores," *Folha de São Paulo* (June 10th, 1983); see also, Santos, "Alcohol as Fuel," 471.

¹²⁹ Stefani, "Álcool: o susto da guerra provocou o 'boom'," *Relatório da Gazeta Mercantil,* (November 28th, 1980); "O outro lado da moeda," *Veja* 707 (March 24, 1982), 92–94; "A subida da montanha," *Veja* 708 (March 31st, 1982), 100–101.

¹³⁰ Santos, "Alcohol as Fuel," 203.

Phase II and the Usina Santa Elisa: 1979–1984

The transition to Phase Two of Proálcool took particular importance in Ribeirão Preto. Proálcool had transformed Ribeirão Preto into the largest alcohol-producing region in the country in the late 1970s. The Usina Santa Elisa had already established itself as one of the largest alcohol-producing usinas in the country, and thus its investment in the program's expansion and continued success was significant. Additionally, the equipment production company, Zanini S/A, was one of many holdings the Biagi family owned in the sugar and alcohol industry. As the second largest alcohol equipment company in the country, Zanini's success was also intricately connected to the continued growth of the program.

The Biagi leader and patriarch, Maurilio Biagi, died in 1978, after which his widow, Edilah Lacerda Biagi, took formal control of the empire. She divided leadership of the family's biggest holdings, the Usina Santa Elisa and Zanini, between her two eldest sons, Maurilio Biagi Filho and Luiz Lacerda Biagi. Maurilio Biagi Filho remained Superintendent and navigator of the Biagi sugar and alcohol holdings. However, acting president of the Usina Santa Elisa in 1980 was Eduardo Diniz Junqueira.¹³¹

Thus, while Maurilio Biagi had directed his sugar empire into the government's alcohol program, his sons would shape the program's growth in the second phase. The two were particularly aggressive promoters of the program in Ribeirão Preto. Geraldo Hasse recounts,

"On the offensive for clients, Luiz Biagi mobilized authorities, friend and relatives. One of his partners in this effort was his brother Maurilio. The two sought to make business in all corners of Brazil, arriving to attract ranchers to the alcohol sector. In battle for the Proálcool market, the objective was to create for Zanini a large market of technical assistance, maintenance and spare pieces and equipment."¹³²

¹³¹ Hasse, Filhos do Fogo, 194.

¹³² Hasse, Filhos do Fogo, 171.

At the same time, the two brothers promoted the program by purchasing the first alcohol-driven car, produced by Fiat, in 1978.¹³³ They promoted the program to local businesses. The two marketed the program to consumers in the region as well. Again, Hasse notes that the brothers "distributed caps and t-shirts with the national motto 'See this t-shirt, Choose alcohol."¹³⁴

As the Biagis promoted the program, the Usina Santa Elisa's sugarcane production capacity substantially expanded in the first years of Proálcool. In the 1975/76 harvest, the Santa Elisa's sugarcane agricultural capacity reached 15,321 hectares of which 7,596 hectares belonged to the Usina directly and sugarcane suppliers provided the additional 7,725 hectares.¹³⁵ Over the next five years, the Biagis purchased land and contracted suppliers deeper and deeper into neighboring regions, extending their cane fields to an estimated 44,332 hectares (109,547 acres) by the 1980/81 harvest. Of this land, the Usina and its shareholders owned 16,562 hectares and suppliers accounted for 27,770 hectares.¹³⁶ In conjunction with its growing cane capacity, the Usina Santa Elisa also returned to the government-financed Proálcool well in 1980 to further expand its distillery capacity.

In September 1980, the Usina Santa Elisa leadership applied for Proálcool assistance to expand their annexed distillery from 300,000 liters a day to 540,000 liters a day.¹³⁷ Proálcool financing would support the addition of two more 120,000 distillers to the four already in place at the Usina Santa Elisa. The additional distilleries would all be for hydrous alcohol production.

¹³³ Hasse claims the family "adopted" despite Biagi Filho recounting how awful the original models were. "[The] first generation of motors was awful, the second awful, the third, bad, the fourth good [...]." Interview with Biagi Filho on May 21st, 2013 by Jennifer Eaglin; Hasse, *Filhos do Fogo*, 195.

¹³⁴ Hasse, *Filhos do Fogo*, 171.

¹³⁵ Usina Santa Elisa Proálcool Application, CNAl n. SP06/76. IAA collection, A6.16 Box 0443, National Archives, Rio de Janeiro.

 ¹³⁶ CENAL Relatório 169/80; Processo CENAL n.122/80, signed by President of the IAA, Hugo Almeida on November 19th, 1980. J5.19 Box 4634, National Archives: Rio de Janeiro.
 ¹³⁷ Ibid.

According to the application, the Usina Santa Elisa produced 71,001,100 liters of alcohol in the 1979/1980 harvest and 40,722,100 liters as of September 20th, 1980 in the 1980/1981 harvest. With the anticipated production expansion requested, Biagi Filho projected that the usina would produce 81,000,000 liters in the 1981/1982 harvest with the additional distillery units.¹³⁸

CENAL approved the Usina Santa Elisa expansion project on November 19th, 1980.¹³⁹ In the application, Santa Elisa management requested extensive financial support for their industrial sector. This included Cr\$51,165,900 in civil works like filters, heaters, generators, and tanks and Cr\$474,642,500 (approximately USD\$9,006,500) in industrial equipment assistance. The industrial equipment requested included: electric energy generation, vapor generation, cane reception and unloading. Most significantly, the distillery itself accounted for over half (Cr\$223,533,000) of the industrial equipment funds requested and the vast majority of all funds requested. Vehicles, installations, and loads rounded out the industrial equipment requests for a total of Cr\$626,938,900 in requested funds. As with all Proálcool projects at this time, the Usina shareholders were to put up 20% of the project's funds (Cr\$125,378,800) while Proálcool financed the other 80% of the project (Cr\$501,506,100). The application estimates that total production costs, including manual labor and various operation and non-operational costs, totale dt an estimated Cr\$674,945,900 (USD\$12,807,323).

Despite the additional capacity expansion slated for the Usina Santa Elisa, alcohol car sales fell along with public support for Proálcool in 1981. Public opinion had grown wary of the program and the alcohol-fueled car, given the publically debated troubles and the financial straights of the program documented above. Upon the entry of the World Bank, Luiz Lacerda

¹³⁸ Ibid.

¹³⁹ CENAL Relatório 169/80; Processo CENAL n.122/80. signed by President of the IAA, Hugo Almeida on November 19th, 1980. J5.19 Box 4634, National Archives: Rio de Janeiro.

Biagi became a frequent voice in support of the potential influence of the new foreign financing, claiming that the new bidding process was a "benefit by stimulating the improvement of the national industry."¹⁴⁰ Barzelay claims that his support was opportunistic as Zanini benefitted substantially from the World Bank financing.¹⁴¹ This is probably true, but Lacerda Biagi's voice was influential, and his support was important to the program regaining public support.

As confidence in the alcohol-fueled car dwindled in 1981, Maurilio Biagi Filho continued to place the usina at the forefront of expanded support for alcohol use. In 1981, all of the trucks used at the Usina Santa Elisa were alcohol-fueled trucks.¹⁴² This was generally unheard of at the time, as only a handful of these trucks had been produced in the country prior to 1981 (10 in 1979 and 14 in 1980, respectively). In fact, in 1981, the car industry only produced 1,126 alcohol-fueled trucks, of which the Biagis purchased 300 to employ at the Usina Santa Elisa. As alcohol-driven agricultural equipment, particularly tractors, became available, the Usina Santa Elisa would be one of the first to use this equipment by 1983 as well.¹⁴³

Biagi Filho considered the Usina Santa Elisa to be an important leader in the Proálcool program, and promoting the new truck fleet was a sign of the usina's leadership in the industry. As Biagi Filho stated in an interview with me, Santa Elisa's inclusion as an early Proálcool

¹⁴⁰ "Para Belotti, descrença no álcool é injustificável," *Estado de São Paulo* (June 24th, 1981), 27. In fact, Zanini was a big winner under the new structure as it established prices well below CENAL's matrix of prices. However, it created problems for the company in the 1980s, which started to fall behind on projects and lose clients. The company ran into major problems in 1984. Things turned dire as the World Bank's US\$250 million credit line that had bolstered the Proálcool project, dried up. Lacerda Biagi left Zanini in 1985, and Biagi Filho assumed the presidency. Hasse, *Filhos do Fogo*, 195–196 and 200.

¹⁴¹ Barzelay, *Politicized Market*, 195n70.

¹⁴² "Assim nasceu Santa Elisa," *A Revista Santa Elisa: Uma Historia de Trabalho e Desenvolvimento*, (Ribeirão Preto: MIC Editorial Ltda, 1996), 15.

¹⁴³ Anfavea (Associação Nacional dos Fabricantes de Veículos Automotores), 2015 Annual Report (São Paulo, 2015), 59; Maurilio Biagi Filho, "O álcool é nosso," *Folha de São Paulo* (May 9th, 1983); Pedro Zan, "A grande usina. Aqui se produz," *O Estado de São Paulo* (June 16th, 1985), 20.

project "was the beginning of the Usina Santa Elisa already as a leader by then but Santa Elisa was a leader not only in production but principally in intellectual leadership [...] in the conduct of the program."¹⁴⁴ As a leader first in the expansion of the program in the late 1970s, as discussed above, the Biagis led by example at the Usina Santa Elisa with alcohol-fueled car and truck fleets as well in the second phase. As the Usina's production capacity expanded with Proálcool-financing, Biagi Filho also embraced the role as a leader in pushing consumer confidence in the program as well.

In 1983, Biagi Filho would continue this campaign in a series of articles published in various newspapers. In his article, "O álcool é nosso," published in the nationally circulated newspaper, *Folha de São Paulo*, Biagi asserted the importance of the program and the need for support from the Brazilian public. He stated,

"If much still needs to be done, all of us Brazilians must, here and now, support and incentivize Proálcool. We ought to, indeed, defend our nationalist interests. The technology and labor are ours, we do not pay royalties [on the technology], on the contrary, we have an international market to import our technology."¹⁴⁵

For Biagi, the Usina Santa Elisa embodied these nationalist development efforts, and its growth through Proálcool over the previous decade supported his assessment of the program's success.

The Usina Santa Elisa would end its expansionary phase in 1984, as a recession already rampant in the rest of the country finally hit Ribeirão Preto.¹⁴⁶ It completed the modernization of its milling equipment along with the incorporation of a neighboring mill in Sertãozinho, the Usina Barbacena. Santa Elisa produced its largest yield of alcohol up to that date in 1984 and 1985, producing a respective 158,004,000 and 162,500,000 liters, respectively. The Usina Santa

¹⁴⁴ Interview with Maurilio Biagi Filho by Jennifer Eaglin, May 21st, 2013 in Ribeirão Preto, SP.
¹⁴⁵ "O álcool é nosso," *A Folha de São Paulo* (May 9th, 1983). This article elicited a fiery response from Proálcool detractors, as will be addressed in the next chapter.

¹⁴⁶ Hasse, *Filhos de fogo*, 199.

Elisa would financially support its counterpart, Zanini, in the following years as the company struggled on the edge of collapse with the end of Proálcool.¹⁴⁷

In the course of a decade, beginning with the Biagis' self-financed distillery expansion in 1974 and through two Proálcool-financed expansion projects, the Usina Santa Elisa had become one of the leading sugar and alcohol producing mills in the country. Proálcool drove this growth, but Maurilio Biagi Filho, too, had shaped the programs' growth, defining a development path particular to the alcohol industry.

Conclusion

Thanks in part to sugar sector leaders like the Biagis, via both the Usina Santa Elisa and Zanini S/A, the National Alcohol Program successfully promoted the growth of alcohol production over the first decade of the program. The program's growth was a reflection of a government-led development model that successfully employed domestic technology and prioritized domestic producers in the process. This model drew criticism and was thoroughly debated in the public sphere, but the Biagi family and the Usina Santa Elisa thrived under this model.

The program continued to grow despite the program's diminishing financial feasibility behind expanding alcohol-fuel car sales. In fact, sales peaked in 1986 at 699,183 units compared to 219,347 gasoline cars. Between 1983 and 1989, alcohol-fuel cars accounted for 90% of the

¹⁴⁷ Hasse, *Filhos de fogo*, 92; see also, "Assim nasceu Santa Elisa," *A Revista Santa Elisa: Uma Historia de Trabalho e Desenvolvimento*, (Ribeirão Preto: MIC Editorial Ltda, 1996), 18, 200, and 238.

cars sold in Brazil.¹⁴⁸ While sugar producers like Biagi Filho ensured the program's economic value, in fact, the program's expansion grew increasingly problematic in the mid-1980s.

Meeting the expanding fuel demand required a massive expansion in sugarcane production, and Ribeirão Preto was central to this growth. Maintaining steady alcohol production in Ribeirão Preto was critical to the program's ongoing success, especially after the struggles producers had getting Brazilian consumers to commit to the alcohol-fueled car in the early 1980s, as discussed above. Thus, any threat to Ribeirão Preto's production would have national implications for alcohol production levels. As Proálcool had a dramatic impact not only on business development and sugarcane producers conversely had a major impact on the program, cane workers, too, would assert their voices on the program in the 1984 Guariba Strikes in Ribeirão Preto.

¹⁴⁸ Barzelay, *Politicized Market*, 31; Anfavea, 2015 Annual Report, 59; Márcia Azanha Ferraz Dias de Moraes, "Considerações sobre a indústria do etanol do Brasil," in *Biocombustíveis: realidade e perspectivas*, org. Ministério das Relações Exteriores (Brasília: Ministério das Relações Exteriores, 2007), 143.

Chapter 5: The Rise of the Brazilian California: Rural Labor Changes and Ribeirão Preto, 1950–1984

As the center of agro-industrial complexes of sugar planters and mills, people began to reference Ribeirão Preto as the "Brazilian California" for its agriculture-driven wealth, but these economic changes accompanied dramatic social change.¹ The previous chapters have addressed the important political and economic changes that occurred around the emerging sugar and alcohol industry in the 1930s through the early 1980s. However, the social landscape of sugar-producing regions transformed along with the political and economic changes that accompanied the federal and private investments in the sugar sector's development.

This chapter explores the social ramifications of alcohol's growth under Proálcool on sugarcane workers in the region as a larger assessment of the development program. To engage these issues properly, one must first understand the trajectory of rural workers' legal standing in the country and their particular position in the region as it evolved in relation to the emerging agro-industrial model.

São Paulo Rural Labor Mobilization

Significant changes to the Brazilian sugar industry's labor structure began in earnest in the 1950s after a relatively uniform labor structure had defined it over the previous centuries. The Brazilian sugarcane industry, first established in the 16th century under Portuguese colonization, created and maintained a semi-feudal power structure that continued to dominate the Northeastern region of Brazil for the next three centuries. The colonization program built on agricultural export commodities laid the foundation for a "land tenure system [that] concentrated

¹ Welch, *The Seed Was Planted*, 350.

the colony's income in the small group of large landowners and the commercial community, and subjugated the rural populations to the hegemony of the landed elite."²

In São Paulo, the coffee industry's labor structure defined the growth of the sugar industry's structure in the 20th century. After the abolition of slavery in 1888, a family-based work system, known as the colonato, pervaded the southern coffee industry.³ Coffee plantation owners contracted free immigrant families, or colonos, to work in the coffee fields until the contracted labor and all debts for the families' transport to Brazil were repaid. Thus, coffee producers were able to maintain their economic interests with little to no agrarian reform. This system remained in place until the 1950s, and the prosperity of the coffee boom allowed some colonato families to experience prodigious social mobility. The decline in the coffee industry began after the collapse of the coffee market in 1930 and the slow transition to sugarcane began.

By the 1950s, the pressure to modernize the sugar industry with extensive mechanization and agricultural technology for a growing domestic and international market pushed dramatic changes in the labor system. With this mechanization process, the previous colonato system collapsed. Modern agricultural complexes began to emerge in which contract short-term employment replaced the longer-term colonato land-labor structure that had preceded them.⁴ Thus, the shift away from coffee production to sugarcane in the Center south coincided with and contributed to decreased wages, diminished investment in community development, and undercut permanent labor in favor of temporary seasonal workers.⁵

² Eisenberg, *The Sugar Industry in Pernambuco*, 7.

³ Welch, *A semente foi plantada*, 51. Welch notes that although the system had been used in tandem with slave labor since 1860, frequent worker protests left coffee producers hesitant and it did not transition to the dominant system until 1890.

⁴ Welch, *The Seed Was Planted*, 8–9.

⁵ Welch, "Mobilizing Rural Workers," 172.

This fundamental shift fomented the growth of rural labor unions in the 1940s and 1950s. It was only in the 1941 that Vargas began the process of forming a rural labor law, which would not take form until 1945 with the formation of the Consolidated Labor Laws.⁶ The movement began in earnest thereafter when rural workers received the right to unionize, through which rural workers would "open their path in the public domain, demanding a voice and a vote, in the sociopolitical and economic life of the country."⁷ The coffee and sugarcane workers used these newly legalized unions to contest severe working conditions, low wages, and came to incorporate demands for federally supported legal land reform, and wage increases.⁸ Leaders like the agricultural worker, Irineu Luís de Moraes, who led the formation of the Dumont Peasant Leagues (Ligas Camponesas de Dumont), rural labor mobilized to successfully influence elections in the region and lead protests for agrarian reform and labor rights.⁹ As anthropologist Verena Stolcke points out, workers identified the pre-1964 period as a "time of plenty" when "all the poor sang."¹⁰ While this seems odd given the extensive political and economic struggles of the era, it reiterates workers' reflections on the time as one in which they were able to actively proetest and hope for substantive change. These opportunities seemed less plausible thereafter under the new military regime.

Alongside the growing rural labor movement, a separate but effective industrial labor movement emerged around the urban centers. Labor mobilization had pervaded the industrial growth of the city of São Paulo, beginning in the textile and metallurgy industries in the early

⁶ Welch, A semente foi plantada, 108–112.

⁷ Welch, *A semente foi plantada*, 40.

⁸ Welch, "Mobilizing Rural Workers," 172–179.

⁹ Welch, A semente foi plantada, 151.

¹⁰ Verena Stolcke, *Cafeicultura: homens, mulheres e capital (1850-1980)* (São Paulo: Editora Brasiliense, 1986), 308 and 327 as cited in Welch, *A semente foi plantada*, 41.

20th century.¹¹ Industrial workers won important labor rights with the establishment of the CLT as well, including a required minimum wage.¹² Indeed, in the early 1950s, with the return of the populist Getúlio Vargas to the presidency, some of the Ministry of Labor's controls loosened and industrial workers to further extended workers' basic labor rights through large-scale minimum wage deliberations.¹³

Political tensions between the unions, political leaders and the elites continued to grow throughout the early 1960s in both the city and the countryside. Following the unexpected resignation of President Quadros in 1961, the contentious former Minister of Labor of President Vargas, Goulart, came to power. Goulart's ties to worker movements accelerated military fears of a communist revolution in the country. Conservative forces, including the military, most feared the threat of Goulart's support of land reform, workers' minimum wage increases, and more broadly the growing economic crisis. These conditions would lead to the military coup in March 1964, after which the military and police quickly and violently repressed leftist leaders from union leaders to political "subversives."¹⁴

Beginning in the 1960s, the new sugar export opportunities drove a growing focus on agro-industrialization. After the coup, the new military government more explicitly pursued an

¹¹ See Joel Wolfe, *Working Women, Working Men: Sao Paulo and the Rise of Brazil's Industrial Working Class, 1900–1955* (Durham: Duke University, 1993), 2–5; For more on industrial labor mobilization in São Paulo, see classic studies such as: John French, *The Brazilian Workers' ABC: Class Conflict and Alliances in Modern São Paulo* (The University of North Carolina Press, 1992); Barbara Weinstein, *For Social Peace in Brazil: Industrialists and the Remaking of the Working Class in São Paulo, 1920–1964* (Chapel Hill: University of North Carolina Press, 1996).

¹² In fact, anthropologist James Holston argues that these laws were one of several toward redefining Brazilian citizenship rights to include larger portions of the population throughout the 20th century. James Holston, *Insurgent Citizenship: Disjunctions of Democracy and Modernity in Brazil* (Princeton: Princeton University Press, 2009), chapter 5.

¹³ Wolfe, Working Women, Working Men, 171-185.

¹⁴ Thomas Skidmore, *Brazil: Five Centuries of Change* (Oxford: Oxford University Press, 2010), 150–151.

agro-industrial development model focused on maintaining and proliferating landowners and large-scale producers' control over low-cost rural workers in support of economic growth.¹⁵ Government officials controlled the "problematic" social unrest that preceded the coup with both formal legal intervention and force, solidifying landed elites support and executing the military's commitment to security as a means to development.¹⁶ These major changes in the Brazilian national development agenda particularly influenced Ribeirão Preto's socio-economic profile in the 1960s through the 1980s as a major sugar-alcohol hub in the country.

Labor Reforms and the Military Dictatorship: Making the Modern Sugar Worker

Two major legal reforms of the 1960s combined with the military government's own economic development polices to significantly diminish rural laborers political and economic position in this period. First, President Goulart passed the Rural Worker Statute (*Estatuto de Trabalhador Rural-* ETR) before his ouster in 1964. The ETR extended urban workers' labor rights to rural workers. Full-time rural workers gained the right to worker registration cards that confirmed employment and required employers provide certain benefits like health care, social security, and legal assistance, holidays, a paid weekly rest day, unionization, job stability after 10 years of work, and a minimum salary.¹⁷

¹⁵ This is a simplified explanation of a far more complicated conflict. See Welch, *The Seed Was Planted* for a more in depth discussion of the issues at play in the 1964 coup and their impact on rural labor movements in the São Paulo.

¹⁶ Stepan discusses the influence of the Superior War College on the pervasive influence of this ideology on military leaders in this era. See Stepan, *The Military in Politics*, chapter 8; See also, chapter 3 of this dissertation, 99.

¹⁷ Silva, *Errantes*, 63-64; Luiz Antonio da Silva, "Sindicalismo, assalariados rurais e a luta pela cidadania," in *Modernização e impactos sociais: o caso da agroindústria sucro-alcooleira na região de Ribeirão Preto (SP)*, Rosemeire Scopinho e Leandro Valarelli, org, (Rio de Janeiro: FASE, 1995): 87. For more on urban labor reforms that first consolidated these rights under

Seemingly beneficial, the new extension of these regulations would force employers to pay more to workers than they had in the earlier structure, cutting into their profits. They quickly found ways to exploit loopholes to their benefit with the use of salaried temporary workers excluded from the ETR requirements. Full-time rural workers could technically use labor courts to contest labor abuses, but these important legal reforms created an entire labor force that existed "outside" the state's legal protection.¹⁸

The military government would go to further lengths to undercut laborers' rights and support usineiros' use of employment loopholes to their benefit. The Médici administration issued Decree n. 5889 in 1973, essentially revoking the ETR gains by legalizing the differentiation between temporary agricultural workers and permanent workers. The Geisel administration then issued Decree n. 6.019 in 1978 further minimizing salaried laborers rights by qualifying temporary workers as those that did not remain employed for more than 90 days, and, if contracted by an intermediary, that worker had no right to rural laborer benefits. The ETR and the subsequent amendments in 1973 and 1978 provided a legal exception for usineiros to not employ workers full-time but rather to focus on contract seasonal workers that did not meet the requirements for full-time benefits that employers did not want to pay.¹⁹

The second law, the Land Statue (*Estatuto da Terra*- ET) was a product of the military dictatorship and its evolving economic development policy. First military President Marshal Humberto Castelo Branco and his Minister of Planning Roberto de Oliveira Campos used

President Getúlio Vargas in the 1940s, see Fischer, A Poverty of Rights and Holston, Insurgent Citizenship.

¹⁸ Full time workers did try to use formal legal means to contest abuses by usineiros in the Labor Court of Ribeirão Preto in the 1980s. These files are stored at the Arquivo Público e Histórico de Ribeirão Preto. Clifford Welch analyzes these cases between 1957 and 1964 in his extensive work on rural labor mobilization in Ribeirão Preto prior to the dictatorship. Welch, *A semente foi plantada*, 279–289.

¹⁹ da Silva, "Sindicalismo, assalariados rurais e a luta pela cidadania," 89; Silva, *Errantes*, 115.

agricultural expansion as an orthodox approach to stabilizing the troubled economy in the first years after the coup, laying the foundation for agricultural modernization to become "a key to economic development" under the dictatorship.²⁰ Campos structured the ET in the first months after the coup in response to earlier demands for agrarian reforms. The law pushed rural development by "modernizing the latifundia and consolidating smaller land holdings into capitalist enterprises" using land taxes, zoning, and a rural land registry.²¹ The law actually reformed very little agrarian landholding in practice. Internal military conflicts between hard-liners and moderates hindered its application, but the law solidified the military's support of land consolidation rather than diversification in order to expand production.

The ET was the first step in the military government's economic development plan, which took clearer shape under the tutelage of the next Finance Minister Antonio Delfim Neto, during General Artur da Costa e Silva's presidency in 1967. Neto waived taxes on farm products and included significant tax breaks for industrialized products like fertilizer, tractors, and processing equipment to incentivize the type of mechanized, capitalist development that the government wanted. Landowners consolidated their power under the ET. The legislation legalized the displacement of small farmers in favor of larger landholdings. This modernization

²⁰ Neto, *Estado e agricultura no Brasil*, 53; Houtzager, "State and Unions," 114. The famous Brazilian economist Celso Furtado contested the agricultural policies, claiming that Castello Branco and Campos subjected the country to a "pastoralization" plan. This economic modernization program driven by loose credit really took shape under the following Minister of Finance Delfim Netto in 1967. Skidmore, *The Politics of Military Rule*, 68–70, 90–92.

²¹ Historian Peter Houtzager notes the important role paulista business groups had in the development of the law and the disproportionately favorable position they had in its structure. Houtzager, "State and Unions," 112. See also, Roberto Campos, "Agricultura, reforma agrária e ideologia," *Folha de São Paulo* (November 12, 1995). Accessed August 29, 2014: http://www1.folha.uol.com.br/fsp/1995/11/12/brasil/4.html.

focus, beginning with the ET in 1964, restructured labor relations while the dictatorship effectively silenced agrarian debates with extreme suppression of rural union leaders.²²

The ET and ETR were crucial to agro-industrial growth in the 1970s and 1980s. The nominal expansion of rural labor rights and agrarian reform driven by the ET and ETR paved the path for the dramatic growth of temporary contract workers in rural agricultural production like sugarcane, oranges, cotton, and peanuts. These regulations ensured the low labor costs necessary that allowed for relatively cheap yet substantial industrial expansion in the sugar industry throughout Proálcool.²³ At the same time that the government employed these legal transformations, a tacit reconstruction of Ribeirão Preto followed these new agro-industrial demands.

Ribeirão Preto in the New Sugar Economy

The expansion of sugarcane production dramatically changed the Ribeirão Preto countryside as the national agenda focused more on agricultural exports to drive economic growth under the military dictatorship. The legal justification for temporary workers contributed to an expanding migration to the region to fill the sector's rural labor demand.

Migration heavily favored Ribeirão Preto in the 1960s. While the military government instituted federal legal reforms, Northeastern migration accelerated to provide a ready workforce to fill the temporary labor demand that developed in conjunction with expanding agricultural and

²² da Silva, "Sindicalismo, assalariados rurais e a luta pela cidadania," 87. See Pereira, *The End* of *Peasantry* for effects on Pernambucan rural labor unions and Welch, *The Seed Was Planted* and *A semente foi plantada* for more on São Paulo impact. For an alternative interpretation of state and union control, see Houtzager, "State and Unions."

²³ Paulista sugarcane businessmen were able to influence policy and draw federal funding disproportionately to the state of São Paulo, and specifically Ribeirão Preto, even before Proalcool. The São Paulo Sugarcane Cooperative, Copersucar, was an important part of this political maneuvering. See Hartzmark, "Businesses, Associations, and Regions."

industrial production in São Paulo. First, landowners legal right to greater land consolidation legitimized an accelerating process of land expropriation that had driven Northeastern rural labor strikes prior to the coup in the 1950s and 1960s. Additionally, increased droughts in the Northeast and the promise of higher wages in the Southeast enticed rural workers to migrate south, particularly to the booming state of São Paulo.

In the sugar industry, the agro-industrial development model focused on technical improvements and mechanization had an adverse effect on workers. Historian Clifford Welch notes,

"Between 1950 and 1970, the number of permanent rural workers in the Upper Mogiana [the greater Ribeirao Preto region] diminished by 65% while the number of temporary workers, commuting daily from the city to the countryside, increased by 15%. The demand for manual labor was reduced with the concentration of land, more developed agricultural techniques and with the use of machinery."²⁴ For example, Maurilio Biagi's use of the trucks to transport sugarcane at the Usina Santa Elisa

drew attention to the Usina Santa Elisa as one o the most advanced usinas in the country but also

set a the path toward more mechanized production and agricultural practices in the region. Thus,

the modernization efforts of the era and the increased focus on export market would relied

heavily not on permanent rural workers but instead on a new source of labor, temporary rural

workers, to undergird the industry's growth.

The connection between the expansion of sugar production and the growth of temporary rural workers is clear. In the sub-region of Sertãozinho within Ribeirão Preto, where the Usina Santa Elisa is located, less than 40% of rural laborers were considered pv permanent laborers by 1960.²⁵ This trend in Sertãozinho, and more broadly the region, preceded the new legislation that

²⁴ São Paulo Secretaria da Economia e Planejamento (Seplan) *Trabalho volante na agricultura paulista* (Estudos e pesquisas) n. 25, 1978, p. 220–225 as cited in Welch, *A semente foi plantada*, 286n81.

²⁵ Welch, *A semente foi plantada*, 298.

facilitated greater dependence on temporary labor in the 1963 and 1964. This practice accelerated in the 1960s and early 1970s behind the IAA's modernization efforts before the creation of Proalcool in 1975.

Labor recruiters facilitated the migrations of some rural workers. Landowners exploited the legal parameters of the ETR by employing *empreiteiros*, or labor contractors, to recruit and employ contract rural laborers rather than directly employing full time laborers.²⁶ These contractors used recruitment programs to draw workers to meet employment demands with loans to pay for transport, coercion, and exploitative propaganda. Contractors' recruitment practices were exploitative. They often trapped workers with exorbitant charges on transportation from their native regions to the town of the employer, housing, and work materials. These purchases exceeded their expected pay for the season. Thus, many workers were forced to stay in their migrant cities rather than returning to their native regions in the interim off-season.²⁷

The creation of the National Alcohol Progam drove job creation in the sugarcane industry due to Proálcool-driven sugarcane expansion in Ribeirão Preto in the 1970s and 1980s. In fact, the expansion of jobs in the interior exceeded that of the Greater São Paulo region, in which the growing temporary rural laborers were an important part.²⁸ This drew high numbers of migrants to the region, which included direct migration from the Northeast and Minas Gerais as well as

²⁶ For a detailed history of the *colonato*, or the rural labor system that dominated the region before the ETR, and a more detailed account of the rise of the labor contractor under the new rural labor system, see Stolcke, *Coffee Planters, Workers, and Wives*, particularly chapter 4, "New Forms of Labor Exploitation and New Conflicts."

²⁷ Rosemeire Aparecida Scopinho, "Modernização e superexploração na agroinduústria sucroalcooleira," *Modernização e impactos sociais: o caso da agroindústria sucro-alcooleira na região de Ribeirão Preto (SP)*, Rosemeire Scopinho e Leandro Valarelli, org, (Rio de Janeiro: FASE, 1995), 76.

²⁸ Maurilio Biagi Filho states that from 1970 to 1986, jobs in the interior of Sao Paulo increased by 121% compared to 54% in the metropolitan region of São Paulo. Maurilio Biagi Filho, "A industrialização do interior" *Isto É Senhor* (November 8th, 1988), 34.

indirect migration through the city of São Paulo into the interior. Migration from the city increased as Proálcool expanded in the early 1980s and the industrial economy contracted in an increasingly stagnant industrial market. Thus, a large supply of cheap labor became available, and planters took advantage. Legalized with the new ETR legislation discussed above, temporary workers lowered their costs.

Minas Gerais migrants were the most abundant in Ribeirão Preto.²⁹ Sociologist Maria Aparecida de Moraes Silva's study of temporary rural workers, or *bóias-frias*, and their migration to the Ribeirão Preto region from the Vale do Jequitinhonha in Minas Gerais reveals important and surprising statistics about migration to the region in the Proálcool era. Ribeirão Preto became a major permanent and seasonal migration destination for rural workers in the 1970s and 1980s. According to a 1980 study, between 1970 and 1980 alone, 120,030 people permanently migrated to the region. Of those workers, Minas Gerais and Paraná furnished the largest number of inter-state migrants, although a significant number came from the interior of Bahia and a smaller number from other Northeastern states as well. In fact, the largest number of migrant workers came from other regions within the state of São Paulo, including the Greater Metropolitan region of São Paulo.³⁰ In fact, between 1980 and 1991, the Ribeirão Preto region had a higher rate of population growth than the entire state of São Paulo and the entire country.³¹

³⁰ Silva, *Errantes*, 68–72; A.C.C.R. Motta and M.C. "Quinteiro, Repercussões do Proálcool no comportamento migratório do Estado de São Paulo: o caso de Ribeirão Preto," *Informe Demográfico (São Paulo)* (Fundação SEADE, n. 10, 1983) cited in Silva, *Errantes*, 69.

²⁹ São Paulo Secretaria de Economia e Planejamento Coordenaria de Ação Regional, *Plano Regional de Ribeirão Preto*, 7.

³¹ This applies to the macroregion of Ribeirão Preto, which is larger than the administrative region of Ribeirão Preto. However, the administrative region of Ribeirão Preto had the second highest rate of population growth in the same period behind the macroregion. Rosemeire Aparecida Scopinho, "A região de Ribeirão Preto e a agroindústria sucro-alcooleira," *Modernização e impactos sociais: o caso da agroindústria sucro-alcooleira na região de*

By 1990, around 40,000-50,000 workers in the region were seasonal, returning to their native regions at the end of each harvest. Over half of these migrant laborers came from the neighboring Minas Gerais, less than 6% came from Paraná, and less than 1% came from the other states, including the Northeast.³² Thus, the particularly concentrated Proálcool-specific modernization of Ribeirão Preto region incentivized a significant increase in both permanent and seasonal migration in the 1970s and 1980s.³³

While Ribeirão Preto led an increasingly mechanized sugar production model, demand for rural laborers remained high. Mechanization displaced permanent workers along with the additional impact of rural labor legislation like the ET and ETR. Clifford Welch notes, "machines had become a normal part of life in the agro-industrial complex of paulsita sugar production." The increasing use of machines in Brazilian agriculture also pushed conflict between temporary workers and mill owners.³⁴ Sugarcane cutting remained a manual laborintensive job in the 1970s and early 1980s, but the pressures of mechanization would further usurp the stability of temporary workers' positions as well.

Ribeirão Preto (SP), Rosemeire Scopinho e Leandro Valarelli, ed., (Rio de Janeiro: FASE, 1995), 40.

³² 52.9% were from Minas Gerais, 5.9% from Paraná, and less than 1% came from Pernambuco, Bahia, Espirito Santo, Goiás, Rio de Janeiro and Pará. Silva, *Errantes*, 71.

³³ According to the IEA (Instituto de Economia Agronomica), in the Ribeirão Preto region, land committed to cane production more than tripled under the dictatorship's modernization efforts thanks to Proalcool, increased from 182,500 hectares in 1968 to 624,700 hectares in 1989. As cited in Silva, *Errantes*, 68.

³⁴ Scopinho, "A região de Ribeirão Preto e a agroindústria sucroalcooleira," 26; Welch, *A semente foi plantada*, 436–437. In fact, Clifford Welch notes that the Guariba Strikes in 1984 would only accelerate mechanization as employers sought to avoid the social costs of labor conflict in sugar production.

The Declining Brazilian Economy, 1980-1984

No account of the Brazil in the early 1980s would be complete without a brief account of the collapsing economy that surrounded the alcohol industry. This section introduces the traditional analysis of the economy's decline and Ribeirão Preto's general immunity thanks in large part to the growth of the sugar sector around the state-driven alcohol industry. In the midst of these major changes, Ribeiraão Preto's image as an island of success, commonly known as the Brazilian California, emerged.

The military dictatorship began in response to the national economic crisis of the early 1960s. They used this economic distress, particularly rampant inflation, as an indicator of the political mismanagement of the democratic-elected Goulart. Thus, it is not without a touch of irony that the same inflation problem would derail the military government's legitimacy in the early 1980s. While inflation had been an alarming 90% in 1964, after which the military intervened, in 1980, inflation surged to 110%. By 1984, the national inflation had reached 224%.³⁵

The extensive demands on government financing employed by the multiple state-led programs developed in the 1970s required extensive foreign debt to support its economic growth model, thus beginning a period of debt-led development. The public sector held much of the growing foreign debt.

In 1979, when the second oil shocks hit, the Brazilian economy suffered again, but this time, it did not have the fiscally sound economic foundation of the "Economic Miracle"-era to fall back on. Instead, foreign debt was already "taking up two-thrids of export earnings," while

³⁵ See Table 16 in the Appendix of this dissertation. See also, Skidmore, *Brazil: Five Centuries of Change*, 169–170.

inglation continued to rise and GDP growth rates threatened to stagnate again.³⁶ The new president, General Figueiredo, had to deal with these issues will trying to maintain export incentives that had driven growth, particularly in the sugar industry, during the early 1970s.³⁷

By December 1979, government officials turned to more orthodox and harsh economic solutions. The new economic package called for a "currency devaluation, elimination fo export subsidies and various tax incentives, increases in the price of public services, temporary taxes on windfall gains in agricultural exports (later abolished)," amongst others.³⁸ These were still unsuccessful as inflation continued to rise.

President Figueiredo and his economic team attempted to impose even steeper macroeconomic policy reforms in the second half of 1980. They tightened up the monetary policy and notably curtailed investments in state programs, including Proálcool.³⁹ However, the policies ultimately affected durable and capital goods the most, and the coutnry's external debt continued to rise. By 1982, debt service (amortization plus interest) accounted for 83% of export earnings. By the end of 1982, the disastrous economic conditions forced the Brazilian government to seek aid from the International Monetary Fund (IMF). Although the Brazilian government continued to contest the terms of the agreement, the trade balance began to improve in 1983.40

Workers were directly affected by these new economic realities despite the industry's growth. First and foremost, the galloping inflation eroded their real wages even if nominal prices increased. At the same time, the recessionary economic conditions of the early 1980s pushed

³⁶ Baer, *The Brazilian Economy* 6th ed., 83.

³⁷ Ibid.

 ³⁸ Baer, *The Brazilian Economy* 6th ed., 84.
 ³⁹ Baer, *The Brazilian Economy* 6th ed., 86.

⁴⁰ Ibid. 86–88.

workers out of other industries. Thus, despite the exploitative realities of these jobs, workers still flocked to the region in response to the midst of Brazil's economic struggles in the 1980s.

Reapproaching Rural Labor's Importance to Development

Given this basic synopsis, rural workers, as an extension of an important element of the dictatorships' economic policy, were an important part of the dictatorship's legitimacy from its inception. Rural labor mobilization drove the military's action in 1964 after active strikes in both the Northeast and the Southeast throughout the 1960s although the Peasant Leagues of the Northeast have garnered more attention.⁴¹ The military's repression was swiftest against these workers and their leaders. Connecting agrarian reform to wage demands and evolving ideas of workers' rights, rural worker protests were key to the military's extreme action. Controlling workers, but particularly rural workers, was a fundamental part of the military's defense of the socio-economic status quo. The military government silently dismantled these rural labor movements with the application of important legal reforms, like the ET and the ETR, to enact its own modernization project in the 1960s and 1970s, of which Proálcool was the largest and most influential in the Ribeirão Preto region. Rural workers continued to migrate to the region in the hopes of finding better pay and decent working conditions than those they left behind, often to their disappointment.

The very make-up of the region transformed around the growing sugar agroindustry. Where fields of trees had once covered the region deforestation accelerated to support sugarfield

⁴¹ For a comparison of the 1961 Guariba strikes and the 1984 Guariba strikes, see Welch, *A* semente foi plantada, 419–437. Also, Clifford Welch and Sebastião Geraldo, *Lutas camponesas* no interior paulista: memorias de Irineu Luis de Moraes (São Paulo: Paz e Terra, 1992). Verena Stolcke points out that São Paulo, Rio Grande do Sul, and Paraná witnessed extensive rural mobilization prior to the dictatorship in her work on coffee and labor. Stolcke, *Coffee Planters, Workers, and Wives*.

expansion. In fact, sugarcane expansion had a damning impact on the decimation of the remnants of the Atlantic Forest in this era. Warren Dean notes that, "In the Ribeirão Preto district of São Paulo, sugarcane was responsible for almost half the loss of primary forest between 1962 and 1984 and was even more damaging to savanna formations, destroying 457 square kilometers of it."⁴² Today, one sees unending miles of sugarfields alongside the highway approaching Ribeirão Preto. This transformation was dramatic and relatively quick. Workers that came to the region in this period to work the cane fields would be most susceptible to these transformative effects.

Ribeirão Preto's economy, agricultural landscape, and its population were intricately connected to sugar production by the 1980s. Thus, the intensification of alcohol production under Proálcool would have the most poignant impact on workers' lives. However, these workers found a means to influence national debate about the program in 1984 thanks to the region's critical importance to the program's success.

⁴² Dean, With Broadax and Firebrand, 294. See chapter 3 of this dissertation, 95n3.

Chapter 6: Changing the Tide: Proálcool, Caneworkers, and the Guariba Strikes of 1984

"The reasons [for the Guariba strikes] are so clear, so known, that this explosion is only surprising for not having happened earlier." Historian José Murilo de Carvalho, *Folha de São Paulo* May 16th, 1984

By the beginning of 1984, Brazilian sugarcane production had more than quadrupled over the previous decade under the national alcohol program, Proálcool. These numbers were even more drastic in Ribeirão Preto, a region that produced over a third of national alcohol production and a fourth of national sugar production, respectively.¹ This study has contested that alcohol production followed a development trajectory different from the traditional Brazilian development models of the era, thanks to intense government intervention and a decidedly diminished foreign presence in the industry. Proálcool ensured this unique process with the development of the alcohol-fueled car and sugar producers' massive expansion of sugarcane production to supply the program-created demand.

Yet, sugarcane workers are largely left out of this development discussion despite their critical importance to the region's intense sugarcane expansion under Proálcool in the 1970s and 1980s. Temporary workers provided the labor that accompanied the massive expansion of the sugar industry in this period.² However, workers' absence from national discourse on Proálcool briefly reversed at the beginning of the São Paulo harvest in May 1984 in the town of Guariba, São Paulo (see Figure 6 below). When over 5,000 temporary salaried sugarcane workers, known as *bóias-frias*, went on strike to contest extended workdays, poor work conditions, underpay, and

¹ Maurilio Biagi Filho, "O álcool é nosso," *Folha de São Paulo* (May 9th, 1983). Ernesto Paglia, *Rede Globo* (June 1984) in "Boias-frias e o Acordo de Guariba ápos a greve de 1984," (July 24th, 2014), YouTube, <u>https://www.youtube.com/watch?v=9ZiZbF6WYUk</u>. Accessed May 1st, 2015. ² For more detail on this process, see chapter 5.

poor transportation services among other complaints, these workers finally gained national attention.³



Figure 6: The Region of Ribeirão Preto and its Satellite Cities⁴

Map: Celso Donizetti Talamoni, Eliana Mastroianni Dieguez, and Teresa Cabral Jahnel. "Região administrativa de Ribeirão Preto." São Paulo, SP: Instituto Geográfico e Cartográfico, 2003. http://www.Ribeirãoeregiao.com.br/mapas.asp.

I argue that the Guariba strikes introduced the realities of sugarcane workers labor

conditions under the national program into already brewing critiques of the social impact of the

program in the public eye. Sociologist Maria Conceição D'Incao studied temporary workers'

³ The term *bóias-frias* means cold-sandwiches in reference to the cold lunches that fieldworkers ate in the fields during their long workdays. The term ha s a generally negative connotation. Ubaldo Silveira, *Igreja e conflito agrário: a comissão pastoral da terra na região de Ribeirão Preto* (Franca: Unesp, 1998), 14. "Proálcool, quem sai ganhando," Cadernos de Estudos, no. 11, published October 1984. Brazilian Popular Groups: agrarian reform Collection, UNICAMP-AEL.

⁴ Located about 50 kilometers southeast of Sertãozinho and a little under 60 kilometers from the central city of Ribeirão Preto, Guariba remained far more rural than the more dominant cities of Ribeirão Preto, Sertãozinho, and Jaboticabal, The usinas São Martinho and Bonfim encircle the city, both benefactors of the state-led program.

lives in the 1970s and 1980s in the middle of the strikes outburst. More recently Cliff Welch and Maria Aparecida de Moraes Silva have connected temporary sugarcane workers' strikes in the Ribeirão Preto region to larger rural labor mobilization movements in the region's history. Their work illuminates the connection that these workers had to the movement and continued mobilization efforts of these workers with the reconstruction of the sugar and alcohol industry after the strikes.⁵ This work contributes to these important rural labor histories by broadening the analysis of the Guariba strikes influence on the discourse around Proálcool.

The strikes questioned the key tenets of the military's development agenda employed through Proálcool. Their actions assert their place in the program's implementation, be they disjointed and refracted through the national lens. In the midst of shifting public opinion about the program, the Guariba strikes contributed to a tipping point. The military dictatorship had held its political legitimacy through economic success since the "economic miracle" in 1968-1970. As the economic crisis of the 1980s fostered increased national discord, Proálcool came under increased fire about not only its economic impact but also its social impact. The previous chapter highlighted the extensive growth in alcohol production thanks to Proálcool and the influence of private businessmen, like Maurilio Biagi Filho, on alcohol's expansion. However, the events in Guariba strikes are an important addition to a study of sugarcane, alcohol, development, and Ribeirão Preto because it fills out the spectrum of participants, though deeply marginalized, that were able to influence the final word on the program at the end of its expansionary phase.

⁵ Maria Conceição D'Incao e Mello, *O bóia-fria: acumulação e miséria* (Petrópolis [Brazil]: Editora Vozes, 1975); Silva, *Errantes*; Welch, *A semente foi plantada*.

Proálcool by 1984: Growing Criticism, 1982-1984

By May 1984, Proálcool had approved 489 sugarcane distillery projects, which accounted for over 10 billion liters of alcohol per harvest year. Having increased from 1.2 billion liters in 1975, the southern and southeastern region accounted for 65% of Proálcool's increased production.⁶ To successfully lead such an expansion, Proálcool had to have a dramatic impact not only on business development, but also the economic and agricultural composition of the region. Nationally, the government authorized the subsidized expansion of sugarcane production capacity to meet Proálcool-driven demand. In 1972, Brazil cultivated 1,541,033 hectares (over 28.5 million acres) of land with sugarcane. This included 619,743 hectares of land in the state of São Paulo alone. By 1983, this number had more than doubled nationally and nearly tripled in the state of São Paulo (See Table 9).⁷ In fact, sugarcane production expanded so quickly that a Pastoral Land Commission pamphlet from Mato Grosso claimed that the program had turned Brazil into "an ocean of sugarcane."⁸

If Brazil was an ocean of sugar, Ribeirão Preto was at its center. Sugarcane's expansion was particularly acute in the region. Between the 1974/75 harvest and the 1980/81 harvest, cane

⁶ Pamplona, *Proálcool*, 22-23. Overall Proálcool had approved 499 projects of which ten were from different sources (manioc, babassu nut, and sweet sorghum). Overall, Proálcool accounted for 10.2 billion liters of alcohol per harvest by this period. These regions represented 85% of national gasoline consumption, thus targeting its prime consumption regions. ⁷ Barzelay, *The Politicized Market*, 31.

⁸ Associação de solidariedade as comunidades carentes de MT (Mato Grosso), Comissão Pastoral da Terra/regional de MT, and Centro de documentação terra e indio, "Pro-álcool: Mar de cana, mar de miséria," (Cuiabá-MT, 1984): 10–11. Brazilian Popular Groups: Agrarian Reform Collection.

cultivation expanded in the region by 63%.⁹ Extensive deforestation and the diminished variety of crops in favor of a single-crop economy drew increasing attention from critics.¹⁰

	1972	1977	1980	1983
Brazil	1,541,033 ha	2,176,218 ha	2,675,646 ha	3,720,300 ha
São Paulo	619,743 ha	927,500 ha	1,217,900 ha	1,836,830 ha

 Table 9: Areas Cultivated for Sugar Production under Proálcool¹¹

 Source: IAA as cited in Pamplona, *Proálcool*, 33 Table XVII.

In the two years leading up to the strikes, criticism of the program mounted. When the powerful Minister of Planning Delfim Neto questioned the inflationary influence of the program and froze national financing of the program in 1982, public opinion quickly turned on the national program. Although alcohol-fueled car sales rebounded following extensive marketing by sugar and alcohol producers and additional government incentives, critics remained vocal.¹²

Some critics, like Professor Fernando Homem de Melo, spoke out often against Proálcool. In response to Biagi Filho's promotion of Proálcool, he notes the inefficient nature of the alcohol industry. Homem de Melo argued that the program was really the product of sugarcane lobbyists that "pressur[ed] a political and economically authoritarian government," which supported a "coalition of planters, mill owners, equipment producers, the automobile

⁹ Scopinho, "A região de Ribeirão Preto e a agroindústria sucroalcooleira," 31.

¹⁰ Fernando Homem de Melo was one of the most outspoken critics of Proalcool and its social and environmental impact on the population. For a few examples, see Fernando Homem de Melo, "Por que o álcool não é a melohor alternativa?" *Revista Exame* (São Paulo), v. 256 (July 28th, 1982), 102; "Crise agrícola," *Folha de São Paulo* (February 13th, 1983), 18; "O álcool é nosso, mas quem paga o desperdício?" *Folha de São Paulo* (May 15th, 1983), 40; "O problema é mais sério do que se imagina" *O Estado de São Paulo-Suplemento Agrícola*, São Paulo, (October 26th, 1983), 3.

¹¹ Hectare (ha)= 2.471 acres.

¹² See Chapter 3 of this dissertation, 190–192.

industry, and middle and high income classes.¹³ A rather acute and astute review of the program, Homem de Melo also highlighted the low production efficiency of the Brazilian sugar industry compared to production in Hawaii, Florida, Australia, and other more efficient regions internationally. Instead, Homem de Melo pointed to more efficient alternative fuel options like coal, shale oil, hydro-electricity as better alternative energy options.¹⁴

In fact, some of the interest groups that had benefitted most from the program began to question its long-term durability. For example, in the midst of the program's economic struggles in June 1983, the new ANFAVEA (National Automobile Producers' Association) President Newton Chiaparini suggested that the government "limit the incentives for the alcohol-car and questioned the production of a sufficient amount of alcohol-fuel to supply the fleet at the current growth rate [of car sales]."¹⁵ Doubters voices grew as the program's dependence on national financing drew increasingly negative attention.

Supporters of the program quickly spoke out against the car industry's program's proclamations. Copersucar President José Luiz Zillo noted the hypocrisy of the car industry's position. He stated, "However, while the alcohol-fueled car was the salvation of the industrial complex no one complained. Now that the alcohol car represents 81% of sales, the [automobile] sector changes its position."¹⁶ Equally outspoken, Maurilio Biagi Filho, one of the strongest supporters of the program, reinforced the program's nationalist connections to draw support to the program's impact. He called those that questioned the program, like ANFAVEA President

¹³ Fernando Homem de Melo, "O álcool é nosso, mas quem paga o desperdício," *Folha de São Paulo* (May 15th, 1983) as cited in Cláudio de Araújo Peçanha, "O álcool é do povo brasileiro," *O Diário* (May 31st, 1983).

¹⁴ Ibid. For a more comprehensive account, see also, Homem de Melo, *Proálcool, energia e transportes*, 5–31. Barzleay's assessment of the program follows Homem de Mello's quite closely.

 ¹⁵ "Productores de alcohol acusam as montadores," *Folha de São Paulo* (June 10th, 1983).
 ¹⁶ Ibid.

Chiaparini, "unpatriotic." Instead, Biagi claimed that the program remained "a part of Brazil's energy solution and can not be under attack at such a difficult moment in the country's economic recovery."¹⁷ For both supporters, the country's economic realities should not apply to reviews of the national program.

The car industry's doubts were not new but rather returned to concerns voiced about the program in its early implementation. Minister of Energy and Mines Shigeaki Ueki and even IAA President Tavares de Carmo, who questioned the sugar industry's ability to produce enough alcohol to fuel the program's more conservative goal alcohol-mixture goals in 1975.¹⁸ After involving the car industry more deeply with hydrous alcohol fueled cars, these questions became more pertinent given the alcohol-fueled car sales rate of around 450,000 cars per year in 1983.¹⁹ Copersucar President Zillo guaranteed that there would be no alcohol shortage, citing the forthcoming 7 billion liters of alcohol committed for the 1983/84 harvest with expectations of producing 8 billion in the 1984/85 harvest.²⁰ Such a guarantee put even more pressure on alcohol producers, who sought more ways to push productivity in their work force in 1984.

Supporters of the program also turned to the program's positive impact on labor to validate the program as questions about its financial efficiency mounted. For example, the avid Maurilio Biagi Filho argued Proálcool's positive influence on the economy in an opinion editorial submitted to the *Folha de São Paulo* on May 9th, 1983 just before the new harvest began. Biagi Filho noted that Ribeirão Preto had many jobs available for sugarcane workers

¹⁷ Ibid.

¹⁸ See chapter 4 of this dissertation, 163–164.

¹⁹ Rubens Rodrigues dos Santos interview with engineer and industrialist João Augusto do Amaral Gurgel, "Valeu a pena investor tanto?" *O Estado de São Paulo* (May 20th, 1984), 48.

²⁰ "Productores de álcool acusam as montadores," *Folha de São Paulo* (June 10th, 1983).

connected to alcohol production in contrast to other industries in the recessionary national economy. He states,

"In this harvest, in the region of Ribeirão Preto alone, [...], more than 11,000 new openings for jobs are available. This is without speaking of other producing regions where usinas and autonomous distilleries absorb large contingents of manual labor while in other sectors of the economy dismissals are accumulating every day that passes."²¹

Biagi Filho also highlighted that producers were not making as much money through the program as it appeared to the public. Rather, "globally, we are losing, and that which keeps us on our feet is a business philosophy that reigns in the sector."²² However, this business philosophy included an increasingly exploitative relationship with agricultural workers.

A growing literature on the social impact of Proálcool has highlighted the detrimental impact Proálcool had on capital and labor relations.²³ This shift was not borne of Proálcool but rather Proálcool was able to succeed in part because of legally structured shifts in these relations had begun in the 1960s and accelerated in the 1970s (see chapter 5). Scopinho argues that Proálcool "definitively opened the doors for the consolidation of capitalist relations to production in Ribeirão Preto agriculture [...]. [The program] consolidate[d] a perverse model of development that brought economic, environmental, and social consequences."²⁴ While this dissertation has explored the economic transformations associated with the program in more depth, the growth of a large salaried temporary work force was one of the most obvious social impacts. Temporary labor drove the expansion of this "perverse model of development" under Proálcool.

²¹ Maurilio Biagi Filho, "O álcool é nosso," *Folha de São Paulo* (May 9th, 1983).

²² Ibid.

²³ For example, Antonio Thomaz Junior, Por trás dos canaviais, os "nós" da cana: a relação capital x trabalho e o movimento sindical dos trabalhadores na agroindústria canavieira paulista (São Paulo: Annablume/Fapesp, 2002); da Silva, "Sindicalismo, assalariados rurais e a luta pela cidadania."

²⁴ Scopinho, "A região de Ribeirão Preto e a agroindústria sucroalcooleira," 32.

By May 1984, project expansion had dramatically diminished in Proálcool. This put even more pressure on the distilleries already established, particularly the largest of them, to produce more alcohol per harvest. Maximizing production capacity, which was one of the tools implicit in Maurilio Biagi Filho's comments about usineiros' entrepreneurial "business philosophy," was built on greater extraction of labor from temporary workers. This point was made explicit in regional usineiros' comments on a new labor policy put in place in the 1983 harvest, known as the seven-rows policy. Thus, meeting the growing Proálcool demand for alcohol-fueled cars, placed additional pressure on the increasingly capitalist agricultural industry, with a direct impact on sugarcane workers' labor and lives. Indeed, laborers' working and living conditions are illuminating in the region rewrite with the most pressure on it to produce for national alcohol market.

Worker Conditions and Everyday Violence

To understand the significance of the Guariba strikes, one must understand not only the legal parameters from which salaried workers emerged but also the conditions in which workers lived and worked. An essential part of workers' experience hinged on their status as temporary or permanent although workers of both statuses lived in similarly precarious conditions. Historians of this period address these workers together as their very division in status was a tool of bureaucrats and usineiros to limit mobilization and extend the military's development agenda with little resistance.²⁵

²⁵ See note 14. Also, Silva, *Errantes*, 61-64; As sociolologist Maria Conceição D'Incao stated in a *Veja* interview following the strikes, "workers do not identify as rural workers," thus hindering worker mobilization. While both are *bóias-frias* to the public, workers themselves disassociated with the term, further empowering the divisive nature of worker laws with social stigmas.

Following the ETR, contractors, known as *empreiteiros* or *gatos*, closely accompanied the expansion of temporary salaried workers in rural labor until changes in rural labor practices undercut these middlemen's position following the 1984 Guariba strikes.²⁶ Padre Bragheto, a priest in the region and important leader of the Guariba strikes in 1984, remembers how poorly contractors and employers treated temporary workers in this period. He states, "the *gatos* mocked all the [labor] legislation."²⁷ Salaried workers remained dependent on these contractors for their jobs. According to journalist Wilson Marini, these intermediaries took around 20% of the salary destined for the canecutter and failed to follow labor laws, pushing workers to accept poor conditions to maintain their jobs in an unstable market.²⁸

Worker status was critical to determining worker pay. A *Veja magazine* report on the Guariba strikes reported that the average caneworker cut five tons of cane per day. These workers worked 8-10 hour days in the fields during the harvest months. Such a worker would make close to Cr\$10,000 daily (little more than USD\$5). In clearer terms, 5 tons= 10,000 pounds. That is 1,000 pounds per hour for \$0.50 per hour!²⁹ However, Moraes Silva's in depth

Interview with Maria Conceição D'Incao, "Despertar do bóia-fria", Emanuel Neri, Veja 821 (May 30th, 1984), 3-6.

²⁶ Silva, *Errantes*, 114-116.

²⁷ Interview with Padre José Domingos Bragheto, Jennifer Eaglin on April 13th, 2013 in São Paulo, SP.

²⁸ Wilson Marini, "Jovem, analfabeto, e inexperiente. "É o bóia-fria" *O Estado de São Paulo* (May 20th, 1984), 18.
²⁹ "Os canaviais da ira," *Veja* 820 (May 23rd, 1984), 24-25. I based the conversion on the

²⁹ "Os canaviais da ira," *Veja* 820 (May 23rd, 1984), 24-25. I based the conversion on the exchange of rate of Cr\$1845.4:US\$1 in 1984 terms. However, with an inflation rate of over 200% in 1984, the actual value of worker pay was even lower in real terms. In fact, real workers' wages had been decreasing consistently over the last year with little wage correction made for this steady trend, further diminishing wage value for rural workers. *Conjunta Economica*, v. 38, n. 7 (July 1984): 65; see also, Baer, *The Brazilian Economy*, 427.

While the *Veja* article estimates that the average worker cuts five tons per day, other studies suggest the average worker cuts closer to 10 tons per day. Unfortunately, I was unable to discuss this topic directly with workers and am unable to resolve the discrepancy. Silva, *Errantes*, 93; Silveira, *Igreja e conflito agrário*, 58; Rosa Ester Rossini, "Mulheres e homens na

study of wages and workers in Ribeirão Preto presents a more complicated system in which sex, age, and status as temporary or permanent drastically influenced the average workers pay. Contractors also hired women, elderly, and children to work in the fields, all of whom they paid less than male workers.³⁰

Take for example the case of Dona Guiomar. The *Globo Rural*, the national station's segment focused on rural Brazil rather than the traditional urban-focused programming, followed Dona Guiomar through a regular day as a canecutter. She prepared her food at 4am in the morning before leaving for work at 5am. Her two sons also worked in the fields as canecutters although she noted the recent prohibition of children in the fields. She expected to make Cr\$150,000 cruzeiros in an entire month. As the head of the household, she paid Cr\$30,000 per month to rent a room in a housing unit that she shared with two other female cane cutters. Her two sons shared the room with her. As the head of the household, she paid the rent plus the additional cost of electricity, gas, and water for housing. This illustrates the pressure that oscillating water prices put on the average cane worker.³¹

força de trabalho na agricultura: o exemplo da macro-área de Ribeirão Preto" Paper presented at the 15th National Conference on Population Studies (ABEP-2006): 11.

³⁰ Conversely, Geographer Rossini study of rural workers pay from 1977 to 1990 estimates that women made about 65% of the wages male workers made in 1977 while they made 75% of the wages that male workers made in 1985 (based on 1977 terms). Rossini, "Mulheres e homens na força de trabalho na agricultura," 12.

³¹ Ibid.



Figure 7: Dona Guiomar³² Source: Reporter Ernesto Paglia, *Globo Rural* (1984).

Cane cutting is arduous work, and laborers suffer work-related injuries often. Using sharp machetes to cut the cane, deep lacerations on the arms and legs were common, as were mangled limbs. Some workers died from heat exhaustion.³³ Other common ailments include breathing difficulty, cramps, dehydration, respiratory infections, poisoning and animal bites, and other pains of physically taxing labor. Usineiros hired their own medics who they paid to downplay extensive work injuries.³⁴ However, without proper pay, access to proper health care, or pay for sick days, these grizzly ailments were all the more life-threatening as workers had to work through these conditions to make enough money to survive and pay their own bills.

Transport to and from the cane fields was precarious at best. Contractors provided transportation to the fields in *pau-de-araras*, or open trucks that packed large numbers of people,

³² Dona Guiomar, pictured in the center, was the topic of a *Globo Rural* exposé in 1984. Ernesto Paglia, *Rede Globo* (June 1984) in "Boias-frias e o Acordo de Guariba ápos a greve de 1984," (July 24th, 2014), YouTube, <u>https://www.youtube.com/watch?v=9ZiZbF6WYUk</u>. Accessed May 1st, 2015.

³³ Interview with Padre José Domingos Bragheto, Jennifer Eaglin on April 13th, 2013 in São Paulo, SP.

³⁴ Scopinho, "A modernização e superexploração," 77.

which were common modes of transportation for rural workers' traveling short and long distances to work in the era. As Dona Guiomar's case illustrates, trucks suited for 45 passengers held 60 in tightly packed, insecure benches.³⁵ Her trip to the fields lasted over an hour. Sharp work tools, tightly packed trucks, and long, bumpy rides to and from work fields were very dangerous. Deadly injuries in highway accidents were a normal occurrence, which local newspapers commonly reported. These tragedies drew little regard for additional safety measures, recompense, or improvements.³⁶

Housing conditions were extreme for these workers. Seasonal workers lived in temporary housing provided by usineiros and contractors on or near usinas in the countryside. These temporary units housed hundreds per barrack, with cases ranging from 500 to 800 workers at times.³⁷ Padre Bragheto recalls the conditions when he went to visit workers. He claims, the units were "barracks that in reality were old coffee houses that had been adapted into precarious housing" for these temporary workers.³⁸ A 1984 exposé on an "alojamento" on the Fazenda São Vicente that provides sugarcane for the usina Santa Elisa paints a detailed picture of the desperate conditions in which workers lived.

³⁵ Ernesto Paglia, *Rede Globo* (June 1984) in "Boias-frias e o Acordo de Guariba ápos a greve de 1984," (July 24th, 2014), YouTube, <u>https://www.youtube.com/watch?v=9ZiZbF6WYUk</u>. Accessed May 1st, 2015.

³⁶ Federação de Órgãos para a Assistência Social e Educacional, *Boia-fria, Sangue Quente: Mobilização e Resistência dos Assalariados Temporários Rurais* (Jabotical: Fase, 1987mimeo.), i-ii. For examples, see Jau cases, Folder 50z383-J, Arquivo Público do Estado de São Paulo: São Paulo.

³⁷ Élcio Thenório, *Jornal Rural* (1985?), Disc-File 5, Copersucar/Museu da Imagem Collection, Ribeirão Preto, SP; Federação dos Trabalhadores na Agricultura do Estado de São Paulo (FETAESP), "Epidemia de sarampo surge em 'alojamento' em Guariba: 1 morto" *Realidade Rural* (August 1984): 7. O Centro de Documentação e Pesquisa Vergueiro: São Paulo. These were presumably batches of men, but it is unclear.

³⁸ Interview with Padre José Domingos Bragheto, Jennifer Eaglin on April 13th, 2013 in São Paulo, SP.

"In each horse bay, in precarious bunks, around 20 workers sleep, in hay mattresses, for which they charge workers Cr\$9000 [a month]. They have no bathrooms, nor showers. They have to carry water serve themselves water from a damn near the barracks to bathe themselves. But the damn water also has been contaminated by cane debris and pigs. Bad smell, mosquitos, this is the ambiance."³⁹

The São Paulo Federation of Agricultural Workers (Federação dos Trabalhadores na Agricultura do Estado de São Paulo) called the barracks "modern *senzalas* [slave quarters]," where breakouts of the measles, rubella, conjunctivitis, and other such diseases were not uncommon.⁴⁰ Permanent migrant workers lived in the periphery of the rural cities and emerging "sleeper-towns" that bordered these cities, many of which lived in guest-house styled *repúblicas* and *pensões*, "living with diverse forms of violence and misery and exposed to risks of epidemics of infectious-contagious sicknesses."⁴¹

Access to water and public services became a particularly contentious point in these peripheral sleeper-towns. The state-owned Water and Sanitation Company (*Companhia de Saneamento Básico do Estado de São Paulo*- Sabesp) provided piped water to the peripheral communities in which bóias-frias lived, which was the only public service available in these communities. However, the Sabesp prices were backbreaking for many workers. By the time the Guariba strikes began, Veja reported that "in Guariba, of the 3,950 houses served by Sabesp, only 8 pay the minimum rate of 1,410; the rest pay around 11,000 cruzeiros per month[.]," which

 ³⁹ FETAESP, "Secretarias estouram 'alojamento' em Pitangueiras: ação exemplar," *Realidade Rural* (August, 1984): 7. O Centro de Documentação e Pesquisa Vergueiro: São Paulo.
 ⁴⁰ Ibid; FETAESP, "Epidemia de sarampo surge em 'alojamento' em Guariba: 1 morto"

Realidade Rural (August 1984): 7.

⁴¹ "Sleeper-cities" are poor cities that emerged apart from urban centers where seasonal workers lived. They gained the name from the fact that workers would work all day in the fields and would only sleep in the cities at night. Scopinho, "A região de Ribeirão Preto e a agroindústria sucro-alcooleira," 42.

was a little more than a typical day's wage.⁴² Guariba clients paid well above other cities' basic Sabesp charge. Local Sabesp manager Carlos Alberto Júlio da Rocha claimed that the majority of workers paid the minimum "C\$1,460" and "Cr\$1,560" in two different reports after the strikes but such inconsistency drove workers' actions as well.⁴³ Sabesp continued to drive up tax prices and fees despite the limited financial abilities of the workers that lived in the communities.⁴⁴ Threats of additional price hikes became a driving factor in the explosion of the strikes.⁴⁵

All these costs and conditions left rural salaried workers in financially dependent situations that made it harder to contest worker abuses. For example, after the harvest, temporary workers that were able could return to their native regions until the next harvest, but many were left unemployed the rest of the year with no support from their temporary employers or from the state because their wages were so meager.⁴⁶ Similarly, many workers accrued debt to pay for their housing with loans that were worth more than they would earn in the entire season, hindering any accumulation of savings. Subsequently, many workers that migrated to make more money than they would have made in their home states, staved in the Ribeirão Preto region

⁴² Sabesp serviced 280 municipalities in the state. It set the minimum space allowed for monthly service at 10 cubic meters. *Veja* reported that neighboring cities like Araçatuba and Piracicaba paid Cr\$1220 and Cr\$1372 for minimum service, which is notably cheaper than Guariba prices. "Os canaviais da ira," *Veja* 820 (May 23rd, 1984), 20-26.

⁴³ "Sistema de corte da cana e contas de agua levaram crise a Guariba," in *Folha de São Paulo* (São Paulo, May 16th, 1984). In *Boia-fria, Sangue Quente: Mobilização e Resistência dos Assalariados Temporários Rurais* (Jabotical: Fase, 1987- mimeo.), 5. Cliff Welch Personal Archive Collection

⁴⁴ "Revolta de bóias-frias provoca destruição e morte," *Folha de São Paulo* (São Paulo, May 16th, 1984). Also, José Murilo de Carvalho, "Surpresa é não ter acontecido antes" in *Folha de São Paulo* (São Paulo, May 16th, 1984). As published in Federação de Órgãos para a Assistência Social e Educacional, *Boia-fria, Sangue Quente: Mobilização e Resistência dos Assalariados Temporários Rurais* (Jabotical: Fase, 1987- mimeo.): 2 and 4. Cliff Welch Personal Archive Collection.

⁴⁵ The *Veja* report indicates that workers received notices that Sabesp prices were going to increase by up to 900% on the previous Monday before the strikes erupted. "Os canaviais da ira," *Veja* 820 (May 23rd, 1984), 21.

⁴⁶ Ibid.

waiting for the next work season, unable to accumulate enough money to even return home in the interim.⁴⁷ Oscillating expenses, like a fluctuating water bill, could easily undo the budget a single worker or a working family with little reprieve or economic alternatives.

Scholars have argued that the policy's success depended on the increasingly extreme exploitation of its rural labor force, and I would agree. The new labor structure, under which temporary workers became the standard model, was an important part of the changing realities of the "modernized" market, facilitated by the military governments' development agenda.⁴⁸ Like Anthopologist Nancy Scheper-Hughes work on everyday life for rural workers in the sugar-producing Pernambuco, rural workers' experienced the everyday violence of hunger and desperation.⁴⁹ Pedro Ulisses de Lima, a 55 yrs old cane cutter from Garanhuns, Pernambuco who worked for the Usina São Martinho in Guariba told *Veja* reporters, "we live worse here than in the Northeast."⁵⁰ Sociologists Ubaldo Silveira and Maria Aparecida de Moraes Silva called it "white," like a deafening white-noise, and "silent" violence that was part of a "hidden and legal violence" promoted by the state's commitment to "tragic modernization."⁵¹ The conditions in which these transient workers lived were exploitative and many were well aware of this fact. As

⁴⁷ Scopinho, "Modernização e superexploração na agroindústria sucroalcooleira," 70–78.

⁴⁸ Karl Polanyi's work on the destructive nature of the capitalist market highlights the imposition of capitalism on the labor market and the violent disruptions created in the process. Legal intervention was critical to the creation of this new labor market just as it was in the Brazilian agricultural labor market. The rise of the agro-industrial market was a first and major step in the introduction of neo-liberalism into the Brazilian society. Karl Polanyi, *The Great Transformation* (New York: Rinehart & Co., Inc., 1944). For a more Marxist perspective on sugarcane workers and capitalism, see Maria Conceição D'Incao e Mello, *O bóia-fria: acumulação e miséria* (Petrópolis: Vozes, 1975) and Thomaz Junior, *Por trás dos canaviais*.

⁴⁹ Nancy Scheper-Hughes, *Death Without Weeping: The Violence of Everyday Life in Brazil* (Berkeley: The University of California Press, 1992), 4

⁵⁰ "Os canaviais da ira," *Veja* 820 (May 23rd, 1984), 25.

⁵¹ Silveira, *Igreja e conflito agrário*, 69; Silva, *Errantes*, 27.

historian José Murilo de Carvalho wrote in a special article for *Folha de São Paulo*, the Guariba events were inevitable.⁵²

And yet, the strikes did not happen earlier seemingly for one major reason: usineiros suppression of workers through the separation of permanent and temporary salaried workers. Usineiros kept workers separated and suppressed workers by outsourcing labor employment and management to *empreiteiros*, or contractors, evading legal obligations to workers, and employed their own *jagunços*, or privately owned gunmen to provide more direct and violent surveillance of workers.⁵³ These employment practices, encouraged by the ETR and ET statutes, separated permanent workers and temporary workers, which also slowed worker mobilization repetition. Social stigma and work instability contributed to the suppression of worker action. Within a system that obstructed workers from legal avenues of contestation and the repressive structure of the labor market, the Catholic Church became a primary vehicle of mobilization for this newly developed and growing population of temporary rural workers. Actors within the Catholic Church and an unfortunate labor policy rallied salaried workers to protest in 1984.

"Creating Consciousness": The Catholic Church, the CPT, and Padre Bragheto

Elements of the Brazilian Catholic Church were major grass-roots organizers and antimilitary leaders during the dictatorship. The Church, as an institution, had supported the coup in 1964 although some bishops, such as Dom Hélder Câmara, were avid supporters of larger economic reforms even before the coup. Still, many members were far more moderate. More broadly, these moderates' support for anti-military action grew substantially as the Vatican

⁵² Murilo de Carvalho, "Surpresa é não ter acontecido antes" in *Folha de São Paulo* (São Paulo, May 16th, 1984). *Bóias-frias, Sangue quente*, p. 4. Cliff Welch Personal Collection.

⁵³ "Guariba: uma questão de tempo," *Jornal do Interior* 100 (Ribeirão Preto, January 14–20, 1985):
3. Folder 50/028. Arquivo Público do Estado de São Paulo: São Paulo.

increasingly encouraged identifying with "marginalized sectors of society and their hopes for justice" after the Vatican's second ecumenical council, from 1962-1965.⁵⁴ Thereafter, the military's repressive crackdown on "internal threats" to its authority increasingly clashed with activist clergy and laymembers, drawing the Church into a more assertive position against the dictatorship's "torture, repression, and social and economic oppression."⁵⁵

Brazil's National Council of Bishops (*Conferencia Nacional de Bispos Brasileiros* – CNBB) emerged as the institutional voice of the Church's powerful opposition during the repressive de Médici administration from 1968 to 1973. It would define church-state relations throughout the 1970s.⁵⁶ The progressive stance of some members won more and more support from moderate clergymen and women. For example, the outspoken São Paulo Archbishop Dom Paulo Evaristo Arns strongly advocated for human rights justice for victims of government repression.⁵⁷ At the same time, more radicalized bishops in the Northeast and the Amazonian region spoke out against government violence and social injustice in support of the rural laborers, small farmers, and Indians. The adoption of human rights defense and a reconstitution

⁵⁴ The 10th Latin American Bishop's Conference in Medellín, Colombia was a major success for the emerging popular Church. As Scott Mainwaring notes, "despite the numerical inferiority fo the popular bishops, [the conference] approved a document that represented pastoral positions more progressive than those found in any Latin American country at the time. The final resolution declared: "It is not enough to reflect upon, to obtain greater clarity, and to speak. It is necessary to act. This has not ceased to be the hour of the Word; it has become, with dramatic urgency, the hour of action." Scott Mainwaring, *The Catholic Church and Politics in Brazil, 1916–1985* (Stanford: Stanford University Press, 1986), 114; Archbishop Paulo Evaristo Arns and the Archdiocese of São Paulo, *Brasil: Nunca Mais* (São Paulo: Vozes, 1985); Catholic Church and the Archdiocese of São Paulo, *Torture in Brazil: A Report by the Archdiocese of São Paulo*, translated by Jaime Wright, edited by Joan Dassin (New York: Vintage Books, 1986), 123–124.

⁵⁵ Margaret Keck, *The Workers' Party and Democratization in Brazil* (New Haven, CT: Yale University Press, 1992), 47.

⁵⁶ Skidmore, *Politics of Military Rule*, 135–137 and 180–183.

⁵⁷ In fact, his work with the Commission of Peace and Justice rallied international support against the dictatorship, producing the popular report on military torture, entitled *Brasil: Nunca Mais*, which was published in 1985 and cited above.

of the church as that of "the people," encouraged more laymembers to identify closer with urban periphery and rural workers than with elite government interests.⁵⁸

Following the 1968 Latin American Bishop's Conference in Medellín, Colombia, Catholic priests, nuns, and laymembers established Ecclesiastical Base Communities (*Comunidades Eclesias de Base-* CEBs) across the country in response to the new more community-based objectives the conference laid out. These CEBs became important bastions of rural mobilization in areas where rural workers had little or no access to organized labor groups. This was particularly true in the North and Northeast, where Brazilian bishops, like Dom Hélder, spoke out against the injustices of the economic system and the failures of Brazilian agrarian reform. In response, priests in Goiana, Mato Grosso founded the Pastoral Land Commission (*Commissão Pastoral da Terra* - CPT) in 1975 to support displaced workers and the struggle for land reform in response to the military's support of land consolidation for large-scale agricultural production despite promises of substantial land redistribution.⁵⁹ A product of these CEBs, the CPT became an important part of rural labor mobilization in the North and the South as CPT chapters quickly spread.

Padre José Domingos Bragheto, a young priest from the Jaboticabal diocese, and a few other members of the Archdiocese of Ribeirão Preto founded the first chapter of the CPT in the

⁵⁸ Silveira, *Igreja e conflito agrário*, 94–95.

⁵⁹ Skidmore, *Politics of Military Rule*, 135. Bishops in the Amazonian region particularly spoke out against the detrimental effects of the military's development programs in the region, which included the construction of the Transamazonian highway and large-scale cattle grazing schemes. For more on Amazonian development schemes and land conflict, see Joe Foweraker, *The Struggle for Land: A Political Economy of the Pioneer Frontier in Brazil, 1930 to Present* (Cambridge: Cambridge University Press, 1981); Anthony L. Hall, *Developing Amazonia: Deforestation and Social Conflict in Brazil's Carajás Programme* (Manchester: Manchester University Press, 1989); Cynthia Simmons et al., "Spatial Processes in Scalar Context: Development and Security in the Brazilian Amazon" *Journal of Latin American Geography*, vol. 6 (2007): 125–148.

state of São Paulo and the entire central-southern region in 1979. Jaboticabal, located between the central Ribeirão Preto, Sertãozinho, and the more distant Guariba, is a satellite town within the greater Ribeirão Preto region, with a strong agricultural presence and a larger population than Guariba. Bragheto, who started the chapter after connecting with CPT members at another conference, established its base in Jaboticabal and became its first coordinator.⁶⁰ As such, Bragheto's work initially focused on traveling throughout the state of São Paulo, trying to create small CPT bases in different municipalities.⁶¹

A native of Jardinópolis, another neighboring city of Ribeirão Preto, Bragheto grew up seeing labor injustice, which he says drew him to study theology and eventually into the church. He was ordained in the Jaboticabal diocese in 1975, after which he moved to two small parishes in the sugar-centered cities of Dobrado and Santo Ernestino. At this time, he became more aware of the conditions in which seasonal workers lived. This exposure made him start "to think more on the agrarian question in the interior of the state" and become more vocal about the "injustices" that rural workers experienced.⁶²

Bragheto and the CPT were fundamental in preparing workers to establish and assert their labor rights, actively helping reconstruct workers' understanding of their place in society as Brazilian citizens. Bragheto and the CPT focused on "organizing workers through unions and fostering consciousness" or as stated in another interview, "in the time that we were out there, all the work [was] in this line of workers' rights, to organize workers that were completely

⁶⁰ The Ribeirão Preto archdiocese includes the dioceses of Ribeirão Preto, Franca, Jales, Jaboticabal, Barretos, São João de Boa Vista e São José do Rio Preto.

⁶¹ Interview with Padre José Domingos Bragheto, Cliff Welch on September 13th, 2004 in São Paulo, SP. Transcription by Ana Cristina (CEDEM) on February 13th, 2007. Cliff Welch Collection: São Paulo.

⁶² Ibid.

disorganized and to organize through unions and to make conscious... to foster consciousness."⁶³ They went about doing this with informal meetings, assemblies, hosting worker celebrations, and the creation of new unions to slowly build workers' own understanding of their situation. As he recalls,

"[...] we started the work just, very simply, visiting those [workers] that lived in the city as much as those that lived [...] in the countryside, and we got up in the morning, and we approached the workers that caught the trucks in the cities, in the periphery[.]" 64

The CPT mobilized workers as a unit with similar interests, helping break down the worker divisions established by usineiros and legal worker status. As Bragheto explained, they gathered groups of salaried workers to "reflect on the light of faith in the situation that they lived, the exploitation, the lack of adequate equipment, [the groups] were made in the trucks while traveling together [to work]."⁶⁵ Through teaching about religion and faith, they helped workers articulate the injustice of the conditions in which they worked and lived. As Bragheto stated, "Then it was all a very difficult job, because the people were not very aware of the situation and this consciousness was awakening slowly."⁶⁶ Although slow, the CPT helped workers understand themselves as conscious actors within a structure of production that exploited them, laying the foundation for the Guariba strikes. Salaried workers, whether permanent or seasonal, began to see themselves as a group of workers with the same struggles, allowing them to assert themselves in the Guariba strikes in a way they had not or could not previously. These meetings and the CPT's presence in general was an important part of this awakening.

⁶³ Ibid. See also, Padre Jose Domingos Bragheto, Interview with Ubaldo Silveira on December 16th, 1993 as cited in Silveira, *Igreja e conflito agrário*, 125. The CPT-São Paulo did not exclusively work on workers rights in the Ribeirão Preto region. They also worked on the fight for land, which gained more traction further west in the state.

⁶⁴ Interview with Padre José Domingos Bragheto, Jennifer Eaglin on April 13th, 2013 in São Paulo, SP.

⁶⁵ Ibid.

⁶⁶ Ibid.

He remembers meeting a great deal of resistance to the work he did with rural workers from within the Ribeirão Preto diocese. Bragheto recalls the divisive nature of local priests' support as the CPT began to work more closely with rural workers. He states,

"Look a good part of the church, [...], was truly involved in the work to liberate, the liberation campaign was still heated then [...], there were bishops [...] that gave a lot of support, we felt very supported, and you had the other part that stayed blind, that stayed indifferent. [...] it was heating up in the city and priest colleagues were totally indifferent to the conflict."⁶⁷

This division within the Church grew stronger as Padre Bragheto and the CPT clashed with usineiros more and more in the region.

Beyond the work that Bragheto and the CPT did directly with workers, they also exposed *pelego* leaders, or government unionists who controlled the state-sanctioned unions, allied with usineiros.⁶⁸ These union leaders also exploited workers for their own gains with business owners. These unions "that were in the hands of union presidents that acted in favor of usineiros which for whatever reason, did not defend workers, at maximum they gave [the workers] a hair cut, some health plan, but they did not defend the workers in their rights[.]"⁶⁹ The CPT gave workers an alternative space to mobilize where, Bragheto felt, their rights were important.

The rural labor union that the CPT helped organize in Jaboticabal met days before the strike began. Workers rallied around the new labor policy that usineiros were enforcing in neighboring usinas, the seven-row policy. Although in the meeting workers and the CPT leadership, including Bragheto, agreed that conditions were not right for a strike, workers still

⁶⁷ Interview with Padre José Domingos Bragheto, Jennifer Eaglin on April 13th, 2013 in São Paulo, SP.

 ⁶⁸ A *pelego* literally is a type of sheepskin horse blanket. For more on *pelegos* and their role in industrial unions, see Wolfe, *Working Women, Working Men*, 75–85.
 ⁶⁹ Ibid.

began the strike a few days later.⁷⁰ Workers actions highlight their own agency in the mobilization, moving beyond the suggestion of the CPT leaders and acting of their own accord. Workers seized an important moment with the beginning of the new harvest at a time in which CPT leaders were unwilling to push the status quo. Bragheto's commentary indicates that workers themselves were very much in control of the mobilization, despite reports to the contrary in the newspapers.⁷¹

The CPT's presence in the region was important to shaping workers' mobilization in 1984. Nationally, the CPT was a central organization in spreading strikes in the North and Northeast as well. However, the CPT's actions were unique in the region, where landed elites had more efficiently suppressed worker unrest for so long. Bragheto was the first to organize the CPT in the central southern region, spreading a level of workers' consciousness about labor exploitation and workers' rights through his work with temporary sugarcane workers. These same workers asserted these ideas of basic workers' rights in 1984. After usineiros attempted to put in place even more exploitative labor policies, best illustrated by the seven-row policy which usineiros first employed in 1983 and then more broadly applied in 1984, workers independently began the labor strikes in Guariba.

⁷⁰ In fact, Bragheto was in Mato Grosso helping with a different land occupation in Ivinhema when the strike broke out despite claims in the news to the contrary. Interview with Padre José Domingos Bragheto, Jennifer Eaglin on April 13th, 2013 in São Paulo, SP.

⁷¹ As Bragheto himself stressed, workers acted of their own volition despite *Veja* and the *Estado de São Paulo* explicitly identifying him as the leader of the strikes. Interview with Padre José Domingos Bragheto, Jennifer Eaglin on April 13th, 2013 in São Paulo, SP. See also, "Igreja ao lado dos sindicatos," *O Estado de São Paulo* (May 16th, 1984), 38; "Os canavias da ira" *Veja* 820 (May 23rd, 1984), 24.

Sparks Fly: the Seven-Row Policy

The imposition of the seven-row system was the "match" that set off the first Guariba strike itself.⁷² In 1983, usineiros at the Usinas São Martinho, Bonfim, Santa Adélia, and São Carlos in the Ribeirão Preto region first applied the seven-row policy to extend worker production in 1983, but they did not employ the policy aggressively until the 1984 harvest.⁷³

Employers had been using the established the five-row policy, in which they paid workers either per ton or per meter for an expected five rows of cut cane per day. Conversely, usineiros began enforcing the seven-row policy during the first week of the 1984 harvest, requiring workers to cover more area per day with the two additional rows. In the five-row system, workers cut a designated five rows at 1.5 meter of cane per row.⁷⁴ Researcher Francisco da Costa Alves of the Universidade Federal de São Carlos noted that usineiros also expanded the width of the rows that workers had to cover so that they were responsible for far greater area while still earning per meter. Cliff Welch indicates that the seven-row system tried to extend rows to two meters on top of adding more rows. Additionally, the new policy required workers to carry the cane in their arms for another three meters to load the cane at the further removed main loading zone.⁷⁵ These descriptions of the seven-row policy illustrate the exploitative nature of the

⁷² Interview with sociologist and social assistant Ubaldo Silveira, Jennifer Eaglin, April 21st, 2013 in Ribeirão Preto, SP.

⁷³ "Sistema de corte da cana e contas de agua levaram crise a Guariba," in *Folha de São Paulo* (São Paulo, May 16th, 1984) in *Boia-fria, Sangue Quente: Mobilização e Resistência dos Assalariados Temporários Rurais* (Jabotical: Fase, 1987- mimeo.), 5. Cliff Welch Personal Archive Collection. The three usinas are some of the better-established usinas in the region and also early Proálcool participants and funding recipients. They reside in Pradópolis, Guariba, and Jaboticabal respectively, which are large municipalities of the Ribeirão Preto region.

⁷⁴ Antenor Braido, "A difícil vida de quem corta cana," *Folha de São Paulo* (May 20th, 1984). See Guariba Workers Agreement in Ana Luiza Martins, ed., *Guariba- 100 anos* (São Paulo, Prefeitura Municipal de Guariba, 1996), 186–187. Also, Welch, *A semente foi plantada*, 426.

⁷⁵ The Guariba Accord established rows at a standard two meters per row. The length requirement in the agreement supports the assertion that usineiros and contractors manipulated

working conditions as the practice was not standardized but instead usineiros and contractors manipulated the length of rows often.

Usineiros justified the program as beneficial for industrial quality of alcohol production. The policy was supposed to "benefit the sugar-alcohol industry, because they receive a raw material with less impurities" accumulated on the land when trucks entered the fields. Instead, workers would carry the land further out of the fields, leaving cane stalks undamaged. Cane suppliers liked the deal "since they receive more for the delivered product." Allegedly, rural workers would win because they could increase production 20% above their daily production under the five-rows policy, thus, "receiving more money in the same workday."⁷⁶ In the most basic capitalist sense, the incorporation of the new policy would maximize production in the most cost-effective way, combining mechanical equipment, with lower inputs into said machinery, and the greater responsibility on cheap labor.

Proálcool encouraged extensive mechanization, but temporary salaried workers still remained a cheaper work source than mechanized sugarcane collection in the 1980s. In fact, D'Incao notes that even after the Guariba strikes required employers to triple workers' pay, they still remained far cheaper than the cost of gasoline to fuel mechanical collection in 1984. This, however, was not the case for year-round labor, where the use of insecticides, fungicides, and

the length of rows often. Cliff Welch notes that workers wanted to return meter length to 1.5 meters but were not successful. Ícaro Ferracini, Leandro Santini, and Heloisa Zaruh, "O Corte-30 anos da Greve de Guariba" (December 16th, 2013), YouTube,

https://www.youtube.com/watch?v=FYUfU9FDguw. Accessed May 1st, 2015; See Guariba Workers Agreement in Martins, *Guariba- 100 anos*, 186-187. Also, Welch, *A semente foi plantada*, 426.

⁷⁶ "Corte da cana em sete ruas, a novidade da lavoura canavieira," originally in *Jornal dos Municípios*- published in *A Comarca de Guariba* No. 269 (Guariba, May 21, 1983). As published in Federação de Órgãos para a Assistência Social e Educacional, *Boia-fria, Sangue Quente*, 9. Cliff Welch Personal Archive Collection.

fertilizer diminished permanent labor demand.⁷⁷ Thus, usineiros mechanized around temporary workers. This meant more heavy equipment, like tractors, trucks, and fertilizer, to expand production at a faster rate, but workers could only cut so much. To save on costs, the seven-row plan would protect the land from greater stress and mechanical manipulation by keeping cane collection points further from the cane and simultaneously cut down on mechanized costs-namely gasoline, which was more expensive than laborers.⁷⁸ The policy focused on the producer's perspective with little practical regard for its impact on the field workers.

The policy pressured workers on three fronts: physical demands, real wages, and job security. Workers were already at their physical labor limits under the five-row system, but the policy tried to extract an additional 2-3 hours of work out of each rural worker per day at minimum to meet the new cutting and loading requirements. Thus, workers would spend more time transporting cut cane to loading areas, less time cutting, and were still expected to cut more cane per day. This was physically impossible.

While usineiros claimed workers would make more money by cutting more in a day, workers argued that the new seven-row policy actually diminished workers ability to the same amount as they had in the five-row system. The two additional rows combined with the extended the distance workers' had to carry the cane to the loading trucks to substantially increase the

⁷⁷ Interview with Maria Conceição D'Incao, "Despertar do bóia-fria", Emanuel Neri, *Veja* 821 (May 30th, 1984), 3-6; also, as cited in "São Paulo: O levante do Bóias-frias: medo e tensão no interior," *Veja* 820 (May 23rd, 1984), 20. Regarding the disadvantaged position of permanent workers, see, Scopinho, "A região de Ribeirão Preto e a agroindústria sucroalcooleira," 26.
⁷⁸ These new advantages included: "a lower quantity of land sent to the industries; less machinery traffic - loaders and truckers- within the cane fields; less area of compaction; less damage to the cane roots, etc." These benefits would produce "more income, more operation efficiency, less expenditure on gasoline (truck and loaders with 28% less gasoline)." "Corte da cana em sete ruas, a novidade da lavoura canavieira," originally in *Jornal dos Municípios*-published in *A Comarca de Guariba* No. 269 (Guariba, May 21, 1983). As published in Federação de Órgãos para a Assistência Social e Educacional, *Boia-fria, Sangue Quente*, 1. Cliff Welch Personal Archive Collection.

overall labor with little additional pay. In fact, the additional loading time cut into their ability to maintain previous cutting production rates, and thus to make the same amount of cane in the same timeframe that they had previously in the five-row system. As workers were paid by the ton of cane cut, they made less money while covering more land for the usineiro.⁷⁹

At the same time, the new policy pressured worker job stability. Usineiros would need fewer workers per square acre if workers covered the two additional rows demanded, further exploiting the instability of the labor market. Not meeting the requisite row policy could lead directly to dismissal at the end of the month, suspension, or other coercive practices.⁸⁰ In an average day, workers were expected to cut and load five to ten tons of cane per day.⁸¹ Thus, usineiros and contractors undercut workers, as salaried workers claimed they had to generally work more to earn the same wages in the seven-row system that they had made under the five-row system.⁸² In a market with poorly established payment structures, the capitalist focus on production speed and quantity put more pressure on exploited salaried rural workers that depended on the established system, however flawed, for survival.

The seven-row policy was an extension of government-supported exploitative ploys by usineiros to extract more labor from caneworkers. As noted previously, the salaried labor market

⁷⁹ Murilo de Carvalho, "Surpresa é não ter acontecido antes" in *Folha de São Paulo* (São Paulo, May 16th, 1984). Also, "Sistema de corte da cana e contas de agua levaram crise a Guariba," in *Folha de São Paulo* (São Paulo, May 16th, 1984). In *Boia-fria, Sangue Quente: Mobilização e Resistência dos Assalariados Temporários Rurais* (Jabotical: Fase, 1987- mimeo.), 4-5. Cliff Welch Personal Archive Collection.

⁸⁰ Maria Aparecida de Moraes Silva, "Atrás das cortinas no palco do etanol," *Folha de São Paulo* (São Paulo: February 10th, 2007). Cliff Welch Personal Archive Collection.

⁸¹ Nonino and Amorim suggest it was more like six tons a day. See discussion above. Carlos Alberto Nonino and Galeno Amorim, "Uma manhã de terror em Guariba," *O Estado de São Paulo*- Agriculture Edition (May 16th, 1984), 1 (p. 38 of full edition).

⁸² "Revolta de bóias-frias provoca destruição e morte," *Folha de São Paulo* (São Paulo, May 16th, 1984). As published in Federação de Órgãos para a Assistência Social e Educacional, *Boia-fria, Sangue Quente*, 2. Cliff Welch Personal Archive Collection.

was essentially unregulated and usineiros had free reign to exploit workers however they saw fit. Padre Bragheto recalls the connection between the government, usineiros, and labor exploitation, stating,

"the mayors were allied with usineiros, [...]. The *gatos*, the usineiros, the *empreiteiros* were all united. There was no support for the worker class. [...] When [the municipal government] did not support [usineiros] directly they were indifferent, convenience turned them into allies of repression, [...]. They wanted to stifle everyone that rose up in that era."

Government officials condoned usineiros' actions with favorable legislation or convenient indifference on the federal and local level to aid usineiros' production abilities. This started with federal legislation and worked its way down to local inaction. The federal government's commitment to Proálcool drove legislative decisions and the Guariba strikes contributed to its slipping grip on security to back up its development agenda, which usineiros had effectively defended in the paulista countryside since the coup.

The Strike

On May 15th, 1984, in the town of Guariba, within the Ribeirão Preto region, over 5,000 temporary salaried sugarcane workers, known as *bóias-frias*, went on strike to contest extended workdays, poor work conditions, underpay, and poor transportation services among other complaints.⁸³ In many ways, Guariba was the quintessential sugar-dominated city, hosting two dominant sugarcane and alcohol producing usinas, the Usina São Martinho and the Usina Bonfim, within its municipal limits. The strike immediately affected three additional usinas, the

⁸³ The term *bóias-frias* means cold-sandwiches in reference to the cold lunches that fieldworkers ate in the fields during their long workdays. The term ha s a generally negative connotation. Silveira, *Igreja e conflito agrário*, 14. "Proálcool, quem sai ganhando," Cadernos de Estudos, no. 11, published October 1984. Brazilian Popular Groups: agrarian reform Collection, UNICAMP-AEL.

Usina Santa Adélia, São Carlos, and Santa Luíza, whose workers lived in Guariba as well. Together, these five usinas were slated to produce 12 million tons of sugar in 1984.⁸⁴

4,000 workers from the Usina São Martinho enlisted cane cutters from the other usinas to strike with picket lines blocking the entrance and exits of the city. Barring entry of the usinas' trucks that transport workers to fields daily at dawn, workers refused to go to the fields and instead marched to the city's small central plaza in protest. These protestors sacked the largest supermarket in the city, the São Paulo State Sanitation building, and burned a few vehicles. The Military Police intervened in the conflict to quell the strikers, killing a recently retired caneworker, Amaral Vaz Melone, and wounding 29 others. The initial strike quickly spread to the neighboring cities of Barrinha and Monte Alto, where the conflict escalated as more workers joined the strike.⁸⁵

⁸⁴ See Figure 6 for a map of Guariba in the 6th administrative region of Ribeirão Preto. Both the Usina São Martinho and Bonfim were benefactors of Proálcool-funding. São Martinho, located in Pradópolis, was the largest usina in the country in 1984. The Usina Bonfim, while not of the same size as its municipal counterpart, would peak as a larger alcohol producer than São Martinho in the 1980s. Martins, *Guariba—100 anos*, 143-149; 227; Carlos Alberto Nonino and Galeno Amorim, "Uma manhã de terror em Guariba," *O Estado de São Paulo* (May 16th, 1984), 38.

⁸⁵ Silveira, Igreja e conflito agrário, 73–75; "Revolta de bóias-frias provoca destruição e morte," Folha de São Paulo (São Paulo, May 16th, 1984). As published in Federação de Órgãos para a Assistência Social e Educacional, Boia-fria, Sangue Quente: Mobilização e Resistência dos Assalariados Temporários Rurais (Jabotical: Fase, 1987- mimeo.), 2. Cliff Welch Personal Collection.



Figure 8: The Guariba Strike⁸⁶ Source: Carlos Fenerich, "Retrato do Brasil", n. 36 (Guariba, 1984).

Following two days of expanding strikes, usineiros finally gave in to workers demands after workers began burning canefields at the peak of the harvest and threatened to continue such actions.⁸⁷ Usineiros repealed the seven-row policy in a labor agreement with workers commonly known as the Guariba Accord. Despite this resolution, the strikes continued to spread, as caneworkers and other temporary fieldworkers sought similar demands from employers, threatening to bring sugarcane and ethanol production to a halt in the most important ethanol-

⁸⁶ Photograph as published in "Guariba – 30 anos da greve que mudou a vida dos 'bóias-fria' no Brasil, por Paulo Mancini," *EcoDebate.com*, August 21st, 2014, accessed April 25th, 2015, http://www.ecodebate.com.br/2014/08/21/guariba-30-anos-da-greve-que-mudou-a-vida-dos-boias-fria-no-brasil-por-paulo-mancini/

⁸⁷ Alan Riding, "For Brazilian Farmhands, a Notable Victory," *New York Times*, (June 10th, 1984), accessed August 25th, 2014, <http://www.nytimes.com/1984/06/10/world/for-brazilian-farmhands-a-notable-victory.html>. For more on the significance of burning land, protest, and sugarcane, see Rogers, *The Deepest Wounds*, particularly chapter 5, "The Zona da Mata Alfame: Political Upheaval, Strikes, and Fire." Rogers argues that caneworkers politicized fire, which was an easily accessible tool, contesting transformations of the land and workers charged history of using fire to terrorize workers in Pernambuco.

producing region in the country. In the three-day conflict, over 25 usinas came to a halt after the strikes expanded to over five municipalities in the region, including the Usina Santa Elisa.⁸⁸

Usineiros' enforcement of the seven-row policy drove workers to strike at the beginning of the 1984 spring harvest.⁸⁹ This strategic move allowed workers to quickly capture the attention of usineiros, government officials, and the national public after the local Military Police violently suppressed the protest and workers began burning cane fields. State officials and usineiros shirked blame for the incident and each blamed the other for the unrest. Federation and union leaders like Francisco Benedito Rocha, the general secretary of Fetaesp (the Federation of Agricultural Workers of the State of São Paulo) took the opportunity to criticize usineiros and state officials, stating, "What provoked all of this was the revolt of workers against the little income that they were receiving for cutting cane, the changes made by usinas to the cutting system, changing from five rows to seven and the abusive increase in water prices that Sabesp was charging." As president of the Rural Workers Union in Guariba, Benedito Vieira de Magalhães stated, "[...] bóias-frias situation has been dramatic since last year, when the usinas São Martinho (Pradópolis), Bonfim (Guariba), Santa Adélia and São Carlos (Jaboticabal) changed the cane cutting system, establishing the seven rows instead of the five as it was before."⁹⁰ The leaders quickly identified the primary complaints around which workers rallied.

⁸⁸ Welch, *A semente foi plantada*, 422. CONTAG/CPT/CIMI/CNBB/ABRA/IBASE, "Companha nacional pela reforma agrária: Informa" 8 (Rio de Janeiro- November/December, 1984): 4. Brazilian Popular Groups: Agrarian Reform Collection. Strikes continued to spread throughout 1985, 1986, and 1987 as well.

⁸⁹ The official international harvest year is September 1st to August 31st. The harvest traditionally begins June 1st for southeastern states. São Paulo usineiros would prepare for the beginning of the crushing period from the first of May. At least this was the situation in 1978 and presumably the case in subsequent harvests. Governo do Estado de SP, Secretaria da Agricultura, and Instituto de Economia Agricola, *Prognostico 78/79* (SP, 1978), 166.

⁹⁰ "Sistema de corte da cana e contas de agua levaram crise a Guariba," in *Folha de São Paulo* (São Paulo, May 16th, 1984). In *Boia-fria, Sangue Quente: Mobilização e resistência dos*

However, some officials connected the strikes to broader social conflicts. Usineiros like Homero Correa Arruda Filho, the director of the Usina São Martinho, blamed the government, claiming that the "the dissatisfaction today is general, principally with complaints against the government, whether on the municipal, state or federal level. Clearly there are those that benefit from this situation. It is strange that explosions like this haven't happened before."⁹¹ In his commentary, Arruda indirectly connects the *bóias-frias* actions to the broader political mobilization of the "*diretas já*" movement. Although it dissipated following the failure of the constitutional amendment to demand democratic elections in 1984, demonstrations in São Paulo and Rio de Janeiro, amongst other cities, built a growing sentiment of the military government's impending demise.⁹² Arruda's comment is a broader critique of the military's weakening position in the country and its extension into the paulista countryside among assignors through the strikes. This is ironic given the fact that the military government's policies, particularly Proálcool and the labor deregulation coupled with it in the 1970s, directly led to the region's notable economic success.

Conversely, other officials looked at broader economic conditions as the cause. The Sabesp (*Companhia de Saneamento Básico do Estado de São Paulo*- the Water and Sanitation Company of São Paulo) was the subject of particular ire for *bóias-frias*, but Sabesp manager Carlos Alberto Júlio da Rocha claimed, "the explosion of *bóias-frias*, [...], is due to the fact that all of these people are living in an extreme situation of misery and hunger. The water bills are

assalariados temporários rurais (Jabotical: Fase, 1987- mimeo.), 5. Cliff Welch Personal Archive Collection.

⁹¹ Ibid.

⁹² Keck, The Workers' Party, 219-221.

only a pretext.⁹³ Similarly, São Paulo Governor André Franco Montoro responded to the strikes by placing workers' desperation in the context of national economic crises. The day after the strike, he noted that with "inflation at over 200% and the federal government so focused on the external debt, the Nation is approaching the tolerable limit," of which the Guariba strike was an example. São Paulo Secretary of Labor Roberto Gusmão connected the national economy to usineiros own greed. In relation to the veritable inflation issue, he stated, "Bóias-frias are actually making less this year than last, and on top of that usineiros try to impose on them the increase in cane collection quotas, [...].⁹⁹⁴ These state officials used the strikes to criticize usineiros actions and distance themselves from political blame for the conditions that drove workers to strike.

As the strikes spread, sugarcane production came to a halt in the region. According to Rogério Orsi, local usineiros and president of the sugar cane commission of the São Paulo Agriculture Federation (Federação da Agricultura do Estado de São Paulo-FAESP), usineiros of the region requested federal support from the notoriously violent Second Army of São Paulo to end the disturbance. The commander, "responded that they ought to use good sense and treat their employees better."⁹⁵ With threats to expand destructive and costly cane burning at the

⁹³ "Sabesp nega que tarifa sejam altas," *Folha de São Paulo* (May 16th, 1984) in Federação de Órgãos para a Assistência Social e Educacional, *Boia-fria, Sangue Quente: Mobilização e Resistência dos Assalariados Temporários Rurais* (Jabotical: Fase, 1987- mimeo.), 5.

⁹⁴ Quotes from Governor Montoro and Secretary of Labor Gusmão cited in "Montoro culpa a crise e Gusmão acusa a 'ganância'" *Folha de São Paulo* (May 16, 1984) in Federação de Órgãos para a Assistência Social e Educacional, *Boia-fria, Sangue Quente: Mobilização e Resistência dos Assalariados Temporários Rurais* (Jabotical: Fase, 1987- mimeo.), 15. Cliff Welch Personal Collection.

⁹⁵ "Os canaviais da ira," Veja 820 (May 23rd, 1984), 26.

beginning of the harvest, usineiros gave in to many of the rural laborers' demands to restart sugarcane production during the time-sensitive harvest season.⁹⁶



Figure 9: Caneworkers Burn the Fields⁹⁷ Source: Carlos Fenerich, originally published in *Veja* (May 23rd, 1984), 20.

On May 17th, two days after the strike first started, a coalition of union representatives

and usineiros' representatives signed a new collective labor agreement, commonly known as the

"Guariba Accord."98 Participants included São Paulo State Secretary of Labor Almir Pazzianotto

Pinto, FAESP Sugarcane Commission President Rogério Orsi, and the presidents of rural unions

from Jaboticabal, Guariba, Cravinhos, and Barrinha, amongst other signatories. Workers won a

good number of their demands including: a return to the five-row system; an increased

⁹⁷ Photograph as reproduced in Pastoral do Migrante, Facebook Page, as accessed April 25th, 2015, https://www.facebook.com/PastoraldoMigrante/photos/pb.225506677641289.-2207520000.1430006916./272921229566500/?type=3&theater

⁹⁶ According to a *Folha de São Paulo* report, usineiros informally agreed to change back to the five-row system and abolish the seven-row system at a meeting at the Jaboticabal Rural Union headquarters that very night. "Revolta de bóias-frias provoca destruição e morte," *Folha de São Paulo* (São Paulo, May 16th, 1984). As published in Federação de Órgãos para a Assistência Social e Educacional, *Bóia-fria, Sangue Quente: Mobilização e Resistência dos Assalariados Temporários Rurais* (Jabotical: Fase, 1987- mimeo.), 2. Cliff Welch Personal Archive Collection.

 ⁹⁸ Original accord reproduced in Martins, *Guariba*, 186-187.

established price of cane set to Cr\$2,100 per ton; employer provided supply of work tools, protection gear like gloves and leather leg guards; free transportation to work; guaranteed worker registration and all the benefits and labor rights that accompany registration.⁹⁹

At the same time, workers and state officials alike praised the Accord for the concerted gains workers were able to achieve in a region that had such economic importance and yet workers had had such little political presence. Padre Bragheto recalls,

"Various laws arose afterward, in relation to salary, in relation to security on the job, thus, from there, many things changed, so we are like to say that it [the Guariba strikes] was a watershed moment. [...] before Guariba it was one situation and after Guariba it was a different situation. [...] It was an awakening in all the region and these strikes afterward, they started to pop up in various municipalities, amongst orange grove pickers, amongst cane cutters[.]"

Strikes spread in the region beyond sugarcane workers. Only days after the Guariba strikes took place, orange workers went on strike in the nearby Bebedouro and beyond.¹⁰¹ The Guariba strikes set a precedent, illustrating that workers could win basic labor rights through such mobilization and establishing the first collective bargaining agreement between usineiros and salaried workers in the region. Their actions, and the subsequent expansion of rural labor strikes, left an important mark on rural workers' struggle for labor rights.

It would seem workers were able to win such concessions in the Guariba Accord because of the public nature of the Guariba strikes, which gained so much attention and publicized the poor conditions in which workers lived. As Padre Bragheto stated in an interview with *Folha de São Paulo* the day after the strikes, "Only the government and usineiros don't want to see the

⁹⁹ Ibid.

¹⁰⁰ Interview with Padre José Domingos Bragheto, Jennifer Eaglin on April 13th, 2013 in São Paulo, SP.

¹⁰¹ "Os canaviais da ira," *Veja* 820 (May 23rd, 1984), 20. The Bebedouro strike became the largest strike of orange workers ever in the country.

problem [with work conditions]."¹⁰² This statement is true both figuratively and literally. Where workers actions failed to impose compliance with the accord, negative press drew employer and government action.

Usineiros faced little pressure to comply with the accord beyond workers' strikes. A National Agrarian Reform newsletter reported, "The Guariba accord, [...], has been bungled almost systematically by contractors [*empreiteiros*] that provide services for cane suppliers. [...] One of the principal problems for workers is that they do not have anyone to rely on and it is made worse with the futility of the Ministry of Labor's supervision system and employers' continuing abuse of power."¹⁰³ As a result, usineiros often broke the agreement and workers strikes expanded intermittently throughout the 1984, 1985, and 1986 harvests.

By late August 1984, workers in Araraquara, Ribeirão Preto, São Manuel, Sertãozinho, Arapoema, and Andradina had used strikes to contest employers' failure to comply with the Accord or additional worker demands. For example, in Araraquara, workers began a strike in July 1984 to protest the usineiros' failure to comply with the recently signed Guariba Accord. In July 1984, over a thousand cane workers in the neighboring region of Araraquara protested against the usinas Maringá, Santa Cruz, and Santa Lúcia in protest of usineiros failure to comply with the Accord. Usineiros failed to provide protective gear for workers and continued inconsistent payment practices for work completed, both of which were key tenets in the Accord.

¹⁰² "Coordenador da Pastoral da Terra diz que não é líder," *Folha de São Paulo* (May 17th, 1984).

¹⁰³ CONTAG/CPT/CIMI/CNBB/ABRA/IBASE, *Companha Nacional Pela Reforma Agraria: Informa* 8 (Rio de Janeiro- November/December, 1984): 14. Brazilian Popular Groups: Agrarian Reform Collection.

While the strikes lasted for undetermined periods, Élio Neves, President of the Rural Laborers Syndicate in Araraquara, stated, "the situation in the region is hot."¹⁰⁴

Similarly, sugarcane workers in Sertãozinho went on strike in early August. Sertãozinho, where the Usina Santa Elisa resided along with five other usinas, was the largest sugar-producing municipality in the country. Workers began the strike at the Usina São Francisco at eight in morning to demand usineiros adhere to payment plans established by the Institute of Sugar and Alcohol (IAA). Batista Antonio, a small cane supplier from the neighboring municipality of Serrana and strike participant, noted, "They only pay 60% of the price of cane with promissory notes for October, which we still have to cash and pay interest on."¹⁰⁵ Regular pay for work done was one of the critical demands of the Guariba Accord.

By the end of the day, the strikes had spread to 150 workers and paralyzed São Francisco's production for the day, meaning that it stopped the usina from crushing seven tons of cane for the day. Representatives from the 18 sugar mills and distilleries in the region met with strikers to resolve the issue that same afternoon. The quick response workers could garner from striking became a tool for "demanding [their] rights peacefully," according to the President of the Western São Paulo Sugarcane Cutters' Cooperative Fernandes dos Reis.¹⁰⁶ Their action illustrates the broader impact of Guariba's success, as more workers pushed usineiros to comply with established rural labor laws with action.

Despite the Guariba Accord's platform for better relations between workers and usineiros, later workers' strikes had less impact and gained less national attention than the initial

¹⁰⁴ "Mil bóias-frias em greve exigem dissídio cumprido," *O Estado de São Paulo* (July 6th, 1984), 9.

¹⁰⁵ As cited in "Produtores de cana param em Sertãozinho," *O Estado de São Paulo* (August 11th, 1984), 30.

¹⁰⁶ Ibid.

Guariba strike. In November 1984, over six thousand rural workers went on strike to demand their continued employment by their employers beyond the short harvest periods. A major strike broke out in Guariba again in January 1985, at the beginning of the second harvest season. These strikes made broader demands for better labor conditions but met with less and less success than the initial strike in 1984.

In these ongoing conflicts, usineiros and *empreiteiros* used increasing violence to force workers back to work. In the first strike, the Military Police intervened after the 14 military police posted in Guariba called in backup from the headquarters of the 13th Battalion in Araraquara. The Batallion mobilized 200 troops in Guariba, but over the week of conflict, the Military Police mobilized over 2000 soldiers from the 80 different cities in the region to control the spreading strikes.¹⁰⁷ Secretary of Public Security Michel Temer asserted that the Military Police did not use excess force to contain the protestors, and Coronel Bonifácio Gonçalves, commander of the policing of the Interior of the Military Police, repeatedly asserted that "the PMs did not use their weapons" although "various shots, never a shootout," did occur.¹⁰⁸

And yet, in subsequent strikes, violence quickly spread. Former Secretary of Agriculture José da Silva recalls that the federal government imposed Proálcool as a part of a "wartime economy" because of the oil shocks, and, at times in the regional conflicts, private owners and Military Police defended it as such.¹⁰⁹ In the nearby city of Arapoema, São Paulo, private owners' henchman (*jagunços do grileiro*) Gilson Santana and the police ambushed and killed the

¹⁰⁷ "Temer critica trabalhadores e garante que ordem sera mantida," *Folha de São Paulo* (May 16th, 1984); "Os canaviais da ira," *Veja* 820 (May 23rd, 1984), 20.

 ¹⁰⁸ Ibid. "Comandante PM reafirma que tropa não atirou" *Folha de São Paulo* (May 17th, 1984).
 ¹⁰⁹ FETAESP, "José Gomes da Silva volta ao batente: e Secretarias querem disciplinar

Proálcool," *Realidade Rural* (July, 1984): 8. O Centro de Documentação e Pesquisa Vergueiro: São Paulo.

secretary of the Rural Workers' Union, Hugo Ferreira de Souza, in August 1984.¹¹⁰ The government increasingly condoned this escalating violence, sending in the São Paulo-based Batalhão do Choque to violently suppress the conflict in Guariba in January 1985. Workers armed with sticks, stones, and fire confronted hundreds of military-clad soldiers. Witnesses reported that police used home invasions, brutal beatings, tear gas, electric batons, firearms, and clubs against men, women, children, journalists, unionists, and religious leaders to suppress the strikes.¹¹¹

Padre Bragheto remained an active supporter of workers' mobilization and liberation after the Guariba strikes. He acted as a negotiator and representative of workers in disputes between workers and usineiros, and denounced employer abuses after the Guariba strikes. This made him a target amongst bosses in the region.¹¹² He recalls, "[...] the pressures against us were very strong, death threats, the threat of ambush, you know…" However, the threats on Bragheto were even stronger. He recalls,

"One of those times, out there in Guariba [...], the police caught me, beat me up[.] And Bebedouro, in the strikes after those in Guariba, which blew up, I was imprisoned, I stayed, I stayed over night detained in jail[.] Thus, it was so, much persecution in this sense, in such a way that I had to leave the region because there were death threats in

¹¹⁰ The National Confederation of Agricultural Workers reported this case to the Ministry of Justice. "Bóias-frias preocupam novamente," *O Estado de São Paulo* (August 16th, 1984), 16; CONTAG/CPT/CIMI/CNBB/ABRA/IBASE, *Companha Nacional Pela Reforma Agraria: Informa* 8 (Rio de Janeiro- November/December, 1984): 15. Brazilian Popular Groups: Agrarian Reform Collection.

¹¹¹ Silveira, *Igreja e conflito agrário*, 79-81; Diário do Município, *Diário Oficial do Estado de São Paulo (DOSP)* (November 30, 1984): Section 1, p. 61, accessed September 8th, 2014, <<u>http://www.jusbrasil.com.br/diarios/7255008/pg-61-poder-executivo-secao-i-diario-oficial-do-estado-de-São-paulo-dosp-de-30-11-1984></u>

¹¹² According to the FETAESP supported *Realidade Rural*, he was "muito malhado pelos patrões na região." Bragheto himself said usineiros blamed him for the strikes, placing a target on his back. FETAESP, "Secretarias estouram 'alojamento' em Pitangueiras: ação exemplar," *Realidade Rural* (August, 1984): 7. O Centro de Documentação e Pesquisa Vergueiro: São Paulo.

Barrinha, a bomb exploding in the parish, and fireworks thrown in the church to blow up the clock tower of the church. All for intimidation."¹¹³

So bad were the threats and violence that his parishioners and colleagues urged him to leave the region. He continued to work with the CPT until he was driven out of the region in 1986 due to his connection to temporary workers and the Guariba strikes.¹¹⁴ He moved to a parish in Brasilândia in the city of São Paulo where he still remains today.

As national attention turned away from workers and returned to the "cacophony of recently-mobilized groups," usineiros had less pressure to uphold the Guariba agreement.¹¹⁵ However, television reports continued to cast a negative light on work conditions, with shows like Jornal Da Terra and Globo Rural running exposés on rural labor conditions regularly.¹¹⁶ As a FETAESP report stated, "after radio and written press, lately it is television that is becoming a channel where the worker can speak of his problems, present his demands." For example, on August 4th, a local team of Globo TV reporters went to a workers' barrack with members from the offices of Labor and Health in Ribeirão Preto, Araraguara and Bebedouro unions, and FETAESP to expose the poor conditions on the fazenda São Vicente, owned by the Marchesi Group, which grew cane for the Usina Santa Elisa.

¹¹³ Interview with Padre José Domingos Bragheto, Jennifer Eaglin on April 13th, 2013 in São Paulo, SP. ¹¹⁴ Ibid.

¹¹⁵ The term is Cliff Welch's but the sentiment is my own. Welch argues that paulista *camponeses* had "memories and structures that they were able to use to make their needs known." While these structures were important, I argue the attention workers gained from television exposés and expanding media attention kept these issues in the public eye. They worked in tandem but media attention should be included in a broader definition of these "structures" that Welch mentions. Welch, A semente foi plantada, 434.

¹¹⁶ FETAESP, "Aos domingos a TV fala do trabalhador rural: e qui vai um convite" and "Secretarias estouram 'alojamento' em Pitangueiras: ação exemplar," Realidade Rural (August, 1984): 3, 7. O Centro de Documentação e Pesquisa Vergueiro: São Paulo.

A month later, the regional newspaper, the *Jornal do Interior*, reported that the Usina Santa Elisa bought 35 buses to transport bóias-frias to and from the fields only a few months after the Guariba strikes. The buses held 50 to 65 passengers each and "were equipped with boxes for cane-cutting tools and reserves for up to 500 liters of potable water."¹¹⁷ Cláudio Borges, the transportation manager of the Biagi owned Companhia Agricola Sertãozinho (CASE), of which Santa Elisa is a part, stated that the buses were part of an effort to "assure more comfort for our rural workers."¹¹⁸ The usina directed this publicized overture for regional businessmen and urban elite as well as to restore public perception of the usina.

The Usina Santa Elisa again presented its improved worker conditions to the public in an exposé on Dona Guiomar in a *Globo Rural* report following the Guariba Accord. While Dona Guiomar and her fellow caneworkers cooked their lunches and brought them in the tin cans that earned these workers the name *bóias-frias*, the reporters also noted that some usineiros offered trailers that provided heated food. Workers paid Cr\$1,460 per month for the company provided food. Paulo Magalhães, an Usina Santa Elisa representative, noted that the heated food provided "personal satisfaction" for cane workers.¹¹⁹ However, given the financial burden of purchasing the heated food every month on top of the financial strain described by Dona Guiomar, surely many workers could not participate. Nevertheless, the Usina Santa Elisa sought to distance itself from the negative image of the Guariba strikes and prove that it had made changes to improve workers' experience in the cane fields to the public.

¹¹⁷ "Usina utiliza ônibus para transporte de bóias-frias," *Jornal do Interior* 86 (Ribeirão Preto, September 10–16th, 1984): 10. Folder 50/028, Arquivo Público do Estado de São Paulo: São Paulo.

¹¹⁸ Ibid.

¹¹⁹ Also, Ernesto Paglia, *Rede Globo* (June 1984) in "Boias-frias e o Acordo de Guariba ápos a greve de 1984" (July 24th, 2014), YouTube, <u>https://www.youtube.com/watch?v=9ZiZbF6WYUk</u>. Accessed May 1st, 2015.

While the Usina Santa Elisa's actions were likely in response to the strikes, exposés on affiliated fazendas and their failure to meet the Guariba agreement's parameters may have also driven such actions. Such action responded to an increasingly negative public gaze on the strikes through television reports. In this respect, the strikes substantially strengthened workers' visibility and stories on these conditions became a mode of holding usineiros and *empreiteiros* somewhat more accountable. The Guariba strikes drew this attention to these conditions and exposing them was seemingly good television. In fact, the Guariba strikes were so popular they inspired a telenovela, *O Salvador Da Patria*, in the late 1980s.¹²⁰ Thus, the Guariba strikes allowed workers to demand tangible improvements to their working conditions. Appeasing workers was not important to employers but public perception was. The strikes and subsequent negative publicity drove some labor improvements.

Overall, the Guariba strikes were an important moment in paulista rural labor history. Workers' unprecedented demands and their gains with the Guariba Accord asserted the position of a growing population of workers, salaried temporary workers, which increasingly dominated the rural labor market. Cliff Welch argues that the strikes drew attention to agrarian reform as a central issue for the new civil government to address in 1985, further supporting the far-reaching implications of the strikes.¹²¹ The attention that the strikes garnered first in Guariba spread through the region and the country, extending to sugar and orange-producing regions in Goiás, Minas Gerais, and Paraná as well. Thus, Guariba drew the attention of workers far outside the

¹²⁰ Paulo Ubiratan et al., "O Salvador da Patria," *Rede Globo* (January 9th, 1989 - August 12th, 1989), accessed September 9th, 2014, <memoriaglobo.globo.com>.

¹²¹ Cliff Welch cohesively summarizes the strikes and Guariba mobilization's influence on the democratic transition. Welch, *A semente foi plantada*, 432-437. On the point of agrarian reform in the new civil government, a long and more violent struggle for agrarian land reform waged on in the Amazon, but the paulista centrality in Brazilian economics and politics certainly forced the issue into view more for Brazilians of the central-southern region.

Ribeirão Preto region, motivating other workers to make similar demands of their agricultural employers.¹²²

Guariba and Critiquing Proálcool

While the Guariba strikes had clear implications for rural labor rights, it also had a lasting influence on reviews of the program in public debate. Over the final two military administrations, President Geisel and then President Figueiredo constructed and promoted Proálcool around the image of a domestic solution to an international problem that would increase job opportunities for rural laborers throughout the countryside among other benefits. Large-scale producers like Maurilio Biagi Filho continued to promote this position, even as the conditions of this labor expansion grew increasingly exploitative.¹²³ Efforts to redirect attention to the program's successful creation of jobs to garner support for the program became increasingly difficult.

For many, it was increasingly clear that the Brazilian government employed Proálcool to meet its own economic and political interests to the detriment of rural laborers. As José Gomes da Silva, founder of the Brazilian Agrarian Reform Association and former Secretary of Agriculture under São Paulo Governor Montoro stated, "the real victims of Proálcool [...] were

 ¹²² Confederação Nacional dos Trabalhadores na Agricultura (CONTAG), *Relatório Annual de 1984* (Brasília (DF), June 29, 1985), 14–25. Brazilian Popular Groups Collection, Arquivo Edgard Leuenroth, UNICAMP: Campinas, São Paulo.

¹²³ As a CPT pamphlet summarized, the program had three key objectives: "1. To end the oil crisis; 2. To end the external debt (debts that were not made by the people nor had their approval); 3. To end employment inequality between the North and the South of the country." Associação de solidariedade as comunidades carentes de MT (Mato Grosso), Comissão pastoral da terra/regional de MT, and Centro de documentação terra e indio, "Pro-álcool: Mar de cana, mar de miséria," (Cuiabá-MT, 1984): 10–11. Brazilian Popular Groups: Agrarian Reform Collection; Maurilio Biagi Filho, "O álcool é nosso," *A Folha de São Paulo* (May 9th, 1983).

the salaried workers [*volantes*], abandoned by the [federal] Government."¹²⁴ Such opinions became increasingly common not only among rural workers but among political appointees surrounding the Guariba strikes.

Rural workers actions, beginning with the Guariba strikes, drew social and political leaders into a conversation about the broader social impact of the Proálcool and long-term effects of the military government's development agenda. These conversations were not new but a connection between social justice and development reemerged around the public nature of the Guariba strikes. Conditions that had been shrouded in the silent dismantling of social responsibility for workers over the past forty years came into sharper view behind the Guariba strikes and the its resolution with the Guariba Accord.

As stated in the National Agrarian Reform newsletter issued following the strikes in July 1984, "The recent events in the countryside, the fights, the conflicts and the violence in general against rural workers and their families has at its core the same cause: the model of economic development applied to the agricultural sector."¹²⁵ The Guariba strikes briefly forced the national spotlight on the realities of the "modernized" agricultural industry. The spreading notoriety of the Guariba strikes drew into sharp relief the impact of Proálcool's expansion on workers. The

¹²⁴ FETAESP, "José Gomes da Silva volta ao batente: e Secretarias querem disciplinar Proálcool," *Realidade Rural* (July, 1984): 8. O Centro de Documentação e Pesquisa Vergueiro: São Paulo. It is worth mentioning that Gomes da Silva became a strong proponent of land reform and together with Minister Nelson Ribeiro proposed the first National Agrarian Reform Plan of the New Republic (*Primeiro Plano Nacional de Reforma Agrária da Nova República*) in 1985 to the new President José Sarney, winning him no favor with agricultural elites. Dr. Flávio Teles de Menezes, President of Sociedade Rural Brasileira (SRB), "Paz no Campo," in *A Rural* 65, n. 594 (December, 1985), 3.

¹²⁵ CONTAG/CPT/CIMI/CNBB/ABRA/IBASE, *Companha Nacional Pela Reforma Agraria: Informa* 8 (Rio de Janeiro- November/December, 1984): 15. Brazilian Popular Groups: Agrarian Reform Collection.

strikes brought vivid imagery and horrific stories of extreme violence, exploitation, and hunger in a region that had prospered most under the program into public debate.

The Guariba Strikes inserted Brazilian sugarcane workers in Ribeirão Preto into a broader review of Proálcool as the military dictatorship's engineered development program, opening another avenue of criticism against the program. As the São Paulo State government gained more political independence from the dictatorship and its imposed development plan, government officials like José Gomes da Silva acknowledged the need to address the disproportionate effects of Proálcool in the state. In fact, the Secretaries of Agriculture, of the Interior, and of Industry and Commerce formed a commission on the subject to reconsider the direction of Proálcool in the state and "looking to 'domesticate' the expansion of cane in traditional sectors and under a policy of deconcentration [of land]."¹²⁶ Such a commission highlights the direct impact that Guariba had on development in the region and how it opened up larger dialogues about development and society for policymakers that had ignored the negative impact of such massive sugarcane expansion for so long.

The political transition to democratic elections had an important impact on these state officials ability to criticize the program. Direct elections for governors in 1982 began a wave of political protest that culminated with the huge mobilization of civil society led by the "Diretas Já" movement. The process of political opening that initially began under President Geisel in 1974 and continued through the Figueiredo administration brought direct elections for the presidency earlier than hard-line officers had anticipated.¹²⁷ The success of these movements

¹²⁶ FETAESP, "José Gomes da Silva volta ao batente: e Secreatrias querem disciplinar Proálcool," *Realidade Rural* (July, 1984): 8. O Centro de Documentação e Pesquisa Vergueiro: São Paulo.

¹²⁷ Francisco Vidal Luna and Herbert Klein, *The Economic and Social History of Brazil since 1889* (Cambridge: Cambringe University Press), 246–247.

along with a concerted commitment to political opening allowed criticism of the national alcohol program bloom in 1984 along with many other critiques of the military government.

At the same time, specialists and businessmen in Proálcool increasingly questioned the program's durability. For example, only five days after the strikes began, the major newspaper, *O Estado de São Paulo*, published a news series, "O programa em debate," on the program. Engineer and automobile specialist João Augusto do Amaral Gurgel reasserted earlier claims of the program's inflationary effect on the economy due to increased financing for production without increased income for the government.¹²⁸

Of course, rural workers still remained outside of Gurgel's analysis and many of the other commenter's analyses. For example, Minister of Industry and Commerce Camilo Penna quickly dismissed Gurgel's assessment and the general doubt in the program conveyed by the interviewer, Rodrigues. He argued that Proálcool, fortified by World Bank financing, "adds up to internal investment to create jobs, open new economic frontiers, develop specific technology, reduce air pollution, secure contracts for the capital goods industries, offer a beneficial balance with the production of sugar, favor the creation of new businesses, many of which are in the Interior."¹²⁹ Under fire, job creation remained a critical counterpoint for government analysis of the program.

And yet, Guariba's influence did reach some commenters' analyses. For example, Lamartine Navarro Jr. also commented on the program in the debate. Navarro Jr. was a paulista

¹²⁸ Rubens Rodrigues dos Santos interview with engineer and industrialist João Augusto do Amaral Gurgel, "Valeu a pena investir tanto?" *O Estado de São Paulo* (May 20th, 1984), 48. Ultimately, eight specialists contributed to the debate, which was published in segments over nine days. Those excluded from this analysis are: usineiros Olacir Francisco de Morais, specialist Eduardo Celestino Rodrigues, biochemistry professor Walter Borzani, and Petrobrás President and former Minister of Mines and Energy Shigeaki Ueki.

¹²⁹ Rubens Rodrigues dos Santos interview with Minister of Industry and Commerce Camilo Penna, "Penna rebate as críticas ao Proálcool," *O Estado de São Paulo* (May 22nd, 1984), 41.

engineer that had worked closely with usineiros and the government in the creation of Proálcool in the early 1970s. A contributor in the original report on opportunities for large-scale alcohol production with Maurilio Biagi in the 1974 report, "Fotosintesse como fonte energética." He became one of the first owners of an autonomous alcohol distillery in the early program.¹³⁰

In his interview, Navarro revealed that state intervention did seek to address the program's social shortcomings. While Navarro quickly dismissed the inflationary accusations about the program, he drew attention to the state of São Paulo's attempt to integrate a social analytical aspect to program selection. He claimed that the state's proposed intervention in program implementation, articulated in the document "Guidelines for the Analysis of Proálcool Projects in the State of São Paulo," proposed to "condition the installation of new units upon 'fulfillment of labor legislation and collective bargaining in consultation with the Ministry of Labor, Rural Workers' Syndicate and the Federation of Agricultural Workers."¹³¹ Thus, while producers like Navarro opposed greater intervention in the program, state officials sought to address the program's apparent iniquities with state restrictions on the national program's implementation. The Guariba strikes surely had an influence on such a policy position.

Ultimately, the Guariba's strikes remained a blemish on the supporters' glowing review of Ribeirão Preto's own leadership in the program. This was most notable in the contributions of Luiz Lacerda Biagi, exiting president of the Biagi's Zanini S/A, to the debate. The very first

¹³⁰ Barzelay, *Politicized Market*, 300n20; Santos, "Alcohol as Fuel," 254; Ruben Rodrigues dos Santos interview with Lamartine Navarro Júnior, "Pretende-se socializar Proálcool em São Paulo," *O Estado de São Paulo* (May 23rd, 1984), 22.

¹³¹ As cited in Ruben Rodrigues dos Santos interview with Lamartine Navarro Júnior, "Pretendese socializar Proálcool em São Paulo," O Estado de São Paulo (May 23rd, 1984), 22. São Paulo state government proposed greater control of program implementation in the document "Diretrizes para Análise de Projetos do Proálcool no Estado de São Paulo" in order to intervene in the program's application. Lamartine claims the document proposed to "drastically limit the installation of new units or the amplification of already existing [units] in the area defined as non-priority through Pró-Oeste."

questions posed to Lacerda Biagi referenced the recent Guariba strikes, questioning if the Guariba Accord would make the program unsustainable for producers. Lacerda Biagi tried to evade the topic, responding that the IAA handled the administration of sugar and alcohol prices and thus the IAA would consider pay increases in the next revision of national prices. Additionally, Lacerda Biagi blamed worker's mobilization on the exorbitant water and electricity prices ("up to 1000%") they faced, which redirected the blame to government administration.¹³² This response dismissed the structural inequalities woven into the program's administration, much like the response of most of the debate participants that sought to promote Proálcool as an obvious success.

However, the interviewer, Rodrigues dos Santos, went further to explicitly connect questions of inflation, surrounding the price of alcohol compared to the price of gasoline, to the forced increase in labor costs for producers in his questioning of Lacerda Biagi. In response, Lacerda Biagi boasted of the profits the program generated, stating:

"anhydrous alcohol alone generates 700 million dollars per year toward the public coffers. There is a surplus production of sugarcane in Brazil, that is to say, if you make a balance of resources that the sector generates and of those that it utilizes, the balance is greatly in favor of an activity that represents a receipt around 12 billion dollars per year in Brazil, if we consider the prices of [refined] sugar, alcohol, sugarcane, and vinhasse [the problematic alcohol by-product most often used as a fertilizer in the fields], and which employs a contingent of around two million workers directly and indirectly."¹³³

Lacerda Biagi touted the program's wealth to assure the public of the program's viability, but, in so doing, he reiterates the social issues created through the program, in which producers made large profits and the workers struggled. Most importantly, the interviewer pushed Lacerda Biagi on the topic, thus illustrating the way the Guariba strikes had drawn public attention to these issues.

¹³² Rubens Rodrigues dos Santos interview with Luiz Lacerda Biagi, "Salário pouco pesa no Proálcool," O Estado de São Paulo (May 27th, 1984), 42.

¹³³ Ibid. See Table 10 as well.

Harvest	Production (10,000,000 liters)	Number of Direct Jobs (industrial and agricultural)
1975/76	.6	28,200
1976/77	.7	32,900
1977/78	1.5	70,500
1978/79	2.5	117,500
1979/80	3.4	159,800
1980/81	3.7	173,900
1981/82	4.2	197,400
1982/83	5.8	272,600
1983/84	7.9	371,300
1984/85	9.0	423,000

 Table 10: Estimated Job Creation Due to Alcohol Production

Source: CENAL as published in Rubens Rodrigues dos Santos, "Proálcool alcançou os objetivos, afirma técnica," *O Estado de São Paulo* (May 25th, 1984), 24.

In June 1985, a year after the first Guariba strike, Pedro Zan called Ribeirão Preto "a model of development" in his *O Estado de São Paulo* special article.¹³⁴ Ribeirão Preto stretched over 3 million hectares (almost 7.5 million acres) with over two million inhabitants by 1985. It was the biggest and largest producer of alternative energy and food in the state of São Paulo. The alcohol industry was an essential part of this economy, strengthening the state of São Paulo's national importance and placing a particular spotlight on the region in national politics. This position was tested with the Guariba strikes of 1984, challenging this pervasive image of Ribeirão Preto development on a national scale and more acutely drawing attention to the social iniquities fundamentally woven into the National Alcohol Program.

Similarly, Zan pointed to the ideal success of the Usina Santa Elisa an example of Ribeirão Preto's model development. He described the Usina Santa Elisa as follows:

¹³⁴ Pedro Zan, "Um modelo de desenvolvimento," O Estado de São Paulo (June 16th, 1985), 20.

"The Usina Santa Elisa is one of the largest and most modern in the country. It occupies an area of 30,000 [discontinuous] hectares [a little less than 75,000 acres] and penetrates 15 municipalities of the State. Its furthest points are 200 kilometers away. At its limits the horizon is mixed with cane-stalks and extensive green area. It is in this location that this year three million tons of cane with be produced, sufficient for the preparation of 200 million liters of alcohol and 2.7 million sacks of sugar."

The principal reference points for the usina are Jaboticabal and Ribeirão Preto, the heart of the Guariba strikes of 1984 and later strikes in 1985. The Usina doubled its area between 1980 and 1985, largely to accommodate a growing alcohol demand. In 1984, the usina had 21,000 hectares, which increased to 30,000 in 1985.¹³⁵ The aggressive expansion described here was not unique, although extreme, to Santa Elisa. Sugarcane production reached deeper into the countryside as demand for alcohol was particularly poignant in the dominant alcohol-producing region so close to the central São Paulo market. With over 3,000 employees, 2,000 were rural labor workers.¹³⁶

However, the Guariba strikes challenged this idealized version of Proálcool, the region, and the Usina Santa Elisa. Despite praise of Ribeirão Preto and the Usina Santa Elisa, temporary salaried workers had, and continued to, publicly protest the labor conditions created for the program's success. This exposed the underbelly of the military government's development program. Usineiros won large profits but workers won very little from Proálcool. Instead temporary salaried workers, or bóias-frias, expanded dramatically in both the North and the South thanks to labor legislation that facilitated emergence of this short-term labor force.

By late 1985, the program remained in trouble, with the World Bank financing drying up and the Brazilian government's unable to support the program. Strikes continued in the region as the transition to a democratic government began in earnest. Biagi Filho remained an adamant supporter of the program with a bit more humility than his brother, Lacerda Biagi. In his praise

¹³⁵ Zan, "A grande usina. Aqui se produz," 20.

¹³⁶ Ibid.

of the program's tenth year, he notes the important impact it had on job production. However, he goes out of his way to address rural workers improved working conditions, noting, "Between August of '84 and '85, the average salary of rural workers for agricultural businesses connected to sugar usinas in the region of Ribeirão Preto increased by 300%, providing an excellent salary adjustment and certainly provoking replication in related areas of production."¹³⁷ This is not to mention the myriad of other social problems that emerged with the program.¹³⁸ Still, the Guariba Strikes would contribute to usineiros like the Biagi's attention to rural workers more in an increasingly hostile national discourse about the program's value. The strikes introduced the social impact of the program. This included not simply citing job production, but forcing these producers and policymakers to engage rural workers' experience more amidst a shifting understanding of the program's costs.

Despite the wealth created through the Proálcool program in Ribeirão Preto, a growing discord around the long-term influence of Proálcool would have a lasting impact on public debate. The Guariba Strikes were an important part of this broader critique gaining ground in the public discourse around the program.

¹³⁷ Maurilio Biagi Filho, "O balanço positivo do Proálcool," *Folha de São Paulo* (October 6th, 1985).

¹³⁸ There is a growing literature that analyzes the costs of the program beyond just wages, especially worker dislocation, prostitution, etc. To solely address changes to wages is to simplify the deep impact the program had on the region. However, that is a project for another scholar. For example, see Silva, *Errantes*; Scopinho and Valarelli, eds, *Modernização e impactos sociais*; Eliana Tadeu Terci et al. *Desconcentração industrial: impactos socioeconomicos e urbanos no interior paulista (1970–1990)* (Piracicaba: UNIMEP, 2005).

Conclusion

Ribeirão Preto was the idealized ethanol capital, on which the federal government built its national policy of salvation for the economy. It was the jewel of the interior, through which it purported to develop the interior of the country, diversify economic opportunities for those outside urban centers, and resuscitate the agricultural economy. It was the pinnacle of agricultural industrialization on which the military government had invested a great deal of hope and more importantly financial resources in effort to push its economic development vision for the country. As such, the Guariba strikes in the Ribeirão Preto region centrally situated the military's development agenda, from its inception in the 1960s to its height under Proálcool, under the public microscope.

Proálcool expanded so quickly due to extensive federal intervention and a great deal of state and local political machinations. However, this process transformed rural workers lives and their place in Brazilian society as the government structured its own development plan behind domestic alcohol for fuel and the alcohol-fueled car. The Guariba strikes brought Proálcool's broader impact into the public debate, exposing the falsity behind the greater military dictatorship promise of economic and social stability that had legitimized the government since the coup in 1964. Just as present as the wealth connected with ethanol's growth was the troubled social reality that these workers experienced as a result of these drastic changes. The Guariba strikes were an important part of exposing this reality to the Brazilian public. Even as the

272

program continued through the 1980s as the government deregulated the industry, the strikes remained an important part of workers ongoing mobilization in the region.¹³⁹

¹³⁹ A good example of the continued labor unrest in the region is the metallurgy workers' strikes at the Biagi's Zanini S/A in the 1990s. See Santos, *A usinagem do capital*.

Conclusion: Assessing Proálcool: Deregulation, the State, and Development

Proálcool's premiere position as a development program slipped away quickly in the latter half of the 1980s. Program expansion ended in 1984. With the formal transition back to a civilian government with the entry of José Sarney in 1985, the military dictatorship came to an end and questions about the program grew. In October 1985, following Petrobrás officials' complaints about the "alcohol bill," the government pursued an investigation of the program's value. Minister of Industry and Commerce Roberto Gusmão and Minister of Mines and Energy Aureliano Chaves put together an interministry working group to evaluate the program.¹

Some, like Maurilio Biagi Filho, remained avid and outspoken supporters of the program and its positive impact on the economy. He supported the government's decision to create an evaluation commission on the program, claiming it was "correct, opportune and necessary" because

"Proálcool demands an full and in-depth examination that considers not only alcohol's contribution to a solution for the oil supply problem in Brazil- a problem that almost brought the country to rationing- but also takes into account the impressive universe of interests mobilized by the program, a true productive and technological achievement for important segments of the Brazilian economy."²

Yet, doubts continued to grow despite such rhetoric. That the government would pursue such an investigation revealed the deteriorating position that the program held in the new civilian government.

The writing was on the wall for Proálcool over the next couple of years. Despite the continued expansion of car sales, consumer support withered around rising alcohol shortages

¹ "Criado grupo de trabalho para avaliar Proálcool," *O Estado de São Paulo* (October 17th, 1985), 34; Maurilio Biagi Filho, "Proálcool veio para somar," *Folha de São Paulo* (November 10th, 1985). The group included representatives from CENAL, the IAA, the CNP, Petrobrás, the Secretary of Control of State Businesses (Sest) and the Ministry of Finance along with the Ministers of Industry and Commerce and Mines and Energy.

² Maurilio Biagi Filho, "Proálcool veio para somar," Folha de São Paulo (November 10th, 1985).

between harvests. By April 1989, these problems had become frontpage news with extensive shortages in the country's major cities.³ Consumers that had once counted on the government's support, and subsidies, of the program lost faith in the alcohol-car.⁴

Certainly, there were more issues at play in the in famous alcohol shortage of 1989. Sugar producers tried to pressure the government to increase sugar and alcohol prices, which was a constant battle. According to *Veja*, sugar producers only began collecting for the harvest after the government raised prices due to Brasília's own alcohol shortage. While Copersucar President Zillo had guaranteed that shortages were not a threat to consumers in 1983, the tides had changed by 1989. Indeed, the report indicates that sugar and alcohol producers received an increasingly bad reputation for opportunistic price demands in the midst of the growing alcohol crisis.⁵

The once effective promotion of Proálcool as a national program completely shifted. Instead, the report describes the program as "expensive and ambitious" and a "dramatic farce that makes up the Brazilian consumer's everyday."⁶ In fact, the *Veja* report points to the alcohol shortage in the seemingly golden Ribeirão Preto region, including Sertãozinho, from whence over 7 billion of the nation's 12 billion annual liters of alcohol came, as proof that the program was failing. Given the program's initial implementation to avoid oil shortages, the irony of alcohol shortages was not lost on the *Veja* author, this author, and likely neither the reader.

³ "Um sonho corroído," *Veja* 1080 (May 24th, 1989), cover and 102–107; "A dinastia do álcool," *Veja* 1080 (May 24th, 1989), 108–110.

⁴ As one Bahian businessman Augusto Garrido, owner of the Lido Confecções, stated in a *Veja* interview, "I do not feel secure with this government that [is in place]... At any moment, alcohol could lose all its advantages over gasoline." "Um sonho corroído," 102.

⁵ "Um sonho corroído," 102.

⁶ "Um sonho corroído," 103.

While the Copersucar President Werther Annichino blamed government planning, the program's reputation continued to decline.⁷

Consumers began to transition back to gasoline-driven cars. Some staunch supporters continued to speak out in favor of the program and its positive long-term impact. For example, former Minister of Finance Delfim Netto argued that, "the current [alcohol] shortages have nothing to do with Proálcool."⁸ Former Minister of Industry and Commerce stated that, "It is a crime to speak of deactivating Proálcool."⁹ Nevertheless, in March 1990, the second democratically-elected president, Fernando Collor de Mello, terminated the IAA as part of a neoliberal economic plan to stabilize the struggling Brazilian economy; in August, he recognized the limits of alcohol as a petroleum substitute, formally ending the program's expansion. Certainly, alcohol production continued, but the state-led development program as it had existed over the previous decade and a half ostensibly ended.

Thereafter, the sugar and alcohol industry underwent extensive deregulation in the 1990s. The removal of the state in the sector fits into a series of neoliberal reforms that swept the country in the 1990s.¹⁰ These reforms successfully removed the state from its central role in the creation and maintenance of the sugar and alcohol industry and replaced the state-led development program with a self-sustaining market. Political scientist Márcia Azanha Ferraz

⁷ Ibid.

⁸ João Camilo Penna, "Chega de inverdades sobre Proálcool," *O Estado de São Paulo* (Febraury 27th, 1990), 38.

⁹ Ibid.

¹⁰ These neoliberal reforms, best embodied in the Washington Consensus' promotion of open trade and macro-economic stability for developing countries, once again restructured ideas of development and growth in Brazil as theorists had in the 1930s and 1940s behind structuralism and dependency theory. Rather than looking to the state to intervene, the state became an unwelcome sign of dependence and backwardness that hindered the development of a functioning market in the 1990s. For example, see Haber, "The Efficiency Consequences of Institutional Change."

Dias de Moraes reveals that the deregulation of the sugar and alcohol sector followed its own unique path just as the industry's reformation in the 1930s through the early 1980s had. Deregulation of the sector began with the end of the IAA and reached its height in 1998 when President Fernando Henrique Cardoso released all sugar and alcohol price controls for a free and floating market in 1998.¹¹

Yet, the sugar and alcohol sector continued to grow as a vibrant private industry. As Historian Amanda Hartzmark points out, sugar producers did just fine without the IAA as they had found new more direct ties to government officials, whether through Copersucar or other access to state officials, that allowed them to secure financial support without going through the IAA.¹² In the 1990s, sugar production accelerated along with rural labor migration to Ribeirão Preto. The region remains the largest sugar and alcohol production hub in the country. Technology and research around the sector have intensified in the region behind event like the agroindustry fairs and conferences along with expanding research institutes in the interior of São Paulo.

Despite the program's conclusion, one should look at sugar and alcohol development behind the program in a broader scope. On the 60th anniversary of the Usina Santa Elisa's founding in 1996, Roberto Rodrigues, agronomist, former São Paulo State Secretary of Agriculture and future Minister of Agriculture, claimed, "Maurilio Biagi was an admirable driver in the cross from agricultural to industrial Brazil. He was one of the constructors of our modernization. The [sugar and alcohol] sector, the region, the state, and the Country owe much

¹¹ Dias de Moraes, A desregulamentação, 15-16.

¹² Hartzmark, "Businesses, Associations, and Regions," 316–317; Dias de Moraes, *A desregulamentação*, 81.

to him and to [the Usina] Santa Elisa.¹³ Indeed, Biagi was among many paulista producers that defined the growth of the sugar industry, leading one of the more unique varieties of industrial development in Brazilian development history: agro-industry.

The sugar and alcohol agro-industry grew in the 20th century with extensive government intervention to assist sugar producers. Peter Evans highlights Brazilian industries in which domestic producers dominated smaller, less technologically centered industries and foreign producers controlled more industrial sectors in his study of Brazilian development. With his classic case of the Brazilian pharmaceutical industry, he highlights the way Brazilian producers were pushed out of the industry because of the foreign producers' technological advantages. In fact, Marshall Eakins extends this argument in his own work, claiming that Brazilian industrial development was defined by a "lack of technological innovation" coupled with Evans' triple alliance of foreign capital, domestic entrepreneurs, and state intervention.

Evans makes but one mention of the growing Brazilian wealth in the sugar and sugar machinery industry, noting the Ometto/Dedini group's dominance in the respective sector. However, he quickly dismisses them, and thus the industry, stating "Even though their Fazenda São Martinho is one of Brazil's largest agricultural companies and the Dedini steel company is one of the top twenty in the steel industry, the groups' combined assets still do not put it among the top hundred corporations."¹⁴ Despite their leadership in the industry, which the Biagis would rival in the 1970s and 1980s, Evans dismisses the entire industry because their wealth does not reach the top 100 corporations in the country. My work suggests that this dismissal ignores another development model in Brazilian history: the sugar industry and more broadly agro-

¹³ "Parabéns à Santa Elisa," *A Revista Santa Elisa: uma história de trabalho e desenvolvimento*, (Ribeirão Preto: MIC Editorial Ltda, 1996), 74; Leão de Sousa and de Carvalho Macedo, *Ethanol and Bioelectricity*, 7.

¹⁴ Evans, *Dependent Development*, 148.

industry. This industry was very much shaped by the government's own political objectives in alcohol production beginning in the 1930s.

The alcohol industry followed a different development model. Born of state intervention, it would unevenly grow alongside an industrializing sugar industry. Formed under the protectionist era of the 1930s by President Vargas, the Institute of Sugar and Alcohol (IAA) would support a dramatic transformation of the sugar industry, physically from the Northeast to the Southeast, and eventually in its nature from a domestic provider to a major world sugar exporter anew by the 1970s. Initially dominated by foreign owners, domestic producers would push out foreign enterprise by the 1950s with the familial connections and entrepreneurial collaboration fostered in cases like Ribeirão Preto in the 1940s and 1950s. The continued government support for alcohol production in the sugar industry endured as an outlet for sugar overproduction and expanding interest in diminished oil imports.

Even still, the symbiotic growth of the sugar and alcohol industry deviates from the traditional industrial development examples presented in Brazilian historiography, primarily because of its agricultural foundation; However, its nature is very much industrial. Peter Eisenberg wrote of a sugar industry whose labor and production structure did not modernize at the turn of the century in his classic study, *Modernization without Change*, but in fact, the milling process did undergo a dramatic industrial expansion thereafter. ¹⁵ Where the industry once tied sugar planting and milling together in old antiquated mils of the 19th century, the 20th century saw the arrival of the "modern" usina, in which milling and planting were increasingly separate. As usinas spread, with larger, more concentrated milling processing for greater production than its predecessor, room for industrial growth in the industry opened.

¹⁵ Eisenberg, *The Sugar Industry in Pernambuco*.

Brazil's diminishing hold on the international market, intensified by a stronghold on the world coffee market, drove new sugar mill owners to invest in usinas with slightly more modern processing structures. The collapse of the world sugar market, along with virtually all other markets with the Great Depression in 1930, forced the government to intervene in a sugar industry that was still operating at varying levels of industrialization, with engenhos, central mills, and some usinas, largely owned by foreigners, speckled throughout the industry. Its inefficiency was most defined in the Northeastern market, the historical sugar-producing region of the country. While these producers pushed for increased government intervention to salvage the industry, sugar production in the state of São Paulo, the traditional coffee country, expanded. With this expansion, a more industrial sugar sector emerged. Eventually, producers in the south, surrounded by more industrial development in other sectors, like textiles, food, and metallurgy, and with access to more state-level support in the industrial capital of the country, would usurp Northeastern production in the 1950s. These paulista producers, with their "modern," namely mechanized and increasingly concentrated, production models would dominate and define the growth of a truly industrial sugar sector in the 1960s and 1970s. All the while a burgeoning, state-driven alcohol industry would grow alongside it.

The government, in the form of the IAA, drove the growth of the alcohol industry. Originally formed as an outlet for chronic overproduction in the Brazilian sugar industry, Moacyr Soares Pereira calls it the first state-led industry.¹⁶ The government completely constructed its demand with government-mandated mixture in the Brazilian fuel beginning in the 1930s. At times of struggle for the industry and the nation, the government promoted the industry as a solution to national problems: whether fuel shortages, balance of payments

¹⁶ Pereira, *O problema do álcool-motor*, 165; see chapter 2 of this dissertation, 40.

iniquities, or excess sugar production on a slumping international market. At other times, particularly in the 1950s, production fell out of favor. However, it persisted as the sugar industry continued to industrialize and grow.

By the 1970s, the sugar industry had grown into a domestic-driven export-oriented "agroindustry." The term grew around the sugar sector as domestic equipment companies reshaped the very make-up of the sector with massive, concentrated milling factories. Behind governmentfinanced modernization programs in the 1970s, these large-sale units came to define the industry.

And here is where the sugar and alcohol industry, so intricately connected in its formation, diverges from the traditional development model proposed by Evans and reasserted by Eakins. Unlike Evans contention, the sugar industry remained in the control of domestic producers despite the incorporation of more foreign technology in the 1960s and 1970s. Despite Eakins assertion, domestic technological development drove the industries' continued expansion in the 1970s with the creation of the alcohol-fueled car and sugarcane equipment and refined production techniques among other innovations.

These developments all occurred under a military dictatorship whose legitimacy was very closely tied to the sugar industry. First, the military pushed the industry's expansion behind a renewed agricultural export-led development model in the late 1960s. A newly modernized sugar industry, supported by government aid in the form of the IAA, drove this development model, producing huge profits on a particularly favorable international market in the 1960s and early 1970s. Then, the military dictatorship pursued a grander state-led development plan with the creation of Proálcool to address a multitude of economic and political issues facing the government, not least of which was a spiraling development agenda and sky-rocketing oil prices. Once again, government officials would look to the alcohol industry to salvage these issues.

281

I argue that the program continues to defy the traditional Brazilian development models described by Evans and Eakin. My study focuses on the Usina Santa Elisa and the role its owners, the Biagi family, had in the modernization of the sugar industry and the recreation of the alcohol interests within the sugar sector in the 1970s and 1980s under Proálcool. Their repeated intervention in the direction of the sugar and alcohol industry's development highlight the very important role that domestic sugar producers' had in the alcohol industry. These entrepreneurs were able to control foreign investment and technological development to a degree far greater than the pharmaceutical and car industry while remaining outside of complete state control like steel and petroleum. This remains quite unique to Brazilian development, perhaps answering Eakins' call to further explore secondary industrial development markets by assessing the place of agro-industry in traditional agricultural producing regions like Ribeirão Preto.¹⁷

Surely the program came with major costs. The agro-industrial nature of the alcohol program allowed the very nature of the sugar industry described by Eisenberg, in which nothing really changed for workers, to intensify and degrade in the case of sugarcane workers under Proálcool. In order to make the program work, regulations of the labor market, so tightly wound in the sugar and alcohol production sector, were increasingly loose and indefinite in the labor sector. These were, in fact, damning for workers' mobilization and organization in the beginning of the program, further supported by an authoritarian political structure.¹⁸

The reality of the program's impact on workers has garnered a great deal of attention in the historiography, with varying claims about the success of the strikes and their broader impact

¹⁷ Eakin, Tropical Capitalism, 170–175.

¹⁸ Although Guillermo O'Donnell's study of bureaucratic authroitatian regimes has been much disputed and revised, his argument about workers' suppression stands. O'Donnell, *Modernization and Bureaucratic-Authoritarianism*, 96.

on social relations between workers and the national government.¹⁹ Yet, I argue that workers found a way to insert themselves in the debate on Proálcool.

Driven by a new labor policy, insupportable service expenses, and trying living conditions, workers in the country's largest alcohol-producing region forced the issue. Their actions won national attention in numerous news sources, and workers experience under Proálcool changed the national debate on the program. These strikes were part of a general shift in support against the program. This was not the first time, but it was possibly the last time that the program would lose support. Ironically, the strikes helped to justify neoliberal policies that abrogated the IAA and other government support for the alcohol industry.

To assume that those that moved away from the program did so because of the Guariba strikes would be to overestimate workers' influence on a national political environment that had rather efficiently ignored them for decades. However, I argue that their very insertion into the debate promoted workers' own referendum on the failures of the military government's development agenda with some success. To say that the great attention the social impact of the program receives in recent Brazilian rural labor histories attests to this point seems ambitious but not overreaching to this author.²⁰

Today, Proálcool remains a polarizing topic. Some argue it was one of the state's most successful development programs to date. Others argue it was a complete disaster, dissolving into the night in the 1990s as a costly blemish on the authoritarian government's pockmarked face. Surely both of these perspectives are extreme. The program's success or failure is less the issue in my work. Rather I focus on the path of development that the program followed as

¹⁹ Welch, *A semente foi plantada*, 426–427. Clifford Welch claims that the strikes influenced the development of the agrarian reform agenda.

²⁰ For example, Thomaz Junior, Por trás dos canaviais; Welch, A semente foi plantada.

debated, manipulated, and pushed by producers and eventually by workers alike. In this space, there is room for both congratulatory recognition of domestic entrepreneurship to sit next to the critical eye for the program's social implications.

From a macroeconomic perspective, the program was a success. The state successfully intervened in the market to create a new product, alcohol, structuring consumption and production through government support. However, the state's basic accomplishment came with high costs. The program itself was expensive, totaling more than USD\$7.5 billion over the course of the program according to former Minister of Industry and Commerce João Camilo Penna.²¹ Economic scholars might question whether this cost was worthy of the product created. Certainly, in the wave of neoliberal reforms that swept the country in the late 1980s and early 1990s, politicians assessed it to be unworthy. In this respect, Proálcool's end, coupled with the end of the IAA itself, fits neatly into the broader neoliberal deconstruction of state-led enterprises in this period.

Still, this project reassesses the state's impact in the development of the alcohol industry given the industry's success today. This work has unveiled the broader agro-industrial development model followed in the sugar sector that allowed the alcohol industry to emerge under state tutelage. The state was a crucial supporter of alcohol production over the course of the 20th century, without which there likely would not have been sufficient economic incentives to develop this alternative fuel industry. The state pushed technological development in and around the industry that preened it to become the most advanced ethanol industry in the world in the 21st century.

²¹ Luiz Carlos Correa, "Para Camilo Penna, Proálcool resiste," *O Estado de São Paulo* (August 19th, 1990), 94.

Assessing a development agenda includes more than just its macroeconomic indicators. The social impact of the program belongs side by side with the state-led industry's accomplishments. That the industry remains such an important part of the Brazilian energy matrix today with a largely mechanized production structure indicates that the issues that boiled over with the Guariba strikes contextualize a larger struggle between capital, labor, and technology that connects Proálcool and the sugar sector to many other industries today.

These coexisting and conflicting realities shape the complicated history of ethanol development in Brazil, but they are not unique to this industry alone. As countries seek to expand alternative energy options around the world, Brazilian politicians and businessmen, including former President Lula, have posited that Brazil's success with ethanol might be a viable development path for other sugar-producing countries. Notably, the US and Brazil entered into the 2007 US-Brazil Biofuel Partnership Agreement under President Bush and President Lula in which both countries have sought to expand the ethanol market and share technology and research information to encourage the the diversification of the world energy matrix further with ethanol. In addition, the agreement has fueled trilateral projects between the US and Brazil in third-party countries, such as the Domincan Republic, Haiti, St. Kitts, Nevis, and El Salvador.²²

Yet, my research indicates that the Brazilian state created very specific conditions over numerous decades that allowed the industry to develop the way that it did. These conditions are not easily replicated, but their implications, macroeconomic and social, indicate that any attempt to do so within an expanding global biofuel market will likely require extensive state intervention to achieve with numerous social ramifications that come in tow. As such, the

²² Bureau of Western Hemisphere Affairs, "Advancing Cooperation on Biofuels: U.S.-Brazil Steering Group Meets August 20 in Brasilia," US State Department Archive, published August 22nd, 2007, http://2001-2009.state.gov/p/wha/rls/fs/2007/91399.htm.

Brazilian ethanol case is a notable tale for alternative energy development today, with highs and lows that need to be considered and addressed head-on.

APPENDIX

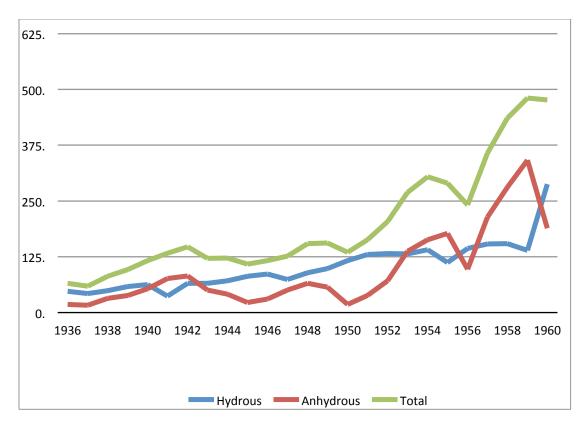


Figure 10: Alcohol Production, 1936–1960

Source: IAA, Anuario Acucarareiro, 1951 and 1966 editions.

Alcohol production measured in millions of liters. The IAA supported alcohol production explicitly beginning in 1933. Anhydrous alcohol first entered the market in 1934. Used in the gasoline mixture promoted by the IAA, anhydrous alcohol grew more slowly than hydrous alcohol, but the overall level of alcohol's expansion highlights the successful intervention of the federal government to promote alcohol production.

Year	Alcool- motor production	Alcohol	Gasoline	Kerosene	Other	Value correspondin g to gasoline substituted by alcohol (Cr\$)
1932	19,265,909	12,147,957	7,096,405	16,491	5,056	3,328,540
1933	14,620,854	12,963,002	1,638,996	23,933	4,923	3,030,379
1934	27,285,269	14,115,963	13,154,824	14,278	204	3,373,715
1935	47,524,474	16,741,945	30,776,386	3,527	2,616	5,876,423
1936	138,611,595	24,340,393	114,268,502	2,700		8,519,137.50
1937	112,342,593	18,446,646	93,858,920	35,826	1,201	6,991,278.80
1938	213,477,743	32,689,879	180,774,813	11,592	1,459	11,408,767.70
1939	312,683,596	49,065,372	263,613,752	2,920	1,552	21,539,698.30
1940	299,216,620	44,834,030	254,382,328		262	17,664,607.80
1941	462,509,137	102,789,512	359,714,871	4,713	41	45,741,332.80
1942	290,575,449	104,692,135	185,619,753	1,421	262,140	46,588,000.10
1943	144,472,374	87,934,676	56,507,970		29,728	55,838,519.30
1944	141,736,330	82,831,623	58,777,538		127,169	40,587,495.30
1945	111,242,247	36,133,748	75,108,499			15,284,575.40

Table 11: Alcohol-Motor Mixture, 1932–1950 (in liters)Source: IAA, Anuario Açucareiro 1950–1951, 76; de Melo, A política do álcool-motor, appendix.

Table 11 (cont'd.)

1946	117,812,916	28,221,688	89,591,228	 	13,264,193.40
1947	558,779,589	76,067,105	482,712,484	 	39,783,095.90
1948	633,579,529	92,903,343	540,676,186	 	48,588,448.40
1949	466,751,745	70,724,786	396,026,959	 	40,525,302.40
1950	111,448,618	10,852,440	100,596,178	 	6,392,087.20

Year	Gasoline imports	Quantity of anhydrous	Production of	Number of Distilleries	Capacity	
	subject to denaturing	alcohol corresponding to legal quota	anhydrous alcohol		Daily	Annual
1933	293,565,711	14,678,286	100,000	1	12,000	1,800,000
1934	353,523,763	17,676,188	911,861	5	48,000	7,200,000
1935	394,008,149	19,700,407	5,411,429	14	138,500	20,775,000
1936	430,757,560	21,537,878	18,462,432	26	275,000	41,250,000
1937	449,177,202	22,458,860	16,397,781	27	377,000	56,550,000
1938	482,503,809	46,804,839	31,919,934	30	427,000	64,050,000
1939	497,201,938	49,720,194	38,171,502	31	437,000	65,550,000
1940	584,935,070	58,493,507	53,473,533	38	572,000	85,800,000

Table 12: National Alcohol-Motor Production Capacity, 1932–1940 (in liters)Source: de Melo, A política do álcool-motor, appendix.

Usina	1951/52	1952/53	1953/54	1954/55	1955/56	1960/61
Santa Elisa	Sugar: 133,159	126,289	170,400	188,000	157,166	483,562
Liisa	Alcohol: H: 1,392,300 A: n/a	125,0971 n/a	1,282,843 n/a	1,821,070 n/a	1,681,320 n/a	1,604,400 1,868,000
Da Pedra	Sugar: 214,637	237,173	302,349	288,200	260,860	403,889
	Alcohol: H: 1,987,000 A: n/a	2,460,000 n/a	2,442,538 255,200	1,398,880 2,026,100	956,120 2,643,900	1,463,700 2,507,300
São Geraldo	Sugar: 64,003	83,304	117,128	152,410	116,187	282,840
Geraido	Alcohol: H: 470,012 A: n/a	665,000 n/a	1,130,400 215,500	300,642 2,394,350	207,400 2,601,610	n/a 2,528,900
Santo Antonio	Sugar: 54,712	71,501	94,602	103,644	104,476	265,572
	Alcohol: H: n/a A: n/a	n/a n/a	n/a n/a	n/a n/a	n/a n/a	n/a 3,800,000
Santa Lydia	Sugar: 47,135	69,877	96,999	104,374	102,505	188,851
	Alcohol: H: 383,745 A: n/a	534,690 n/a	983,500 n/a	1,157,910 n/a	597,060 n/a	419,000 1,523,300

Table 13: Sugar and Alcohol Expansion in the Ribeirão Preto Region in the 1950s Source: IAA, *Anuario Acucareiro*, 1950, 53–56, and 60/61–65/66 editions. H=hydrous alcohol and A= anhydrous alcohol

Year	GDP Growth Rate (%)	Agriculture (% of Total GDP)	Industry (% of Total GDP)
1964	3.4	16.28	32.52
1965	2.4	15.86	31.96
1966	6.7	14.15	32.76
1967	4.2	13.71	32.03
1968	9.8	11.79	34.77
1969	9.5	11.39	35.24
1970	10.4	11.55	35.84
1971	11.3	12.17	36.22
1972	12.1	12.25	36.99
1973	14	11.02	39.59
1974	9	11.44	40.49
1975	5.2	10.75	40.37

Table 14: National Growth Rates, 1964–1975

Source: Baer, *Brazilian Economy*, 462. Note that the remaining % of GDP went to the Service Sector.

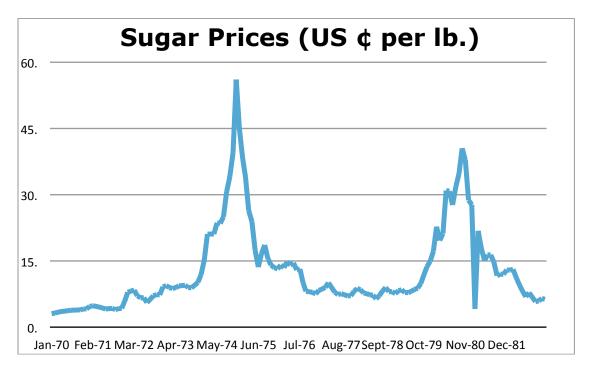


Figure 11: Monthly World Sugar Prices, 1973–1982

Source: Sugar prices from International Sugar Organization, *Sugar Yearbooks* as published in Santos, "Alcohol as Fuel," 600.

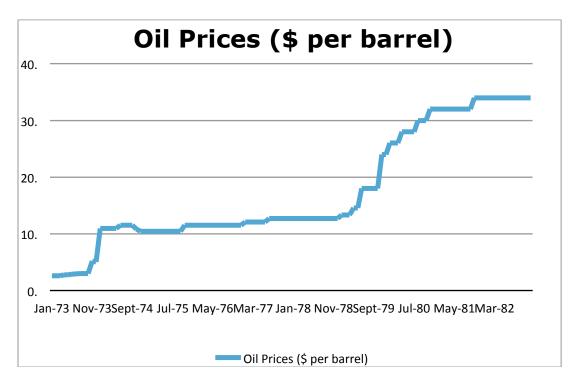


Figure 12: World Oil Prices, 1973-1982

Source: Oil Prices reflect OPEC prices in nominal prices Data from *International Crude Oil and Products Prices* (Beirut, Lebanon) and Michael C. Lynch from Energy Laboratory, MIT as published in Santos, "Alcohol as Fuel," 590.

Year	Exports	Imports	Trade Balance	Current Account
1970	2739.00	2507.0	232.00	-562.00
1971	2904.00	3245.0	-341.00	-1037.00
1972	3991.00	4235.0	-244.00	-1489.00
1973	6199.00	6192.2	7.00	-1688.00
1974	7951.00	12641.3	-4690.30	-7122.40
1975	8669.90	122210.3	-3540.40	-6700.20
1976	10128.30	12383.0	-2254.70	-6017.10
1977	12120.10	12023.0	97.10	-4037.30
1978	12658.90	13683.1	-1024.20	-6990.40
1979	15244.40	18083.1	-2838.70	-10741.60
1980	20133.00	22954.0	-2821.00	-12807.00
1981	23292.00	22092.0	1200.00	-11734.00
1982	20176.00	19395.0	781.00	-16311.00
1983	21899.00	15429.0	6469.00	-6837.00
1984	27006.00	13916.0	13088.00	45.00
1985	25642.00	13154.0	12487.00	-242.00

Table 15: Brazilian Balance of Payment (in US\$ millions)Source: Werner Baer, *The Brazilian Economy: Growth and Development* 5th ed. (Boulder: Greenwood Press, 2001), 468.

Year	Real Minimum Wage (Growth Rate)	Inflation Rate
1970	1.8%	16.4%
1971	9%	20.3%
1972	-2.7%	19.1%
1973	-3.4%	22.7%
1974	5.4%	34.8%
1975	-5.1%	33.9%
1976	1.7%	47.6%
1977	9%	46.2%
1978	-1.7%	38.9%
1979	-17%	55.8%
1980	2.5%	110%
1981	-1.90%	95%
1982	.70%	100%
1983	-10.20%	211%
1984	-8.80%	224%
1985	-10.10%	235%

Table 16: Brazilian Annual Inflation Rate (Average), 1950–1985Source: Werner Baer, *The Brazilian Economy: Growth and Development* 5th ed. (Boulder: Greenwood Press, 2001), 470-471.

Harvest year	Cane crushed (1,000,000 tons)*	Sugar produced	Alcohol produced
1975/76	68.3	68,322,619	555,627
1976/77	87.8	87,826,664	662,598
1977/78	104.6	104,633,795	1,470,404
1978/79	109.7	107,626,377	2,490,603
1979/80	117.3	112,648,423	3,396,455
1980/81	132.1	123,006,681	3,706,375
1981/82	133.3	132,886,342	4,240,123
1982/83	166.7	166,178,592	5,823,339
1983/84	210.0	196,742,941	7,8674,208
1984/85	228.0	201,218,937	9,129,329

Table 17: Sugarcane Crushed and Production of Sugar and Alcohol, 1970–1985

Source: Unica data as cited in Dias de Moraes, *A desregulamentação do setor sucroalcooleiro do Brasil*, 27-28.

*Cane crushed data from IAA as cited in Pamplona, *Proálcool*, 25. 1984/85 is an estimate.

Harvest	North/Northeast	Center-South	Brazil
1975/76	25,600,659	42,721,960	68,322,619
1976/77	34,530,942	53,295,722	87,826,664
1977/78	35,683,051	68,950,744	104,633,795
1978/79	36,169,466	71,456,911	107,626,377
1979/80	35,224,179	77,424,244	112,648,423
1980/81	40,248,489	82,758,192	123,006,681
1981/82	41,731,267	91,155,075	132,886,342
1982/83	50,210,312	115,968,280	166,178,592
1983/84	52,221,376	144,521,565	196,742,941
1984/85	57,072,802	144,146,135	201,218,937

Table 18: Evolution of Sugar Production, 1975/76–1984/85Source: Unica data as cited in Dias de Moraes, A desregulamentação, 28.

Harvest	North/Northeast	Center-South	Brazil
1975/76	93,790	461,837	555,627
1976/77	110,511	553,087	662,598
1977/78	207,795	1,262,609	1,470,404
1978/79	411,252	2,079,351	2,490,603
1979/80	569,245	2,827,210	3,396,455
1980/81	650,472	3,055,903	3,706,375
1981/82	825,720	3,414,403	4,240,123
1982/83	1,188,288	4,635,051	5,823,339
1983/84	1,129,635	6,734,573	7,864,208
1984/85	1,603,841	7,588,488	9,129,329

Table 19: Evolution of Alcohol Production, 1975/76–1984/85 (in cubic meters)Source: Unica data as cited in Dias de Moraes, *A desregulamentação*, 27.

Harvest	Total	Anhydrous	Hydrous
1930/31	33.3	N/A	33.3
1931/32	37.4	N/A	37.4
1932/33	39.0	N/A	39.0
1933/34	43.4	.1	43.3
1934/35	54.3	3.2	47.2
1935/36	62.0	7.7	54.3
1936/37	57.4	14.1	43.3
1937/38	63.9	20.6	43.2
1938/39	92.3	36.5	55.8
1939/40	92.3	36.5	55.8
1940/41	126.6	67.6	59.0
1941/42	128.6	70.6	57.9
1942/43	151.7	76.9	74.8
1943/44	125.0	46.6	78.3
1944/45	119.8	30.4	89.3
1945/46	106.5	26.1	80.4
1946/47	117.0	36.1	80.9
1947/48	143.8	61.5	82.3
1948/49	167.3	75.1	92.2
1949/50	135.6	30.6	105.0
1950/51	140.1	28.4	111.7

Table 20: Brazilian Alcohol Production, 1930/31–1982/83 (in millions of liters) Source: Unica data as cited in Dias de Moraes, *A desregulamentação*, 27 and Santos, "Alcohol as Fuel," 620.

Table 20 (cont'd.)

1951/52	170.4	50.0	122.4
1952/53	229.5	99.1	130.4
1953/54	274.0	144.5	129.5
1954/55	306.2	168.5	137.7
1955/56	283.2	165.8	117.3
1956/57	252.4	104.4	148.0
1957/58	398.8	245.1	153.7
1958/59	444.2	281.7	162.5
1959/60	472.0	302.1	170.0
1960/61	456.3	175.3	281.0
1961/62	427.5	206.2	221.3
1962/63	343.7	101.1	242.6
1963/64	405.5	96.1	309.4
1964/65	387.0	110.2	276.7
1965/66	602.7	336.3	266.4
1966/67	727.5	382.1	345.3
1967/68	676.3	358.5	317.8
1968/69	473.6	143.3	330.3
1969/70	461.6	100.4	361.2
1970/71	637.2	252.4	384.8
1971/72	613.1	389.9	223.1
1972/73	681.0	388.9	292.0
1973/74	660.0	306.2	359.8
1974/75	625.0	216.5	408.4

Table 20 (cont'd.)

1975/76	555.6	232.6	323.0
1976/77	664.0	300.3	363.7
1977/78	1470.4	1176.9	293.4
1978/79	2490.6	2095.6	395.0
1979/80	3396.4	2713.4	683.1
1980/81	3706.4	2104.0	1602.3
1981/82	4240.1	1453.1	2787.0
1982/83	5823.3	3549.7	2273.6

BIBLIOGRAPHY

BIBLIOGRAPHY

Primary Sources

Archival Sources: Associação de Comercio e Indústria de Ribeirão Preto (ACIRP)

Arquivo Nacional, Rio de Janeiro Instituto do Açúcar e do Álcool (IAA) Collection

Arquivo Nacional, Brasília

Arquivo Público e Histórico de Ribeirão Preto, Municipal Archive of Ribeirão Preto

Arquivo Público do Estado de São Paulo

Arquivo Edgard Leuenroth (AEL), Universidade Estadual de Campinas (UNICAMP) Brazilian Popular Groups Collection

Biblioteca Canaoeste, Sertãozinho, São Paulo

O Centro de Documentação e Pesquisa Vergueiro, São Paulo

Published Primary Sources: Anuário Açucareiro (1938-1967)

Brasil Açucareiro (1934-1979)

Newspapers and Magazines: Diário do Município

Estado de São Paulo

Folha de Säo Paulo

Jornal do Brasil

Realidade Rural

Veja

Personal Collection: Clifford Welch

Interviews:

Biagi Jr., Maurilio. Interview with Maurilio Biagi Jr. Interview by Jennifer Eaglin. Ribeirão Preto, SP, May 20, 2013.

Bragheto, José Domingos. Interview with Padre Bragheto. São Paulo, SP, April 13, 2013.

———. Interview with Padre José Domingos Bragheto. Interview by Cliff Welch. São Paulo, SP, September 13, 2004.

Garnero, Mario. Interview with Mario Garnero. Interview by Jennifer Eaglin. São Paulo, SP, November 12, 2013.

Golfeto, Antonio Vicente. Interview with Antonio Vicente Golfeto. Interview by Jennifer Eaglin. Ribeirão Preto, SP, May 9, 2013.

Silveira, Ubaldo. Interview with Ubaldo Silveira. Interview by Jennifer Eaglin. Ribeirão Preto, SP, April 21, 2013.

Secondary Sources

- Abrams, Philip. "Notes on the Difficulty of Studying the State (1977)." *Journal of Historical Sociology* 1, no. 1 (March 1, 1988): 58–89.
- Abreu, Marcelo de Paiva, ed. *A ordem do progresso: cem anos de política economica republican, 1889–1989.* Rio de Janeiro: Campus, 1989.
- Alves, Maria Helena Moreira. *State and Opposition in Military Brazil*. Austin: University of Texas Press, 1985.
- Aretxaga, Begoña. "Maddening States." *Annual Review of Anthropology* 32, no. 1 (2003): 393–410.
- Arns, Archbishop Paulo Evaristo and the Archdiocese of São Paulo. *Brasil: Nunca Mais.* São Paulo: Vozes, 1985.
- Atalla, Jorge Wolney. *Reflexões e sugestões para o desenvolvimento brasileiro*. Brasília: Confederação Nacional da Agricultura, 1979.
- Baccarin, J.G. "O Papel Do Estado No Proálcool." *Ciencia Agronomica- Jabotical* 3, no. 2 (1988).
- Baer, Werner. *The Brazilian Economy: Growth and Development*. Boulder, CO: Lynne Rienner Publishers, 2008.

Barzelay, Michael. The Politicized Market Economy: Alcohol in Brazil's Energy Strategy.

University of California Press, 1986.

- Bethell, Leslie. *The Cambridge History of Latin America*. New York: Cambridge University Press, 1984.
- Brandão, Adelino. *Cana de açúcar: álcool e açúcar na história e no desenvolvimento social do Brasil.* Brasília: Editora Horizonte, 1985.
- Brannstrom, Christian. *Territories, Commodities and Knowledges: Latin American Environmental Histories in the Nineteenth and Twentieth Centuries.* London: Institute for the Study of the Americas, 2004.
- Brown, Lester. "Worldwatch Paper #35: Food or Fuel: New Competition for the World's Cropland." *WorldWatch Institute*, March 1980, 43.

——. *World on the Edge: How to Prevent Environmental and Economic Collapse.* W. W. Norton & Company, 2011.

- Brown, Lester R., Christopher Flavin, and Colin Norman. "Worldwatch Paper #32: The Future of the Automobile in an Oil-Short World." *WorldWatch Institute*, September 1979, 64.
- Brunner, Heinrich. *Cuban Sugar Policy from 1963 to 1970*. Pittsburgh: University of Pittsburgh Press, 1977.
- Bulmer-Thomas, Victor. *The Economic History of Latin America since Independence*. 2nd ed. Cambridge University Press, 2003.
- Calabrese, Guiseppe, ed. *The Greening of the Automotive Industry*. New York: Palgrave Macmillan, 2012.
- Cano, Wilson. Desequilíbrios regionais e concentração industrial no Brasil, 1930-1970. UNESP, 2007.
- ------. *Ensaios sobre a formação econômica regional do Brasil*. Campinas, SP: Editora da UNICAMP, 2002.
- ------. Raízes da concentração industrial em São Paulo. Campinas: Instituto de Economia, UNICAMP, 1998.
- Cardoso, Fernando Henrique, and Faletto Enzo. *Dependency and Development in Latin America*. Berkeley: University of California Press, 1979.
- Carvalho, Luiz Carlos Correa. *Proálcool: despesas e receitas a nível de governo*. São Paulo: Sociedade de Produtores de Acucar e do Alcool, 1985.

Castro, Moacyr. "Pedro Biagi." Os desbravadores. Ed. Galeno Amorim. Ribeirão Preto: Palavra

Mágica, 2001.

- Catholic Church and the Archdiocese of São Paulo. *Torture in Brazil: A Report by the Archdiocese of São Paulo*. Translated by Jaime Wright. Edited by Joan Dassin. New York: Vintage Books, 1986.
- Chasteen, John Charles. *Born in Blood & Fire: A Concise History of Latin America*. 3rd edition. New York: W. W. Norton & Company, 2011.
- Chiovetti, Simão Pedro. "Reestruturação produtiva na agroindústria paulista e a luta dos trabalhadores rurais assalariados." *Lutas Sociais* 6 (June 1999).
- Coatsworth, John H., and Alan M. Taylor. *Latin America and the World Economy since 1800*. Cambridge, Mass.: David Rockefeller Center for Latin American Studies, 1999.
- Collier, David. "The Bureaucratic-Authoritarian Model." In *The New Authoritarianism in Latin America*. Princeton, N.J.: Princeton University Press, 1979.
- Cooper, Frederick and Randall Packard. "The History and Politics of Development Knowledge." *The Anthropology of Development and Globalization: From Classical Political Economy to Contemporary Neoliberalism*, edited by Marc Edelman and Angelique Haugerud. Malden, Mass: Wiley-Blackwell, 2004.
- Coronil, Fernando. *The Magical State: Nature, Money, and Modernity in Venezuela*. 1st edition. Chicago: University Of Chicago Press, 1997.
- Coronil, Fernando, and Julie Skurski. "Dismembering and Remembering the Nation: The Semantics of Political Violence in Venezuela." *Comparative Studies in Society and History* 33 (1991): 288–337.
- D'Incao e Mello, Maria Conceição. *O bóia-fria: acumulação e miséria*. Petrópolis [Brazil]: Editora Vozes, 1975.
- Das, Veena. "The Signature of the State: The Paradox of Illegibility." In *Anthropology in the Margins of the State*, 1st ed. Santa Fe: School of American Research Press, 2004.
- de Melo, Joaquim. *A política do álcool-motor no Brasil*. Rio de Janeiro: Instituto de Açúcar e do Álcool, 1942.
- de Melo, Mario Lacerda. *O açúcar e o homem: problemas sociais e economicos do nordeste canaviero*. Recife: Instituto Joquim Nabuco de Pesquisas Sociais, 1975.

de Oliveira, Hugo Paulo. Os presidentes do IAA. Rio de Janeiro: MIC/IAA, 1975.

Dean, Warren. "The Green Wave of Coffee: Beginnings of Tropical Agricultural Research in Brazil, 1885-1900." *Hispanic American Historical Review* 69, no. 1 (1989), 91–115.

The Industrialization of São Paulo, 1880-1945. Austin: The Institute of Latin American Studies, the University of Texas Press, 1969.

——. *With Broadax and Firebrand: The Destruction of the Brazilian Atlantic Forest.* Berkeley: University of California Press, 1997.

- Demetrius, F. Joseph. Brazil's National Alcohol Program: Technology and Development in an Authoritarian Regime. New York: Praeger, 1990.
- Dias de Moraes, Márcia Azanha Ferraz, and David Zilberman. *Production of Ethanol from Sugarcane in Brazil: From State Intervention to a Free Market*. 1st edition. Natural Resource Management and Policy 43. Charn: Springer, 2014.
- Dias de Moraes, Marcia Azanha Ferraz. *A desregulamentação do setor sucroalcooleiro do Brasil*. Americana, SP: Caminho Editorial, 2000.
- Dinius, Oliver. Brazil's Steel City: Developmentalism, Strategic Power, and Industrial Relations in Volta Redonda, 1941–1964. Stanford University Press, 2010.

Eakin, Marshall C. Brazil: The Once and Future Country. New York: Palgrave Macmillan, 1998.

------. *Tropical Capitalism: The Industrialization of Belo Horizonte, Brazil.* New York, N.Y: Palgrave Macmillan, 2002.

- Eisenberg, Peter L. Sugar Industry in Pernambuco 1840–1910: Modernization Without Change. Berkeley: University of California Press, 1973.
- Emboaba, Osmani. *História da fundação de Ribeirão Preto*. São Paulo: "IMAG" Gráfica Editora, 1990 (1955).
- Erickson, Kenneth Paul. "State Entrepreneurship, Energy Policy, and the Political Order in Brazil." In *Authoritarian Capitalism: Brazil's Contemporary Economic and Political Development*. Boulder: Westview Press, 1981.
- Escobar, Arturo. *Encountering Development: The Making and Unmaking of the Third World.* Princeton University Press, 1997.
- Evans, Peter B. Dependent Development: The Alliance of Multinational, State, and Local Capital in Brazil. Princeton, N.J.: Princeton University Press, 1979.

Federative Republic of Brazil. First National Development Plan, 1972–1974. Brasília: 1971.

- Federative Republic of Brazil. *Second National Development Plan- II PND, 1975–1979.* Brasília: 1974.
- Ferguson, James. *The Anti-Politics Machine: Development, Depoliticization, and Bureaucratic Power in Lesotho*. Minneapolis: University of Minnesota Press, 1994.
- Ferracini, Ícaro, Leandro Santini and Heloisa Zaruh. "O Corte- 30 anos da Greve de Guariba." Published December 16th, 2013. YouTube. <u>https://www.youtube.com/watch?v=FYUfU9FDguw</u>. Accessed May 1st, 2015.
- Fischer, Brodwyn. A Poverty of Rights: Citizenship and Inequality in Twentieth-Century Rio de Janeiro. Stanford: Stanford University Press, 2008.
- Font, Mauricio A. *Coffee and Transformation in São Paulo, Brazil*. Lanham, Md: Lexington Books, 2012.
- Foweraker, Joe. *The Struggle for Land: A Political Economy of the Pioneer Frontier in Brazil,* 1930 to Present. Cambridge: Cambridge University Press, 1981.
- Fraginals, Moreno and Teresita Pedraza Moreno. "The Ten Million Ton Sugar Harvest." unpublished article. Accessed April 20th, 2015. <u>http://faculty.mdc.edu/tpedraza/MMF-Ten%20Million%20Ton%20Harvest.htm</u>
- Frank, Andre Gunder. Capitalism and Underdevelopment in Latin America: Historical Studies of Chile and Brazil. New York: Monthly Review Press, 1967.
- French, John D. *The Brazilian Workers' ABC: Class Conflict and Alliances in Modern São Paulo*. The University of North Carolina Press, 1992.

———. Drowning in Laws: Labor Law and Brazilian Political Culture. The University of North Carolina Press, 2004.

Furtado, Celso. Desenvolvimento e subdesenvolvimento. Rio de Janeiro: Fundo de Cultura, 1961.

-----. *The Economic Growth of Brazil: Survey from Colonial to Modern Times*. Translated by Ricardo W. de Aguiar and Eric Charles Drysdale. Los Angeles: University of California Press, 1965.

. Formação economica do Brasil. Rio de Janeiro: Fundo de Cultura, 1959.

Garnero, Mário. Energia: o futuro é hoje. São Paulo: Edição Anfavea, 1980.

. JK: A coragem da ambição. São Paulo: Editora MM, 2011.

Gaspari, Elio. A ditadura encurralada. São Paulo: Companhia das Letras, 2004.

-. A ditadura envergonhada. São Paulo: Companhia das Letras, 2002.

- Geraldo, Sebastião. "Agroindustria canavieira e a mecanização: as relações de trabalho e a resistencia dos trabalhadores rurais na região de Ribeirão Preto." *Revista da Universidade de Franca: publicações dos docentes da Universidade de Franca* 7, no. 8 (December 1999).
- Gleijeses, Piero. *Shattered Hope: The Guatemalan Revolution and the United States, 1944–1954*. Princeton, N.J.: Princeton University Press, 1991.
- Gomes, Gustavo M. *The Roots of State Intervention in the Brazilian Economy*. New York; London: Praeger, 1986.
- Gordinho, Margarida Cintra. *Do álcool ao etanol: trajetoria unica*. São Paulo: Terceiro Nome, 2010.
- Grandin, Greg. "Human Rights and Empire's Embrace." In *Human Rights and Revolutions*, edited by Jeffrey Wassterstrom et al., 2nd ed. New York: Rowman & Littlefield Publishers, 2007.
- Grosfoguel, Ramón. "Developmentalism, Modernity, and Dependency in Latin America." *Nepantla: Views from South*, vol. 1, no. 2 (2000).
- Haber, Stephen, Douglass North, and Barry Weingast. *Political Institutions and Financial Development*. Stanford University Press, 2007.
- Haber, Stephen. "The Efficiency Consequences of Institutional Change: Financial Market Regulation and Industrial Productivity Growth in Brazil, 1866–1934." In *Latin America* and the World Economy Since 1800, edited by John H. Coatsworth and Alan M. Taylor. Cambridge, Mass.: Harvard University Press, 1998.
- Hall, Anthony L. Developing Amazonia: Deforestation and Social Conflict in Brazil's Carajás Programme. Manchester: Manchester University Press, 1989.
- Halperin-Donghi, Tulio. "Dependency Theory' and Latin American Historiography." *Latin American Research Review* 17, no. 1 (1982): 115–30.
- Hammond, Allen. "Alcohol: A Brazilian Answer to the Energy Crisis." *Science* 195, no. 4278 (February 11, 1977): 564–66.
- Hanley, Anne. "Business Finance and the São Paulo Bolsa, 1886–1917." In Latin America and the World Economy Since 1800, edited by John H. Coatsworth and Alan M. Taylor. Cambridge, Mass.: Harvard University Press, 1998.
 - ------. Native Capital: Financial Institutions and Economic Development in São Paulo, Brazil, 1850-1920. 1st ed. Stanford University Press, 2005.

- Hannah, A C and Donald Spence. *The International Sugar Trade*. New York: John Wiley & Sons, Inc., 1997.
- Hartzmark, Amanda. "Businesses, Associations, and Regions in the Brazilian Sugar Industry, 1920–1990." PhD diss., University of Chicago, 2014.
- Hasse, Geraldo. *Filhos do fogo: memória industrial de Sertãozinho, 1896–1996*. Ribeirão Preto: Editora Ceu e Terra, 1996.
- Hecht, Gabrielle. *The Radiance of France: Nuclear Power and National Identity after World War II.* Cambridge, Mass: The MIT Press, 2009.
- Hentschke, Jens R. Vargas and Brazil: New Perspectives. New York: Palgrave Macmillan, 2006.
- Hollander, Gail M. Raising Cane in the 'Glades': The Global Sugar Trade and the Transformation of Florida. Chicago: University of Chicago Press, 2008.
- Holloway, Thomas H. Immigrants on the Land: Coffee and Society in São Paulo, 1886–1934. 1st edition. Chapel Hill: The University of North Carolina Press, 1980.
- Holston, James. *Insurgent Citizenship: Disjunctions of Democracy and Modernity in Brazil.* Princeton: Princeton University Press, 2009.
- Homem de Mello, Fernando. *Proálcool, energia e transportes*. São Paulo: Enio Matheus Guazzelli & Cia. Ltda., 1981.
- Houtzager, Peter P. *Os últimos cidadãos: conflito e modernização no Brasil rural (1964–1995).* São Paulo, SP: Editora Globo, 2004.
- ------. "State and Unions in the Transformation of the Brazilian Countryside, 1964–1975." *Latin American Research Review*, Vol. 33, No. 2 (1998), 103-142.
- Ives, Ralph and John Hurley. "United State Sugar Policy: An Analysis." International Trade Administration, US Department of Commerce, (April 1988).
- Johnson, Frederick. "Sugar in Brazil: Policy and Production." *The Journal of Developing Areas*, 17 (January, 1983).
- Keck, Margaret. *The Workers' Party and Democratization in Brazil*. New Haven, CT: Yale University Press, 1992.
- Kovarik, Bill. "Henry Ford, Charles Kettering and the Fuel of the Future." *Automotive History Review* 32 (Spring 1998), 7–27.

Levine, Robert M. Father of the Poor?: Vargas and His Era. New York: Cambridge University

Press, 1998.

- Leão, Regina Machado. *Alcool: energia verde*. São Paulo: IQUAL- Instituto de Qualificação Editoria Ltda., 2002.
- LeGrand, Catherine. "Living in Macondo: Economy and Culture in a United Fruit Company Banana Enclave in Colombia." *Close Encounters of Empire: Writing the Cultural History of U.S.-Latin American Relations*. Ed. Gilbert M. Joseph, Catherine LeGrand, and Ricardo D. Salvatore. 333–368. Durham: Duke University Press, 1998.
- Li, Tania Murray. *The Will to Improve: Governmentality, Development, and the Practice of Politics*. Durham: Duke University Press Books, 2007.
- Lima, Léo da Rocha, and Aluizio de Abreu Marcondes. Álcool Carburante: Uma Estratégia Brasileira. Curitiba: Editora UFPR, 2002.
- Lopes, Luciana Suarez. *Ribeirão Preto a dinâmica da economia cafeeira de 1870 a 1930.* Ribeirão Preo: Fundação Instituto do Livro, 2011.
- Louis, Arthur M. "Brazil's Coffee (with Sugar) Billionaire." Fortune 96 (July 1977): 82-88.
- Love, Joseph. Crafting the Third World : Theorizing Underdevelopment in Romania and Brazil. Stanford, Calif.: Stanford University Press, 1996.
 - ———. "Of Planters, Politics, and Development." *Latin American Research Review* 24, no. 3 (1989): 127–35.

_____. São Paulo in the Brazilian Federation, 1889–1937. Stanford: Stanford University Press, 1980.

- Love, Joseph L., and Nils Jacobsen. *Guiding the Invisible Hand: Economic Liberalism and the State in Latin American History*. New York: Praeger, 1988.
- Luna, Francisco Vidal and Herbert Klein. *The Economic and Social History of Brazil since 1889*. Cambridge: Cambringe University Press.
- Magalhães, João Paulo de Almeida, Nelson Kuperman, and Roberto Crivano Machado. *Proálcool: uma avaliação global.* Rio de Janeiro: Assessores Técnicos Ltda, 1991.
- Machado Jr., Guilherme Rossi. "Melhoramento da cana-de-açúcar." In *Cana-de-açúcar: cultivo e utilização*, edited by Sergio Bicudo Paranhos. Campinas: Fundação Cargill, 1987.
- Mainwaring, Scott. *The Catholic Church and Politics in Brazil, 1916–1985*. Stanford: Stanford University Press, 1986.

Marchesi, Ida Pizzoli. João Marchesi: história de um imigrante. Ribeirão Preto: Editora Colégio,

1987).

- Martins, Jose de Souza. *Os camponeses e a política no Brasil- as lutas sociais no campo.* Petrópolis [Brazil]: Edição Vozes, 1981.
- Martins, Ana Luiza, editor. *Guariba- 100 anos*. São Paulo, Prefeitura Municipal de Guariba, 1996.
- Médici, Emílio Garrastazu. *A verdadeira paz.* Brasília: Departamento de Imprensa Nacional, 1971.
- MIC/IAA, Relatório 75. Rio de Janeiro: IAA.
- Miceli, Paulo Celso. Era uma vez em Sertãozinho...: certas histórias de uma história que é do trabalho: pessoas, fatos e feitos. São Paulo: Nobel, 1984.
- Ministerio da Agricultura. Álcool e emprego: o impacto da produção de álcool de cana-deaçúcar e de madeira sobre a geração de empregos. São Paulo: Cadernos Coalbra, 1983.
- Ministry of Mines, *O modelo energético brasileiro*. Brasília: Ministry of Mines and Energy, 1979.
- Mintz, Sidney W. Sweetness and Power: The Place of Sugar in Modern History. Reprint edition. New York: Penguin Books, 1986.
- Mitchell, Timothy. *Rule of Experts: Egypt, Techno-Politics, Modernity*. Berkeley: University of California Press, 2002.
- Miranda, Maria Augusta Tibiriça. O petroleo é nosso: a luta contra o "entreguismo" pelo monopolio estatal, 1947-1953. Petrópolis: Vozes, 1983.
- Negri, Barjas. "As politicas de descentralização industrial e o processo de interiorização em São Paulo: 1970–1985." In *Modernização e desenvolvimento no interior de São Paulo*, edited by José Carlos Tartaglia and Osvaldo Luiz de Oliveira. UNESP, 1988.

——. *Concentração e desconcentração industrial em São Paulo, 1880–1990*. Editora da Unicamp, 1996.

- Neto, Wenceslau Gonçalves. *Estado e agricultura no Brasil: política agricola e modernização economica Brasileira, 1960-1980*. São Paulo: Editora Hucitec, 1997.
- Nunberg, Barbara. "State Intervention in the Sugar Sector in Brazil: A Study of the Institute of Sugar and Alcohol." Doctor of Philosophy, Stanford University, 1979.
 - —. "Structural Change and State Policy: The Politics of Sugar in Brazil Since 1964." *Latin American Research Review* 21, no. 2 (1986): 53–92.

- O'Brien, Thomas. *The Revolutionary Mission: American Enterprise in Latin America, 1900–1945.* Cambridge: Cambridge University Press, 1999.
- O'Donnell, Guillermo A. *Modernization and Bureaucratic-Authoritarianism: Studies in South American Politics*. Berkeley: University of California Press, 1973.
- Owensby, Brian. *Intimate Ironies: Modernity and the Making of Middle-Class Lives in Brazil.* Stanford: Stanford University Press, 2002.
- Paglia, Ernesto. *Rede Globo* (June 1984) in "Boias-frias e o Acordo de Guariba ápos a greve de 1984" (July 24th, 2014), YouTube, <u>https://www.youtube.com/watch?v=9ZiZbF6WYUk</u>. Accessed May 1st, 2015.
- Pamplona, Confúcio. Proálcool: Technical-Economic and Social Impact of the Program in Brazil. Belo Horizonte: Ministry of Industry and Commerce/The Sugar and Alcohol Institute, 1984.
- Parra, Francisco. Oil Politics: A Modern History of Petroleum. New York: I.B. Tauris, 2004.
- Pereira, Anthony W. End Of The Peasantry: The Rural Labor Movement in Northeast Brazil, 1961–1988. 1 edition. Pittsburgh, Pa: University of Pittsburgh Press, 1997.
- Pereira, Moacyr Soares. *O problema do álcool-motor*. Rio de Janeiro: Jose Olympio Editora, 1942.
- Pinheiro, Murilo et al. Ribeirão Preto. Ribeirão Preto: MIC Editorial Ltda, 1996.
- Piña, Hélio. A agro-indústria açucareira e sua legislação. São Paulo: Edição Apec, 1971.
- Polanyi, Karl. *The Great Transformation: The Political and Economic Origins of Our Time*. 2nd edition. Boston, MA: Beacon Press, 2001.
- Poleman, Thomas T.; Freebairn, Donald K. Food, Population, and Employment: the Impact of the Green Revolution. Praeger, 1973.
- Prebisch, Raúl. "The Economic Development of Latin American and its Principal Problems." United Nations Department of Economic Affairs, 1950.
- Presidencia da República. *Metas e bases para a ação de governo: síntese*. Brasília, September 1970.
- Ramos, Pedro. *Agroindústria canavieira e propriedade fundiária no Brasil*. São Paulo: Editora Hucitec, 1999.

------. "Um estudo da evolução e da estrutura da agroindústria canavieira do estado de São

Paulo (1930-1982)." Master's Thesis, EAESP-FGV, 1983.

Randall, Laura. The Political Economy of Brazilian Oil. Westport, CT: Praeger, 1993.

- Riding, Alan. "For Brazilian Farmhands, a Notable Victory." *New York Times*. June 10th, 1984. http://www.nytimes.com/1984/06/10/world/for-brazilian-farmhands-a-notable-victory.html>.
- Roe, Emery. "Development Narratives, Or Making the Best of Blueprint Development." In *The Anthropology of Development and Globalization: From Classical Political Economy to Contemporary Neoliberalism*, edited by Marc Edelman and Angelique Haugerud. Malden, Mass: Wiley-Blackwell, 2004.
- Roett, Riordan. "The Debt Crisis and Economic Development." In *United States Policy in Latin America: A Decade of Crisis and Challenge*, edited by John Martz, 249–71. Lincoln: University of Nebraska Press, 1995.
- Rogers, Thomas D. *The Deepest Wounds: A Labor and Environmental History of Sugar in Northeast Brazil.* Raleigh: The University of North Carolina Press, 2010.
- Rothman, Harry. *Energy From Alcohol: The Brazilian Experience*. Lexington, Ky: The University Press of Kentucky, 1983.
- Rossini, Rosa Ester. "Mulheres e homens na força de trabalho na agricultura: o exemplo da macro-área de Ribeirão Preto." Paper presented at the 15th National Conference on Population Studies (ABEP-2006), 1-21.
- Safatle, Fernando Netto. *A economia política do etanol: a democratização da agroenergia e o impacto na mudança do modelo economico*. São Paulo: Alameda, 2011.
- Santos, Adriano Pereira. *A usinagem do capital e o desmonte do trabalho: reestruturação prodtiva nos anos de 1990, o caso da Zanini S/A de Sertãozinho-SP*. São Paulo: Editora Expressão Popular, 2010.
- Santos, Maria Helena de Castro. "Alcohol as Fuel in Brazil: An Energy Policy Analysis." PhD Diss., MIT, 1984.
 - *———. Política e políticas de uma energia alternativa: o caso do Proálcool.* Rio de Janeiro: Notrya, 1993.
- São Paulo Secretaria de Economia e Planejamento Coordenaria de Ação Regional. *Plano Regional de Ribeirão Preto*. Trabalho elaborado pela PROPLASA. São Paulo: December 1978.
- Scheper-Hughes, Nancy. *Death Without Weeping: The Violence of Everyday Life in Brazil.* Berkeley: University of California Press, 1993.

- Schwartz, Stuart B. Sugar Plantations in the Formation of Brazilian Society: Bahia, 1550–1835. New York: Cambridge University Press, 1986.
- Scopinho, Rosemeire, and Leandro Valarelli, org. *Modernização e impactos sociais: o caso da agricultura sucro-alcooleira na região de Ribeirão Preto (SP)*. Rio de Janeiro: FASE, 1995.
- Scott, James C. Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed. New Haven: Yale University Press, 1998.
- Secretaria do Planejamento. *Brazil's III National Development Plan 1980–1985*. Brasília: Presidencia da República, 1979.
- Segalla, A.L. and R. Alvarez. "Variedades de cana-de-açúcar: II, Série de ensaios realizado no período de 1953-1956." *Bragantia* Vol. 17 (1958): 45–79.
- Silva, Maria Aparecida de Moraes. *Errantes do fim do século*. São Paulo: Fundação Editora da UNESP, 1999.
- Silva, Ozires, and Decio Fischetti. *Etanol a revolução verde e amarela*. 1st edition. São Paulo, SP: Edição Bizz, 2008.
- Silveira, Ubaldo. Igreja e conflito agrário: a Comissão Pastoral da Terra na região de Ribeirão Preto. Franca, Sao Paulo: UNESP, 1998.
- Simmons, Cynthia et al. "Spatial Processes in Scalar Context: Development and Security in the Brazilian Amazon." *Journal of Latin American Geography*. Vol. 6 (2007): 125–148.
- Skidmore, Thomas E. *Politics in Brazil, 1930–1964: An Experiment in Democracy.* Updated ed. New York: Oxford University Press, 2007.
- *Brazil: Five Centuries of Change.* 2nd edition. New York: Oxford University Press, 2009.
- *The Politics of Military Rule in Brazil, 1964–1985.* New York: Oxford University Press, 1990.
- Soluri, John. Banana Cultures: Agriculture, Consumption, and Environmental Change in Honduras and the United States. Austin: University of Texas Press, 2006.
- Soto, Hernando De. *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else.* Reprint edition. Basic Books, 2007.
- Stein, Howard. Beyond the World Bank Agenda: An Institutional Approach to Development. Chicago: University Of Chicago Press, 2008.

Stein, Stanley. The Brazilian Cotton Manufacture Textile Enterprise in an Underdeveloped Area, 1850-1950. Cambridge Mass.: Harvard University Press, 1957.

- Stepan, Alfred. *Authoritarian Brazil: Origins, Policies, and Future*. New Haven: Yale University Press, 1973.
- ———. *Rethinking Military Politics: Brazil and the Southern Cone*. Princeton: Princeton University Press, 1988.

———. The Military in Politics: Changing Patterns in Brazil. Princeton, N.J.: Princeton University Press, 1971.

- Stolcke, Verena. *Cafeicultura: homens, mulheres e capital (1850–1980)*. São Paulo: Editora Brasiliense, 1986.
 - ———. Coffee Planters' Workers and Wives: Class Conflict and Gender Relations. 1st edition. Basingstoke: Palgrave Macmillan, 1988.
- Striffler, Steve. *Banana Wars: Power, Production, and History in the Americas*. Durham: Duke University Press Books, 2003.
- Summerhill, William R. Order Against Progress: Government, Foreign Investment, and Railroads in Brazil, 1854-1913. Stanford, Calif: Stanford University Press, 2003.
- Szmrecsányi, Tamás. O planejamento da agroindústria canavieira do Brasil 1930 / 1975. Edição Hucitec, 1979.

——. "The Growth and Crisis of the Brazilian Sugar Industry, 1914–1939." In *The World Sugar Economy in War and Depression, 1914-1940*, edited by Bill Albert and Adrian Graves, 59–70. London: Routlege, 1988.

- Tartaglia, José Carlos, and Osvaldo Luiz de Oliveira. *Modernização e desenvolvimento no interior de São Paulo*. UNESP, 1988.
- Terci, Eliana Tadeu. *O desenvolvimento de Piracicaba- historia e perspectivas*. Piracicaba: Edição Unimep, 2001.
- Terci, Eliana Tadeu, et al. Desconcentração industrial: impactos socioeconomicos e urbanos no interior paulista (1970–1990). Piracicaba: UNIMEP, 2005.
- Thomaz Junior, Antonio. Por trás dos canaviais, os "nós" da cana: a relação capital x trabalho e o movimento sindical dos trabalhadores na agroindústria canavieira

paulista. São Paulo: Annablume/Fapesp, 2002.

- Topik, Steven. *Political Economy of the Brazilian State, 1889–1930.* Austin: University of Texas Press, 1987.
 - —. "State Enterprise in a Liberal Regime: The Bank of Brazil, 1905–1930." *Journal of Interamerican Studies and World Affairs* Vol. 22, n. 4, Special Issue: Public Enterprise in Latin America (November 1980), 401–422.
- Topik, Steven, Carlos Marichal, and Zephyr Frank. From Silver to Cocaine: Latin American Commodity Chains and the Building of the World Economy, 1500–2000. Duke University Press Books, 2006.
- Triner, Gail D. *Mining and the State in Brazilian Development*. London: Pickering & Chatto, 2011.

———. Banking and Economic Development: Brazil, 1889–1930. New York: Palgrave, 2011.

- Truda, Leonardo. *A defesa da produção açucareira*. Rio de Janeiro: Instituto do Açúcar e do Álcool, 1971.
- Ubiratan, Paulo et al. "O Salvador da Patria." *Rede Globo*. January 9th, 1989 August 12th, 1989. Accessed September 9th, 2014. <memoriaglobo.globo.com>.
- United States Cuban Sugar Council. Sugar: Facts and Figures. New York: United States Sugar Council, 1948.
- Unknown. "Guariba 30 anos da greve que mudou a vida dos 'bóias-fria' no Brasil, por Paulo Mancini." *EcoDebate.com*. August 21st, 2014. Accessed April 25th, 2015. http://www.ecodebate.com.br/2014/08/21/guariba-30-anos-da-greve-que-mudou-a-vidados-boias-fria-no-brasil-por-paulo-mancini/
- . "Morre Jorge Wolney Atalla," (August 4th, 2009) Unica (União da indústria de cana-de-açuúcar) (São Paulo). Accessed January 28th, 2015.
 < http://www.unica.com.br/noticia/15975202920334743692/morre-jorge-wolney-atalla/>.
- US Environmental Protection Agency. "Methyl Tertiary Butyl Ether (MTBE)." Web Archive. Last updated on November 15, 2014. Accessed on April 7th, 2015. http://www.epa.gov/mtbe/gas.htm
- Vasconcellos, Gilberto Feliserto and J.W. Bautista Vidal. *Poder dos Tropicos: meditação sobre a alienação energetica na cultura brasileira*. São Paulo: Casa Amarela, 1998.
- Vidal, J.W. (José Walter) Bautista. *O esfacelamento da nação*. Petrópolis: Editora Vozes Ltda, 1994.

- Veazey, Matthew. "Brazil's 'Father of Ethanol' Sees Bounty for Biofuel." *DownstreamToday.com*, February 8, 2012. <http://www.downstreamtoday.com/News/ArticlePrint.aspx?aid=35449&AspxAutoDete ctCookieSupport=1>.
- Walker, Thomas. "From Coronelismo to Populism: The Evolution of Politics in a Brazilian Municipality, Ribeirao Preto, Sao Paulo, 1910–1960." Doctor of Philosophy, The University of New Mexico, 1974.
- Walker, Thomas, and Agnaldo de Sousa Barbosa. *Dos Coroneis a Metropole: Fios e tramas da sociedade e da politica em Ribeirao Preto no seculo XX*. Ribeirao Preto: Palavra Magica, 2000.
- Weinstein, Barbara. For Social Peace in Brazil: Industrialists and the Remaking of the Working Class in São Paulo, 1920-1964. Chapel Hill: University of North Carolina Press, 1996.

———. *The Color of Modernity: São Paulo and the Making of Race and Nation in Brazil.* Durham: Duke University Press, 2015.

Welch, Clifford. A Semente Foi Plantada: As Raizes Paulistas Do Movimento Sindical Campones No Brasil, 1924-1964. São Paulo: Editora Expressão Popular, 2010.

———. The Seed Was Planted: The São Paulo Roots of Brazil's Rural Labor Movement, 1924– 1964. University Park, Pa: Penn State University Press, 1999.

———. "Rivalry and Unification: Mobilising Rural Workers in São Paulo on the Eve of the Brazilian Golpe of 1964." *Jounal of Latin American Studies* 27, no. 1 (February 1995): 161–87.

- Welch, Clifford and Sebastião Geraldo. *Lutas camponesas no interior paulista: memorias de Irineu Luis de Moraes*. São Paulo: Paz e Terra, 1992.
- Westad, Odd Arne. *The Global Cold War: Third World Interventions and the Making of Our Times*. New York: Cambridge University Press, 2007.
- Wirth, James. *The Politics of Brazilian Development, 1930–1954*. Stanford: Stanford University Press, 1970.
- Wolfe, Joel. *Autos and Progress: The Brazilian Search for Modernity*. New York: Oxford University Press, 2010.
 - ———. Working Women, Working Men: São Paulo and the Rise of Brazil's Industrial Working Class, 1900-1955. Durham: Duke University Press, 1993.

Woodard, James. A Place in Politics: São Paulo, Brazil, from Seigneurial Republicanism to

Regionalist Revolt. Duke University Press, 2009.