

THREE ESSAYS IN INTERNATIONAL ECONOMICS

By

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ABSTRACT

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Chapter 1: This paper contributes to a growing literature on the effects of credit constraints on international trade, and an existing body of literature on the exporting advantage of multinational firms. Using 2013 data from Estonian and Hungarian exporting firms, I find that traditional measures of credit constraints (cash flows, debt to sales ratio, and tangible asset share) have a significant negative effect on the intensive margin of international trade, and being a multinational affiliate has a positive effect on trade. Multinational affiliates export nearly twice as much as domestic firms. I find no strong evidence that multinational affiliates are less credit constrained than domestic firms conditional on firms already exporting. Therefore, any differences between the two types of firms appear on the extensive margin of trade or in domestic activities. Estonia and Hungary are relatively recent EU members that experienced an influx of foreign investment during their transition periods in the 1990s. Therefore, these results provide useful information for studying the long-term benefits of EU accession and foreign investment in transition economies.

Chapter 2: This paper analyzes the impact of multinational banking and multinational ownership on the performance of exporting Central European firms. Using a panel of Hungarian, Croatian, and Estonian exporters, I find that controlling for a firm's borrowing behavior leads to a 12.5% reduction in the coefficient on multinational status. Such a non-trivial amount indicates that the "multinational advantage" in export revenue falls from 122% to 102%. This outcome is strongest for Hungarian firms and weakest for Croatian firms, indicating a long-run benefit to increases in foreign banking among recent EU members. Additionally, I find that the Hungarian government's effort to increase domestic banking presence by purchasing two major multinational banks, MKB and Budapest Bank, led to a \$270,000 decrease in loans among domestically owned exporters. However, this purchase had no effect on the loans of multinational affiliates. These results provide

evidence that multinational affiliates are better able to smooth their borrowing behavior in the presence of a tumultuous banking sector, and that the firms most affected by anti-global banking policies are smaller, locally owned firms.

Chapter 3: In 2014, the Austrian bank Hypo Group Alpe Adria went bankrupt and was purchased and rebranded as Addiko bank. The bank was purchased by the American banking group Advent International, and the European Bank for Reconstruction and Development (EBRD), an international organization that serves as an investment bank in former transition economies. Their primary goal is to assist European transition countries in establishing or enriching a market-based economy. In this paper, I explore how this bailout of Addiko Bank by an international organization affected exporting firms in Croatia. Specifically, I investigate whether there was a positive effect on firm performance, therefore justifying the need for intervention by an international financial institution. I find that the turnover of Addiko bank led to a \$260,000 decrease in loans taken out by firms. However, this effect seems to occur immediately after the turnover, and vanishes over time. Additionally, I find no effect on the export revenue, and total revenue of firms, and a small increase in the domestic revenue amongst the firms. These results indicate that after an initial period of turmoil, the intervention by EBRD and Advent International had no lasting negative (and perhaps slightly positive) effects on firm outcomes.

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CHAPTER 1

THE ADVANTAGE OF MULTINATIONAL FIRMS UNDER CREDIT CONSTRAINTS: EVIDENCE FROM ESTONIA AND HUNGARY

1.1 Introduction

Multinational firms tend to be larger and more efficient than their domestic counterparts, and the size and scope of these firms have increased over time¹. Consequently, they are also more resilient than domestic firms during periods of economic hardship. There are several explanations for this phenomenon, and the main question explored in this paper is whether or not the affiliates of large multinational firms perform better in the presence of credit constraints when compared with domestic firms. One possible explanation for this advantage is that multinational affiliates have access to different, or rather more, means of financing their operations. They are privy to financing through themselves, and through the resources of their parent company.

There are significant startup costs for a firm to engage in international trade. If a firm cannot gain access to adequate financing, it can significantly hamper their export decisions on the extensive and intensive margins. This problem is more prevalent for firms in countries that are less financially developed². Thus, it is logical that an affiliate of a multinational enterprise that can use financial channels afforded to it by the parent company is at an advantage to engage in trade over a domestic firm without these additional means of financing.

In this paper I analyze two Central European economies (CEE): Estonia and Hungary. Both are European Union members, having joined in 2004, that experienced increases in foreign investment during the time period around their EU accession. However, this occurrence is not unique to Estonia and Hungary as other nations, including Slovakia and the Czech Republic, have experienced a similar influx of foreign investment surrounding EU accession. There are several reasons for

¹Markusen and Venables (1998)

²Manova (2013)

this inflow of capital including greater access to other EU markets through the lower-cost Central European members and access to an emerging, and later rapidly developing, market in the CEE. This makes Central Europe an interesting region to study because it has experienced rapid development while remaining a relatively “low-cost” area in which to invest.

The remainder of this paper proceeds as follows: section two provides a review of literature, section three describes the data, section four specifies an empirical design, section five presents the results, and section six concludes and discusses avenues for further research. Tables and figures are presented in section seven.

1.2 Review of Literature

The previous literature on this topic is largely divided into two categories: studies of the effects that financial constraints have on exporting, and studies that explore the behavior of multinational firms under imperfect capital markets. An additional body of literature that is relevant to this paper covers foreign investment in Central Europe.

1.2.1 Investment in Central Europe and Historical Context

After the Iron Curtain fell in the late 1980s, several Central European countries applied for EU membership. In 2004, Hungary and Estonia joined the EU along with eight other Central European countries, resulting in a significant enlargement of the European Union (EUROPA). During their EU candidacy phase, there was a large increase in foreign investment in Central European countries. The candidacy phase for most Central European economies also corresponded with the country’s transitions from planned economies to a market economies. It is important to understand why Central Europe saw an increase in foreign investment in the transition and candidacy period of the 1990s and early 2000s.

Bevin and Estrin (2004) find that public announcements of EU membership negotiations had a positive impact on foreign direct investment (FDI) in the candidate country. Additionally, Bevin and

Estrin conclude that the increase in foreign investment in central and eastern European countries during the 1990s was due to lower skilled-labor costs, market size, and proximity. Unsurprisingly, the authors find that Western European EU members such as Germany and Italy invested in Central European economies disproportionately more than other large economies such as the United States.

Carstensen and Toubal (2004) find that the level of privatization in Central and Eastern Europe affects the amount of foreign investment in a host country. Privatization is a key variable in the attractiveness of a host country because a higher level of privatization indicates a more successful transition to a market economy from a planned economy. Thus Carstensen and Toubal show that Central European economies (Hungary, Poland, etc.), which were more privatized during this time period, experienced more foreign investment than Eastern European economies (Belarus, Bulgaria, etc.). Additionally, Lansbury, Pain, and Smidkova (1996) corroborate these results and show that increased privatization in Central Europe, relative to Eastern Europe, led to the influx of foreign investment by EU members in Western Europe.

More recently, a paper by Bilir, Chor, and Manova (2016) shows that when a multinational enterprise is choosing an affiliate location, host country financial development plays a significant role. Since Central European economies were more financially developed than Eastern European economies during the transition period, they were considered a better location choice for the multinational affiliates of large Western European MNAs.

1.2.2 Exporting Under Financial Constraints

There is a recent, and growing, literature on the effects of credit constraints on international trade, particularly on a firm's exporting behavior. In her 2013 paper, Kalina Manova constructs a theoretical model that introduces credit constraints into a heterogeneous firm model (à la Melitz (2003)). She finds that credit constraints affect a firm's activities through three mechanisms: domestic production, a firm's selection into exporting (extensive margin), and the level of firm exports (intensive margin). However, her paper uses aggregate level data to confirm the theoretical predictions, as opposed to firm level micro-data, thus making it difficult to draw conclusions about

an individual firm's export behavior under credit constraints.

Importantly, further studies have been conducted using firm level micro-data in different countries including Peru ³, Italy ⁴, and China ⁵, all of which conclude that credit constraints affect exports both on the extensive and intensive margin. The wide range of countries used in these studies gives credence to the significant role that credit constraints have on international trade, and that this phenomenon is not regionally concentrated.

1.2.3 Multinational Activity Under Financial Constraints

Other studies have found that multinational affiliates are at an advantage over domestic firms when financial frictions are present. Alfaro and Chen (2012) find that foreign owned firms fared much better during the 2008 global financial crisis than domestic firms, indicating an advantage of multinational affiliates during periods of economic hardship. Additionally, Desai, Fritz, and Foley (2008) find that U.S. multinational affiliates respond much better to currency depreciations in a host country than domestic firms. In particular, multinational affiliates increase their sales and investment much more than the corresponding domestic firms. In their 2009 paper, Antras, Desai, and Foley study the effects of financial contracting and investor protections (imperfect capital markets) on a firm's decision to engage in FDI. The authors show theoretically that FDI flows and multinational activity arise endogenously for a parent company under financial frictions and imperfect monitoring in the host country. Multinational activity occurring as a workaround to imperfect capital markets indicates that there is an advantage to multinational firms over their domestic counterparts.

Furthermore, Buch et al. (2014) use German micro-data, including balance sheet data, and find that firms are less likely to engage in FDI when credit constraints are present. The effect is strongest for the most productive firms as they are the most likely to engage in FDI. Their analysis

³Paravisini et al. (2014)

⁴Minetti and Zhu (2011)

⁵Feenstra, Li, and Yu (2014)

is conducted on the extensive margin, i.e. financial constraints lower the probability that a firm chooses FDI. Interestingly, the authors find that unproductive firms who will never invest abroad do not face this negative impact of financial frictions.

Lastly, a recent paper by Manova, Wei and Zhang (2015) addresses the question of multinational activity under financial constraints using Chinese microdata. The authors do not have balance sheet data available in their dataset, and thus cannot compute a measure of firm-level financial vulnerability. Instead, they study financial vulnerability at the sector level. Their results show that while financial frictions (financially vulnerable industries) negatively affect exports, this effect is not as large for multinational affiliates. This suggests that multinational affiliates have access to better means of financing than domestic firms, and thus can circumvent the affect of domestic market imperfections. However, multinational affiliates in China and Central Europe are likely very different, thus it is important to analyze other areas of the world in order to see if this phenomena occurs elsewhere.

My paper contributes to the existing literature by examining a region that is historically known to have a high level of foreign investment; it is important to know if foreign ownership gives firms in Central Europe an advantage over domestic firms, particularly when firms are credit constrained. In analyzing an area of the world that has largely been neglected by the existing literature on the role of credit constraints in international trade, I am attempting to bridge the three branches of literature mentioned above. Studying Central European firms and their ownership provides valuable insight into the long-term benefits of foreign investment in transition economies and EU membership.

1.3 Data

The data used in this paper is from ORBIS, provided by Bureau van Dijk. I am using the data collected from Estonia and Hungary, which are part of the AMADEUS (European) subset of ORBIS for the year 2013. The firm-level data is collected annually from businesses through websites and various business registries and reports. ORBIS is a well-known firm-level datasource and it is used

in several other papers on foreign direct investment and multinational enterprise behavior⁶.

One advantage of the ORBIS dataset is that it provides detailed balance sheet data for firms of all sizes (including unlisted firms and publicly owned firms). Examples of these useful balance sheet variables are: cash flows, external debt, and tangible fixed assets. These measures have all been used in previous papers such as Buch et al. (2014) to proxy for financial constraints. A novel aspect of the ORBIS data is that it provides detailed ownership information on each firm including the country of the global ultimate owner in the case of a multinational affiliate. There is also an independence indicator which shows how much autonomy a multinational affiliate has. These are unique features that I exploit in my analysis. To define a multinational affiliate in my paper, I follow the work of Cravino and Levchenko (2017). To be considered a multinational affiliate, a firm must have a global ultimate owner (GUO) country that differs from the home country, and additionally, a multinational affiliate will have an independence indicator of “D”. An independence indicator of “D” means that the GUO shareholders have direct ownership over 50% of a Hungarian or Estonian firm. I believe these firms have more direct access to the parent companies, and their resources, and are thus at an advantage over other firms whose international shareholders have less direct control of the Estonian or Hungarian firm.

Other useful variables from the dataset included in my analysis are: NACE industry classification, total employees and firm profitability (measured as Gross Profit/Sales). These provide other controls for the firm that might also affect exporting behavior. Summary statistics for the key variables for the exporting firms are presented below in Table 1.1 through Table 1.3.

Table 1.1 breaks the sample down by firm country; 60% of the firms are Estonian and 40% are Hungarian. Table 1.1 also summarizes multinational affiliate status; 12% of the firms in the sample are multinational affiliates and 88% are domestic firms. From Table 1.2, it is evident that the Hungarian firms are larger in assets (fixed and total), employees, export revenue, and total sales. However, Estonian firms are more profitable on average and the two countries have a similar percentage of multinational affiliates: 14% for Hungarian firms and 10% for Estonian firms. When

⁶For example, Cravino and Levchenko (2017) and Buch et al. (2014)

separating the sample by firm ownership status in Table 1.2, it is clear that multinational affiliates are larger than domestic firms in almost every regard, with the exception of profitability. Additionally, multinational affiliates have a higher percentage of Hungarian firms than domestic firms. It is also apparent that export activity varies by firm sector. As shown in Table 1.3, the most common industries for firms are wholesale and retail trade, manufacturing, and transportation and storage.

Figure 1.1 illustrates the countries with the largest number of multinational affiliates in this dataset. Excluding Estonia and Hungary, the countries with the most affiliates are: Finland, Sweden, Germany, and the United States. Unsurprisingly, other EU member countries (e.g. Italy, France, and Great Britain— which was an EU member in 2013) also have several affiliates in Estonia and Hungary. This phenomenon is consistent with the result of Bevin and Estrin (2004) that Western European EU members invested more in Central Europe in the 1990s than North American and Asian countries.

Currently, my sample only includes exporting firms. Hence, my analysis of the effect of credit constraints and firm ownership on exports is limited to the intensive margin of international trade. In the future I will include non-exporting firms to study these effects on the extensive margin of trade.

1.4 Empirical Specification

It is reasonable to expect that credit constraints and firm ownership status would affect both the extensive and intensive margins of trade. Additionally, multinational firms should have the advantage on both margins as they are usually larger, more productive firms who should perform better than domestic firms. Therefore, I propose two specifications: one to study the extensive margin of trade (which will be included in a later draft of this paper) and one to study the intensive margin.

My main specification for analyzing the effects of firm ownership status and credit constraints

on the intensive margin of international trade for firm f in industry i is:

$$\text{LogExports}_{fi} = \alpha + \theta \text{MNA}_f + \beta X_f + \gamma \text{Fin}_f + \varphi_i + \epsilon_{fi} \quad (1.1)$$

MNA is an indicator for firm f being a multinational affiliate. X_f refers to the firm characteristics: size, profitability, and an indicator for Hungarian firms. Fin_f is a vector of financial variables that act as proxies for financial constraints. The variables are: debt to sales ratio, tangible asset ratio, and cash flows. The φ_i are industry dummies.

In the above specification, size is measured as the log of the number of employees at a firm. Naturally, the expected sign on this variable is positive, indicating larger firms export more. Profitability serves as a measure of firm quality, where more profitable firms are “better” and should thus also export more. The Hungarian indicator accounts for differences between Hungarian and Estonian firms, and the MNA firm ownership variable is the main characteristic of interest. A positive coefficient is expected for that variable, demonstrating an exporting advantage of multinational affiliates over domestic firms.

These financial variables were chosen because they are the most common measures of financial constraints in the literature. Following Buch et al. (2014), the tangible asset ratio acts as a proxy for fixed cost of exporting and thus the higher the tangible asset ratio, the higher the fixed costs associated with exporting. Consequently, one would expect a negative coefficient associated with this variable. In Manova (2013), the tangible asset ratio acts as a proxy for pledgeable collateral and would therefore have a positive sign. The fixed cost interpretation seems more logical in this specification since I am using balance sheet data for individual firms rather than industry average values for tangible asset ratio. A firm with a high debt to sales ratio would be considered more financially constrained than a firm with a low ratio because it would be more difficult to obtain additional external financing when your debt to sales ratio is already very high. A lender would be more reluctant to lend to these firms. Thus the expected sign on the debt to sales ratio is negative. Lastly, cash flows are used in Buch et al. (2014) and Hericourt and Poncet (2009) to proxy for internal funds. A firm with higher cash flows is able to fund more projects internally and

is consequently less financially constrained, and also less dependent on borrowing, so the expected sign on this term is positive.

In order to address the question of whether or not multinational affiliates are less credit constrained than their domestic counterparts, I include interaction terms⁷ between the ownership status indicator and each of the financial variables, yielding the following specification:

$$LogExports_{fi} = \alpha + \theta MNA_f + \beta X_f + \gamma Fin_f + \delta(Fin_f \times MNA_f) + \varphi_i + \epsilon_{fi} \quad (1.2)$$

A multinational affiliate having an advantage with respect to credit constraints would have positive interaction terms for cash flows, tangible asset ratio, and debt to sales ratio. The interpretation is that effect of these credit constraints is less strong for multinational affiliates. This would give credence to the belief that multinational affiliates benefit financially from their parent companies in ways that put them at an advantage over domestic firms. They can alleviate financial market imperfections in their country through parent firms.

1.5 Results

The first column in Table 1.4 presents baseline results for the effect of firm characteristics on the log of exports without the financial data or industry controls. Unsurprisingly, size, and profitability have a positive and significant effect on exports, as does being a Hungarian firm instead of an Estonian firm (Hungarian firms export at least 43% more than Estonian firms). And importantly, the foreign ownership variable has a positive and significant coefficient indicating an advantage of multinational affiliates over domestic firms with regards to exporting. The coefficient on the MNA variable is 1.25 which means that multinational affiliates export over twice as much as domestic firms⁸. The coefficients remain significant after controlling for firm industry (see column 2 of Table 1.4). Controlling for sector is necessary to account for any differences between industries

⁷All financial constraint variables are centered in the interaction term analysis

⁸The 95% confidence interval on the MNA coefficient in Column 1 is between 1.14 and 1.35, and $exp(1.14) - 1 = 2.12$

that affect exports such as skilled-labor intensity and producing goods (which are easier to export) versus services.

Column 3 of Table 1.4 includes firm characteristics, industry controls, and the financial variables. Multinational affiliates still export nearly twice as much as domestic firms after adding these additional controls⁹. The results show that a high debt to sales ratio has a significant negative effect on exporting, indicating a more financially constrained firm exports less, as expected. Also, there is a negative, and significant, coefficient on a firm's tangible asset ratio, which gives credence to interpreting the tangible asset ratio as a proxy for fixed cost rather than pledgeable collateral. The higher the fixed costs for a firm, the less they export. Cash flows have the expected positive sign, implying that the more internal financing available to a firm, the more it can export. These findings are consistent with the existing literature on the effects of credit constraints on international trade. The more financially constrained a firm is, the less it exports on the intensive margin. Overall, these results support previous findings that credit constraints negatively affect exporting on the intensive margin and crucially, that multinational affiliates have an advantage over domestic firms with regards to exports.

In Table 1.5, the financial variables are standardized in order to provide a more meaningful interpretation to the coefficients on these terms. The .15 coefficient on Cash flows indicates that a one standard deviation increase in cash flows for a firm (measured in millions of 2013 USD) leads to a 16% increase in exports. The coefficients on the Tangible Asset share and the Debt/Sales ratio are almost identical (although the Debt/Sales ratio has a larger confidence interval). A one standard deviation increase in the Tangible Asset ratio decreases a firm's exports by more than 39%¹⁰, and a one standard deviation increase in the Debt/Sales ratio decreases exports by more

⁹Similarly, the 95% confidence interval on the MNA coefficient in Column 3 is between 1.07 and 1.30, and $\exp(1.07) - 1 = 1.92$

¹⁰The 95% confidence interval for Tangible Asset is between -.68 and -.50, and $1 - \exp(-.50) = .39$. Thus, a one standard deviation increase in the tangible asset share lowers exports by more than 39%

than 10%¹¹. These are relatively large effects, consistent with the literature¹², which confirm that credit constraints have a significant dampening effect on the intensive margin of international trade.

Table 1.6 includes interaction terms between the multinational enterprise indicator and the various measures of financial constraints for the full sample. These terms address the question of whether or not multinational enterprises are less financially constrained than domestic firms. One would assume that a multinational firm might have better resources for obtaining financing through their parent company. Interestingly, the only highly significant interaction term in the results shown in Table 1.6 is MNA x Debt/Sales Ratio, which is negative. This means that a credit constrained multinational affiliate exports much less than a credit constrained domestic firm when credit constraints are measured as the debt to sales ratio. The interaction term with cash flows is only marginally significant (see Column 3). Since the decision to engage in international trade involves high fixed costs and requires firms to obtain additional financing, we might see more of an advantage of the multinational enterprises in this regard on the extensive margin. In other words, multinational firms might be less financially constrained than domestic firms on the extensive margin of international trade where there is a larger dependence on external financing. This question remains to be explored in a later paper.

1.5.1 Results by Country (Robustness)

Since there are large differences in the characteristics of Hungarian and Estonian firms, Table 1.7 shows the results when the sample is split by firm country as a robustness check. Doing so allows coefficients to differ in each regression, and is more straightforward than including interaction terms for all the variables with the Hungarian indicator. As shown in the table, the size, profitability, tangible asset share, and cash flow coefficients are similar to the results from the full sample regressions in Column 3 of Table 1.4 (i.e. their 95% confidence intervals include the estimates

¹¹Similarly the 95% CI for Debt/Sales ratio is between -1.33 and -.11, and $1 - \exp(-.11) = .10$

¹²For example, Minetti and Zhu (2011) find that credit rationing reduces intensive margin exports by more than 38%

from Column 3 of Table 1.4). All of those coefficients are also significant with the exception of cash flows in Estonia. Crucially, the multinational coefficient is very different for Estonian and Hungarian firms: 1.05 compared to 1.32. This result indicates that multinational affiliates have a larger advantage over domestic firms in Estonia than in Hungary. However, the 95% confidence intervals for the MNA coefficient in each country do nest the estimate on the MNA indicator from Column 3 of Table 1.4. Additionally, the debt to sales ratio is no longer significant in Hungary and only marginally significant, but negative, in Estonia.

Table 1.8 includes interaction terms between the multinational affiliate indicator and the measures of financial constraints separating the sample by firm country. By doing so, I test whether multinational firms are less credit constrained than domestic firms while allowing for firms in different countries to be constrained in different ways. The interaction term between the multinational indicator and the tangible asset share is insignificant for both countries, and the other two interaction terms are significant (albeit only marginally significant for the debt to sales ratio interaction term) and negative, for Hungarian firms. For the Estonian firms, MNA x Cash Flows is positive and significant which supports the claim that multinational affiliates are financially at an advantage with cash flows, they export more than domestic firms when they have more cash flows on hand. However, the interaction term with the debt to sales ratio is not significant for Estonian firms. These results do support the interesting claim that the multinational affiliates are constrained in different ways between the two countries given that the significant interaction terms has a different sign in Hungary and Estonia.

1.6 Conclusion

The main findings in this paper are that multinational firms have an advantage over domestic firms, and export nearly twice as much on the intensive margin. Additionally, credit constraints, measured by tangible asset ratio, debt to sales ratio, and cash flows reduce exports among firms in Estonia and Hungary. Moreover, Hungarian firms export more than Estonian firms. This is unsurprising since

Hungary is a larger country than Estonia and is closer to large economies such as Germany and Italy. These results support the conclusion that the influx of multinational investment that occurred in Central Europe after the fall of the Iron Curtain still had lingering effects in 2013. Multinational affiliates have an advantage over their domestic counterparts, and these affiliates appear to be mostly owned by countries that are nearby EU members. These results provide useful information to studying the benefits of EU membership and foreign investment in transition economies.

However, further work remains to be done on this topic. Primarily, I would like to obtain data from ORBIS on non-exporting firms in Estonia and Hungary. This is crucial in order to study extensive margin effects of firm ownership and credit constraints on international trade. Furthermore, obtaining several years of data from ORBIS to construct a panel would also be useful to add a time dimension to this analysis. For example, if domestic firms are acquired by multinational enterprises, we can study how this affects their international trade behavior over time.

Lastly, there has been an increased presence of multinational banks in this area of the world. It would be useful to parse out the difference between benefits of multinational ownership versus access to multinational banks. To do so would require finding a way to measure a firm's exposure to multinational banks. The large and significant MNA coefficient could partially be reflecting access to multinational banks by an affiliate firm.

APPENDIX

Table 1.1 Overall Firm Characteristics

	Number	Percent
Estonian Firms	9,039	59.85
Hungary Firms	6,064	40.15
Domestic Firms	13,321	88.20
Multinational Affiliates	1,782	11.80
Total	15,103	100.00

Table 1.2 Summary Statistics

Variable	Full Sample	MNA	Domestic	Hungary	Estonia
MNA	0.11 (0.32)			0.14 (0.35)	0.10 (0.30)
Number of Employees	69.31 (533.56)	169.45 (641.36)	55.19 (515.99)	1150.87 (831.72)	14.70 (64.64)
Profitability	5.29 (16.14)	3.70 (14.59)	5.50 (16.33)	3.71 (11.71)	6.35 (18.45)
Sales	15,946 (133,122)	62,972 (328,168)	9,655 (73,192)	35,300 (206,366)	2,963 (24,955)
Export Revenue	7,954 (108,512)	41,926 (305,483)	3,410 (26,412)	17,831 (169,024)	1,328 (20,020)
Cash Flows	1,054 (13,113)	3,874 (32,734)	676 (7,106)	2,258 (20,393)	246 (2,598)
Total Debt	1,356 (9,194)	4,174 (17,427)	979 (7,351)	2,989 (14,185)	260 (1,813)
Total Assets	12,878 (162,843)	44,842 (371,523)	8,602 (107,027)	29,018 (254,924)	2,050 (20,564)
Tangible Fixed Assets	4,422 (61,515)	11,938 (99,059)	3,417 (54,496)	9,905 (95,048)	745 (15,132)
Number of Observations	15,103	1,782	13,321	6,064	9,039

Table 1.3 Firm Industry (NACE Main)

Industry	Frequency	Percent
A - Agriculture, forestry and fishing	424	2.81
B - Mining and quarrying	54	0.36
C - Manufacturing	3,822	25.31
D - Electricity, gas, steam and air conditioning supply	47	0.31
E - Water supply; sewerage, waste management and remediation activities	92	0.61
F - Construction	1,258	8.33
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	4,326	28.64
H - Transportation and storage	1,479	9.79
I - Accommodation and food service activities	101	0.67
J - Information and communication	749	4.96
K - Financial and insurance activities	101	0.67
L - Real estate activities	258	1.71
M - Professional, scientific and technical activities	1,418	9.39
N - Administrative and support service activities	623	4.13
O - Public administration and defence; compulsory social security	2	0.01
P - Education	54	0.36
Q - Human health and social work activities	63	0.42
R - Arts, entertainment and recreation	88	.58
S - Other service activities	144	.95
Total	15,103	100

Table 1.4 Baseline Results

Dependent Variable: log(Exports)			
	(1)	(2)	(3)
MNA	1.25*** (0.060)	1.31*** (0.058)	1.20*** (0.056)
Size	0.83*** (0.015)	0.76*** (0.016)	0.76*** (0.016)
Profitability	0.011*** (0.001)	0.012*** (0.001)	0.011*** (0.001)
Hungarian	0.41*** (0.052)	0.49*** (0.052)	0.49*** (0.051)
Tangible Asset Share			-1.08*** (0.078)
Debt/Sales Ratio			-0.028** (0.012)
Cash Flows			0.012*** (0.003)
Industry Controls	No	Yes	Yes
Observations	15,103	15,103	15,103
R-squared	0.329	0.356	0.382

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 1.5 Baseline Results with Standardized Financial Variables

Dependent Variable: log(Exports)	
	(1)
MNA	1.20*** (0.058)
Size	0.76*** (0.016)
Profitability	0.011*** (0.001)
Hungarian	0.49*** (0.052)
Tangible Asset Share	-0.59*** (0.043)
Debt/Sales Ratio	-0.72** (0.314)
Cash Flows	0.15*** (0.045)
Industry Controls	Yes
Observations	15,103
R-squared	0.382
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Table 1.6 Baseline Results with Interaction Terms

Dependent Variable: log(Exports)			
	(1)	(2)	(3)
MNA	1.19*** (0.058)	1.16*** (0.058)	1.20*** (0.058)
Size	0.76*** (0.016)	0.75*** (0.016)	0.75*** (0.016)
Profitability	0.011*** (0.001)	0.011*** (0.001)	0.011*** (0.001)
Hungarian	0.49*** (0.052)	0.49*** (0.052)	0.49*** (0.052)
Tangible Asset Share	-1.07*** (0.082)	-1.08*** (0.078)	-1.08*** (0.078)
Debt/Sales Ratio	-0.028** (0.012)	-0.016*** (0.006)	-0.028** (0.012)
Cash Flows	0.012*** (0.003)	0.012*** (0.003)	0.020*** (0.005)
MNA x Tangible Asset Share	-0.072 (0.232)		
MNA x Debt/Sales Ratio		-0.21*** (0.027)	
MNA x Cash Flows			-0.011* (0.006)
Industry Controls	Yes	Yes	Yes
Observations	15,103	15,103	15,103
R-squared	0.382	0.382	0.382

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 1.7 Results by Country

Dependent Variable: log(Exports)		
	(1)	(2)
MNA	1.05*** (0.085)	1.32*** (0.077)
Size	0.79*** (0.025)	0.73*** (0.022)
Profitability	0.01*** (0.003)	0.01*** (0.001)
Tangible Asset Share	-1.39*** (0.147)	-0.98*** (0.091)
Debt/Sales Ratio	-0.121 (0.100)	-0.013* (0.007)
Cash Flows	0.011*** (0.004)	0.017 (0.024)
Industry Controls	Yes	Yes
Observations	6,064	9,039
R-squared	0.322	0.269

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 1.8 Results by Country with Interaction Terms

Dependent Variable: log(Exports)		
	(1)	(2)
MNA	1.04*** (0.085)	1.33*** (0.085)
Size	0.78*** (0.025)	0.73*** (0.021)
Profitability	0.010*** (0.003)	0.011*** (0.001)
Tangible Asset Share	-1.39*** (0.158)	-0.97*** (0.095)
Debt/Sales Ratio	-0.05 (0.089)	-0.01 (0.008)
Cash Flows	0.021*** (0.006)	0.004 (0.024)
MNA x Tangible Asset Share	-0.062 (0.361)	-0.056 (0.297)
MNA x Debt/Sales Ratio	-0.19* (0.099)	-0.12 (0.150)
MNA x Cash Flows	-0.013** (0.006)	0.094*** (0.030)
Industry Controls	Yes	Yes
Observations	6,064	9,039
R-squared	0.324	0.271

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 1.1 Global Ultimate Owner Countries

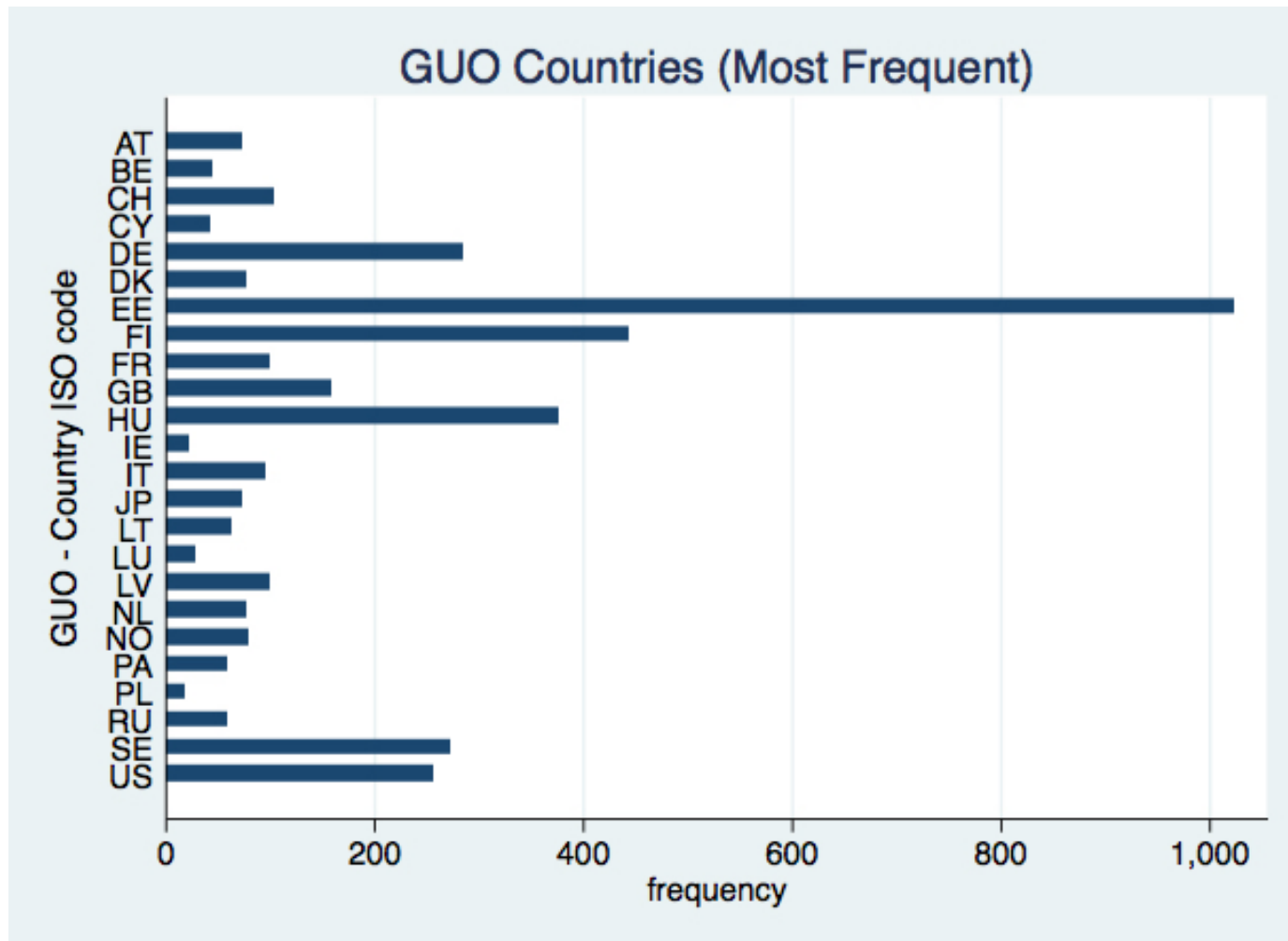


Table 1.9 ISO Country Code Key

ISO Code	Country
AT	Austria
BE	Belgium
CH	Switzerland
CY	Cyprus
DE	Germany
DK	Denmark
EE	Estonia
FI	Finland
FR	France
GB	Great Britain
HU	Hungary
IE	Ireland
IT	Italy
JP	Japan
LT	Lithuania
LU	Luxembourg
LV	Latvia
NL	Netherlands
NO	Norway
PA	Panama
PL	Poland
RU	Russia
SE	Sweden
US	United States

CHAPTER 2

MULTINATIONAL ACTIVITY AND BANKING: THE EFFECTS OF OWNERSHIP STATUS ON EXPORTERS

2.1 Introduction

In recent years there has been growing interest in the broad question of globalization and specifically, whether or not the expansion of multinational enterprises is beneficial. Multinational enterprises are firms that are headquartered in one country, but have operations or branches in one or more different countries abroad. It is well known that multinational firms tend to be larger and more efficient than their domestic counterparts, and the size and scope of these firms have increased over time¹. However, it is difficult to determine if this expansion is harmful or beneficial to the countries receiving foreign investment. Foreign investment can increase domestic wages² and productivity³, but conversely, can also lead to a detrimental dependence on foreign technology in the domestic country and hinder economic development⁴.

An additional factor to consider in the expansion of multinational enterprises is the spread of multinational banking. Similarly defined, a multinational bank is a bank that operates in multiple countries. Usually these banks are part of a larger “banking group” with branches in several countries. Naturally, these two concepts are related, as multinational firms encounter multinational banks in their financing decisions.

In this paper I analyze whether or not a naive “Multinational Advantage” coefficient on exports suffers from omitted variable bias when neglecting to include a firm’s banking behavior. Additionally, this paper contributes to a growing literature studying the impacts of credit constraints and imperfect capital markets on international trade. This suggests that multinational firms and

¹Markusen and Venables (1998)

²Figlio and Blonigen (2000)

³Lipsey (2004) and Fons-Rosen et al. (2017)

⁴Vissak and Roolaht (2005)

banks (in effect, “globalization”) have a positive impact in a country with imperfect capital markets. Previous literature on the benefits of multinational ownership may overstate the importance of parent companies if multinational bank access also benefits affiliates. I then use a staggered difference-in-differences approach to analyze the channels through which multinational banking affects exporting firms. I exploit variation in the country of bank ownership through different mergers and acquisitions. Specifically, I study the effects of the Hungarian government purchasing two large multinational banks in Hungary on an affected firm’s borrowing and export performance. My empirical results indicate that multinational banking plays an important role (in addition to foreign ownership) in a firm’s export performance.

This paper uses a novel firm-level panel data from three Central European economies (CEE): Croatia, Estonia, and Hungary. All three are European Union members, Estonia and Hungary having joined in 2004 and Croatia in 2013. These countries all experienced increased foreign investment during the time period around their EU accession⁵. Central and Eastern European countries experienced high levels of foreign investment and banking in the 1990s and early 2000s, but have largely been neglected in the growing body of literature on financial constraints and international trade. In addition, studying firm ownership and banking in Central Europe can provide information on the long-term benefits of EU accession and foreign investment in transition economies.

The remainder of this paper proceeds as follows: section two provides a review of literature, section three explains institutional details, section four describes the data, section five presents a conceptual framework and descriptive evidence for the importance of firm banking behavior, section six presents the results for the effect of two major bank purchases on exporting firms in Hungary, and section seven concludes and discusses avenues for further research. Tables and figures are presented in section eight.

⁵Janicki and Wunnava (2006) study this phenomenon in the case of the 2004 enlargement, and more recently several papers including Vachudova (2014) analyze the Balkan region from which Croatia was the first EU member.

2.2 Review of Literature

2.2.1 Investment in Central Europe

It is important to understand precisely why Central Europe saw an increase in foreign investment in the transition period of the 1990s and early 2000s. This was the time after the Iron Curtain fell and several Central European countries applied for EU membership. In 2004, ten countries joined the EU, eight of which were Central and Eastern European countries such as Hungary and Poland. The result was a significant enlargement of the European Union (EUROPA).

In a 2004 paper, Bevin and Estrin find that the increase in foreign investment in central and eastern European countries during the 1990s was mainly due to lower skilled-labor costs, market size, and proximity. Interestingly, and perhaps unsurprisingly, the authors discover that Western European EU members invested in Central European economies disproportionately more than other large economies such as the United States and Japan. Additionally, Bevin and Estrin conclude that public announcements of EU membership negotiations had a positive impact on foreign direct investment (FDI) in the candidate country.

These results are corroborated by Carstensen and Toubal (2004) who also find that the level of privatization in Central and Eastern Europe affects the amount of foreign investment in a host country. Privatization is a key variable in the attractiveness of a host country because a higher level of privatization indicates a more successful transition to a market economy following the fall of the Iron Curtain. Thus, Carstensen and Toubal show that Central European economies, which were more privatized during this time period, experienced more foreign investment than Eastern European economies. Lansbury, Pain, and Smidkova (1996) also show that increased privatization in Central Europe, relative to Eastern Europe, led to the influx of foreign investment by EU members in Western Europe.

A recent paper by Bilir, Chor, and Manova (2016) shows that host country financial development plays a significant role in the affiliate location choice of a multinational enterprise. Since Central European economies were more financially developed than other potential affiliate locations during

the transition period, they were a good location choice for multinational affiliates.

2.2.2 Multinational Activity and Export Under Financial Constraints

In their 2009 paper, Antras, Desai, and Fritz Foley study the effects of financial contracting and investor protections (imperfect capital markets) on a firm's decision to engage in FDI. The authors show theoretically that FDI flows and multinational activity arise endogenously for a parent company under financial frictions and imperfect monitoring in the host country. Multinational activity occurring as a workaround to imperfect capital markets indicates that there is an advantage to multinational firms over their domestic counterparts.

Other studies have found that when financial frictions are present, multinational affiliates are at an advantage compared to domestic firms. For example, Alfaro and Chen (2012) find that foreign owned firms fared much better during the 2008 global financial crisis than domestic firms, indicating an advantage of multinational affiliates during periods of economic hardship. Additionally, Desai, Fritz Foley, and Forbes (2008) find that U.S. multinational affiliates respond better to currency depreciations in a host country than domestic firms. In particular, multinational affiliates increase their sales and investment much more than corresponding domestic firms.

Lastly, a recent paper by Manova, Wei and Zhang (2015) addresses the question of multinational activity under financial constraints using Chinese micro-level customs data. Since they do not have balance sheet data available in their dataset, the authors cannot compute financial vulnerability at the firm level. Instead, they study financial vulnerability at the sector level. Their results show that while financial frictions (financially vulnerable industries) negatively affect exports, this effect is not as large for multinational affiliates. This suggests that MNCs have access to different means of financing than domestic firms, and thus can ameliorate the affect of domestic market imperfections.

There is also a recent, and growing, literature on the effects of credit constraints on international trade, particularly on a firm's ability to export. Importantly, studies have been conducted using firm level micro-data in different countries including Peru (Paravisini et al. (2014)), Italy (Minetti and Zhu (2011)), and China (Feenstra, Li, and Yu (2014)), all of which conclude that credit constraints

affect exports both on the extensive and intensive margin. The wide range of countries used in these studies gives credence to the significant role that credit constraints have on international trade, and that this phenomenon is not regionally concentrated.

2.2.3 Multinational Banking

In the previous section, I discuss the advantage that multinational affiliates face. This result could stem from better access to multinational banks (MNBs), and not just from resources afforded to them by the parent company. There is an extensive literature on the effects that multinational banking can have on an economy, and perhaps too much credit is given to multinational enterprises, and not enough to banks.

However, the impact that international banks have can be ambiguous. Historically, international banks opening, or acquiring, existing banks in less financially developed countries has led to inefficiently run banks. In a 2010 paper, Weller argues that an increase in the number of multinational banks in Poland after 1991 actually led to a negative effect on business investments due to lower credit supplies by all Polish banks. This was an unintended consequence immediately following the transition process. One goal of the transition process in CEEs was to achieve more financial liberalization and in the long run develop a more sophisticated financial sector.

Chang, Hasan, and Hunter (2010) find that multinational banks are more inefficient than domestic banks, however, their study is conducted using the US banking sector. One would not expect the same dynamic to hold in less financially developed countries. Another paper by Lensink, Meesters, and Naaborg (2008) studies the relationship between foreign ownership and bank efficiency in Central Europe's post-transition period (1991-2003). The authors measure inefficiency in the standard way as expenses divided by revenue. During this time period, they studied over 2000 banks in over 100 countries scattered globally, including countries in Asia and Oceania. While they find inefficiency in foreign-owned banks is present, this inefficiency diminishes with the quality of host country governance and with the similarity between home and host country. Central Europe is a good example of an area in which this inefficiency would be reduced due to its close proximity

to Western Europe and EU membership goals during this period.

Additionally, De Haas and Van Lelyveld (2010) find multinational banks weather local financial crises better than domestic banks. The internal capital markets afforded to them by financially strong parent banks enable the subsidiaries to face minimal changes during periods of local crisis⁶. Another paper by Havrylchyk and Jurzyk (2011) shows that Central and Eastern European banks acquired by multinational banking groups experience increases in market share and profitability following the turnover. These banks experience a transmission of knowledge from parent to subsidiary and are thus at an advantage over banks that remain domestically owned. A similar phenomenon is found between multinational enterprise parent companies and their affiliates.

My paper contributes to the existing literature by examining a region that is historically known to have a high level of foreign investment and banking; it is important to know if foreign ownership gives firms in Central Europe an advantage over domestic firms, particularly when firms are credit constrained. Furthermore, I investigate how much of that advantage is due to bank access that has been historically misattributed to parent companies. In analyzing an area of the world that has largely been neglected by the existing literature on the role of credit constraints on firm performance, I am attempting to bridge the three branches of literature mentioned above. Studying Central European firms and their ownership and borrowing behavior provides valuable insight into long-run benefits of EU membership and the corresponding foreign investment from Western Europe.

2.3 Background and Institutional Details

The history of the banking sectors in Central European economies (and particularly the three countries studied in this paper) mirrors the increase in multinational activity and FDI during the post-transition period. Financial development is a crucial factor in economic development, and during the transition to market-based economies, many Central European countries began to develop or enrich their banking sector. As shown in Table 2.21, Table 2.22, and Table 2.23 many

⁶These results do not extend to global crises (2008). De Haas and Van Lelyveld (2014) show that spillover effects existed between parent bank and subsidiary during the Great Recession.

of the modern day banks in Croatia, Estonia, and Hungary were established in the late 1980s and 1990s (when the Iron Curtain fell). The banking sector in each country is unique, with a different makeup of banks and international presence.

2.3.1 Estonia

Estonia began a rapid transition to a market-based economy in 1992 shortly after gaining independence from the Soviet Union in 1991. The country experienced rapid economic development and in 2004 became a member of the European Union. During the 1990s several Estonian Banks were established and there was an additional shakeup of the banking sector in Estonia following the financial crisis with several banks re-branding, being turned over, or closing.

Presently, the largest banks in Estonia are owned by international banking groups. Swedbank and SEB Bank are both owned by Swedish groups and account for over 60% of the market share in 2016 (see Table 2.22). Luminor Bank is the third largest bank in Estonia (with 14% of the market share), and it is owned by Norwegian and Finnish groups. Not only is the banking sector in Estonia dominated by multinational banks, these banks are geographically close to Estonia, representing Scandinavian or other Baltic countries. This is consistent with the findings of Lensink, Meesters, and Naaborg (2008) that multinational bank inefficiency diminishes with similarity between home and host country.

2.3.2 Hungary

Hungary has historically remained an independent state since the collapse of the Austro-Hungarian Empire. However, following World War II, the country operated as a Communist state with some free-market aspects until 1989. Following the fall of the Iron Curtain, Hungary began rapid privatization and experienced a large influx of foreign investment from Western European countries. Many of the current banks in Hungary were established in the 1990s during this period of transition. Hungary joined the EU in 2004, but it was already host to several multinational banks. Presently,

Hungary is ranked as the 36th largest export economy in the world (2017) and has benefited from its proximity to economically large neighboring countries.

Similarly to Estonia, there were several changes to the banking sector following the financial crisis in 2008. Notably, the election of a far-right government in 2010 put the domestication of the banking sector into the media spotlight. This has led to the turnover and government purchase of several international banks. While many domestic banks were bought-out by international groups during the transition, the reverse phenomenon has been happening recently. The Hungarian government has expressed a goal for over 50% of the banking sector to be domestic. This is a topical field of study. However, despite this recent shakeup, there is still a large multinational banking presence in Hungary (see Table 2.21). Many of the largest international banks in Hungary are owned by groups in Germany, Austria, and Italy.

2.3.3 Croatia

Croatia is the most recent EU member, having joined in 2013 after a lengthy candidacy which began in 2003 and became official in 2004. Following a similar timeline as Estonia and Hungary, Croatia declared its independence from Communist Yugoslavia in 1992, and had already started the privatization process in 1991. There was already an established banking system in place (Reininger and Walko (2005)) with several domestic banks with establishment dates in the late 19th and early 20th century (see Table 2.23). This is a phenomenon unique to Croatia relative to other Central and Eastern European countries. There are also several present-day banks that were established during the transition to a market economy in the late 1990s. Similarly to Estonia and Hungary, a few banks went through restructuring and mergers after the global financial crisis, and many of the internationally-owned banks are from countries in close geographic proximity.

It is reasonable to compare these three countries because they went through similar transition patterns. Each declared independence from a communist country, or transitioned from communism in the early 1990s. This was then followed by the rapid privatization of industry and the development/enrichment of a banking sector. Lastly, each country was granted EU membership or

candidacy in 2004, and experienced some shakeups in their banking sector following the financial crisis. Each country also has a strong multinational banking presence, with variation in the ownership countries. This variation comes from a strong geographic link between a country and the international banking groups operating there. Therefore, it is valid to analyze these three countries in one study.

2.4 Data

The data in this analysis is from ORBIS, provided by Bureau van Dijk, and is comprised of exporting firms from the three EU members: Croatia, Hungary, and Estonia. 33% of the firms in my sample are Estonian, 44% are Croatian, and 23% are Hungarian. These countries are part of the AMADEUS (European) subset of ORBIS for the years 2010-2017. The firm-level data is collected annually from businesses through websites and various business registries and reports. ORBIS is a well-known datasource used in several papers on FDI and multinational enterprise behavior⁷. Croatia joined the EU in 2013, towards the beginning of the panel. Therefore it is interesting to compare a newer EU member to more established members from 2004.

There are several advantages to this dataset. First, ORBIS provides detailed balance sheet data for firms of all sizes (including unlisted firms). Examples of these variables are: cash flows, debt, and fixed assets. These measures have all been used in previous papers to construct proxies for financial constraints⁸. Additionally, ORBIS provides detailed ownership information on each firm including the country of the global ultimate owner, and an independence indicator showing how much autonomy a multinational affiliate has. For my analysis, I follow the work of Cravino and Levchenko (2017) and consider firms with a global ultimate owner (GUO) country that differs from the home country, and with an independence indicator of "D" as a multinational subsidiary.

⁷For example, Cravino and Levchenko (2017) study business cycle transmission through multinational firms and Buch et al. (2014) use ORBIS linked with German customs data to analyze the effects of credit constraints on firm's FDI behavior.

⁸See Buch et al. (2014)

This means that the GUO (and thus international) shareholders have direct ownership over 50%. I believe these firms have more direct access to the parent companies and their resources, and are therefore at an advantage over other internationally owned firms with less direct control.

Other useful variables from the dataset included in my analysis are: NACE industry classification, total employees, profitability, and city as these provide other controls for the firm that might also affect firm performance. Summary statistics for the key variables for the exporting firms are presented below in Table 2.1 and Table 2.2. For clarity, I present the means for key variables for the full sample, then divide by firm ownership status, then finally present the means across country. Overall, approximately 11% of firms are considered multinational affiliates by my definition, with some differences across countries. Hungary has a higher ratio of MNAs and Croatia's ratio is slightly below the mean. Additionally, in line with previous literature and findings, MNAs are much larger (both in terms of employees and revenue). They also have higher average amounts for debt and assets, indicating a higher level of financial activity. Interestingly, multinational affiliates are more likely to be located in the capital city of a country. However, this is unsurprising given the three countries in my sample. For Hungary, Croatia, and Estonia, the capital is the largest and most "global" city.

When looking at summary statistics across country, Croatian and Estonian firms are similar across many firm characteristics. These include percentage of MNAs, profitability, capital city share, and export revenue. However, they differ along many of the balance sheet variables with Croatian firms having larger means for all types of assets, debt, and cash flows. The Hungarian firms dominate along all variables except profitability. They have more financial activity and are larger in terms of revenue and employees. This is logical since Hungary is a much larger country than either Croatia or Estonia. Table 2.6 shows the most frequent foreign ownership country across the three countries. Most of the countries listed are Western European EU members (several of which border the countries in the sample), corroborating the findings of Bevin and Estrin (2004)⁹.

⁹Central Europe was an attractive area for FDI among Western EU members in the period following the transition to market economies and prior to EU membership

Table 2.2 presents the banking characteristic summary statistics for all firms, firms separated by ownership status, and across countries. It is evident that for the full sample of firms that borrow from banks, most of them use multinational banks as either the sole means of financing or combined with domestic banks. Moreover, MNAs are more likely to only borrow from foreign banks than domestic firms. Domestic firms are more likely than MNAs to combine foreign banking with domestic banking. Another fact to note is that 16% of multinational affiliates borrow from a bank that is owned by a group in the same country as their parent enterprise. This is a non-trivial amount, considering that not every GUO country has a corresponding multinational banking presence in Croatia, Estonia, or Hungary. One last takeaway from Table 2.2 is that multinational affiliates borrow from a slightly larger number of banks on average than domestic firms, and that they have more non-bank advisors, indicating more diversification in their financing behavior.

When comparing banking behavior across countries in Table 2.2, there are vast differences between Croatian, Hungarian, and Estonian firms' borrowing behavior. It is important to look across countries as there are idiosyncrasies in the banking sector in each country and this could lead to different borrowing patterns. In addition, the options available to firms in different countries are unique. For example, in Estonia only 437 firms borrow from an Estonian bank, because the domestic banks are much smaller and tend to cater to households and not firms. Thus, when firms borrow, they more likely choose multinational banks. Conversely, Hungary has several large and competitive domestic banks (OTP), along with many big international banks (ING) which gives exporters more options. This is seen in the Hungarian column of the table where firms have more diversity among the banking options (Foreign Borrower (excl.), Foreign Borrower (comb.), and Domestic Borrower (excl.)). Estonia and Croatia have similar shares among the three variables since the domestic banks tend to be small, rendering multinational banking more attractive.

Measuring a firm's multinational bank exposure is not immediately clear. Firms could use banks in their parent country, domestic country, or any other country. One of the advantages of ORBIS is that for most firms, banks are included along with other firm information in the dataset. The banks from which a firm borrows are listed in the "Advisor" column. In order to

code which banks a firm uses, I compiled a list of the largest banks in a country along with the country of ownership, and create an indicator for each bank the firm lists in their “Advisor” column. This required scraping the column for the name of the bank (sometimes in the original language) since the “Advisor” variable is simply a list of names and sometimes up to 15 banks were listed. Table 2.3, Table 2.4, and Table 2.5 list all the banks and owner countries for the exporting panel separated across country and Table 2.7 lists the most frequent banks for each country. I coded 46 unique banks across the three countries in the dataset, with a good mix of domestic banks and multinational banks. These were the most prevalent across all the firms. I then aggregated the individual banks to the bank-country level. This allows for a direct comparison of bank borrowing behavior to multinational affiliate ownership country (e.g. one can see if an Italian owned firm in Hungary borrows from an Italian bank etc.).

2.5 Descriptive Motivation and Conceptual Framework

2.5.1 Conceptual Framework

An exporting firm has several means of financing available: domestic banks, multinational banks, and non-bank financing (e.g. private individuals). Each of these options comes with different costs (interest rates, ease of access). It is reasonable to assume that these costs are heterogeneous across ownership status. Multinational affiliates could use banks in their parent country, domestic country, or any other country. For example, it would be more straightforward for a Estonian firm owned by a Danish company to borrow from a Danish bank than it would be for an Estonian firm with no connection to Denmark. This would be an example of a firm using the internal capital markets between MNA and parent companies found by Desai, Fritz Foley, and Hines (2008). Furthermore, it could also be easier for the Danish-owned firm to access banks in Germany or Sweden, both neighboring countries to Denmark with strong banking presences there. I propose that multinational affiliates have better access to international banks through the networks afforded to them by their parent company. Therefore multinational affiliates face a lower cost of borrowing

internationally than domestic firms.

For clarification I present the following example: Figure 2.1 shows an example of two Hungarian multinational affiliates: Louis Vuitton Hungaria and Lidl Hungary. Lidl is a German affiliate and Louis Vuitton is a French affiliate. In the advisor column (ADV) Louis Vuitton borrows exclusively from the BNP Paribas Hungarian branch, which is a French-owned bank. This borrowing behavior is relatively straight forward: a French company borrows from a French bank. However, Lidl borrows from five different banks: BNP Paribas, CIB, ING, and two OTP branches, which are French-owned, Italian-owned, Dutch-owned, and Hungarian-owned respectively. Lidl's pattern behavior is not as simple. The firm borrows from domestic banks and larger multinational banks that are not from the same country as their parent company, but are banks from nearby Western European countries. Both firms borrow internationally, and through parsing out the different banks in the advisor column, I can differentiate between firms that borrow exclusively from foreign banks (Louis Vuitton) and firms who use both domestic and multinational banks (Lidl). In both cases it would be naive to just examine a multinational ownership coefficient and neglect their borrowing from multinational banks.

2.5.2 Descriptive Evidence and Omitted Variable Bias

It is reasonable to expect that firm ownership status and credit constraints would affect firm performance, both domestically and through exporting. Additionally, multinational firms should have the advantage in both cases as they are usually larger, more productive firms who should perform better than domestic firms. Therefore, I propose two specifications: one to study exporting behavior of a firm, and a second to study domestic behavior.

For analyzing the effects of firm ownership status, multinational banking, and credit constraints on the intensive margin of international trade for firm f in industry i in country j I estimate the following random effects model:

$$\mathbf{Log}(\text{ExportRevenue}_{fijt}) = \alpha + \theta \mathbf{MNA}_f + \chi \mathbf{MNB}_f + \beta \mathbf{X}_f + \gamma \mathbf{Fin}_f + \varphi_i + \varphi_j + \varphi_t + \epsilon_{fijt} \quad (2.1)$$

Where $\mathbf{MNA}_f$ is an indicator for a firm being a multinational affiliate; $\mathbf{MNB}_f$ is a measure of multinational banking access; $\mathbf{X}_f$ is a vector of firm characteristics: capital city indicator, profitability, and size measured as $\log(\text{Employment})$; $\mathbf{Fin}_f$ is a vector of financial variables that act as proxies for financial constraints: debt to sales ratio, tangible asset ratio, and cash flows; Lastly, φ are industry (NACE 2 digit), country, and year effects. Controlling for sector is necessary to account for any differences between industries that affect exports such as skilled-labor intensity and producing goods (which are easier to export) versus services.

The variables in $\mathbf{MNB}_f$ include an indicator if the firm borrows from a multinational bank from the same country as its headquarter country (Same Country) and two indicators for whether or not a firm borrows from a foreign bank exclusively, or a combination of foreign and domestic banks. In the Lidl and Louis Vuitton example from above, Lidl would have a value of 1 for the combined foreign borrowing indicator and a 0 for the exclusive foreign borrower indicator, and vice versa for Louis Vuitton. Louis Vuitton would also have a value of 1 for the Same Country variable. One would expect the sign on the banking variables to be positive since firms that borrow from international banks should be able to export more as they are better able to finance their activities due to access to larger more financially sophisticated banks. Furthermore, the sign on the Same Country variable should be positive. This follows because borrowing from a bank owned by a group headquartered in the same country as your parent company should give you an advantage such as better knowledge of the banking sector in that country. This would lead to more efficient financing activities and therefore, a better ability to export.

Once the variables for multinational banking are included, along with controlling for each bank (columns 3 and 4 in Table 2.9 - Table 2.14), the coefficient on $\mathbf{MNA}_f$ should fall. This occurs since omitting banking information causes the coefficient on $\mathbf{MNA}_f$ to be upwardly biased. This result is expected because both:

$$\text{Corr}[\mathbf{MNA}, \mathbf{MNB}] > 0 \quad (2.2)$$

and

$$\text{Corr}[\text{Log}(\text{Export Revenue}), \mathbf{MNB}] > 0 \quad (2.3)$$

These findings demonstrate that neglecting to account for firm borrowing and multinational banks overstates the effect of multinational ownership on a firms levels of exports. Additionally, non bank advisors (e.g. private borrowing) also have a positive effect on exports that could have been mistakenly captured in the coefficient on multinational ownership.

These financial variables were chosen because they are the most common measures of financial constraints in the literature. Following Buch et al. (2014), the tangible asset ratio acts as a proxy for fixed cost of exporting and thus the higher the tangible asset ratio, the higher the fixed costs associated with exporting. Consequently, one would expect a negative coefficient associated with this variable. In Manova (2013), the tangible asset ratio acts as a proxy for pledgeable collateral and would therefore have a positive sign. The fixed cost interpretation seems more logical in this specification since I am using balance sheet data for individual firms rather than industry average values for tangible asset ratio. A firm with a high debt to sales ratio would be considered more financially constrained than a firm with a low ratio because it would be more difficult to obtain additional external financing when your debt to sales ratio is already very high conditional on already exporting. A lender would be more reluctant to lend to these firms. Thus the expected sign on the debt to sales ratio is negative. Lastly, cash flows are used in Buch et al. (2014) and Hericourt and Poncet (2009) to proxy for internal funds. A firm with higher cash flows is able to fund more projects internally and is consequently less financially constrained, and also less dependent on borrowing, so the expected sign on this term is positive. The expected signs on the size, profitability, and capital city variables are also positive. More profitable firms should have higher export revenue (mechanically), and firms with more employees should also export more.

Similarly, my specification to study the effects of MNA status and multinational banking on domestic performance of exporters under financial constraints is:

$$\text{Log}(\text{DomesticRevenue}_{fijt}) = \alpha + \theta \text{MNA}_f + \chi \text{MNB}_f + \beta \mathbf{X}_f + \gamma \text{Fin}_f + \varphi_i + \varphi_j + \varphi_t + \epsilon_{fijt} \quad (2.4)$$

Where

$$\text{DomesticRevenue}_{fijt} = \text{TotalRevenue}_{fijt} - \text{ExportRevenue}_{fijt} \quad (2.5)$$

As a robustness check, I also measure firm performance as $\text{Log}(TotalRevenue_{fijt})$ and use the following random effects specification (for these results please see appendix Table 2.25, Table 2.26, and Table 2.27):

$$\text{Log}(TotalRevenue_{fijt}) = \alpha + \theta \mathbf{MNA}_f + \chi \mathbf{MNB}_f + \beta \mathbf{X}_f + \gamma \mathbf{Fin}_f + \varphi_i + \varphi_j + \varphi_t + \epsilon_{fijt} \quad (2.6)$$

2.5.3 Results

2.5.3.1 Exports

The results from estimating Equation 1 for all exporters show that including banking information (comparing Column 1 to Column 4 in Table 2.9) causes the coefficient on $\mathbf{MNA}$ to fall by 12.5%. This is a non-trivial amount and shows that the “multinational advantage” in export revenue falls from 122% to 102%¹⁰. To avoid concern that this drop is attributed to generic “bank borrowing”, I test whether the MNA coefficient stays the same when including a dummy variable for a firm borrowing from any bank. The results of this test are shown in column 2 of Table 2.9. While this variable is large and significant, it has no effect on the ownership status variable. However, upon controlling for the type of bank (see Column 3) and including dummies for each of the 46 unique banks (see Column 4), there is a clear reduction in the MNA effect. This indicates that this phenomenon is not attributed to “banks,” but rather, multinational banks.

Additionally, the signs on the firm characteristics are as expected. More profitable firms export more, as do larger firms with more employees. The capital city indicator is insignificant. Since the capital is the largest major city in all three countries, there is no clear distinction between the type of firm that locates in the capital or elsewhere. Firms with a higher debt/sales ratio and a higher tangible asset share also export less, while higher cash flows are associated with more exports. This is in line with the literature about financial constraints negatively affecting exports, even on the intensive margin¹¹. These signs are consistent throughout specifications and for clarity

¹⁰The coefficient on the MNA indicator falls from .798 to .705, and $\exp(.798) - 1 = 1.22$ & $\exp(.705) - 1 = 1.02$

¹¹As shown in Minetti and Zhu (2011) in Italy, and other countries in related literature.

of presentation the variables have been removed from the subsequent tables.

An advantage of splitting the MNB coefficient into Foreign Borrower (exclusive) and Foreign Borrower (combined) is that one can analyze whether it is better to borrow solely from international banks or diversify between types of bank. I find that for the full sample, the coefficients on Foreign Borrower (e) and Foreign Borrower (c) are both positive but the magnitude is larger for Foreign Borrower (e), indicating that it is better to borrow only from foreign banks. This effect holds for all groups except Estonian exporters. The coefficient on Same Country is large and significant which indicates an advantage associated with borrowing from a bank owned by a group in the same country as an affiliate's parent company.

When running the specification across countries, it is evident that the reduction of the MNA coefficient is most pronounced for Hungarian firms (see Table 2.10). The coefficient falls by 36% (from .537 to .342), which is the largest drop across countries in the full sample, and corresponds in a change in "multinational advantage" from 71% to 41%. This result is relatively unsurprising as Hungary is a larger country with more investment from large Western European countries (see Table 2.6). The coefficient also falls for Estonian firms (13.7%), but not for Croatian firms. Since Croatia is the most recent EU member in the sample, it is plausible that it has not experienced the same influx of foreign investment and banking from Western Europe as Estonia and Hungary. These results also indicate that there is a long term benefit to EU membership and globalization. The dataset spans from 2010 to 2017 and thus, the timeline is too short to see a large benefit from multinational banking in Croatia.

Additionally, I run the specification across firm size and the results are shown in Table 2.13 and Table 2.14. I divide the sample into small/medium enterprises (SME) and large firms. I use the same designation for a SME as the European Union. An SME is a firm with less than 250 employees, and large firms are those with more than 250 employees. The vast majority of firms in the dataset, approximately 84%, are SMEs. This ratio is about the same across all three countries and across ownership status. The multinational affiliate coefficient falls in both cases, but the magnitude of the drop as a percentage of original coefficient is greater for large firms. However, it

is important to note that the coefficient on **MNA** is not significant in either column for large firms, most likely due to a lack of power. There is still evidence that the coefficient on multinational ownership was overstated for both types of firms but more so for large enterprises (i.e. accounting for banking behavior has a stronger effect on large firms).

2.5.3.2 Domestic Revenue

The results from estimating Equation 4 across the full sample, separating by country, and separating by size are presented in Table 2.15 through Table 2.17. The firm characteristics and financial variables have similar magnitudes and signs as those when using export revenue as the dependent variable. However, it is interesting to note that there appears to be no significant “multinational advantage” across any specification for the exporting firms. This follows from the fact that the mean amount of exports as a percentage of total revenue is 53% for multinational affiliates and 44% for domestic firms. The percentage is relatively constant across countries with Estonian firms having the highest amount with 56%. This suggests that once a firm selects into exporting, the majority of their operations will be concentrated there. Although the coefficient on MNA falls once one controls for banking status, the coefficients are small and insignificant. The results for total revenue mirror those of export revenue at a smaller scale. This follows from the high Export/Total Revenue ratio among all firms in the sample. The results are shown in the appendix.

2.5.4 Robustness Checks

I conduct several sensitivity analyses to verify whether the dynamics between multinational affiliate status and multinational banking behavior holds. First, I estimate Equation 6. Since the majority of firm revenue comes from export activity, one would expect the same relationship between the MNA coefficient and the multinational banking coefficients. I present the results with **Log(TotalRevenue)** as the dependent variable in Table 2.25 through Table 2.27. While the point estimates on the MNA indicator are lower, the coefficient falls by about 10% when controlling for specific banking

behavior, a result which is close to the 12% found for exporters in Section 4.2. The results are also heterogeneous across country. The small result for Croatian firms is similar to those for exports, but there is a very large decrease in the coefficient for Estonian firms and a smaller decrease for Hungarian firms. This phenomenon diverges from results found in Table 2.10 through Table 2.12.

Furthermore, I run the specifications in Table 2.9 controlling for bank country instead of individual bank indicators. This might better capture idiosyncrasies among each parent country's banking sector. There are a few countries with several banks in the sample, for example: Italy and Austria. I find that this does not change the results significantly from Column 4 of Table 2.9. The coefficient on MNA falls by 11% (instead of 12%) but the coefficients are not statistically different from each other. The results are presented in Table 2.28.

Finally, I allow for my definition of multinational affiliate to include any firm whose Global Ultimate Owner country does not match the firm country. Doing so absorbs an extra 1,700 firms into the MNA category. These firms are more independent from their parent companies, and their international shareholders have direct company ownership of less than 50%. When I run the specification from Equation 1 (see Table 2.29), I find that although the point estimates are higher, the drop on the MNA coefficient is consistent with the results from the original MNA definition (11% compared to 12%). The point estimates are higher because I have reclassified some of the "best" domestic firms (in terms of export revenue) as multinational affiliates. It is interesting that some of the better domestic firms have some minority of foreign-owned shareholders.

2.6 Causal Effects of Bank Turnover on Firm Performance

2.6.1 Difference-in-Differences Framework

In 2014 and 2015, the Hungarian government purchased two major banks from international owners. Budapest Bank was purchased from the German group Bayern LB and MKB was purchased from the American group GE Capital. The purchases of MKB and Budapest Bank by the Hungarian government were in 2014 and 2015 respectively. These purchases were announced and completed

within a year of each other, and affected 26% of Hungarian exporters in the dataset (Table 2.24). I assert that these turnovers are both instances of a multinational bank switching to a domestic bank. These banks were purchased by the government with the intention to privatize them¹² and were thus run as domestic private banks rather than public banks.

To study the impact this turnover in banking ownership had on exporting firms in Hungary, I use the following difference-in-differences model:

$$Y_{fit} = \alpha_f + \delta_t + \sum_k \gamma_k \mathbf{D}_{fk} + \varphi_i + \epsilon_{fit} \quad (2.7)$$

Which I estimate as:

$$y_{fi} = \beta_1 \text{Borrower}_f + \beta_2 \text{PostPurchase}_f + \beta_3 \text{PostPurchase}_f * \text{Borrower}_f + \beta \mathbf{X}_f + \gamma \mathbf{Fin}_f \varphi_i + \epsilon_{fi} \quad (2.8)$$

Where y_{fit} is the measure of firm outcome: $\mathbf{Log}(\text{ExportRevenue}_{fijt})$ or Loans_{fijt} ; Borrower_f is an indicator that takes a value 1 if firm f borrows from either MKB or Budapest Bank (or both); PostPurchase_f is a dummy variable that equals 1 if the observation for firm f is in the period following the purchase of the banks. Post treatment year is 2015 for Budapest Bank borrowers and all control firms, and 2014 for MKB borrowers. β_3 represents the causal effect of the turnover from international to domestic banking on firm exports and loans and thus, is my coefficient of interest. This follows from differencing out any unobserved changes shared across all firms. I present the results for all firms and then subsequently separate the firms into two groups: domestic firms and multinational affiliates, and estimate Equation 8 for each group.

In order for this estimation method to be valid, the assumption of parallel trends must be satisfied. Specifically, I test whether the firms borrowing from MKB and Budapest bank had common trends in loan amount and exports prior to the government purchase as the unaffected firms (non-MKB and Budapest Bank borrowers). I can use the following related model to analyze

¹²According to contemporaneous articles in several Hungarian news sources such as the *Budapest Business Journal* and *Daily News Hungary*

pre and post trends and test this assumption:

$$Y_{fit} = \alpha_f + \delta_t + \sum_{t=m}^{-1} \beta_t \mathbf{T}_{ft} + \sum_{t=1}^g \gamma_t \mathbf{K}_{ft} + \varphi_i + \epsilon_{fit} \quad (2.9)$$

Which I estimate as:

$$y_{fit} = \alpha_f + \delta_t + \sum_{\tau=m}^{-1} \beta_{\tau} \mathbf{1}(\tau = t) * Borrower_f + \sum_{\tau=1}^g \beta_{\tau} \mathbf{1}(\tau = t) * Borrower_f + \varphi_i + \epsilon_{fit} \quad (2.10)$$

Figure 2.2 through Figure 2.7 plot the estimated β s from estimating Equation 10 across all firms, then separating multinational affiliates from domestic firms. As seen in and Figure 2.6 and Figure 2.7, the coefficients before the purchase are statistically indistinguishable from zero, lending credence to the parallel trend assumption for multinational affiliates. In Figure 2.2 through Figure 2.5 the coefficients are also statistically indistinguishable from zero in the pre-period with the exception of the earliest coefficient. The time period closest to the purchase satisfy this assumption for all firms and, separately, for domestic firms. One can therefore interpret the findings as causal, particularly when separating the sample into multinational affiliates and domestic firms, since affiliates and their domestic counterparts are quite different (see Table 2.1 and Table 2.2).

2.6.2 Difference-in-Differences Results

The acquisitions of MKB and Budapest Bank appear to have no significant impact on loans and exports for all firms in the sample together (Table 2.18). However, upon splitting the analysis by firm ownership status, a more interesting dynamic becomes evident. For domestic firms, there is a decrease in total loans taken out by the firm of about \$270,000 (with a p-value of .06 in both Columns 1 and 2 in Table 2.19). There is also a very small, increase in Log(Exports) among domestic firms. I find no evidence of an effect on loans or exports for multinational affiliates. Table 2.19 and Table 2.20 indicate that the transition of an international bank to a domestic bank negatively affects loans for domestic firms, but not multinational affiliates. This result provides evidence that multinational affiliates are better able to smooth borrowing behavior in a tumultuous

banking environment than their domestic counterparts. It is well-known that multinational firms are more efficient and larger (for example, the mean loan amount for affiliates is \$2.21 million whereas for domestic firms it is \$1.05 million) and Columns 1 and 2 of Table 2.19 and Table 2.20 show that this extends to the amount of loans taken out by a firm in the presence of international bank turnover. These results show that the firms affected most by nationalistic banking policies are smaller locally owned firms.

2.7 Conclusion

This paper aims to address the broad question: “Does multinational banking matter in the discussion of globalization of firms?” and subsequent to finding positive evidence asks: “How does it play a role?” I concentrate my analysis to three Central European Economies: Hungary, Estonia, and Croatia. These countries are all EU members and experienced an increase in investment following the fall of the Iron Curtain. To incorporate firm borrowing behavior, I include the following variables: a dummy variable if the firm borrows from a multinational bank from the same country as its headquarter country and dummy variables for whether or not the firm borrows from a foreign bank, and a domestic bank. I demonstrate that the coefficient corresponding to the “multinational advantage” falls upon controlling for borrowing behavior. Furthermore, I utilize a staggered difference-in-differences methodology to analyze the impact of the Hungarian government purchasing two multinational banks on an exporting firm’s loans and exports.

I find that once banking behavior is included in the regression of $\text{Log}(\text{Exports})$ on MNA status, the coefficient on **MNA** to fall by 12.5%. This corresponds to the “multinational advantage” in export revenue falling from 122% to 102% which is a non-trivial amount. The result is strongest for Hungarian exporters where the “multinational advantage” falls from 71% to 41%. Additionally, I find evidence that multinational affiliates are able to smooth their borrowing behavior in the presence of international turnover of banks. When the Hungarian government purchased MKB and Budapest Bank (effectively transforming them from multinational to domestic banks), loans

among domestic exporters fell by over \$300,000, but loans among multinational affiliates remained unchanged. There appeared to be no adverse effect on exports from this purchase. However, more post-turnover analysis may be necessary to see whether long-term effects of this event exist. This represents one avenue for further research.

Another expansion of this project is a study how the purchases of MKB and Budapest Bank affected domestic firms. This paper is limited to the analysis of exporting firms' behavior and performance, but outcomes such as selection into exporting and domestic firm performance may also be impacted by this event.

This avenue of research has several broader implications. First, it provides evidence that global banking is more relevant for countries that have been EU members for a longer period of time. Croatia is the newest member and the multinational affiliate coefficient remains almost unchanged upon controlling for borrowing behavior. Hungarian and Estonian firms display a noticeable drop in the "multinational advantage" having been members of the EU since 2004 rather than joining in 2013. This indicates a more long-term benefit to foreign investment and banking. Second, while Havrylchyk and Jurzyk (2011) find that international acquisition of domestic banks in Central Europe improved bank profitability and market share, the recent trend in the other direction could have detrimental effects on exporting firms' loans. Although the prevailing sentiment of the Hungarian government is to turn banks domestic, this could be actually be problematic for firms that borrow from these banks.

APPENDIX

Table 2.1 Summary Statistics- Firm Characteristics

Variable	Full Sample	MNA	Domestic	Hungary	Estonia	Croatia
MNA	0.11 (0.32)			0.16 (0.37)	0.11 (0.31)	0.10 (0.29)
Number of Employees	57.20 (453.73)	144.14 (667.83)	45.99 (416.89)	167.90 (892.23)	15.57 (62.86)	31.12 (207.32)
Profitability	5.95 (16.80)	3.52 (15.26)	6.27 (16.97)	3.88 (12.34)	6.56 (18.22)	6.57 (17.60)
Total Revenue	11,092 (102,921)	41,504 (259,546)	7,170 (56,000)	36,249 (207,897)	2,865 (21,517)	4,218 (28,833)
Export Revenue	4,794 (81,064)	23,866 (229,290)	2,334 (24,193)	16,947 (167,224)	1,273 (17,332)	1,124 (8,333)
Domestic Revenue	6,298 (51,615)	17,637 (91,976)	4,836 (43,565)	19,301 (99,716)	1,592 (11,126)	3,094 (26,112)
Capital City	0.43 (0.50)	0.55 (0.50)	0.42 (0.49)	0.39 (0.49)	0.49 (0.50)	0.41 (0.49)
Cash Flows	0.90 (40.00)	3.69 (117.23)	0.53 (5.71)	2.91 (83.45)	0.21 (1.78)	0.36 (3.28)
Debt	1,137 (7,465)	3,333 (15,507)	853 (5,585)	2,818 (12,682)	248 (1,323)	937 (6,318)
Total Assets	9,068 (164,776)	33,486 (446,335)	5,919 (69,803)	29,087 (339,697)	1,886 (17,659)	4,085 (34,868)
Tangible Fixed Assets	3,062 (43,038)	7,983 (50,863)	2,427 (41,880)	9,305 (83,904)	665 (12,622)	1,629 (20,128)
Number of Observations	190,581	21,773	168,808	43,596	63,797	83,188

Table 2.2 Summary Statistics- Banking Characteristics

Variable	Full Sample	MNA	Domestic	Hungary	Estonia	Croatia
Same Country	0.02	0.16	0.00	0.04	0.01	0.02
Foreign Borrower (excl.)	0.63	0.76	0.61	0.55	0.34	0.88
Foreign Borrower (comb.)	0.10	0.06	0.11	0.28	0.01	0.09
Domestic Borrower (excl.)	0.05	0.02	0.05	0.16	0.00	0.02
# of Non-Bank Advisors	1.09	1.72	1.01	3.06	0.80	0.29
Number of Banks	1.21	1.26	1.20	1.73	0.48	1.50
Austrian Bank	0.29	0.26	0.30	0.27		0.53
Belgian Bank	0.06	0.05	0.06	0.24		
Chinese Bank	0.00	0.00	0.00	0.00		
Croatian Bank	0.05	0.02	0.05			0.11
Danish Bank	0.03	0.05	0.02		0.08	
Estonian Bank	0.00	0.00	0.00		0.01	
French Bank	0.01	0.03	0.00	0.03		
Finnish Bank	0.00	0.00	0.00		0.00	
German Bank	0.01	0.05	0.01	0.06		
Hungarian Bank	0.15	0.11	0.15	0.44		0.11
Italian Bank	0.34	0.34	0.34	0.35	0.00	0.59
Korean Bank	0.00	0.00	0.00	0.01		
Latvian Bank	0.00	0.00	0.00		0.00	
Dutch Bank	0.01	0.04	0.01	0.04		
Russian Bank	0.02	0.02	0.02	0.04		0.03
Swedish Bank	0.11	0.13	0.10		0.32	
US Bank	0.02	0.06	0.02	0.09		
Number of Observations	190,581	21,773	168,808	43,596	63,797	83,188

Table 2.3 List of Banks–Hungary

Bank	HQ Country
Bank of China	China
BNP Paribas	France
Budapest Bank	Hungary
CIB Bank	Italy
Citi Bank	USA
Commerzbank	Germany
Deutsche Bank	Germany
Erste & Steiermärkische	Austria
Gránit Bank	Hungary
ING Bank	Netherlands
K&H Bank	Belgium
KDB	South Korea
Kinizsi Bank	Hungary
Központi Bank	Hungary
MagNet Bank	Hungary
Merkantil Bank	Hungary
MKB	Hungary
Oberbank	Austria
OTP	Hungary
Polgári Bank	Hungary
Raiffeisenbank	Austria
Sberbank	Russia
UniCredit Bank	Italy

Table 2.4 List of Banks–Estonia

Bank	HQ Country
AS Citadele	Latvia
Big Bank	Estonia
Coop Pank	Estonia
Danske Bank	Denmark
LHV Pank	Estonia
Luminor Bank	Sweden
Marfin Pank	Estonia
OP Corporate	Finland
SEB Bank	Sweden
Svenska Handelsbanken	Sweden
SwedBank	Sweden
Tallinna Aripank	Estonia
UniCredit Bank	Italy

Table 2.5 List of Banks–Croatia

Bank	HQ Country
Addiko	Austria
Banka Kovanica	Croatia
Croatia Banka	Croatia
Erste & Steiermärkische	Austria
Hrvatska Poštanska	Croatia
Istarska Kreditna Banka	Croatia
Karlovača Banka	Croatia
OTP	Hungary
Podvrvaska Banka	Croatia
Primorska Banka	Croatia
Privrenda Bank	Italy
Raiffeisenbank	Austria
Sberbank	Russia
Splitska Bank	Hungary
UniCredit Bank	Italy

Table 2.6 Most frequent foreign owners – Exporters

Croatia	Estonia	Hungary
1. Slovenia	1. Finland	1. Germany
2. Germany	2. Sweden	2. USA
3. Austria	3. Latvia	3. France
4. Italy	4. USA	4. Switzerland
5. USA	5. UK	5. Italy
6. B&H	6. Germany	6. Austria
7. UK	7. Lithuania	7. UK
8. Switzerland	8. Norway	8. Japan
9. Hungary	9. Russia	9. Sweden
10. Serbia	10. Denmark	10. Netherlands

Notes:Countries in red represent a bordering country (by land)
Countries in blue represent a maritime border

Table 2.7 Most Frequent Banks for Multinational Affiliates

Croatia	Estonia	Hungary
1. Raiffeisenbank (Austria)	1. Swedbank (Sweden)	1. UniCredit (Italy)
2. UniCredit (Italy)	2. SEB Pank (Sweden)	2. Citibank (USA)
3. Privredna Banka (Italy)	3. Luminor Bank (USA)	3. K&H (Belgium)
4. Erste & Steiermärkische (Austria)	4. Danske Bank (Denmark)	4. Raiffeisenbank (Austria)
5. Splitska Banka (Hungary)	5. LHV Pank (Estonia)	5. ING Bank (Netherlands)
6. Addiko Bank (Austria)	6. Svenska Handelsbanken (Sweden)	6. BNP Paribas (France)
7. Sberbank (Russia)	7. Coop Pank (Estonia)	7. OTP Bank (Hungary)
8. Hrvatska Poštanska (Croatia)	8. OP Corporate Bank (Finland)	8. CIB Bank (Italy)
9. Istarska Kreditna Banka (Croatia)	9. AS Citadele (Latvia)	9. Deutsche Bank (Germany)
10. Podravska Banka (Croatia)	10. Tallinna Aripank (Estonia)	10. Commerzbank (Germany)

Table 2.8 Firm Industry (NACE Main)

Industry	Frequency	Percent
A - Agriculture, forestry and fishing	4,591	2.41
B - Mining and quarrying	620	0.33
C - Manufacturing	49,542	26.00
D - Electricity, gas, steam and air conditioning supply	437	0.23
E - Water supply; sewerage, waste management and remediation activities	1,271	0.67
F - Construction	11,667	6.12
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	53,203	27.92
H - Transportation and storage	17,431	9.15
I - Accommodation and food service activities	1,983	1.04
J - Information and communication	13,384	7.02
K - Financial and insurance activities	768	.40
L - Real estate activities	2,206	1.16
M - Professional, scientific and technical activities	22,240	11.67
N - Administrative and support service activities	7,119	3.74
O - Public administration and defence; compulsory social security	16	0.01
P - Education	716	.38
Q - Human health and social work activities	649	0.34
R - Arts, entertainment and recreation	1,167	.61
S - Other service activities	1,568	.82
Total	190,578	100

Table 2.9 Export Results for All Firms

Dependent Variable: log(Exports)				
	(1)	(2)	(3)	(4)
MNA	0.798*** (0.0466)	0.793*** (0.0458)	0.733*** (0.0530)	0.706*** (0.0537)
"Bank" Indicator		0.272*** (0.0871)		
Same Country			0.279*** (0.0822)	0.172* (0.0905)
Foreign Borrower (c)			0.177** (0.0862)	0.0816 (0.0763)
Foreign Borrower (e)			0.291*** (0.0587)	0.263*** (0.0521)
Size	0.746*** (0.0332)	0.740*** (0.0327)	0.729*** (0.0345)	0.724*** (0.0344)
Profitability	0.0108*** (0.000530)	0.0108*** (0.000529)	0.0109*** (0.000529)	0.0109*** (0.000529)
Capital City	0.0532 (0.0377)	0.0515 (0.0378)	0.0477 (0.0380)	0.0305 (0.0385)
# of Non-Bank Advisors			0.0682*** (0.0151)	0.0678*** (0.0145)
Tangible Asset Share	-0.117*** (0.0159)	-0.116*** (0.0157)	-0.116*** (0.0158)	-0.114*** (0.0158)
Debt/Sales Ratio	-0.250* (0.138)	-0.250* (0.138)	-0.250* (0.138)	-0.250* (0.138)
Cash Flows	0.00657*** (0.00137)	0.00659*** (0.00138)	0.00630*** (0.00130)	0.00528*** (0.00112)
Individual Bank Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Firm Country Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	190,581	190,581	190,581	190,581
Number of bvdid	48,063	48,063	48,063	48,063

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.10 Export Results for Hungarian Firms

Dependent Variable: log(Exports)				
	(1)	(2)	(3)	(4)
MNA	0.537*** (0.0863)	0.537*** (0.0859)	0.412*** (0.100)	0.342*** (0.0970)
"Bank" Indicator		0.728*** (0.162)		
Same Country			0.461*** (0.110)	0.294** (0.132)
Foreign Borrower (c)			0.283*** (0.110)	0.137 (0.101)
Foreign Borrower (e)			0.530*** (0.0728)	0.391*** (0.116)
# of Non-Bank Advisors			0.0267* (0.0140)	0.0260* (0.0138)
Individual Bank Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	43,596	43,596	43,596	43,596
Number of bvdid	9,147	9,147	9,147	9,147

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.11 Export Results for Estonian Firms

Dependent Variable: log(Exports)				
	(1)	(2)	(3)	(4)
MNA	0.850*** (0.107)	0.839*** (0.104)	0.742*** (0.109)	0.733*** (0.109)
"Bank" Indicator		0.228* (0.127)		
Same Country			-0.00642 (0.189)	-0.00413 (0.193)
Foreign Borrower (c)			0.222 (0.173)	0.211 (0.744)
Foreign Borrower (e)			0.0426 (0.118)	0.0308 (0.106)
# of Non-Bank Advisors			0.236*** (0.0356)	0.231*** (0.0407)
Individual Bank Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	63,797	63,797	63,797	63,797
Number of bvdid	16,474	16,474	16,474	16,474

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.12 Export Results for Croatian Firms

Dependent Variable: log(Exports)				
	(1)	(2)	(3)	(4)
MNA	0.903*** (0.0592)	0.903*** (0.0591)	0.892*** (0.0629)	0.885*** (0.0592)
"Bank" Indicator		-0.0811 (0.0839)		
Same Country			0.0806 (0.100)	0.0665 (0.100)
Foreign Borrower (c)			0.00171 (0.0819)	0.0259 (0.107)
Foreign Borrower (e)			0.0721 (0.0766)	-0.0654 (0.0878)
# of Non-Bank Advisors			0.144*** (0.0366)	0.159*** (0.0365)
Individual Bank Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	83,188	83,188	83,188	83,188
Number of bvdid	22,442	22,442	22,442	22,442

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.13 Export Results for Small/Medium Enterprises (≤ 250 Employees)

Dependent Variable: log(Exports)				
	(1)	(2)	(3)	(4)
MNA	0.831*** (0.0525)	0.825*** (0.0516)	0.768*** (0.0611)	0.743*** (0.0619)
"Bank" Indicator		0.280*** (0.0877)		
Same Country			0.244** (0.0959)	0.165 (0.103)
Foreign Borrower (c)			0.204** (0.0840)	0.0565 (0.0763)
Foreign Borrower (e)			0.277*** (0.0578)	0.227*** (0.0532)
# of Non-Bank Advisors			0.0819*** (0.0153)	0.0820*** (0.0149)
Individual Bank Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Firm Country Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	183,665	183,665	183,665	183,665
Number of bvdid	47,226	47,226	47,226	47,226

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.14 Export Results for Large Firms (> 250 Employees)

Dependent Variable: log(Exports)				
	(1)	(2)	(3)	(4)
MNA	0.129 (0.118)	0.130 (0.118)	0.0541 (0.120)	0.0133 (0.125)
"Bank" Indicator		0.930** (0.402)		
Same Country			0.401** (0.168)	0.237 (0.190)
Foreign Borrower (c)			0.164 (0.208)	0.328 (0.237)
Foreign Borrower (e)			0.542*** (0.209)	0.638** (0.276)
# of Non-Bank Advisors			-0.0180 (0.0235)	-0.0135 (0.0246)
Individual Bank Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Firm Country Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	6,916	6,916	6,916	6,916
Number of bvdid	1,384	1,384	1,384	1,384

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.15 Domestic Results for All Firms

Dependent Variable: log(Domestic Revenue)				
	(1)	(2)	(3)	(4)
MNA	0.0152 (0.0734)	-0.00179 (0.0731)	-0.0466 (0.0707)	-0.0146 (0.0702)
"Bank" Indicator		0.801*** (0.0864)		
Same Country			0.133** (0.0672)	0.0727 (0.0696)
Foreign Borrower (c)			0.636*** (0.0541)	-0.150*** (0.0376)
Foreign Borrower (e)			0.420*** (0.0526)	-0.0256 (0.0638)
# of Non-Bank Advisors			0.179*** (0.0129)	0.165*** (0.0123)
Individual Bank Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Firm Country Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	183,095	183,095	183,095	183,095
Number of bvdid	46,657	46,657	46,657	46,657

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.16 Domestic Results by Country

Dependent Variable: log(Domestic Revenue)						
	Hungary		Estonia		Croatia	
	(1)	(2)	(3)	(4)	(5)	(6)
MNA	0.0351 (0.0731)	0.0197 (0.0666)	0.00503 (0.103)	-0.204** (0.0947)	-0.00251 (0.0626)	0.0159 (0.0724)
Same Country		-0.0335 (0.0534)		-0.0927 (0.141)		0.215 (0.147)
Foreign Borrower (c)		-0.0801** (0.0400)		-0.182 (0.264)		-0.227*** (0.0633)
Foreign Borrower (e)		-0.0152 (0.0496)		0.377*** (0.0601)		-0.744*** (0.0633)
# of Non-Bank Advisors		0.0921*** (0.00876)		0.389*** (0.0290)		0.406*** (0.0273)
Individual Bank Controls	N	Y	N	Y	N	Y
Industry Effects	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y
Observations	43,201	43,201	60,204	60,204	79,690	79,690
Number of bvdid	9,119	9,119	15,848	15,848	21,690	21,690

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.17 Domestic Results by Firm Size

Dependent Variable: log(Domestic Revenue)				
	SME (≤ 250 Employees)		Large Firms (> 250 Employees)	
	(1)	(2)	(3)	(4)
MNA	0.0171 (0.0779)	-0.0225 (0.0755)	-0.0448 (0.0586)	-0.0336 (0.0660)
Same Country		0.0725 (0.0780)		-0.0261 (0.138)
Foreign Borrower (c)		-0.187*** (0.0417)		0.0985 (0.129)
Foreign Borrower (e)		-0.0423 (0.0682)		0.133 (0.125)
# of Non-Bank Advisors		0.184*** (0.0144)		0.0295* (0.0159)
Individual Bank Controls	N	Y	N	Y
Industry Effects	Y	Y	Y	Y
Firm Country Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	176,240	176,240	6,855	6,855
Number of bvdid	45,820	45,820	1,381	1,381

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.18 Difference in Differences Results for All Firms

Dependent Variable:	Loans	Loans	Log(Exports)	Log(Exports)
MKB or Budapest Bank Borrower	0.361** (0.155)	0.339** (0.155)	-0.312*** (0.0341)	-0.313*** (0.0324)
Post Acquisition	-0.392*** (0.0935)	-0.379*** (0.0936)	-0.0541* (0.0295)	-0.0554** (0.0272)
Post x MKB or BB	0.0481 (0.210)	0.0692 (0.211)	0.0257 (0.0530)	0.0514 (0.0496)
Industry Controls	N	Y	N	Y
Outcome Mean	1.23	1.23	6.47	6.47
Observations	43,931	43,931	43,966	43,966

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: This table contains the estimated coefficients of Equation 8 where y = Loans (in millions of USD) or Log(Exports) using the entire sample of firms. All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.19 Difference in Differences Results for Domestic Firms

Dependent Variable:	Loans	Loans	Log(Exports)	Log(Exports)
MKB or Budapest Bank Borrower	0.381*** (0.105)	0.378*** (0.103)	-0.170*** (0.0358)	-0.194*** (0.0340)
Post Acquisition	-0.158*** (0.0546)	-0.162*** (0.0538)	-0.0675** (0.0327)	-0.0676** (0.0305)
Post x MKB or BB	-0.268* (0.146)	-0.274* (0.144)	0.0336 (0.0559)	0.0634 (0.0525)
Industry Controls	N	Y	N	Y
Outcome Mean	1.05	1.05	6.22	6.22
Observations	36,890	36,890	36,921	36,921

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: This table contains the estimated coefficients of Equation 8 where y = Loans (in millions of USD) or Log(Exports) for domestically owned firms in the sample. All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.20 Difference in Differences Results for Multinational Affiliates

Dependent Variable:	Loans	Loans	Log(Exports)	Log(Exports)
MKB or Budapest Bank Borrower	1.675 (1.278)	2.153* (1.284)	-0.380*** (0.119)	-0.106 (0.103)
Post Acquisition	-1.097*** (0.425)	-1.139*** (0.432)	0.00165 (0.0628)	0.00334 (0.0540)
Post x MKB or BB	2.373 (2.191)	1.925 (2.092)	0.122 (0.186)	0.0431 (0.152)
Industry Controls	N	Y	N	Y
Outcome Mean	2.21	2.21	7.81	7.81
Observations	7,041	7,041	7,045	7,045

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

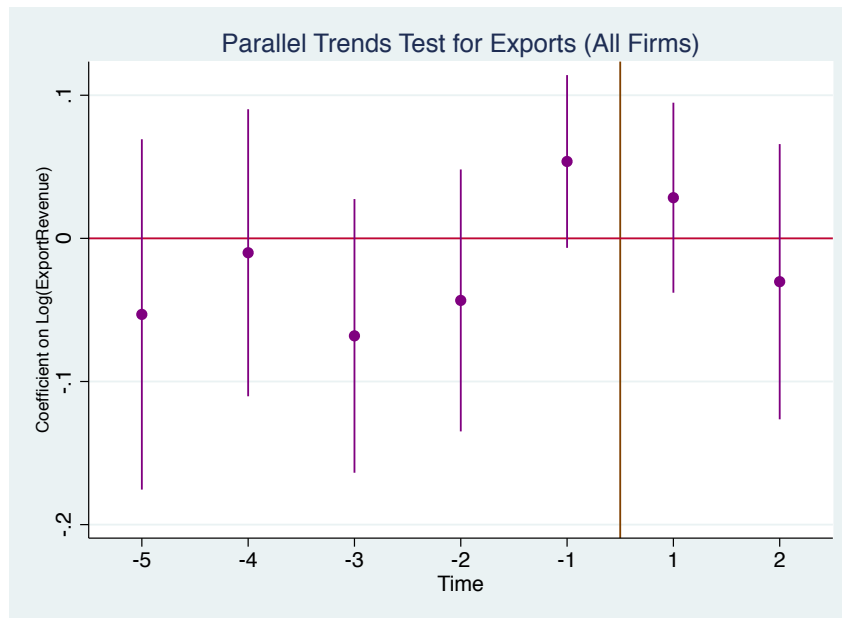
Note: This table contains the estimated coefficients of Equation 8 where y = Loans (in millions of USD) or Log(Exports) for multinational affiliates. All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Figure 2.1 Example From the Data

Company name	Country ISO Code	City	GUO - Name	GUO - Country ISO code	ADV Full name
LIDL MAGYARORSZAG KERESKEDELMI BETETI TARSASAG	HU	BUDAPEST	SCHWARZ BETEILIGUNGS-KG	DE	BNP-Paribas Magyarorszag fioktelepe CIB Bank Zrt Medve u. fiok ING Bank N.V. Magyarorszag Fioktelepe OTP Budapesti r., II. Margit korut OTP II.ker. Belfoldiek Devizai Unicredit Bank Hungary Zrt. BNP-Paribas Magyarorszag fioktelepe
LOUIS VUITTON HUNGARIA KERESKEDELMI KORLATOLT FELELOSSEGU TARSASAG	HU	BUDAPEST	M ARNAULT BERNARD & FAMILY	FR	

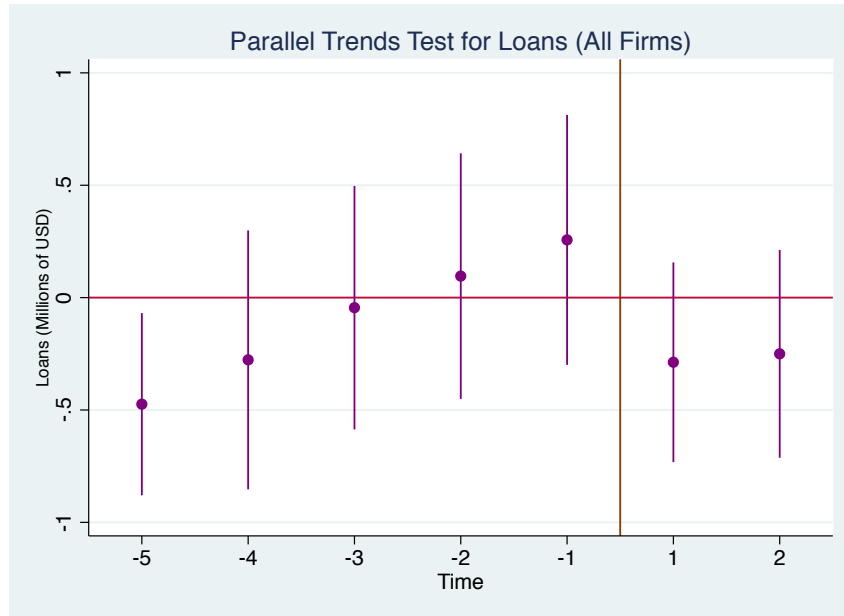
Note: This figure shows an example of the list of banks used by two large multinational affiliates in Hungary (Lidl and Louis Vuitton).

Figure 2.2 Event Study results for Exports (All Firms)



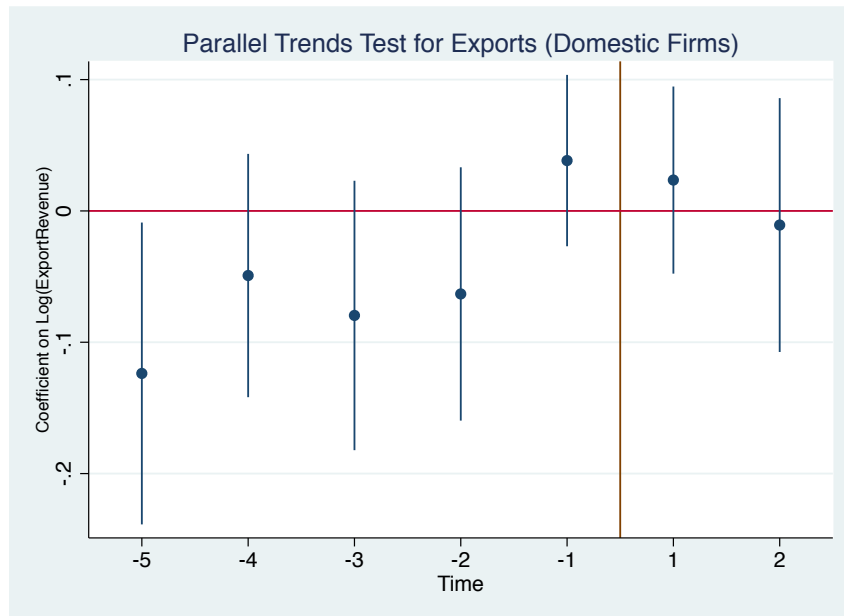
Notes: This figure plots the estimated coefficients from Equation 10 where $y = \text{Log}(\text{Exports})$ using the entire sample of firms. The coefficient when $T=0$ is omitted and therefore equal to zero.

Figure 2.3 Event Study results for Loans (All Firms)



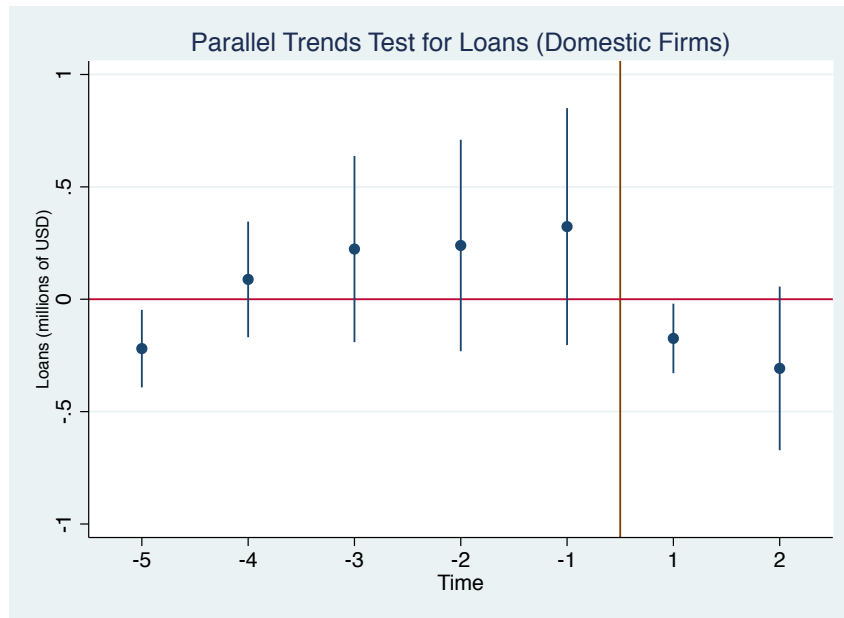
Notes: This figure plots the estimated coefficients from Equation 10 where $y=\text{Loans}$ (in millions of 2016 USD) using the entire sample of firms. The coefficient when $T=0$ is omitted and therefore equal to zero.

Figure 2.4 Event Study results for Exports (Domestic)



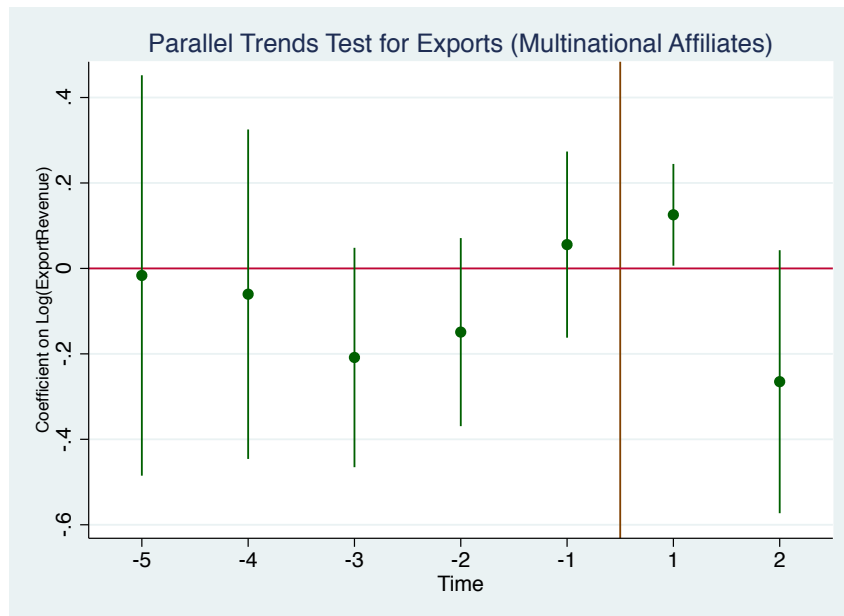
Notes: This figure plots the estimated coefficients from Equation 10 where $y=\text{Log(Exports)}$ for domestic firms. The coefficient when $T=0$ is omitted and therefore equal to zero.

Figure 2.5 Event Study results for Loans (Domestic)



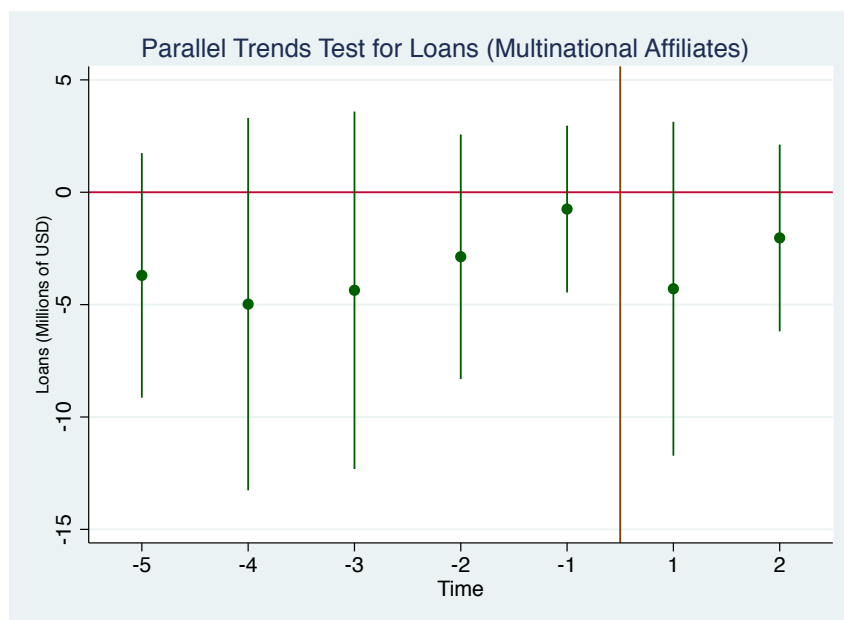
Notes: This figure plots the estimated coefficients from Equation 10 where y =Loans (in millions of 2016 USD) for domestic firms. The coefficient when $T=0$ is omitted and therefore equal to zero.

Figure 2.6 Event Study results for Exports (MNA)



Notes: This figure plots the estimated coefficients from Equation 10 where y =**Log**(Exports) for MNAs. The coefficient when $T=0$ is omitted and therefore equal to zero.

Figure 2.7 Event Study results for Loans (MNA)



Notes: This figure plots the estimated coefficients from Equation 10 where y =Loans (in millions of 2016 USD) for MNAs. The coefficient when $T=0$ is omitted and therefore equal to zero.

Table 2.21 Size and History of Banks- Hungary

Bank	HQ Country	# Branches (2015)	Established
Bank of China	China	1	2002 (Rebranded in 2015)
BNP Paribas	France	1	1991
Budapest Bank	Hungary	95	1986
CIB bank	Italy	95	1979
Citibank	USA	10	1985
Commerzbank	Germany	1	1993
Deutsche Bank	Germany	1	1995
Erste & Steiermärkische	Austria	129	1998
Gránit Bank	Hungary	2	1985 (Latest rebranding in 2010)
ING	Netherlands	1	1991 (Rebranded 2008 after financial crisis)
KDB	South Korea	1	1989
Kereskedelmi és Hitelbank Zrt	Belgium	210	1986
Kinizsi Bank	Hungary	16	savings bank (1958); commercial bank (2007)
Központi Bank	Hungary		1993
MagNet Bank	Hungary	14	1995
Merkantil Bank	Hungary	1	1988
MKB (MBK)	Hungary	81	1950
Oberbank	Austria	8	2007
OTP Bank	Hungary	388	1949
Polgári Bank	Hungary	22	1972 (Latest rebranding in 2015)
Raiffeisen Bank Zrt	Austria	68	1986
Sberbank	Russia	30	Austrian Volksbank (1993) (Became Sberbank in 2012)
UniCredit	Italy	56	1990

Table 2.22 Size and History of Banks- Estonia

Bank	HQ Country	Market Share (2016)	Established
AS Citadele banka	Latvia	0.71%	2010
Bigbank	Estonia	1.81%	1992
Coop Pank	Estonia	1.45%	1992
Danske Bank	Denmark	6.16%	2007 (Acquired Sampo Bank in 2000)
LHV Pank	Estonia	6.83%	1999
Luminor Bank	Finland/Norway	14.16%	2017 (Formerly Nordea (1995) and DNB (2006))
Marfin Pank (Versobank)	Estonia	1.16%	Versobank (1999) (Renamed Marfin in 2008)
OP Corporate Bank	Finland	2.56%	1991
SEB Pank	Sweden	23.42%	1998
Svenska Handelsbanken	Sweden	0.58%	1995-2002 (Reopened in 2006)
Swedbank	Sweden	39.43%	1991 (as Hansabank) (Rebranded in 2009)
Tallinna Aripank	Estonia	0.92%	1991 (oldest commercial bank in Estonia)
UniCredit Bank	Italy	Closed in 2013	N/A

Table 2.23 Size and History of Banks- Croatia

Bank	HQ Country	Market Share (2016)	Established
Addiko Bank d.d.	Austria	5.32%	2015 formerly Hypo Alpe-Adria-Bank (1990s)
Banka Kovanica	Croatia	0.29%	1997
Croatia Banka	Croatia	0.62%	1989
Erste & Steiermärkische	Austria	14.15%	1997-2002 (through acquisitions of 4 smaller banks)
Hrvatska Poštanska Banka (HPB)	Croatia	4.88%	1991
Istarska Kreditna Banka	Croatia	0.84%	1956
Karlovača Banka	Croatia	0.55%	1856
OTP Bank	Hungary	4.92%	2005
Podravska Banka	Croatia	0.82%	1872
Primorska Banka	Croatia	0.14%	2001
Privredna Banka (Intesa)	Italy	18.27%	1966, privatized in 1999 merged with Sanpaolo in 2007
Raiffeisenbank	Austria	7.92%	1994
Sberbank	Russia	2.23%	Austrian Volksbank (1997) became Sberbank in 2012
Splitska banka d.d.	Hungary	6.82%	1965, purchased by UniCredit in 2002, and OTP in 2017
Zagrebacka Banka (UniCredit)	Italy	26.51%	1914, purchased by UniCredit in 2002

Table 2.24 Mergers and Acquisitions

Bank	Change	Year of Change	Old owner	New owner	Old country	New country	Firms affected	Percentage
Hungary								
Budapest Bank	Purchased by Hungarian Government	2015	GE Capital	Hungary	US	HU	4591	14.22%
MKB	Purchased by Hungarian Government	2014	Bayern LB	Hungary	DE	HU	4592	14.23%
Citibank	Withdrew from Hungarian retail market	2015	Citibank	Erste Bank	US	AT	2978	9.23%
Sberbank	Purchased Volksbank	2012-2013	Volksbank (Austria)	Sberbank	AT	RU	1178	3.65%
Polgári Bank	Opened	2015	N/A	Polgari Bank	N/A	HU	71	0.24%
Bank of China	Opened in Hungary	2015	N/A	Bank of China	N/A	CN	49	0.15%
Estonia								
Luminor Bank	Acquired branches of Nordea and DNB	2017	Nordea and DNB	Blackstone Group	FI/DK	US	2535	3.07%
Danske Bank	Capital shares acquired by LHV	2016	Dankse Bank	LHV	DK	EE	2283	2.77%
Coop Pank	Purchased by Inbank and Coop Pank (formerly Eesti Krediitipank)	2017	Bank of Moscow	Coop Pank	RU	EE	99	0.12%
UniCredit	Closed	2013	Unicredit	N/A	IT	N/A	47	0.06%
Marfin (Versobank)	Purchased by Estonian Governemnt	2012	Bank of Greece/Cyprus Marfin Popular Bank	Estonia	CY/GR	EE	13	0.02%
Croatia								
Addiko Bank	Purchased by Advent International (80%) and ERBD (20%)	2014	Hypo Alpe-Adria-Bank International A.G.	Advent International/ERBD	AT	US	7196	10.83%
Sberbank	Purchased Volksbank	2012-2013	Volksbank (Austria)	Sberbank	AT	RU	1897	2.85%

Table 2.25 Robustness Check: Total Revenue Results for All Firms

Dependent Variable: log(Total Revenue)				
	(1)	(2)	(3)	(4)
MNA	0.338*** (0.0224)	0.329*** (0.0217)	0.295*** (0.0194)	0.305*** (0.0197)
"Bank Indicator"		0.523*** (0.0379)		
Same Country			0.117*** (0.0318)	0.0391 (0.0348)
Foreign Borrower (c)			0.399*** (0.0274)	-0.0504** (0.0233)
Foreign Borrower (e)			0.331*** (0.0217)	0.0840** (0.0338)
# of Non-Bank Advisors			0.122*** (0.00819)	0.116*** (0.00784)
Individual Bank Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Firm Country Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	190,583	190,583	190,583	190,583
Number of bvdid	48,063	48,063	48,063	48,063

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.26 Robustness Check: Total Revenue Results by Country

Dependent Variable: log(Total Revenue)						
	Hungary		Estonia		Croatia	
	(1)	(2)	(3)	(4)	(5)	(7)
MNA	0.239*** (0.0384)	0.192*** (0.0394)	0.375*** (0.0331)	0.228*** (0.0295)	0.362*** (0.0395)	0.383*** (0.0436)
Same Country		0.00363 (0.0431)		-0.0900 (0.0926)		0.0753 (0.0619)
Foreign Borrower (c)		0.0353 (0.0301)		-0.0329 (0.134)		-0.104** (0.0455)
Foreign Borrower (e)		0.171*** (0.0323)		0.182*** (0.0330)		-0.440*** (0.0398)
# of Non-Bank Advisors		0.0572*** (0.00492)		0.334*** (0.0240)		0.294*** (0.0174)
Individual Bank Controls	N	Y	N	Y	N	Y
Industry Effects	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y
Observations	43,598	43,598	63,797	63,797	83,188	83,188
Number of bvdid	9,147	9,147	16,474	16,474	22,442	22,442

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.27 Robustness Check: Total Revenue Results by Firm Size

Dependent Variable: log(Total Revenue)				
	SME (≤ 250 Employees)		Large Firms (> 250 Employees)	
	(1)	(2)	(3)	(4)
MNA	0.345*** (0.0244)	0.309*** (0.0217)	0.0844*** (0.0278)	0.0782*** (0.0246)
Same Country		0.0358 (0.0371)		-0.00974 (0.0587)
Foreign Borrower (c)		-0.0938*** (0.0237)		0.155** (0.0743)
Foreign Borrower (e)		0.0617* (0.0357)		0.149** (0.0680)
# of Non-Bank Advisors		0.131*** (0.00694)		0.00616 (0.00750)
Individual Bank Controls	N	Y	N	Y
Industry Effects	Y	Y	Y	Y
Firm Country Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	183,667	183,667	6,916	6,916
Number of bvdid	47,226	47,226	1,384	1,384

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.28 Robustness Check: Export Results for All Firms (Controlling for Bank Country)

Dependent Variable: log(Exports)				
	(1)	(2)	(3)	(4)
MNA	0.798*** (0.0466)	0.793*** (0.0458)	0.733*** (0.0530)	0.712*** (0.0553)
“Bank” Indicator		0.272*** (0.0871)		
Same Country			0.279*** (0.0822)	0.170* (0.0920)
Foreign Borrower (c)			0.177** (0.0862)	0.107 (0.0849)
Foreign Borrower (e)			0.291*** (0.0587)	0.328*** (0.0563)
# of Non-Bank Advisors			0.0682*** (0.0151)	0.0670*** (0.0141)
Bank Country Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Firm Country Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	190,581	190,581	190,581	190,581
Number of bvdid	48,063	48,063	48,063	48,063

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

Table 2.29 Robustness Check: Export Results for All Firms (Different MNA Definition)

Dependent Variable: log(Exports)				
	(1)	(2)	(3)	(4)
MNA	0.869*** (0.0631)	0.864*** (0.0621)	0.812*** (0.0715)	0.775*** (0.0719)
“Bank” Indicator		0.268*** (0.0867)		
Same Country			0.166* (0.0871)	0.0738 (0.0962)
Foreign Borrow (c)			0.180** (0.0867)	0.0777 (0.0766)
Foreign Borrow (e)			0.284*** (0.0582)	0.253*** (0.0520)
# of Non-Bank Advisors			0.0666*** (0.0154)	0.0662*** (0.0147)
Individual Bank Controls	N	N	N	Y
Industry Effects	Y	Y	Y	Y
Firm Country Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Observations	190,581	190,581	190,581	190,581
Number of bvidid	48,063	48,063	48,063	48,063

Robust standard errors, clustered at the NACE 2 Digit Industry level, in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All columns include firm characteristics (Size, Profitability, and Capital City Indicator) and financial characteristics (Tangible Asset Share, Cash Flows, and Debt/Sales Ratio).

CHAPTER 3

BANKRUPTCY AND INTERNATIONAL INTERVENTION: THE CASE OF ADDIKO BANK

3.1 Introduction

The Balkans region is no stranger to turmoil and change. One aspect of the region that is often neglected or forgotten, but is just as tumultuous as Balkan politics, is the financial sector. Following the fall of the Iron Curtain and the dissolution of Yugoslavia, there was a major restructuring of the banking sector in all Balkan countries. This was done during the economic transition to open market economies. In the period after the transition, there has been financial restructuring following the Great Recession, and again during a country's EU candidacy. These changes have largely been done with the goal of enriching the country's financial sector hoping to attract more foreign investment and improving open market operations in the Balkans.

This paper exploits a change to the Croatian banking sector in 2014. The corrupt Austrian bank Hypo Group Alpe Adria went bankrupt and was purchased and rebranded as Addiko bank. When Hypo Group Alpe Adria went under, they had a large presence in many Balkan countries (not only Croatia). This prompted the European Bank for Reconstruction and Development to assist in the bank purchase in order to aid in the financial stabilization of the region. I am interested in whether or not this turnover had positive effects on firms in Croatia, in effect justifying the need for intervention from an international development bank.

Using a panel of exporting firms in Croatia, I find that while firm borrowing falls initially following the turnover, that effect is short-lived and diminishes over time. Additionally, I find that total revenue is largely unaffected by the bank purchase and domestic revenue increases slightly. There is some additional evidence that firms responded to the bank turnover by switching from exporting to domestic operations as a means of recovering from a shock to their loan amount.

The remainder of this paper proceeds as follows: section two provides a review of literature, section three describes the data, section four specifies an empirical design, section five presents the results, and section six concludes and discusses avenues for further research. Tables and figures are presented in section seven.

3.2 Review of Literature and Background

Croatia is the most recent EU member, having joined in 2013 after a lengthy candidacy which began in 2003 and became official in 2004. Following a similar timeline as Estonia and Hungary, Croatia declared its independence from Communist Yugoslavia in 1992, and had already started the privatization process in 1991. There was already an established banking system in place (Reininger and Walko (2005)) with several domestic banks with establishment dates in the late 19th and early 20th century (see Table 2.23). This is a phenomenon unique to Croatia relative to other Central and Eastern European countries. There are also several present-day banks that were established during the transition to a market economy in the late 1990s. A few banks went through restructuring and mergers after the global financial crisis, and many of the internationally-owned banks are from countries in close geographic proximity.

3.2.1 Multinational Banking

The impact that international banks have can be ambiguous. Historically, international banks opening, or acquiring, existing banks in less financially developed countries has led to inefficiently run banks. In a 2010 paper, Weller argues that an increase in the number of multinational banks in Poland after 1991 actually led to a negative effect on business investments due to lower credit supplies by all Polish banks. This was an unintended consequence immediately following the transition process. One goal of the transition process in CEEs was to achieve more financial liberalization and in the long run develop a more sophisticated financial sector.

Chang, Hasan, and Hunter (2010) find that multinational banks are more inefficient than

domestic banks, however, their study is conducted using the US banking sector. One would not expect the same dynamic to hold in less financially developed countries. Another paper by Lensink, Meesters, and Naaborg (2008) studies the relationship between foreign ownership and bank efficiency in Central Europe's post-transition period (1991-2003). The authors measure inefficiency in the standard way as expenses divided by revenue. During this time period, they studied over 2000 banks in over 100 countries scattered globally, including countries in Asia and Oceania. While they find inefficiency in foreign-owned banks is present, this inefficiency diminishes with the quality of host country governance and with the similarity between home and host country. Croatia is a good example of an area in which this inefficiency would be reduced due to its close proximity to Western Europe and EU membership goals during this period.

Additionally, De Haas and Van Lelyveld (2010) find multinational banks weather local financial crises better than domestic banks. The internal capital markets afforded to them by financially strong parent banks enable the subsidiaries to face minimal changes during periods of local crisis¹. Another paper by Havrylchyk and Jurzyk (2011) shows that Central and Eastern European banks acquired by multinational banking groups experience increases in market share and profitability following the turnover. These banks experience a transmission of knowledge from parent to subsidiary and are thus at an advantage over banks that remain domestically owned. A similar phenomenon is found between multinational enterprise parent companies and their affiliates.

3.2.2 The EBRD

The European Bank for Reconstruction and Development was founded in 1991 when several Eastern and Central European countries were in the process of transitioning from a planned economy to a market-based economy. Initially, the bank was founded to assist these Eastern Bloc countries with their transition process. In modern times, the scope of the bank has grown and reached Central Asia and other transitioning economies outside of Europe (EBRD.com). The EBRD also collects

¹These results do not extend to global crises (2008). De Haas and Van Lelyveld (2014) show that spillover effects existed between parent bank and subsidiary during the Great Recession.

and publishes data on bank performance in transition economies that aid in research on transition economies and particularly their financial sector².

There are several criteria that must be met by a country before it can receive funds from the EBRD. Most importantly, a country must be wholeheartedly committed to “multiparty democracy, pluralism, and market economies” (Liu 2012). Liu argues in their 2012 paper that the conditions mandated by the EBRD are inherently politically motivated, however they are “a form of good international co-operation rather than that of willful or arbitrary intervention”. This lends credence to the assumption that the EBRD assisting in the purchase of Addiko bank was done in good faith with “noble” intentions to improve the banking sector in Croatia.

In another paper by Shields, he argues that the EBRD has led to an increased presence of neoliberalism in Central Europe. In effect, he claims that the conditions for EBRD assistance, and their framework are inherently neoliberal (Shields 2020). When Hypo Group Alpe Adria went under, they were a corrupt bank operating mainly in the Balkans. Therefore, the more neutral neoliberal framework of the EBRD would be a welcome change of pace in a corrupt bank.

This paper assumes that the EBRD assisted in the purchase of Addiko Bank to replace a “bad bank” and help increase the financial stability of the Balkan region, particularly Croatia as a recent EU member. This assumption is supported by existing research on the EBRD and their own mission statement. Enriching a transition economy’s financial sector has positive outcomes for both households and firms in the country³, and is thus very important to study.

3.3 Data

The data in this analysis is from ORBIS, provided by Bureau van Dijk, and is comprised of exporting firms from Croatia. Croatia is part of the AMADEUS (European) subset of ORBIS, and the panel consists of the years 2010-2017. The firm-level data is collected annually from businesses through websites and various business registries and reports. ORBIS is a well-known datasource used in

²For example Haselmann and Wachtel (2007) and Bjornskov and Potrafke (2011)

³Havrylchyk and Jurzyk (2011)

several papers on FDI, credit constraints, and multinational enterprises⁴. Croatia joined the EU in 2013, towards the beginning of the panel.

There are several advantages to this dataset. First, ORBIS provides detailed balance sheet data for firms of all sizes (including unlisted firms). Examples of these variables are: cash flows, debt, and fixed assets. These measures have all been used in previous papers to construct proxies for financial constraints⁵. Additionally, ORBIS provides detailed ownership information on each firm including the country of the global ultimate owner, and an independence indicator showing how much autonomy a multinational affiliate has. Other useful variables from the dataset included in my analysis are: NACE industry classification⁶, total employees, profitability, and city as these provide other controls for the firm that might also affect firm performance. Summary statistics for the key variables for the Croatian exporting firms are presented below in Table 3.1. For clarity, I present the means for key variables for the full sample, then divide by firm ownership status, then finally present the means for Addiko Borrowers (the treated group), and Non-Borrowers (the control group). Overall, approximately 10% of firms are considered multinational affiliates by my definition, and 11% are Addiko-Borrowers. It is evident that the Addiko borrowers are larger in terms of most financial variables (e.g. debt, total assets, revenue). Therefore it is necessary to control for financial characteristics in all analyses.

Another important feature of ORBIS is that it provides banking data for each firm. This is presented as a list of “advisors”. Advisors can be banks, private individuals, or other means of financing that a firm uses. Table 3.2 presents the list of all possible banks in Croatia from which exporting firms can borrow.

⁴For example Buch et al. (2014) uses ORBIS linked with German customs data to analyze the effects of credit constraints on firm’s FDI behavior.

⁵See Buch et al. (2014)

⁶See Table 3.3 for a detailed breakdown of industry across all firms

3.4 Empirical Specification

When Hypo Group Alpe Adria went under in 2014, they had a large presence in the Balkans. This prompted the EBRD to assist in the bank purchase in order to aid in the financial stabilization of the region. Many countries in the Balkans are in the process of joining the EU and are following in the footsteps of the successful Central European Economies. Therefore, sustaining strong financial institutions in those countries is extremely important. In the dataset of Croatian exporters, 11% borrow from Addiko bank. These firms serve as the treated group, while the other firms fall in the control group.

To study the impact this turnover in bank ownership had on exporting firms in Croatia, I use the following difference-in-differences model:

$$Y_{fit} = \alpha_f + \delta_t + \sum_k \gamma_k \mathbf{D}_{fk} + \varphi_i + \epsilon_{fit} \quad (3.1)$$

Which I estimate as:

$$y_{fi} = \beta_1 \text{AddikoBorrower}_f + \beta_2 \text{PostPurchase}_f + \beta_3 \text{PostPurchase}_f * \text{AddikoBorrower}_f + \beta \mathbf{X}_f + \gamma \mathbf{Fin}_f \varphi_i + \epsilon_{fi} \quad (3.2)$$

Where y_{fit} is the measure of firm outcome: $\mathbf{Log}(\text{TotalRevenue}_{fijt})$, $\mathbf{Log}(\text{ExportRevenue}_{fijt})$, $\mathbf{Log}(\text{DomesticRevenue}_{fijt})$, or Loans_{fijt} ; AddikoBorrower_f is an indicator that takes a value 1 if firm f borrows from Addiko Bank; PostPurchase_f is a dummy variable that equals 1 if the observation for firm f is in the period after 2014. β_3 represents the causal effect of the turnover to Advent International and EBRD on firm revenues and loans and is therefore the coefficient of interest.

In order for the difference-in-difference estimation method to be valid, the parallel trends assumption must be satisfied. Specifically, one must test whether the firms borrowing from Addiko Bank had common trends in loan amount and revenues before the turnover as the unaffected firms (non-Addiko-Bank borrowers). I can use the following related model to analyze pre and post trends and test this assumption:

$$Y_{fit} = \alpha_f + \delta_t + \sum_{t=m}^{-1} \beta_t \mathbf{T}_{ft} + \sum_{t=1}^g \gamma_t \mathbf{K}_{ft} + \varphi_i + \epsilon_{fit} \quad (3.3)$$

Which I estimate as:

$$y_{fit} = \alpha_f + \delta_t + \sum_{\tau=m}^{-1} \beta_{\tau} \mathbf{1}(\tau = t) * AddikoBorrower_f + \sum_{\tau=1}^g \beta_{\tau} \mathbf{1}(\tau = t) * AddikoBorrower_f + \varphi_i + \epsilon_{fit} \quad (3.4)$$

Figure 3.1 through Figure 3.4 plot the estimated β s from estimating Equation 4 across all firms, then separating multinational affiliates from domestic firms. As seen in and ?? and ??, the coefficients before the purchase are statistically indistinguishable from zero, lending credence to the parallel trend assumption for the exporting firms. One can therefore interpret the findings as causal.

3.5 Results

The main results for the paper are presented in Table 3.4 and Table 3.5. Table 3.4 shows the results for the effect of the bank turnover on loans taken out by firms. I find that the turnover of Addiko bank led to a \$260,000 decrease in loans taken out by firms. However, this effect seems to occur immediately after the turnover, and vanishes over time⁷. \$260,000 is a non-trivial amount, since the mean amount of loans taken out by firms is \$240,000. This phenomenon could stem from the fact that a significant restructuring of the bank was required after purchase. During and immediately after restructuring, it would have been difficult to maintain the same lending portfolio for affected firms.

Table 3.5 breaks the results for revenue down across total revenue, exporting revenue, and domestic revenue. There is no significant effect of the bank turnover on total revenue or exports, yet there is a slightly positive effect on domestic revenue. It is interesting to see that there is a slightly positive impact of this bank turnover, but only on domestic firm performance. The turnover had a

⁷See Figure 3.1

small positive impact (or at least non-negative impact) on firm outcomes, which falls in line with the story of the “noble” intentions of the EBRD to increase financial stability in Croatia, which should ultimately benefit firms.

3.5.1 Firm Switching

One explanation for the increase in domestic revenue could be that firms are switching operations from exporting to domestic activities. Since the amount of firm financing (loans) fell, firms would need to switch to “cheaper” operations. It is well-known that exporting requires more financing than domestic operations, both in fixed costs, and variable costs⁸. To analyze whether or not this is occurring, I estimate the following equation:

$$\begin{aligned} ExportShare_{fi} = & \beta_1 AddikoBorrower_f + \beta_2 PostPurchase_f \\ & + \beta_3 PostPurchase_f * AddikoBorrower_f + \beta X_f + \gamma Fin_f \varphi_i + \epsilon_{fi} \end{aligned} \quad (3.5)$$

Where the effect on a firm’s export share would capture a firm switching from exporting to domestic activities. A positive effect on export share indicated a firm exporting more following the turnover whereas a negative coefficient on export share shows more domestic activity following the bank purchase.

Table 3.6 presents the results for Equation 5. The coefficient on *Post * Addiko* (β_3) is weakly negative which provides some evidence that firms are switching out of exporting following the purchase of Addiko bank. More analyses should be done to further explore this hypothesis.

3.6 Conclusion

When Hypo Group Alpe Adria went under, they had a large presence in the Balkans. This prompted the EBRD to assist in the bank purchase in order to aid in the financial stabilization of the region. The bank was then rebranded as Addiko bank. Many countries in the Balkans are in the process of

⁸Melitz (2003) presents the seminal framework for this phenomenon

joining the EU and are following in the footsteps of the successful Central European Economies. Therefore, sustaining strong financial institutions in those countries is extremely important.

In this paper, I study the effect of the purchase of Hypo Group Alpe Adria on exporting firms' financing (loans) and performance (revenue). I find that the turnover of Addiko bank led to a \$260,000 decrease in loans taken out by firms. Importantly, this decrease occurs immediately after the turnover, and then vanishes over time. Furthermore, I find no effect on firm exports, and total revenue, and there is also a small increase in the firms' domestic revenue after the purchase. I also find weak evidence that firms are switching from exports to domestic activities when their loans fall after the purchase of Addiko bank. These results indicate that after an initial period of turmoil, the intervention by EBRD and Advent International had no lasting negative, and slightly positive domestic effects on firm outcomes. The key contribution of this paper is the unique circumstances of the bank turnover. Advent International and EBRD wished to operate the bank efficiently and help stabilize the banking sector in the Balkans, and appeared to have been successful in Croatia.

There are several broad implications from this paper, the first is that a more sophisticated (and consequently less corrupt) Croatian banking sector can lead to more foreign investment and an increased presence of Croatia both in the EU and on a larger global scale. Additionally, the EBRD intervention had a positive impact in Croatia. The "noble intentions" of this organization arguably led to a small positive impact (or at least non-negative impact) on firm performance, contrasted with the negative outcomes observed after the nationalistic Hungarian bank turnovers (Gabriel 2020).

This project creates several avenues for further research. Firstly, It would be interesting to see how this bank turnover affected purely domestic operating firms, not just exporters. Secondly, more work needs to be done to study whether or not firms change their behavior when they see a shock to the amount of financing they receive.

APPENDIX

Table 3.1 Summary Statistics- Firm Characteristics

Variable	Full Sample	MNA	Domestic	Addiko Borrowers	Non-Addiko Borrowers
MNA	.10 (0.29)			0.08 (0.26)	0.10 (0.30)
Number of Employees	31.12 (207.32)	62.95 (192.00)	27.73 (208.61)	76.53 (458)	24.95 (141.61)
Profitability	6.57 (17.60)	2.71 (17.11)	6.98 (17.60)	4.97 (15.70)	6.79 (17.83)
Total Revenue	4,219 (28,834)	11,324 (33,992)	3,472 (28,126)	10,717 (67,180)	3,336 (18,022)
Export Revenue	1,124 (8,333)	4,319 (20,654)	784 (5,496)	2,022 (12,654)	1,003 (7,550)
Domestic Revenue	3,094 (26,113)	6,915 (22,938)	2,687 (26,396)	8,695 (63,737)	2,333 (14,760)
Capital City	0.41 (0.49)	0.53 (0.49)	0.40 (0.49)	0.32 (0.47)	0.42 (0.49)
Cash Flows	0.36 (3.28)	.97 (5.58)	0.30 (2.93)	0.81 (5.30)	0.30 (2.90)
Debt	973 (6,318)	2,889 (15,174)	730 (4,382)	2,170 (9,962)	770 (5,624)
Total Assets	4,086 (34,869)	10,815 (3,617)	3,369 (32,517)	10,788 (79,147)	3,175 (22,873)
Tangible Fixed Assets	1,629 (20,129)	7,983 (18,927)	1,417 (20,241)	4,318 (46,623)	1,264 (12,799)
Number of Banks	1.50 (0.74)	1.46 (0.69)	1.50 (0.74)	2.11 (0.74)	1.42 (0.69)
# of Non-Bank Advisors	0.29 (0.63)	0.30 (0.62)	0.29 (0.63)	0.48 (0.80)	0.26 (0.59)
Number of Observations	83,188	8,008	75,180	9,949	73,239

Table 3.2 List of Banks

Bank	HQ Country
Addiko	Austria
Banka Kovanica	Croatia
Croatia Banka	Croatia
Erste & Steiermärkische	Austria
Hrvatska Poštanska	Croatia
Istarska Kreditna Banka	Croatia
Karlovača Banka	Croatia
OTP	Hungary
Podvrska Banka	Croatia
Primorska Banka	Croatia
Privreda Bank	Italy
Raiffeisenbank	Austria
Sberbank	Russia
Splitska Bank	Hungary
UniCredit Bank	Italy

Table 3.3 Firm Industry (NACE Main)

Industry	Frequency	Percent
A - Agriculture, forestry and fishing	1,572	1.89
B - Mining and quarrying	620	0.24
C - Manufacturing	49,542	25.78
D - Electricity, gas, steam and air conditioning supply	437	0.17
E - Water supply; sewerage, waste management and remediation activities	1,271	0.69
F - Construction	11,667	3.96
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	53,203	27.03
H - Transportation and storage	17,431	8.23
I - Accommodation and food service activities	1,983	1.58
J - Information and communication	13,384	9.57
K - Financial and insurance activities	768	.16
L - Real estate activities	2,206	.54
M - Professional, scientific and technical activities	22,240	14.79
N - Administrative and support service activities	7,119	3.47
O - Public administration and defence; compulsory social security	16	0.01
P - Education	716	.34
Q - Human health and social work activities	649	0.28
R - Arts, entertainment and recreation	1,167	.55
S - Other service activities	1,568	.73
Total	83,188	100

Table 3.4 Difference in Differences Results for Loans

Dependent Variable:	Loans	Loans
Addiko Bank Borrower	0.899*** (0.108)	0.606*** (0.0922)
Post Turnover	-0.0695*** (0.0147)	-0.0270* (0.0156)
Post x Addiko	-0.235* (0.121)	-0.262** (0.116)
Other Controls	N	Y
Outcome Mean	.24	.24
Observations	83,188	83,188
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Note: This table contains the estimated coefficients of Equation 2 where y = Loans (in millions of 2016 USD) for the full sample. Other controls are: Industry, Size, Profitability, Capital City Indicator, Tangible Asset Share, Cash Flows, and Debt/Sales Ratio.

Table 3.5 Difference in Differences Results (Revenue)

Dependent Variable:	Log(Total)	Log(Total)	Log(Exports)	Log(Exports)	Log(Domestic)	Log(Domestic)
Addiko Bank Borrower	0.893*** (0.0293)	0.151*** (0.0136)	0.570*** (0.0408)	0.00619 (0.0335)	1.059*** (0.0355)	0.275*** (0.0219)
Post Turnover	-0.267*** (0.0129)	-0.189*** (0.00648)	-0.167*** (0.0184)	-0.107*** (0.0152)	-0.338*** (0.0171)	-0.247*** (0.0122)
Post x Addiko	0.0419 (0.0395)	-0.00858 (0.0181)	0.0282 (0.0553)	-0.0151 (0.0448)	0.111** (0.0475)	0.0527* (0.0287)
Other Controls	N	Y	N	Y	N	Y
Outcome Mean	6.46	6.46	4.20	4.20	5.80	5.80
Observations	83,188	83,188	83,188	83,188	79,690	79,690

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: This table contains the estimated coefficients of Equation 2 for the full sample where y = Log(Revenue), Log(Exports), and Log (Domestic). Other controls are: Industry, Size, Profitability, Capital City Indicator, Tangible Asset Share, Cash Flows, and Debt/Sales Ratio.

Table 3.6 Difference in Differences Results for Export Share

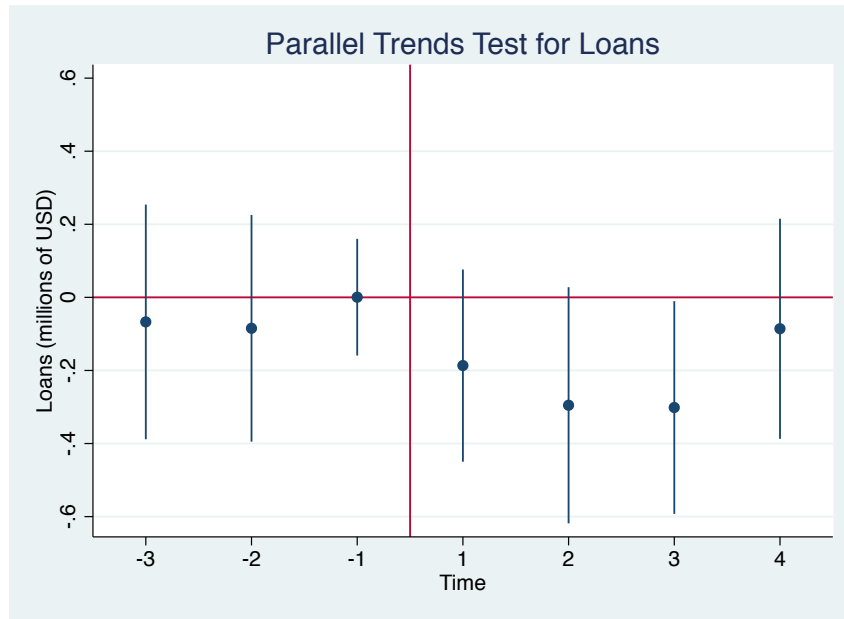
Dependent Variable:	Export Share	Export Share
Addiko Bank Borrower	-0.0642*** (0.00521)	-0.0379*** (0.00487)
Post Turnover	0.0218*** (0.00269)	0.0149*** (0.00254)
Post x Addiko	-0.0119* (0.00695)	-0.00821 (0.00644)
Other Controls	N	Y
Outcome Mean	.33	.33
Observations	83,188	83,188

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

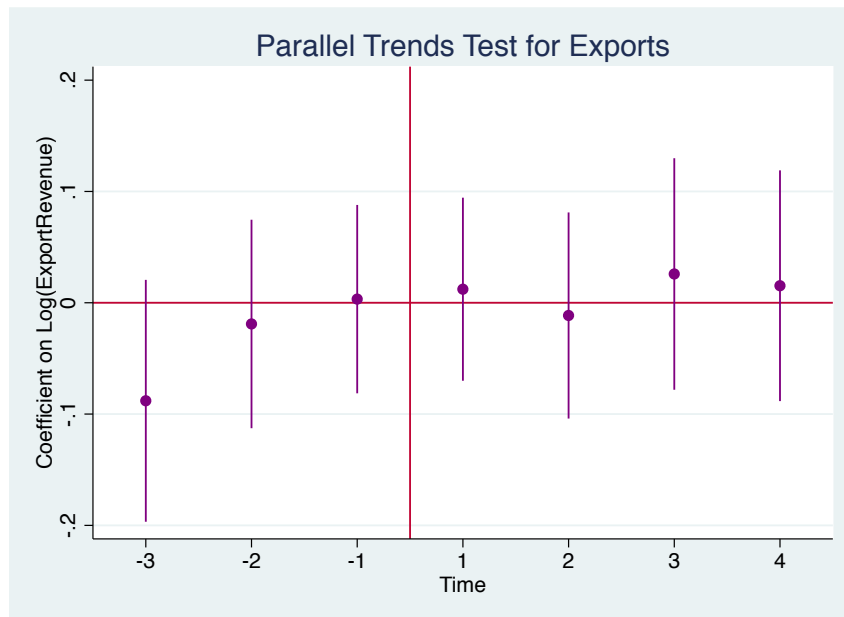
Note: This table contains the estimated coefficients of Equation 5 where y = Export Share for the full sample. Other controls are: Industry, Size, Profitability, Capital City Indicator, Tangible Asset Share, Cash Flows, and Debt/Sales Ratio.

Figure 3.1 Event Study results for Loans



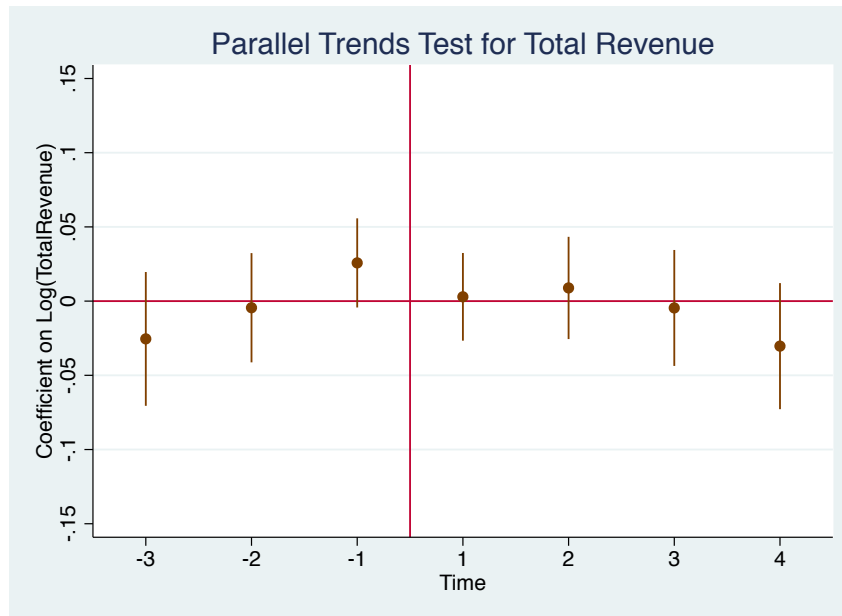
Notes: This figure plots the estimated coefficients from Equation 4 where $y = \text{Loans}$ (in millions of 2016 USD) using the entire sample of Croatian Exporters. The coefficient when $T=0$ is omitted and therefore equal to zero.

Figure 3.2 Event Study results for Exports



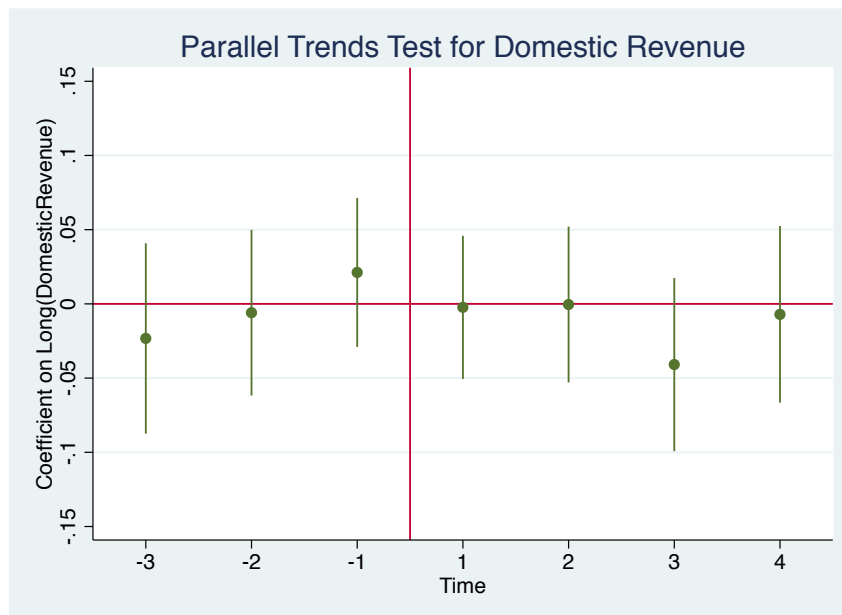
Notes: This figure plots the estimated coefficients from Equation 4 where $y = \text{Log}(\text{Exports})$ using the entire sample of Croatian Exporters. The coefficient when $T=0$ is omitted and therefore equal to zero.

Figure 3.3 Event Study results for Total Revenue



Notes: This figure plots the estimated coefficients from Equation 4 where $y = \text{Log}(\text{TotalRevenue})$ using the entire sample of Croatian Exporters. The coefficient when $T=0$ is omitted and therefore equal to zero.

Figure 3.4 Event Study results for Domestic Revenue



Notes: This figure plots the estimated coefficients from Equation 4 where $y = \text{Log}(\text{DomesticRevenue})$ using the entire sample of Croatian Exporters. The coefficient when $T=0$ is omitted and therefore equal to zero.

Table 3.7 Size and History of Banks- Croatia

Bank	HQ Country	Market Share (2016)	Established
Addiko Bank d.d.	Austria	5.32%	2015 formerly Hypo Alpe-Adria-Bank (1990s)
Banka Kovanica	Croatia	0.29%	1997
Croatia Banka	Croatia	0.62%	1989
Erste & Steiermärkische	Austria	14.15%	1997-2002 (through acquisitions of 4 smaller banks)
Hrvatska Poštanska Banka (HPB)	Croatia	4.88%	1991
Istarska Kreditna Banka	Croatia	0.84%	1956
Karlovača Banka	Croatia	0.55%	1856
OTP Bank	Hungary	4.92%	2005
Podravska Banka	Croatia	0.82%	1872
Primorska Banka	Croatia	0.14%	2001
Privredna Banka (Intesa)	Italy	18.27%	1966, privatized in 1999 merged with Sanpaolo in 2007
Raiffeisenbank	Austria	7.92%	1994
Sberbank	Russia	2.23%	Austrian Volksbank (1997) became Sberbank in 2012
Splitska banka d.d.	Hungary	6.82%	1965, purchased by UniCredit in 2002, and OTP in 2017
Zagrebacka Banka (UniCredit)	Italy	26.51%	1914, purchased by UniCredit in 2002

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