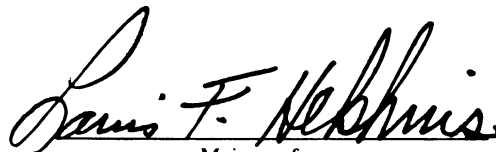This is to certify that the

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THE RELATIONSHIP OF SELECTED STUDENT BORROWER CHARACTERISTICS TO PROPENSITY TO DEFAULT ON STAFFORD GUARANTEED STUDENT LOANS AND IMPLICATIONS FOR POLICY DEVELOPMENT

presented by

Philomena V. Mantella

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Major professor

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THE RELATIONSHIP OF SELECTED STUDENT BORROWER CHARACTERISTICS

TO PROPENSITY TO DEFAULT ON STAFFORD GUARANTEED STUDENT

LOANS AND IMPLICATIONS FOR POLICY DEVELOPMENT

By

Philomena V. Mantella

A DISSERTATION

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

DOCTOR OF PHILOSOPHY

Department of Educational Administration

1990

ABSTRACT

THE RELATIONSHIP OF SELECTED STUDENT BORROWER CHARACTERISTICS TO PROPENSITY TO DEFAULT ON STAFFORD GUARANTEED STUDENT LOANS AND IMPLICATIONS FOR POLICY DEVELOPMENT

By

Philomena V. Mantella

The Stafford student loan is the principal source of financial aid today. Federal costs currently exceed $9 billion, of which approximately $2 billion is default costs.

The focus of the study was the relationship of selected student characteristics to default, a critical examination of ethnicity and its relationship to default, and the viability of default prediction. The objective was to provide useful information formulating default-prevention strategies. The study was performed at Ferris State University in Michigan on a stratified random sample of defaulters and repayers, for 504 Stafford loan borrowers.

ANOVA and chi-square tests were performed for each of the 25 selected academic, demographic, and financial variables to determine their relationship to default. The findings revealed, in examinations performed on a univariate level, significant differences between defaulters and repayers in terms of their age, ethnicity, family income, last grade level completed, program of study, completion of degree program, highest degree completed,

enrollment load carried, freshman grade point average, grade point average at exit, ACT scores, and the dollar level of student loans other than Stafford. The majority of the variables found significant were related to the student's academic standing.

Multiple regression was used to test the multivariate relationship of the significant variables to the prediction of default. The findings revealed the prediction of default was possible using all significant variables. However, further analysis led to the conclusion that risk prediction was not possible with only information available at the beginning of the college experience.

The true contributive value of ethnicity to these prediction models was tested by controlling ethnicity. The findings revealed that, all other variables being equal, ethnicity's contribution to the prediction of default was trivial.

The researcher concluded that default prediction used to exclude or preclude students from the Stafford loan program at the front end of the college experience should be considered with serious reservation due to the lack of accuracy and the potential effect on student access. Proactive strategies employed by universities targeted at improving the academic profile and retention of students at risk were suggested as a viable direction for default prevention.

To my husband, Robert Howard Avery, whose love, strong support, motivation, warmth, and ability to leap small buildings in a single bound create a partnership with the freedom of spirit to explore, grow, and achieve.

To my children, Vincent Mantella Avery and Nickolas Robert Mantella Avery, who enable me to see today's priorities and who are the focus of my vision for the future.

ACKNOWLEDGMENTS

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CHAPTER I

INTRODUCTION

Access to higher education in the United States has been facilitated through a variety of student financial aid programs. Forms of financial aid include scholarship, grant, work, and loan.

The Stafford Guaranteed Student Loan (GSL) program is one type of federal loan. In 1988-89, more than $9.1 billion in Stafford student loans were borrowed by students in postsecondary education. Borrowing to meet college costs has reached unprecedented levels and has become a mainstay in today's financial aid portfolio. The Stafford GSL program generates more than half of all student financial assistance from federal, state, and institutional programs. It has become the largest single source of aid to students at the postsecondary level and central to federal efforts at promoting educational opportunity (Trends in Student Aid, 1989). The program is increasingly beset by problems with which it was not designed to cope: rising loan volumes and defaults, increased reliance of low-income students on loans, reduced access to middle-income students, and the burden on the federal budget of the government guaranteed interest subsidies. All of these issues are capable of bringing the system into crisis with renewed inflation (Gladieux, 1990).

Stafford GSL program costs have escalated, with default costs alone expected to exceed $2 billion in fiscal 1990 (Wilson, 1990). The default cost exposure level of the Stafford GSL program has been identified by the legislature, executive branch, College Board, Department of Education, and many others as the single most critical issue facing student financial aid today (Merisotis, 1988).

Examination of a critical aspect of the Stafford student loan default issue was the subject of this study. The relationship between selected student-borrower characteristics and the propensity to default on Stafford GSLs was examined. Further, implications for policy development on an institutional level and beyond were explored.

Statement of the Problem

The Stafford GSL program is the most complex program in student financial aid. Complexity is apparent in the multiplicity of purpose and constituencies involved in the program. The Stafford GSL, at various points in the program's history, has been expected to meet very different needs. It has been identified as a program of last resort, a program geared to middle-income-level families, and a program geared not to those of middle income but to the needy. This variability of purpose has caused disagreement on such fundamental issues as who is the most appropriate borrower and what is the most appropriate structure of the program.

Having multiple constituents in the program structure also complicates the quest for the ideal structure and borrower. Most

federal aid programs involve the legislative branches, the Department of Education, the postsecondary institution, and the student. The Stafford GSL program involves, in addition, private lenders, secondary markets, state agencies, and guarantors. All of these constituents have a vested interest in the program structure.

Attention and responsibility for the default issue must not be disclaimed at any constituent level, including the institutional one. Student aid must be a coordinated system, designed to provide financial resources to students who would otherwise be unable to begin or complete a postsecondary education (National Task Force on Student Aid Problems, 1974). To effect this coordinated effort, institutions need to develop a commitment to the study of financial aid default.

Success at lowering the federal default costs has direct implications for the effective use of federal dollars and the future of student aid programs. Such success would also reduce the negative consequences associated with default on the student.

Background of the Problem

Stafford GSL default costs have been escalating. The American Council on Education reported default costs in 1978 as $175 million, representing 32% of the total federal costs. By 1982, that figure had grown to $310 million, representing 39% of the total program costs (Hauptman, 1983). The Belmont Task Force reported in testimony to Congress in fiscal year 1988 that default costs had soared to $1.6 billion, representing 47% of the total program costs

(Staff Report, 1988). The 1989 costs were reported by the United States Department of Education to be $1.8 billion, and 1990 costs are projected to exceed $2 billion (DeLoughrey, 1989).

Critical examination of the default issue requires insight into the GSL program's history, structure, size, and relationship to other student aid programs. The GSL was authorized in 1965 when Congress enacted the Higher Education Act (Title IV, Part B, HEA, 20 USC 1071, et seq). The act authorized a federally insured, reduced-interest guaranteed student loan program and stimulated and assisted the formation of comparable state programs.

Major provisions of the original program have been altered and amended in Higher Education Amendments of 1968, 1972, 1976, 1980, and 1986, and through subsequent technical amendments. The funding of the program at the federal level was through interest-free advances for program start-up costs to guarantee agencies and a cost allowance to bring the lender's profit on lower-interest loans to approximately market rate. A significant federal cost component of the GSL program is the payment of default claims to lenders. The federal government does not provide the principle that is borrowed. The principle is provided predominantly by private lenders.

The structure and emphasis of the GSL program have evolved and changed throughout the history of the program. An accumulation of revisions in the program and changing economic circumstances have directly contributed to causing the program to drift far from its original purpose and place in financing students. The program was designed in 1965 as an unsubsidized loan of convenience to help

middle-income families finance their education (Gladieux, 1989). In the late 1960s and the 1970s, federal aid was on the rise, and grant aid was the foundation of student aid programs. In 1975-76, loans comprised 17% of all financial aid awarded. By 1980, grant aid represented 55.8% of all student aid offered. In 1978, with the passage of the Middle Income Assistance Act, students from all income levels became equally eligible to receive subsidized loans. As borrowing increased, so did program costs. Market interest rates were high, and costs escalated.

In the 1980s, economics altered the goals of the Stafford GSL program primarily as a cost-saving measure. The 1981 Omnibus Budget Reconciliation Act required a need test for families to qualify. In 1986, the program legislation was again amended to require a full need test, similar to other federal programs. This legislation changed the program focus from lending to middle-income families to lending to needy families. In addition, inflation outpaced growth in financial aid programs. Growth was stagnant in grant and work programs, and the loan programs grew to fill the gap. The escalation in volume of student borrowing to meet basic educational expenses, the lack of growth in other aid programs, and the change in program focus caused the Stafford program to become the foundation of financial aid, representing 44.5% of all student aid (College Board, 1989).

Stafford is now the principal source of financial support for lower-income students, consuming federal subsidies that cut into

support for today's student grant programs. The Stafford GSL program now provides twice as much aid to students as does the Pell Grant, which was designed as the base of support for needy students. The Stafford GSL program consumed 33% of federal appropriations for programs authorized under Title IV of the Higher Education Act in 1989, as compared to 13% in 1978 (Gladieux, 1989).

Changes in the Stafford program contributed to the default issue. In a sense, today's default levels are a symptom of the drift of student loan policy and the uncertainty of plans and consensus for the future (Gladieux, 1989). Escalation of default costs has stimulated interest in who defaults, how policy contributes to the problem, and what program changes will arrest the default levels. In 1988, the emphasis on cause of and accountability for the problem focused on the institution when the United States Department of Education released results of a study on characteristics of student loan defaulters. Since then, legislative interest and inquiry have abounded. Regulatory proposals demand accountability of the schools. On June 5, 1989, the U.S. Secretary of Education published default legislation 34 CFR, Parts 668 and 682 of the General Provision regulations. This plan authorized limitation, suspension, and termination provisions for schools with excessively high default rates. Further, the plan provided mandated strategies for default prevention and reduction. In summary, effective June 5, 1989, institutions must employ methods to control default rates, some legislatively mandated and others institutionally authorized within the confines of the legislation.

Constituent concern relative to the Stafford loan default issue will persist on all levels. Federal funds are exhaustible, and the competition among government-sponsored programs is intensifying. The public concern relative to governmental efficiency continues to escalate. Public officials feel the pressure of public scrutiny on the default issue as defaulted dollars are perceived as waste. Institutions with unacceptable default rates will find their participation in the program suspended or terminated. Ultimately, and more important, students will suffer as a result of the default problem. The quest for a solution has suggested the limitation of participation in the program without adequate and thorough investigation of the problem. Students threatened with exclusion or preclusion from the program, without other options for financing their education, are those who may desperately need and benefit from a higher education. Students who default on their educational loans will be prohibited from participating in other government-sponsored programs.

Purpose of the Study

The evolution of legislation and the growing default costs in the Stafford GSL program require schools to focus on default prevention through policy and administrative procedure. A knowledge of the differences between repayers and defaulters and what characteristics may be predictive of a propensity to default is essential, and discovering methods to improve default rates without inhibiting access to higher education is critical.

The purpose of this study was to examine the relationship of selected student-borrower characteristics to the propensity to default on Stafford GSLs. In this investigation, the writer explored an institutional model for default risk analysis and the implications of this method and findings for policy development. The model has three features:

1. The identification of student characteristics that are related to default behavior.

2. The identification of the most efficient set of predictors, using a two-thirds subsample.

3. The trial of the prediction equation on a one-third subsample.

Thus, the study was designed to offer a model of pertinent data analysis that would be predictive of high-risk potential to default based on a profile of repayer and default populations. The utility of quantitative prediction models will be explored. The primary aim is to provide reliable data to be utilized when establishing policies and procedures that are effective in curtailing default on the campus level, while preserving access to higher education for students in need.

Significance of the Study

In this study, the writer focused on both defining the problem of Stafford GSL default and, based on the study conclusions, suggesting solutions to the problem. The investigator sought

empirical evidence of student characteristics that are associated with Stafford GSL default, the application of these characteristics to risk assessment, and the implication and utility for using risk prediction in developing methods of lowering loan default rates.

The data collected in this study may be useful to similar institutions. The survey instrument and the method of collection or model of risk assessment may be useful to other institutions in examining their borrowing populations.

The findings may have implications for the development of policy or practice relative to the Stafford GSL program.

The findings may suggest the restructuring of the institutional financial aid package to minimize default while preserving access to financial aid.

In summary, effective methods of reducing the levels of default on Stafford GSLs could result in important cost savings, preserve or restore an institution's good standing in the federal student aid programs, and/or prevent individual students from experiencing the consequences of loan default.

Research Questions and Hypotheses

The following research questions guided the inquiry.

Research Question 1. What characteristics of student Stafford GSL borrowers are indicative of a propensity to default?

Hypothesis 1. There will be no difference in characteristics of student financial aid loan recipients who repay or default.

Research Question 2. Which set of characteristics most effectively predicts students as high-risk borrowers?

Hypothesis 2. Among the set of characteristics examined of student financial aid recipients, there is no one set that predicts students as high-risk borrowers.

Research Question 2a. Is ethnicity significant in the prediction of Stafford student loan default?

Hypothesis 2a. Ethnicity is not significant in the prediction of the propensity to default on Stafford student loans.

Research Question 3. How accurate is a prediction equation in identifying those who default on loan repayment?

Hypothesis 3. There are no accurate prediction equations identifying those who default on Stafford student loans.

Definition of Terms

Cumulative default rate. The default rate used in this study; a ratio of the total dollars defaulted to the dollars entered in repayment since the beginning of the program (Merisotis, 1988).

Default. Defined by statute as a loan payment overdue by at least 120 days (20 USC, sec. 1080(c), 1976).

Dependent student. A student whose consideration for financial aid is based on a combination of student and parental resources.

High-risk student. A student who is more likely than the average borrower to default on his/her student loan. High risk was quantified through the use of a risk coefficient developed in the predictive model.

Independent student. A student who meets the federal definition to apply and be considered for financial aid based solely on his/her own financial resources.

Need test. The financial aid community's accepted method of assessing a family's ability to pay for college expenses.

Net default rate. Reduces the cumulative default rate by repayments made after the loan is in default through agency collections and other acceptable cancellations.

Simplified need test. A shorter method than the need test for assessing ability to pay, based solely on number of family members, number in college, and income.

The Study Setting

The setting for this study was Ferris State University in Big Rapids, Michigan. Ferris is a four-year publicly supported institution that offers predominantly associate and baccalaureate degree programs. Ferris enrolled 11,792 undergraduate and 211 graduate students in fall 1988. Full-time students represent the vast majority of the enrollment; of the 11,792 students, 1,359 (11.5%) were studying part time.

Ferris's financial aid profile in fiscal year 1988 totaled $19.5 million. Of that assistance, $14.1 million or 77.3% was federal funding. The federal aid component was larger than the national average of 75% of all aid distributed in 1988 (College Board, 1989). In addition, 47.5% of the total assistance at Ferris State University was in the form of loans, reflecting a slightly

higher than average reliance on loans. In 1988, 46% of the aid distributed nationally was in the form of a loan (<u>Trends in Student Aid</u>, 1988).

The higher than average reliance on federal aid illustrates the potential devastation if the university lost good standing in the federal aid programs under the new default regulations. The slightly larger than average loan component highlights the importance of effective default reduction. Ferris State University's 1988 default rate, according to the Department of Education, was 9.4%.

<div align="center"><u>Delimitations and Limitations</u></div>

<u>Delimitations</u>

The student characteristics investigated in this study were those previously examined in the literature, to impose a basis of comparison for the findings. Further, the variables examined were limited to those available in the students' academic or financial records. The borrowers examined were students who took out loans between the years 1983 and 1987 and whose loans matured and entered repayment or default in 1987 or 1988. The time of borrowing was delimited to minimize the variable of different policy under which the borrower secured the loan. There was limited policy change during that period. The change that did occur is addressed as a limitation.

The delimitation of specific repayment years was imposed to lessen the potential for economic climate to be a factor affecting ability to repay.

Students characterized as repayers have the potential to default as the loan matures. However, in a cohort analysis performed in New Jersey, Merisotis (1988) concluded that the risk of default diminishes the longer the loan is in maturity. Therefore, longevity of repayment period, although it does not ensure that a repayer will not later default, was not necessary for purposes of this study. A study of California defaulters revealed that more than two-thirds of the defaulters had repaid less than 25% of their loans when they went into default (Mortgaging a Future, 1985).

The extent of default was not differentiated in this study. A borrower in default of a $200 loan for six months was treated the same as a borrower in default of an $8,000 loan for six years.

If the model of risk assessment is found to predict default with some level of assurance, one should be cautious in generalizing the model to other study groups because of the potential differences in populations, circumstances, and experiences. Moreover, it should not be assumed that students with a specific set of characteristics who default with higher frequency than average borrowers should be limited or suspended from participating in the Stafford loan program.

Limitations

This correlational study was conducted in an educational environment, which imposed some restrictions.

The scarcity of institutional research on this topic was a limitation. Models, to be examined for comparative purposes, were limited.

Although limiting the years of borrowing that were examined minimized the policy changes in the Stafford program, during the period examined there was a change with the October 17, 1987, Higher Education Amendments to limit the Stafford program from a simple to a full need test of eligibility. All years studied required a test of financial need to determine program eligibility. The researcher did not combine those who had borrowed under a "convenience" lending structure with those who had borrowed under a "need" structure. However, because of a need to explore students at all levels of success along their completion of the degree, it did require a minimum time frame for borrowing of four years. Therefore, in the study there were subjects who might have applied and qualified for their loan under modest changes in loan-eligibility policy.

Although the limitation of repayment years was imposed to control economic condition, geographical differences in residences may still have somewhat modified the economic condition and could not be controlled.

Some of the personal characteristics of the individuals studied were subject to change--for example, marital status. The findings relative to personal characteristics were those of the individual at the time the loan was made, with the exception of those otherwise specified--for example, age at the time of the survey.

The literature available on Stafford loan default patterns is limited in that the problem has most often been studied from a univariate rather than a multivariate perspective. Further, changing program regulations, institutional policy, research methodology, and populations have led to some lack of consistency in the findings of previous studies.

The final limitation is that the study of default does not lend itself to a controlled experimental method. Researchers cannot randomly assign student loan recipients different characteristics and then observe the relationships between these two variables and default. In the absence of a controlled experimental method, clear understanding of the causal relationship is not available.

Overview of the Remainder of the Dissertation

Chapter II contains a review of the literature relevant to the research questions posed in the study. The methods and procedures employed in the study are described in Chapter III. The findings of the data analyses are reported and interpreted in Chapter IV. Chapter V includes a summary of the study, major findings, conclusions based on the study findings, and recommendations for practice and further research.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this chapter is to identify through a comprehensive review of the literature those characteristics associated with the propensity to default and prediction models developed using these characteristics. The review of the literature was limited to studies that explored the relationship between student characteristics and borrowing and/or defaulting on student loans. Results of the descriptive and predictive investigations of this topic are critically examined and the principal findings reported.

National and Multi-State Stafford GSL Studies

One of the first studies done on the national level was by Lee and Associates in 1980 (Lee and Associates, 1984). The researchers examined student enrollment, elapsed time between borrowing and default, loan debt level, colleges attended, and lender type. The study had some methodological weaknesses. Fifty-five percent of the loan records were usable, and 21 states were excluded. The study included defaulters from 1965 through 1980. Lee and Associates found that those who borrowed the most were least likely to default on their student loans. This inverse relationship was reflected in

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the data by a default rate of 13.66% among borrowers of $2,000 or less, whereas students who borrowed between $13,000 and $15,000 defaulted at a rate of 5.67%.

The Higher Education Amendments of 1986, section 1311, required that an ongoing analysis of characteristics of borrowers and defaulters be undertaken and maintained by the General Accounting Office. The population of the initial study was 1,182,000 borrowers who received their last loan in 1983 and began repayment or defaulted as of September 30, 1987. The data were submitted through guarantors (General Accounting Office, 1988). The study findings revealed that, in fiscal year 1987 alone, $1.3 billion in Stafford student loans were defaulted. In the five-year period of the study, from 1983 through 1987, defaults increased 276%. The study was based on a gross default rate and did not consider any payments made on a loan after default. The principal findings were that independent students defaulted at a higher rate than dependent students--28% and 15%, respectively. More than 33% of students who attended one year or less defaulted on their loans. There was an inverse correlation between years in attendance and default rate. The family's adjusted gross income was found to be a significant indicator of default risk. Defaulters had a lower average loan balance than did the average borrower: $2,815 as compared to $3,564. Because of the volume of the population, guarantors' data were not verified before analysis.

Similar findings were reported as the U.S. Department of Education analyzed a random sample of 1,000 borrowers from each of

58 guaranty agencies. The study identified a number of characteristics associated with a higher than average risk of default. The principal characteristics were students who attended programs of short duration or dropped out or withdrew from longer programs, independent students, vocational school students, students with low adjusted gross incomes, and students with lower than average loan balances. Students who attended postsecondary institutions for one year or less accounted for 38% of the sample and 56% of the defaulters. Independent students represented 39% of the sample but 65% of those who defaulted. Students attending vocational schools were 21% of the borrowers but 35% of the default group. The average income for the default group was 49% lower than that of the borrowers (Gainer, 1988).

Statewide Studies

The significance of characteristics identified and explored on the national level has also been investigated in a number of states. The literature reviewed in this section is organized by selected characteristics found to have a relationship to the propensity to default.

Income

A number of statewide studies have reaffirmed the significance of disadvantaged economic backgrounds in investigations of default (Wilms, Moore, & Bolus, 1986). A report reviewing five separate state studies contained results showing students in the less-than-$6,000 group with the greatest risk of default (Merisotos, 1988). A

Pennsylvania and New Jersey study using the cohort method showed disproportionate number of disadvantaged students represented in the higher rates of default in the vocational sector (Wolfe, Osman, & Miller, 1987).

More than 33% of Virginia and Pennsylvania defaulters reported less than $5,000 income at the time of application. These state findings are consistent with the national General Accounting Office study of defaulting borrowers, which revealed that 12.1% had no family income and 28.6% had incomes less than $5,000 (Staff Report, 1988). The California Student Aid Commission Study also showed defaulters exhibiting a lower family income than repayers. Sixty-six percent of defaulters had family incomes below $10,000 (Mortgaging a Generation, 1985). A study of student populations at California proprietary schools in 1985 further supported the notion that economically disadvantaged students default at a higher rate than those with higher family incomes (Baker, 1986).

Years of Attendance

Many investigators have examined the years of attendance in school of defaulters and repayers. The predominance have shown a strong inverse relationship between default and the number of years in school. The default rate dropped as the class level rose. In the New York State study by Cross and Orinsky (1984), freshmen exhibited a default rate of 14.2%, and there was a downward progression to a 2.6% rate for seniors and graduate students. Graduation rates were only slightly higher for repayers, at 79.7%,

versus 71% for defaulters. Davis (1985) studied defaulters in Pennsylvania and found that 54% were first-year students. "Illinois, Vermont, and Virginia all found that most of their defaulters took out their last loan in their freshman or sophomore years of college" (Mortgaging a Generation, 1985).

Loan Debt Levels

Several state agencies have studied the issue of loan debt levels as they relate to ability to repay. The Stafford GSL findings are instructive.

> According to the Pennsylvania Higher Education Assistance Agency (PHEAA), data from research reports and state data files show that very few borrowers default on loan balances of more than $5,000. In Virginia only 10.6 percent of all defaulters had loan balances greater than $5,000. In Pennsylvania 10.8 percent of all defaulters had such higher loan balances. In California only 4.8 percent defaulted on loan balances of $5,000 or more. In Vermont 80 percent of the defaulters had obligations of $3,000 or less. In New York the average defaulted loan was $1,181 and in Illinois it was almost $2,900. The Department of Education has recently estimated that the average FY 86 defaulted loan was $3,260. Clearly the loans on which most borrowers default are small balance obligations. (Staff Report, 1989, p. 6)

Using data supplied by the Florida Student Aid Program and of a statewide sample of community college students who participated in the GSL program, Schmidt (1983) examined selected student demographic characteristics and their effect on the student loan default problem. Of six variables selected, size of loan total and marital status distinguished significantly those who repayed from those who did not.

In a New York study, it was found that, on the average, defaulters had 1.75 loans and had borrowed a total of $3,106, as compared to 2.25 loans and $4,626 for borrowers who were repaying their loans (Cross & Orinsky, 1984). Davis (1985) found that defaulters had an average loan balance between $2,500 and $2,700. In his earliest study, Lee (1982) found that cumulative loan size was not significant in the assessment of the characteristics of default. This study was a minority opinion of those reviewed.

Ethnicity

Ethnicity was examined by Wilms, Moore, and Bolus (1987) in their California study. They reported a higher probability for black students to default than for white students.

According to Gray (1985),

> Several researchers have associated race of borrower with repayment behavior. Hauptman's (1977) data reveals that while only 11.6% of Federal Insured Student Loans (F.I.S.L.s) and 9.8% of Guaranteed Student Loans (G.S.L.s) made during the years 1966-74 were made to Black students, this group represented 32.5% of all borrowers who defaulted on their F.I.S.L.s and 25.8% of all G.S.L. defaulters. Barnes (1979) developed profiles of delinquent and non-delinquent student loan borrowers on the basis of a number of characteristics, and concluded that single, Black males were the poorest loan risks. Racial factors were also found to be of relevance by Weber (1978), who reported that Black, American Indian, and Alaskan Native borrowers became delinquent more often than Whites and Asian and Pacific Islanders. In two studies commissioned by the U.S. Department of Education (1978, 1979) the researchers found being Black to be a strong predictor of student loan default.

In Baker's (1986) study of California proprietary school GSL borrowers, Asian Americans were found to have higher default rates than their white counterparts.

One must be cautious in examining ethnicity as a characteristic associated with default. One must examine whether ethnicity, in and of itself, is a characteristic associated with or predictive of the propensity to default, or whether socioeconomic characteristics that are present in greater frequency in ethnic groups, such as lower income level, may in fact be the significant variable. In none of the studies reviewed was there a control for ethnicity to determine the true relationship.

Multiple Loans

Students with multiple loans have also been studied (Cross & Orinsky, 1984). Loan defaulters were found to be more likely than repayers to have more than one educational loan.

Age

The California Aid Commission looked at age at the time of default (Mortgaging a Generation, 1985). The findings indicated that, in the state universities, defaulters were slightly older than repayers; in the community colleges and vocational schools they were slightly younger.

In a study of Pennsylvania borrowers, Davis (1984) found a positive correlation between relative youth of the borrower and the propensity to default. In Illinois and Vermont, 70% of defaulters were under 30 years of age at the time of default (Mortgaging a Generation, 1985).

Institutional Study

Few studies were found on the institutional level concerning the characteristics of Stafford GSL defaulters. Holland and Health (1989) studied characteristics of borrowers in general. No comparative analysis of defaulters and repayers was presented. The lack of studies on the institutional level is an indication of a resistance to view Stafford GSL default as an institutional issue. It is clear that further study on this level is critical due to recent program legislation. Institutional study will also provide more comprehensive knowledge of this complex problem at the policy level.

Because no studies were found that explored sets of significant characteristics in assessing default risk in GSL borrowers, the researcher reviewed studies of Perkins National Direct Student Loan (formerly National Defense Student Loan--NDSL) borrowers. Perkins is the oldest federal student loan program and presently is the second largest such program. Because of the longevity of the program and its campus-based administration, the Perkins NDSL has been studied on the institutional level.

Perkins National Defense
Student Loan Studies

A number of studies have dealt with the issue of default in the Perkins National Direct Student Loan program. Although the Stafford GSL program and the Perkins NDSL program have some fundamental differences in policy and administration, examination of the

findings of some recent studies of student characteristics associated with Perkins default may be instructive.

In 1983, Parent examined the relationship between default, loan repayment amounts, and selected characteristics of student borrowers at Indiana University. Data were collected on 3,448 NDSL borrowers, and a profile of defaulted borrowers was developed. Included in the analysis were comparisons of default status to monthly payment amount, total amount borrowed, gender, age, race, class standing, school residency status, cumulative grade point average, cumulative credit hours, and other selected variables. Kendall's tau and eta were calculated, when appropriate, as a measure of correlation between variables at the .05 level of significance. Relative to default, the findings revealed a higher percentage of defaulters were students enrolled in the School of Arts and Sciences and the University Division. A weak relationship was found between cumulative hours and default status. A weak, moderate relationship was found between principle amount and default status. Although Parent observed that race had a strong potential to explain default, no direct correlation was found because of the disproportionately high number of the smaller overall black student population in the default group.

Dyl and McGann (1977) used multivariate discriminant analysis on a sample of 200 student loan applications at the University of Wyoming to develop a profile of good-risk and bad-risk student

loans. Applicant characteristics that were analyzed included class, college, personal characteristics, residence, financial characteristics, loan characteristics, and other information. Four characteristics were found to have a direct, positive relationship to loan repayment: (a) students with a high grade point average were more likely to repay; (b) married students were more likely to repay; (c) students in the School of Engineering were more likely to repay; and (d) the higher the monthly payment on the loan obligation, the more likely were students to repay. Three factors were negatively associated with repayment: (a) total amount of loan debt, including other educational loans; (b) residence in an apartment; and (c) size of the loan.

Numerous studies of NDSL recipients were conducted in the 1970s and the early 1980s. Hauptman (1977) found that the characteristics highly associated with delinquency of loans were low family income, attendance in programs of less than four years, racial background (black), and type of school (proprietary).

Ruble (1982), in studies at Indiana University and Purdue University, found that race, cumulative credit hours, age, cumulative grade point average, family income, and marital status were all significant in predicting student repayment.

In a study undertaken by the United States Accounting Office, characteristics of 667 NDSL defaulters and 664 repayers were reviewed using chi-square tests (Ruble, 1980). Factors found to be associated with default were out-of-state status; divorced, separated, or widowed marital status; black, Hispanic, or Native

American ethnicity; lower academic standing; lower total amount borrowed; failure to graduate; and not making the first monthly payment on time.

Summary of Characteristics Associated With Propensity to Default

The literature review resulted in a number of descriptive characteristics associated with default behavior. The following summary represents the principal findings:

Low average borrowing levels or total loan debt.

Low average family income or adjusted gross income.

Student status of independent.

Fewer average years of college attendance.

Vocational-school students.

Ethnicity (black, Asian, Hispanic, or Native American).

Students with multiple loans.

Slightly higher or lower than average borrower age.

School or program of study.

Lower than average cumulative hours.

Residence in an apartment.

Marital status of divorced, separated, or widowed.

Out-of-state status.

Failure to complete the academic program.

Failure to make the first monthly loan payment on time.

The preceding listing was for the purpose of summary. Terminology is not identical to that used in the studies reviewed.

This compilation from a comprehensive literature review was used in formulating the characteristics examined in this study.

Multivariate Studies Used in Developing
Prediction Equations

The following literature review outlines the principal findings of studies using a multivariate approach to the issue of student loan default. They represent selected studies in the literature that have sought to develop prediction equations or models of student loan default. They are similar in approach to that of the present study.

Early studies that established models for predicting default or proposed methods for reducing default were conducted on Perkins NDSL borrowers. Dyl and McGann (1977) performed a discriminant analysis of student loan applications and transcript data, which resulted in a canonical variable consisting of seven predictors within a canonical correlation of .72. The discriminant model provided data for the purpose of validating the model and correctly classified students as repayers or defaulters in 84% of the cases.

Stockham and Hesseldenz (1979) used loan size and personality, academic aptitude, and achievement data in a discriminant-analysis model. In the validation sample, the model correctly classified 91.5% of the repayers and 94.5% of the defaulters.

Myers and Siera (1980) developed three models through discriminant analysis to assess the potential to default. The first was derived from application data alone, the second included student transcript data with the exclusion of less significant variables,

and the third was without variable exclusion. Each model was shown to be capable of discriminating between good and bad loans in the screening sample. None demonstrated predictive ability beyond that of chance in the validation sample.

A study of a statewide sample of Florida community college students who borrowed GSLs used six variables to develop a prediction model of GSL default (Schmidt, 1983). Size of the loan, marital status, gender, grade point average, college standing, and age were found to be instrumental in developing a prediction model. The model was found to predict group membership--defaulter or repayer--in 70% of the sample cases. Clearly, a primary limitation was the inability to make an accurate prediction for the remaining 30%.

Gray (1985) examined loan records and academic transcripts of 328 former GSL borrowers from the University of Missouri. Fifty-eight repayers and 55 defaulters were used to validate the model; the remaining 110 repayers and 105 defaulters composed the model-development sample. Gray developed a regression model with those variables that correlated with repayment at the .05 level of significance or beyond. To test the reliability of the regression model, he cross-validated it with subjects withheld from the analysis. The high concordance between predicted default probability and observed default rate was evident. Sixty-nine and one-tenth percent of the default group were found to have default probability scores of .50 or greater, whereas 81% of the repayers

were predicted to default with a probability of less than .50. The results supported the hypothesis that repayment behavior of student loan applicants can be accurately forecasted.

Little research has been done on establishing a prediction equation on loan default, specifically on the Stafford GSL program. Moreover, the research that has been done has been inconsistent in the ability and/or capacity to predict the propensity to default or to discriminate repayers from defaulters through the use of mathematical models. Lack of consistency in the findings has been due, in part, to the employment of different methodologies and the analysis of different variables in the studies. These results suggest a need for further study.

CHAPTER III

METHODOLOGY

A review of the literature relating to student default revealed relationships between defaulted borrowers and specific personal and financial characteristics, which were summarized in Chapter II. Chapter III includes the identification of the population and sample, the development and administration of the data-gathering instrument, a description of the procedures used in conducting the study, and the statistical treatment of the data.

The purpose of the study was to investigate further the relationship of selected student characteristics to the propensity to default on Stafford GSLs. The correlation of characteristics of default was used to build a model for determining a risk coefficient to delineate the relative risk of student loan borrowers to default. This model was tested for its predictive efficiency.

The study was undertaken in an effort to contribute to the improvement of institutional default levels, provide information that may assist in minimizing the number of students who experience the negative consequences of default, and preserve access to students who need the program and have the potential to benefit from the educational experience, yet have a high probability to default.

The study differs from previous efforts in that it is an institutionally based study of Stafford GSL borrowers. Further, a multivariate approach to the development of a prediction equation was used. The ethnicity variable was controlled to determine the true contribution of ethnicity to the prediction model. Finally, an inquiry was initiated into how the ability to predict with a reasonable level of surety may be used to benefit the program, institution, and most important, the student.

There were six steps to the methodology: (a) identification and selection of the population and sample; (b) formulation of the study design; (c) development of the data-gathering instrument, including pilot testing the instrument and making the necessary revisions; (d) design of the procedures used in collecting the data; (e) selection of the appropriate statistical treatments for analysis of the data, and (f) analysis of the data.

The Population and Sample

Ferris State University Stafford GSL borrowers whose loans matured between September 1987 and May 1988 were the population selected for the study. The total number of students borrowing in this category was 2,677. A 9.4% cumulative default rate was present in the study population. A representative sample of the entire group was required, in addition to a representative sample of stratified groups--defaulters and repayers. Therefore, a stratified random sample was used to select the repayer group, and the

total population was used for the defaulters to assure an adequate N count and groups of approximately equal sizes (see Table 3.1).

Table 3.1.--Population and sample for the study.

	Repayers	Defaulters	Total
Population	2,422	255	2,677
Sample--Percent of population	10%	100%	
Model development (2/3)	166	169	
Model tryout	83	86	
Total sample	249	255	504

The Study Design

Because a period of time must elapse before repayers and defaulters can be identified, the study was ex post facto in design. Data-collection procedures involved survey research in student records. Statistical significance testing (multivariate and univariate) was used to identify promising variables for further analysis.

Correlational research was used to explore the relationship between selected student characteristics and the propensity to default on Stafford GSLs. This design was selected because of the complex nature of the variables and because the variables do not lend themselves to experimental or controlled manipulation. The

sensitivity of the issue of default creates a reluctance of defaulted borrowers to provide information directly.

Instrumentation

The variables identified for study were selected, based on a review of the literature. The instrument (see Appendix) was created to collect data on these selected variables. The instrument was used to record information from the students' academic and financial aid records.

The instrument was pilot tested on 100 students and revised prior to use in this study. The pilot instrument was designed and tested at Ferris State University in 1988 as an exploration of variables related to default and a test of method. It dealt with limited variables, including grade point average, curriculum, loan debt, adjusted income, dependency, and exit type. Significance was tested through the use of chi-square. After further review of the literature, additional variables were added to the revised instrument to result in the list of variables identified in this study.

Validity and reliability of the instrument were insured in two ways. The assurance that the variables selected were relevant was made by conducting a thorough review of the literature and using this review as a guide. Ten percent of the instruments were audited to verify accuracy of data collection.

Data Processing

The academic-profile data were collected primarily from students' computer records. The financial aid data were collected from both student financial aid files and academic records. A mature, adult part-time student experienced in the pilot phase collected and entered the data. The data were processed with the Statistical Package for the Social Sciences (SPSS-X version) on the Ferris State University mainframe computer.

Statistical Treatment

In this section, the statistical treatment for each research question is explained. The research variables are included in Table 3.2, showing the potential responses, the variable type, codes used, and the statistical test appropriate for each variable.

Research Question 1. What characteristics of student Stafford GSL borrowers are indicative of a propensity to default?

The statistical treatments that were applied included ANOVA and chi-square, as shown in Table 3.2. The .05 alpha level was the criterion for statistical significance.

Research Question 2. Which set of characteristics most effectively predicts students as high-risk borrowers?

Stepwise multiple regression was the statistical treatment applied to determine the extent of relationship between variables. A risk coefficient was developed to associate with sets of characteristics to use as a predictor of propensity to default.

Table 3.2.--Research variables, potential responses, variable types, codes used, and statistical tests employed.

Variable	Potential Response	Type	Coding	Statistical Test
Gender	Male/female	Dichotomous	1,0	ANOVA
Ethnicity	Minority/majority	Dichotomous	1,0	ANOVA
Program completion	Graduated/withdrawn	Dichotomous	1,0	ANOVA
Highest degree completed	Associate/bachelor's/ no degree	Ordinal	1,2,3	Chi-square
Last grade level	Freshman/sophomore/ junior/senior	Ordinal	1,2,3,4	Chi-square
Student status	Independent/dependent	Dichotomous	0,1	ANOVA
Program of study	Technology Business Arts and Sciences Allied Health Health Professions	Dichotomous	1,0,0,0,0 0,1,0,0,0 0,0,1,0,0 0,0,0,1,0 0,0,0,0,1	ANOVA
Age--time of application	Less than 18 years	Continuous		ANOVA
Age--time of survey	More than 18 years	Continuous	1,2,3,4	ANOVA
GPA--freshman	.01-4.0	Continuous	1,2,3,4,5	ANOVA
GPA--time of exit	.01-4.0	Continuous	1,2,3,4,5	ANOVA
Number of curriculum changes	0-X	Continuous	1,2,3,4,5	ANOVA

Table 3.2.--Continued.

Variable	Potential Response	Type	Coding	Statistical Test
Predominant enrollment status	Below 1/2 time (0-6 hr.) 1/2 time (6-8 hr.) 3/4 time (9-11 hr.) Full time	Ordinal	1,2,3,4	Chi-square
ACT score	1 to 30	Continuous	1,2,3,4,5	ANOVA
Family income	14 ranges	Continuous	1-14	ANOVA
Marital status	Married/single	Dichotomous	1,0	ANOVA
Family size	1,2,3,4,5,6 7,8,or more	Continuous	1-8	ANOVA
Gift aid offered	Yes/no	Dichotomous	1,0	ANOVA
Work offered	Yes/no	Dichotomous	1,0	ANOVA
Work accepted	Yes/no	Dichotomous	1,0	ANOVA
More than one guarantor	Yes/no	Dichotomous	1,0	ANOVA
Multiple other loans	Yes/no	Dichotomous	1,0	ANOVA
Cumulative gift aid	$1 and up	Continuous	1,2,3,4,5	ANOVA
Cumulative Stafford debt	$1 and up	Continuous	1,2,3,4,5	ANOVA
Cumulative multiple other loans	$1 and up	Continuous	1,2,3,4,5	ANOVA

<u>Research Question 2a</u>. Is ethnicity significant in the predict-
ion of the propensity to default on Stafford student loans?

The ethnicity variable was examined, with close attention to
its predictive value irrespective of socioeconomic or demographic
characteristics associated with various ethnic groups. Ethnicity
was controlled by considering it last in the stepwise multiple
regression analysis to determine its true predictive value.

<u>Research Question 3</u>. How accurate is a prediction equation in
identifying those who default on loan repayment?

An independent subsample was used to test the predictor
equation developed in Research Question 2. The sample was plotted
on a scale by the risk coefficient. The extent of actual repayment
or defaulting for a one-third subsample was expressed in
percentages. The size of the percentages and gaps in the
distribution of percentages along the scale of risk coefficients was
used to assess justifiable cut-points for assessing risk.

Definition of Variables Examined in the Study

The variables can be reviewed as presented on the survey
document in the Appendix to ascertain the format of the collection
of variable data.

For reporting of the findings, the variables are grouped by the
nature of the inquiry into demographic variables, academic
variables, or variables related to the acquisition of student
financial aid. The variables are subgrouped by the type of analysis
performed. Where variable terminology has changed slightly from the
survey instrument to the reporting of findings is where clustering

of responses was required due to inadequate numbers on a given response for the type of analysis used. Any clustering of data after initial analysis will be reported in the findings.

A list of the variables, grouped as they will be reported by the nature of the inquiry, is shown in Table 3.3.

Table 3.3.--Variables used in the study.

Continuous	Categorical
Demographic Variables	
- Age at the time of application	- Gender
- Age at the time of the survey	- Ethnicity
- Family size	- Student status
- Family income	- Marital status
Academic Variables	
- Freshman grade point average	- Last grade level
- Grade point average at exit	- Program of study
- ACT score	- Program completion
	- Highest degree completed
	- Enrollment load
	- Number of curriculum changes
Financial Variables	
- Cumulative gift aid	- Gift aid offered
- Cumulative Stafford debt	- Work offered
- Multiple other student	- If work accepted
loan debt	- More than one guarantor for Stafford loans
	- Multiple student loans

<u>Definition of Variables</u>

Age at the time of the loan application was collected to establish a mean age for the Stafford student loan borrower. It may offer some insight as we compare the age at which a repayer or defaulter tends to borrow.

Age at the time of the survey will enable a determination of the mean age of the defaulter and repayer group.

In defining the **family size** variable, a distinction must be noted relative to student status. If the student in the sample was independent, as defined by federal regulations, the student no longer reported his/her parents' family income on the financial aid application. The family size reported and used in the calculation of financial aid eligibility is the student's family, to include student, spouse, and children, if applicable. If the student is dependent on his/her parents, as defined by federal regulations, the family size used and reported relates to the parents' family, to include the parents and their children, among which the student is a member. **Family income** relates to the income of the family members. Family membership is defined by the status, dependent or independent, as detailed above. In the case of a dependent student, the family income is the parents' plus the student's income. For independent students, the family income is that of the student and spouse, if applicable.

No definition is required for **gender** or **ethnicity**. The origin of the findings was data reported by the student on registration records. Ethnicity was coded as White, Black, Native American,

Hispanic, Asian, or unreported. A result of the preliminary analysis of ethnicity data revealed a less than adequate number for analysis in all categories. In the sample of 504 students, there were 413 White, 80 Black, 8 Asian, 4 Native American, 1 Hispanic, and 0 unreported students. When the sample was stratified to repayer and defaulter groups, the numbers were insufficient for analysis. Thus, the responses were clustered to majority being defined as the white respondents and minority as the sum of Black, Asian, Native American, and Hispanic students. No students in the sample failed to report ethnicity.

Student status was defined by federal regulations as dependent or independent, based on the student's financial and living arrangements with his/her parents over the two immediately preceding tax years to the year of the application for financial aid.

Student marital status was acquired from review of the student's academic and financial aid records. Students reporting divorced, separated, or widowed were considered single.

Clarification of the academic variables is as follows: last **grade level** was the highest grade level completed by the student at Ferris State University. The **program of study** was initially organized by the schools of study at Ferris State University, which included Arts and Science, Business, Technology, Allied Health, Education, Pharmacy, and Optometry. The initial analysis revealed insufficient numbers of students in the sample to have valid results for Education, Optometry, and Pharmacy. Thus, the students studying

in Pharmacy and Optometry were clustered and redefined for analysis purposes as Health Professions. Education students were clustered with the Arts and Science students.

Program completion recorded whether or not a student achieved a degree at the point of exit from the college. Highest degree recorded the highest degree achieved. Ferris has three small graduate programs offering a baccalaureate degree, with a total enrollment of 128 students. Thus, students who achieved a higher degree were reported as receiving a bachelor's or beyond.

Enrollment load on the survey instrument recorded the student's predominant attendance pattern at Ferris Sate. Possible responses for enrollment load were below one-half time, which was equivalent to average credit hour loads of 1 to 5 credit hours; one-half time, defined as average credit hour loads between 6 and 8 hours, three-quarters time, defined as average credit hour loads between 9 and 11 hours, and full time, defined as average credit hour loads of 12 or more hours. Due to Ferris's predominantly full-time population, cells were of insufficient size for analysis with this level of definition. Thus, enrollment load was clustered into two responses: full time, which was defined as 12 credit hours or more, and below full time, defined as an average load between 1 and 11 credit hours.

At Ferris State University all students declare a major at entry. No students are reported undecided as to major. The number of curriculum changes reflects the number of times the student officially made a curriculum or major change.

The freshman grade point average records the student's cumulative grade point at the conclusion of 30 credit hours. Grade point average at exit is the last cumulative grade point recorded for the student at Ferris State. In either case, transfer credits into Ferris did not contribute to the grade point calculation.

The ACT score recorded was the last reported score before entry to Ferris State.

Amount of gift aid offered was defined as the cumulative amount of gift aid awarded to the student throughout his/her attendance at the university. Work offered is defined in a similar manner. In the case of work, however, a number of students exercised the option to decline the award. Therefore, also recorded was the student's response to the offer of work.

The information collected relative to the loan portion of the student's financial aid included data on both the student's Stafford loan and any other student loans borrowed. Loans other than Stafford included in the multiple loan amount were Perkins National Direct Student Loan, Health Profession loans, Nursing student loans, supplemental loans, and institutional loans. The parent loans (PLUS) were not recorded in the other multiple loans questions because the student is not the borrower.

The information collected relative to the Stafford program included the cumulative loan debt and whether the Stafford loan(s) were borrowed through a single guarantor or multiple guarantors. All dollar amounts collected relative to the student's financial aid were cumulative.

In summary, 25 variables were examined. Eight were categorized as demographic, nine were categorized as academic, and the remaining eight were information pertaining to the student's eligibility for or acquisition of financial aid.

CHAPTER IV

RESULTS OF THE DATA ANALYSIS

The purpose of the study was to investigate the relationship of selected student-borrower characteristics to the propensity to default on Stafford GSLs. Those characteristics that correlated with the propensity to default were used to build a model for determining a risk coefficient to delineate the relative risk of student loan borrowers to default. As an elaboration on the question of risk, two alternative models were developed. An alternative model was developed that used in the prediction equation exclusively "front-end" variables. Front-end variables were defined as those that are evident at the beginning of a student's university experience. An example of a front-end variable is an ACT score, which is determined and recorded before a student's entry into college. Conversely, cumulative student loan debt level is unavailable until the conclusion of the college experience and thus is not a front-end variable. A second alternative model was developed in which ethnicity was controlled to determine its contribution to the prediction equation, irrespective of other socioeconomic variables. All risk-prediction models were developed using a randomly selected two-thirds subsample.

The three models developed in the study, the aforementioned primary and two secondary, were tested on the remaining one-third of the sample population to determine their predictive efficiency. The analysis was concluded by exploring the possible implications of these findings for policy and practice in the administration of student financial aid.

The Sample Population

The sample of 504 Stafford student loan borrowers comprised 249 repayers and 255 defaulters. The sample was selected through a stratified random sample process to derive a group that could be split into repayer and defaulter groups of approximately equal size. Thus, the sample, as termed here, was not a representative group of the borrowing population in total, but was more heavily loaded with defaulters than a straight random sample would provide, in an effort to equalize the defaulter and repayer sample groups. The sampling approach selected was done to facilitate the majority of the analysis, which compared defaulters to repayers. The stratified sample of 255 defaulters represented the full default population for the period of the study, and the 249 repayers were 10% of the repayer population. This provided groups of comparable size for ease of analysis. The sample population was examined as a full group before the comparative groups of defaulters and repayers were examined in detail.

The analysis of the full sample provided some important background information for addressing the research questions. Two types of comparisons were used to develop the baseline data:

1. The borrowers were compared to the Ferris population, where Ferris population data were available.

2. A comparison of the analysis of the full sample--the borrowers--to the stratified sample groups--repayers and defaulters --was also made, where instructive.

Baseline Data for the Full Sample

Multiple univariate tests were performed on each variable to determine baseline data for the full sample. Analysis of variance and chi-square tests were performed for each of the variables in the study. Table 4.1 shows the results of the analysis for continuous demographic variables.

Table 4.1.--Demographic data descriptive of the population: continuous variables (N = 504).

Variable	Mean	SD
Age at Time of Loan Application	20.9	4.50
Age at Time of Survey	25.4	4.98
Family Size	3.1	1.83
Family Income	$13,092	$14,446

The mean age at the time of the loan application for the sample group was 20.9 years. The mean age of the full Ferris student population was 20.5 years.

Age at the time of the survey was collected to compare the average age of the repayer and defaulter groups. There are no corresponding data to compare to the full population. An examination of family size reveals a mean of 3.1 family members in the students' families, with an average income of $13,092.

Table 4.2 shows the categorical demographic variables descriptive of the sample population. Data are available from the Registrar's office for the full population relative to the student body, in the year of the study, by gender and ethnicity. The gender distribution in the sample was consistent with that of the full Ferris student population. The gender distribution among the sample group was 59.5% male and 40.5% female. The gender distribution among Ferris students in 1987-88 was 58% male and 42% female.

The ethnic distribution reveals a larger minority population among the sample group than the ethnic distribution of the Ferris student population. The Ferris student population had an ethnic distribution of 94% majority and 6% minority students. The sample was 81.9% majority and 18.1% minority. The difference may be a factor of the manner in which the sample was created with 10% repayers and 100% of the defaulter population.

Table 4.2.--Demographic data descriptive of the population: categorical variables (N = 504).

Variable	Frequency	Percent
Gender		
Male	300	59.5
Female	204	40.5
Ethnicity		
Majority	413	81.9
Minority	91	18.1
Student Status		
Dependent	286	56.7
Independent	218	43.3
Marital Status		
Single	445	88.3
Married	59	11.7

Student status and marital status data were unavailable for the full Ferris student population, but were available through financial aid records for the financial aid applicant population. In comparing the distribution of student status and marital status, the study revealed the sample with a higher percentage of independent and married students than that of the financial aid applicant pool. The financial aid applicants were 21% independent compared to 43.3% of the sample. During the year of the study, 8.9% of the financial aid applicants were married, as compared to 11.7% of the sample group.

Tables 4.3 and 4.4 detail the analysis of academic data descriptive of the sample population. Thirteen and nine-tenths percent of the sample left the university after their freshman year, 20% after their sophomore year, 16.9% after their junior year, 43.5% after their senior year, and 5.8% after five or more years of study. The only retention data available at the university for comparison were after freshman year, which indicated that, in the year of the study, 27.2% departed after their freshman year. Thus, the sample population exhibited a lower percentage of attrition after year one.

The program-of-study data were fairly consistent between the sample borrowers and the Ferris population:

	Sample	Population
Technology	25%	19%
Business	38%	36%
Arts & Sciences	27%	31%
Allied Health	8%	9%
Health Professions	2%	5%

A slightly lower representation among the sample group existed in the health professions and a slightly higher representation of students in technology. Again, the difference may be a factor of the high percentage of defaulters used in the sample.

No comparison was available for degree-completion data.

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Table 4.3.--Academic data descriptive of the population: categorical variables (N = 504).

Variable	Frequency	Percent
Last Grade Level		
Freshman	70	13.9
Sophomore	101	20.0
Junior	85	16.9
Senior	219	43.5
Five or more	29	5.8
Program of Study		
Technology	124	24.6
Business	193	38.3
Arts & Sciences	135	26.8
Allied Health	40	7.9
Health Professions	12	2.4
Program Completion		
Degree	238	47.2
No degree	266	52.8
Highest Degree Completed		
Bachelor's or beyond	152	30.2
Associate	91	18.1
No degree	261	51.8
Enrollment Load		
Full time--12 or more credit hours	467	92.7
Less than full time--fewer than 12 credit hours	37	7.3
Number of Curricular Changes		
Zero	363	72.0
One	103	20.4
Two	17	3.4
Three	12	2.4
Four or more	9	1.8

5000

loans (SLS), and Health Professions, Nursing, or institutional loans.

Table 4.5.--Financial data descriptive of the population: categorical variables (N = 504)

Variable	Frequency	Percent
Gift Aid Offered		
Yes	454	90.1
No	50	9.9
Total	504	
Work Offered		
Yes	279	55.4
No	225	44.6
Total	504	
If Offered Work, Was Work Accepted?		
Yes	249	89.2
No	30	10.8
Total	279	
Stafford Loans Have More Than One Guarantor		
Yes	15	3.0
No	489	97.0
Total	504	
Total Multiple Student Loans (Other Multiple Student Loans)		
Yes	338	67.1
No	166	32.9
Total	504	

As shown in Table 4.6, the average indebtedness of these students was $3,940.30, considering only Stafford GSL. The average cumulative loan debt for other than Stafford loans was $5,058.03. Thus, the average total indebtedness of students in the sample would be the total of Stafford and other multiple loan debt, or $8,998.33. No population comparisons were available on these financial aid elements.

Table 4.6.--Financial data descriptive of the population: continuous variables (N = 504).

Variable	Mean	SD
Cumulative Amount of Gift Aid Offered	$3,709.12	$3,236.38
Stafford GSL Total Debt	$3,940.30	$2,656.63
Other Multiple Student Loan Debt	$5,058.03	$3,541.25

Findings Relative to the Research Questions

Research Question 1

What characteristics of student Stafford GSL borrowers are indicative of a propensity to default?

Hypothesis 1: There will be no difference in characteristics of student financial aid loan recipients who repay or default.

Similar to the examination of the sample population, the variables were divided into three groups for reporting purposes. The three groups of common variables were demographic, academic, and financial-aid related. Of the 25 variables examined, eight were demographic, nine were academic, and eight were related to the acquisition of the student's financial aid. Multiple tests were

performed at a univariate level to test the hypothesis. A significant difference between the repayer and defaulter groups was revealed for 12 of the 25 tested variables. Of the 12 significant variables, three were demographic, eight were academic, and one was financial-aid related. The multiple univariate testing revealing 12 variables with a significance level of .05 or beyond resulted in a rejection of the null hypothesis.

The results of the significance testing comparing repayers and defaulters for continuous demographic variables are reported in Table 4.7.

Two of the four continuous demographic variables tested at a significance level beyond .05. Age at the time of the survey tested at the .0013 significance level. The repayers were a younger group (mean age = 24.7) than the defaulters (mean age = 26.1). This finding is consistent with that of the California Aid Commission Study ("Mortgaging a Generation," 1985) relative to four-year public institutions. However, the findings throughout the literature relative to age are inconsistent.

A second difference between the defaulters and repayers was family income. Consistent with the literature, defaulters showed a lower family income than repayers. The mean income of the defaulters was $10,200, whereas the repayers had a mean family income of $16,055.

Table 4.7.--Comparison of demographic characteristics for defaulters and repayers: continuous variables.

Variable	Repayers (N=249)		Defaulters (N=255)			Sig. of F
	Mean	SD	Mean	SD	F	
Age at Time of Loan Application	20.8	3.70	21.1	5.16	0.4069	.05240
Age at Time of Survey	24.7	4.23	26.1	5.53	10.4900	.00130
Family Size	3.1	1.75	3.2	1.91	0.7763	.37870
Family Income	$16,055	$16,125	$10,200	$11,931	21.5400	.00001

Family size did not vary significantly between the two groups.

The remainder of the demographic variables examined were categorical and thus were analyzed through the use of a chi-square test. The results are reported in Table 4.8.

The chi-square tests revealed no significant differences between the defaulter and repayer groups by gender, student status, or marital status. The ethnic backgrounds of the defaulters and repayers varied significantly. Ninety and four-tenths percent of the repayer group were majority students, whereas 9.6% were minority. In the default group, 73.7% were majority and 26.3% were minority. In anticipation of the significance of ethnicity, based on the literature, a subquestion to Research Question 2 was established to examine further the issue of ethnicity.

In summary, of the eight demographic variables examined, there were differences between the defaulter and repayer groups in age at the time of the survey, family income, and ethnicity.

The second group of variables investigated at the univariate level were academic in nature. They were indicators of academic ability, college level, major, and predominant attendance pattern. They were characteristics of the individuals acquired by virtue of being a student. The results of the analysis of the nine academic variables investigated are reported in Tables 4.9 and 4.10.

Table 4.8.--Comparison of demographic data for defaulters and
repayers: categorical variables.

Variable	Repayers (N=249)		Defaulters (N=255)	
	Freq.	Percent	Freq.	Percent
Gender				
Male	149	59.8	151	59.2
Female	100	40.2	104	40.8

Chi-square = .0027, df = 1, significance = .9586

Ethnicity				
Majority	225	90.4	188	73.7
Minority	24	9.6	67	26.3

Chi-square = 22.45, df = 1, significance = .00001

Student Status				
Dependent	143	57.4	143	56.1
Independent	106	42.6	112	43.9

Chi-square = .0468, df = 1, significance = .8288

Marital Status				
Single	225	90.4	220	86.3
Married	24	9.6	35	13.7

Chi-square = 1.6597, df = 1, significance = . 1976

Table 4.9.--Comparison of academic data for defaulters and
repayers: categorical variables.

Variable	Repayers (N=249)		Defaulters (N=255)	
	Freq.	Percent	Freq.	Percent
Last Grade Level				
Freshman	7	2.8	63	24.7
Sophomore	31	12.4	70	27.5
Junior	46	18.5	39	15.3
Senior	146	58.6	73	28.6
Five or more years	19	7.6	10	3.9

Chi-square = 87.5033, df = 4, significance = .00001

Program of Study				
Technology	58	23.3	66	25.9
Business	109	43.8	84	32.9
Arts & Sciences	46	18.5	89	34.9
Allied Health	26	10.4	14	5.5
Health Professions	10	4.0	2	.8

Chi-square = 26.3164, df = 4, significance = .00001

Program Completion				
Degree	155	62.2	83	32.5
No degree	94	37.8	172	67.5

Chi-square = 43.4049, df = 1, significance = .00001

Highest Degree Completed				
Bachelor's or beyond	112	45.0	40	15.7
Associate	48	19.3	43	16.9
No degree	89	35.7	172	67.5

Chi-square = 60.7118, df = 2, significance = . 00001

Table 4.9.--Continued.

Variable	Repayers (N=249)		Defaulters (N=255)	
	Freq.	Percent	Freq.	Percent
Enrollment Load				
Full time--12 or more credit hours	239	96.0	228	89.4
Less than full time-- fewer than 12 credit hours	10	4.0	27	10.6

Chi-square = 7.0626, df = 1, significance = .0079

Number of Curricu- lum Changes				
None	183	73.5	180	70.6
One	48	19.3	55	21.6
Two	10	4.0	7	2.7
Three	6	2.4	6	2.4
Four or more	2	.8	7	2.7

Chi-square = 3.7368, df = 4, significance = .4428

The findings revealed a difference between repayers and defaulters on all academic measures examined with the exception of the number of curriculum changes the student made.

Examination of the last grade level revealed large differences among defaulters and repayers. A larger percentage of students who terminated their education after the freshman or sophomore year were in the defaulter group, 24.7% and 27.5%, respectively, as compared to 2.8% and 12.4% in the repayer group. This finding is consistent with the literature, in which a number of studies showed an inverse

Table 4.10.--Comparison of academic data for defaulters and repayers: continuous variables.

Variable	Repayers (N=249)		Defaulters (N=255)		F	Sig. of F
	Mean	SD	Mean	SD		
Freshman Grade Point Average	2.62	.7558	2.02	.8069	75.1425	.00001
Grade Point Average at Exit	2.68	.6463	1.95	.7245	105.3124	.00001
ACT Score	15.84	4.2591	13.49	4.3437	37.3862	.00001

relationship between the years of college and the potential to default on student loans.

Differences were also observed between the defaulter and repayer groups relative to the students' programs of study. A higher percentage of defaulters than repayers came from the program of Arts and Sciences--34.9% as compared to 18.5%. Arts and Sciences majors at Ferris represent a diversity of majors. A number of students, unclear as to the focus of career or major goal, will fall within Arts and Sciences with a pre-arts or pre-science major designation. Also, a slightly higher percentage of defaulters came from technology programs.

The examination of program completion revealed that 67.5% of the defaulter group had not achieved a degree at the conclusion of their studies, as compared to 35.7% of the repayer group. That relationship was reinforced as the highest degree completed was examined. Forty-five percent of the repayer group had achieved a bachelor's degree or beyond, as compared to 15.7% of the default group.

The difference in number of students attending part time was also significant in the defaulter group, with 10.6% of the students studying part time as compared to 4% of the repayers.

Examination of academic ability indicators revealed a significant difference between defaulters and repayers on freshman grade point average, grade point average at exit, and ACT scores. The mean freshman grade point average for the repayers was 2.62 and

grade point average at exist was 2.68, as compared to a freshman grade point average of 2.02 and grade point average at exit of 1.95 for the defaulters. It is important also to note the progression of the grade point average for the repayers from freshman year to exit was a positive one, whereas, conversely, the progression of the grade point average for the defaulters was a negative one. ACT scores for the repayer group were higher, with a mean of 15.84 as compared to a mean of 13.49 for the defaulter group.

Tables 4.11 and 4.12 compare the defaulter and repayer groups on variables related to the acquisition of student financial aid.

The findings for the financial aid variables were revealing. The repayer and defaulter groups exhibited a difference in only one of eight variables examined, other student loan debt. Thus, defaulters and repayers had similar financial aid packages, with the one noted exception. The demographic examination revealed that the defaulters had an average family income $5,855 lower than that of the repayers. This suggests an inconsistency meriting discussion. Family income as a key determinant of eligibility for financial aid suggests the defaulters as a needier population. Yet there were minimal differences in their level of student financial aid, and where a difference existed it was the repayer who had acquired more aid. It may be that more repayers complete a higher grade level, creating time spans with increased potential for the acquisition of financial aid. Or it may suggest inconsistency in the manner in which financial aid is distributed. In order to examine this issue,

Table 4.11.--Comparison of financial data for defaulters and
repayers: categorical variables.

Variable	Repayers		Defaulters	
	Freq.	Percent	Freq.	Percent

Gift Aid Offered

Yes	221	88.8	233	91.4
No	28	11.2	22	8.6
Total	249		255	

Chi-square = .6952, df = 1, significance = .4044

Work Offered

Yes	135	54.2	144	56.5
No	114	45.8	111	43.5
Total	249		255	

Chi-square = .1758, df = 1, significance = .6750

If Offered Work, Was It Accepted?

Yes	125	92.6	124	86.1
No	10	7.4	20	13.9
Total	135		144	

Chi-square = 2.4122, df = 1, significance = .1204

**Stafford Loans/More
Than One Guarantor**

Yes	4	1.6	11	4.3
No	245	98.4	244	95.7
Total	249		255	

Chi-square = 2.3289, df = 1, significance = .1270

Multiple Student Loans
(Multiple Other Loans)

Yes	177	71.1	161	63.1
No	72	28.9	94	36.9
Total	249		255	

Chi-square = 3.2513, df = 1, significance = .0714

Table 4.12.--Comparison of financial data for defaulters and repayers: continuous variables.

Variable	Repayers (N=249)		Defaulters (N=255)		F	Sig. of F
	Mean	SD	Mean	SD		
Cumulative Amount of Grant Aid	$3,844.32	$3,252.92	$3,577.11	$3,221.05	.8586	.3546
Stafford GSL Total Debt	$4,115.62	$2,467.08	$3,769.10	$2,823.87	2.1482	.1434
Other Student Loan Debt	$5,408.79	$3,381.38	$4,715.53	$3,664.97	4.8653	.0279

it would require the analysis of variables relative to the student financial aid be done by year rather than cumulatively. Although beyond the purview of this analysis, this may suggest a topic requiring further study.

In summarizing the findings of the investigation of Research Question 1, the following can be observed:

1. The hypothesis was rejected as the series of univariate tests revealed significance in 12 of the 25 variables examined. Differences between the repayer and defaulter groups were observed in the following characteristics:

> Age
> Ethnicity
> Family income
> Last grade level
> Program of study
> Program completion
> Highest degree completed
> Enrollment load
> Freshman grade point average
> Grade point average at exit
> ACT score
> Other multiple student loan debt

2. The largest group of variables where differences could be observed in the default and repayer groups were academic in origin.

3. The progression of the grade point average from freshman year to exit was a positive progression for the repayer and a regression of the grade point average for the defaulter group.

4. The examination of variables related to the acquisition of financial aid revealed some inconsistency between differences in key

demographic indicators used to determine financial aid eligibility and the variables relating to the actual receipt of financial aid, meriting further study.

Research Question 2

Which set of characteristics most effectively predicts students as high-risk borrowers?

Hypothesis 2: Among the set of characteristics examined of student financial aid recipients, there is no one set that predicts students as high-risk borrowers.

As a result of the analysis of the findings, the hypothesis was rejected. A set of variables was discovered that resulted in a multiple R of .6176. This set of characteristics, accounting for more than 38% (R^2) of the variance in the model, was operating at a level of predictive efficiency sufficient to reject the null hypothesis. Stepwise multiple regression was the statistical treatment applied to determine the extent of the risk relationship between the variables examined.

The variables used in the stepwise regression analysis were the 12 variables that were found to be significant on a univariate level in the comparison of the defaulter and repayer groups:

Age
Ethnicity
Family income
Last grade level
Program of study
Program completed
Highest degree completed
Enrollment load
Freshman grade point average
Grade point average at exit
ACT score
Other multiple student loan debt

To perform the regression analysis, it was necessary to create dummy variables for the categorical variables. This enabled isolation of the significant characteristic within the variable examined. Thus, dummy variables were created for all potential responses to grade level, program of study, and highest degree.

The findings that resulted from stepwise multiple regression testing of significant variables are shown in Table 4.13.

Table 4.13.--Stepwise multiple regression of significant variables contributing to default.

Step No.	Variable Entered	Multiple R	Multiple R^2	F-to-Enter
1	Grade point average at exit	.3961	.1569	61.959
2	Age at time of survey	.5061	.2562	57.167
3	Arts & Sciences	.5426	.2945	46.046
4	Bachelor's degree or higher	.5689	.3236	39.476
5	Ethnicity	.5847	.3418	34.174
6	Last grade--level 1	.5934	.3522	29.719
7	Multiple other loan amounts	.6016	.3620	26.502
8	Last grade--level 2	.6114	.3738	24.329
9	Family income	.6176	.3815	22.270

The findings outlined in Table 4.13 reveal the nine steps developed in the stepwise multiple regression. The initial step, with a multiple R of .1569, was grade point average at exit, contributing most heavily to the prediction equation. Age at the time of the survey contributed .0993, bringing the multiple R^2 to .2562. The next step was a single characteristic of program of study, which identified enrollment in a program of Arts and Sciences

as contributing .0383 to the prediction of the risk of default. Acquisition of the Bachelor's degree was the next variable entering the stepwise multiple regression. Ethnicity entered the prediction equation next, contributing .0182 to the prediction of risk. The sixth step was last grade level of freshman, contributing .0104 to the prediction equation. Multiple other loan amounts, last grade level of sophomore, and family income were steps 7, 8, and 9, each contributing less than 1% to the multiple R^2 in the prediction equation. The stepwise multiple regression concluded at step 9, reflecting a minimal or no effect to the multiple R for the remaining variables tested. Because of the strength of the prediction variance of 38%, the null hypothesis was rejected.

Figure 4.1 is offered as a graphic depiction of the predicted variance in the stepwise multiple regression.

The following is offered as the prediction equation as a result of the stepwise multiple regression:

Prediction equation of high-risk borrowers = -.152 * (GPA at exit) + .028 * (age at time of survey) + -.244 * (bachelor's degree) + .136 * (Arts & Sciences) + .154 * (ethnicity) + .284 * (last grade--level 1) + .00002 * (multiple other loan amount) + .161934 * (last grade--level 2) + -.000003 * (family income) + .018.

In examining the equation, it can be noted that grade point average at exit, Bachelor's degree, and income have a negative value in the prediction equation.
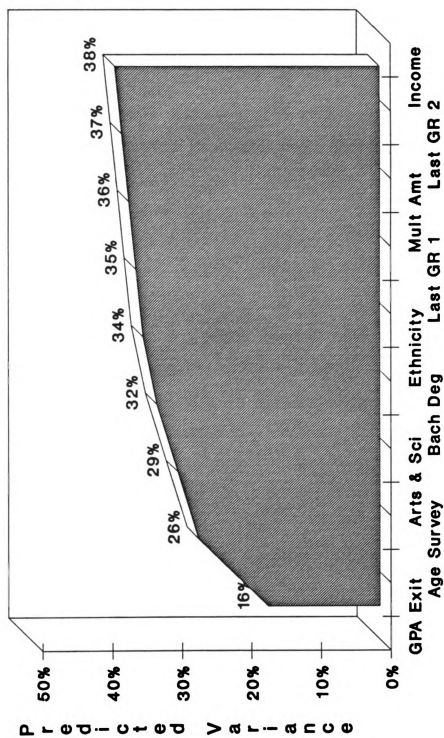
Figure 4.1: Prediction of high-risk borrowers.

To move beyond the theoretical analysis of the prediction of risk to a consideration of the potential of using an equation to predict the propensity to default, the timing of availability of these variables must be considered. In reviewing the nine variables that contributed to the prediction of the propensity to default, it can be noted that only three, program of study, ethnicity, and family income, can be known at the beginning or "front end" of the college experience. The remainder cannot be known until the conclusion of the college experience. This accentuates limitations in the use of this model to predict risk before borrowing.

This finding leads to a questioning of the utility of predicting default risk. To analyze the utility of risk prediction required the development of a secondary model, or front-end variable model. Thus, a second stepwise multiple regression using only those variables that can potentially be known at the beginning of the college experience was developed.

In Table 4.14 are the results of the stepwise multiple regression to test the predictive efficiency of front-end variables in determining the propensity to default.

The predictive efficiency was greatly reduced when the variables entered were limited only to front-end variables. A total of six steps resulted, with a total multiple R of .4364 in the front-end model, as compared with the multiple R of .6176 that was the result of the primary model. The prediction of variance in the front-end variable model achieved a total predicted variance of 19%, as compared to 38% in the primary model. Figure 4.2 shows a graphic

depiction of the prediction of high-risk borrowing, using front-end variables only.

Table 4.14.--Stepwise multiple regression of significant front-end variables contributing to the prediction of high-risk borrowing.

Step No.	Variable Entered	Multiple R	Multiple R^2	F-to-Enter
1	ACT scores	.2785	.0776	28.006
2	Arts & Sciences	.3405	.1159	21.764
3	Family income	.3900	.1521	19.796
4	Enrollment load	.4082	.1667	16.500
5	Ethnicity	.4232	.1791	14.358
6	Technology	.4364	.1904	12.857

Notable also in the secondary model is the entry of new variables into the prediction of risk. ACT score was the largest contributor to the stepwise multiple regression, contributing 8% toward the predicted variance, and was a new variable in the regression analysis. Enrollment load and a program of study in Technology both were new contributors at .0146 and .0113 multiple R^2, respectively.

The prediction equation developed as a result of the regression analysis of front-end variables is as follows:

Front-end prediction equation of high-risk borrowers = -.020 * (ACT scores) + .223 * (Arts & Sciences) + -.000006 * (family income) + -.214 * (enrollment load) + .155 * (ethnicity) + .137 * (technology) + .954.

It can be noted that ACT score, family income, and enrollment load had a negative value in the prediction equation. Those with lower ACT scores, lower family income, and lower academic loads were more likely to default.

To summarize the findings relative to the potential for the prediction of high-risk borrowing, the following is offered:

1. A model can be developed with reasonable predictive efficiency (multiple R = .6176) if all significant variables are entered into the prediction equation. Thus, the null hypothesis is rejected.

2. The potential utility of this equation is somewhat limited in that many of the variables are available only upon conclusion of the individual's college experience.

3. A model can be developed using only front-end variables; however, the predictive efficiency is greatly reduced (multiple R = .4364). Although this level may be instructive, it is not a sufficient basis on which to develop policy or eligibility criteria based on this efficiency level.

4. In a more detailed analysis through the creation of dummy variables, it can be noted that only specific responses entered into the prediction equation as contributors to the prediction of risk in areas where multiple rather than dichotomous responses were possible. As a result, not all programs of study were significant in the regression analysis of the risk of default. Technology and Arts and Sciences, specifically, contributed to the prediction equation. Not all grade levels entered into the prediction

equation. The findings revealed only freshman and sophomore grade levels contributing. Finally, not all degree-completion possibilities contributed to the prediction equation. The findings revealed that only bachelor's degree completion or lack thereof contributed to the prediction of risk in the stepwise multiple regression.

Research Question 2a

Is ethnicity significant in the prediction of Stafford student loan default?

Hypothesis 2a: Ethnicity is not significant in the prediction of the propensity to default on Stafford student loans.

In a close examination of ethnicity, the researcher was unable to reject the null hypothesis. By examining the prediction equation before and after controlling ethnicity, its specific contribution to the prediction equation was apparent. Ethnicity contributed only minimally to the predictive efficiency of the model. In reexamining Table 4.13, one can observe a relatively small contribution to the stepwise multiple regression, .0182 multiple R^2 or 1.8%. Controlling for ethnicity by entering it last in the stepwise multiple regression allowed ethnicity to be observed irrespective of other related socioeconomic variables. The contribution of ethnicity (controlled) at the ninth position of the predictor equation reduced its level of contribution further, to a .0119 multiple R^2 level or 1.2%. Controlling for ethnicity by removing it from the model resulted in an overall loss of predictive efficiency of .5%.

The analyses of the ethnicity-controlled models are presented in Tables 4.15 and 4.16. The results of the stepwise multiple regression controlling for ethnicity by eliminating it from the model are presented in Table 4.15.

Table 4.15.--Stepwise multiple regression of significant variables, controlling for ethnicity.

Step No.	Variable Entered	Multiple R	Multiple R^2	F-to-Enter
1	Grade point average at exit	.3961	.1569	61.959
2	Age at time of survey	.5061	.2562	57.167
3	Bachelor's degree	.5426	.2945	46.046
4	Arts & Sciences	.5689	.3236	39.476
5	Family income	.5801	.3366	33.381
6	Last grade--level 1	.5894	.3474	29.102
7	Multiple other loan amounts	.5975	.3570	25.938
8	Last grade--level 2	.6079	.3696	23.892
9	ACT score	.6134	.3763	21.787

In reviewing Table 4.15, it is notable that controlling for ethnicity resulted in the ACT score moving into the ninth position in the stepwise multiple regression. If a comparison is made of the predictive efficiency of the primary model, with ethnicity presenting itself in the fifth position, to the controlled model, the comparison reveals only a trivial loss in predictive efficiency. The predicted variance of the primary model was .3815 multiple R^2 as compared to .3763 in the ethnicity-controlled model. This is a minimal loss in predictive efficiency at .0052 multiple R^2 after the variable of ACT score moved into the prediction model. A graphic

depiction of the model controlled for ethnicity is presented in Figure 4.3.

The prediction equation for the model controlled for ethnicity is as follows:

Prediction equation of high-risk borrowers controlling for ethnicity = -.147 * (grade point average at exit) + .026 * (age at time of survey) + -.241 * (bachelor's degree) + .150 * (Arts & Sciences) + -.000003 * (family income) + .292 * (last grade--level 1) + .00001 * (multiple other loan amount) + .162 * (last grade--level 2) + -.011 * (ACT score) + .216.

It should be noted that the value of ACT score that moved in to the prediction equation had a negative value.

To further examine ethnicity, a secondary control method was used to prevent the movement of ACT into the ninth position. This was done to assure that the entry of the ACT score was not skewing the analysis of ethnicity. In this model the ethnicity variable was forced into the ninth position, considering it at the end of all significant variables in the model and thus blocking the entry of the ACT score variable. The results of this analysis are presented in Table 4.16.

Again, this analysis strengthens the conclusion that ethnicity has a trivial contributive value to the predictive efficiency of the propensity-to-default model. There was no difference between the overall predictive efficiency of the model with ethnicity forced to last position and the primary model, since all the same variables were considered but presented in different order. Considering all other variables first, however, forced all socioeconomic and
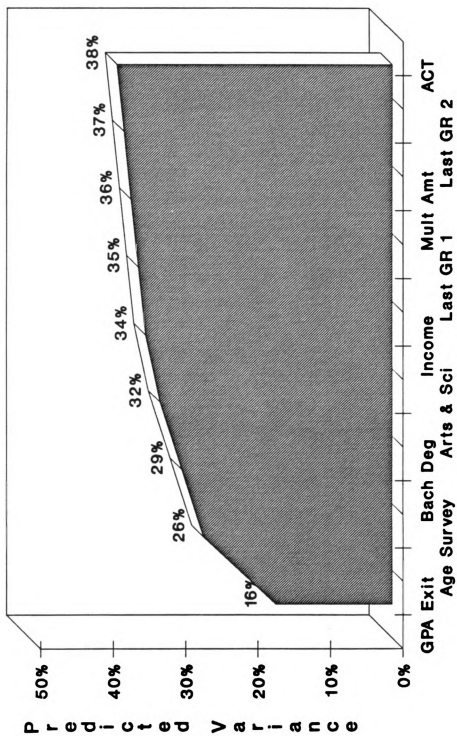
Figure 4.3: Prediction of high-risk borrowers, controlling for ethnicity.

academic characteristics to be considered before ethnicity. This analysis resulted in a reduction in ethnicity's specific contribution to the prediction model from 1.8% to 1.2%.

Table 4.16.--Stepwise multiple regression of significant variables with ethnicity in the ninth position.

Step No.	Variable Entered	Multiple R	Multiple R^2	F-to-Enter
1	Grade point average at exit	.3961	.1569	61.959
2	Age at time of survey	.5061	.2562	57.167
3	Bachelor's degree	.5426	.2945	46.046
4	Arts & Sciences	.5689	.3236	39.476
5	Last grade--level 1	.5786	.3348	33.112
6	Multiple other loan amounts	.5884	.3462	28.948
7	Last grade--level 2	.5989	.3587	26.127
8	Family income	.6079	.3696	23.892
9	Ethnicity	.6176	.3815	22.270

Again, for consistency and to enable comparison of the models and equation, Figure 4.4 is offered of the second ethnicity-controlled model.

The prediction equation for this model, where ethnicity is forced into the ninth position, is as follows:

Predictive equation of high-risk borrowers with ethnicity in the ninth position = -.152 * (grade point average at exit) + .028 * (age at time of survey) + -.244 * (bachelor's degree) + .136 (Arts & Sciences) + .284 * (last grade--level 1) + .00002 * (multiple other loan amounts) + .162 * (last grade--level 2) + -3.178 * (family income) + .154 * (ethnicity) + .018.

To summarize Research Question 2a relative to the true contributed value of ethnicity, the following finding is offered:
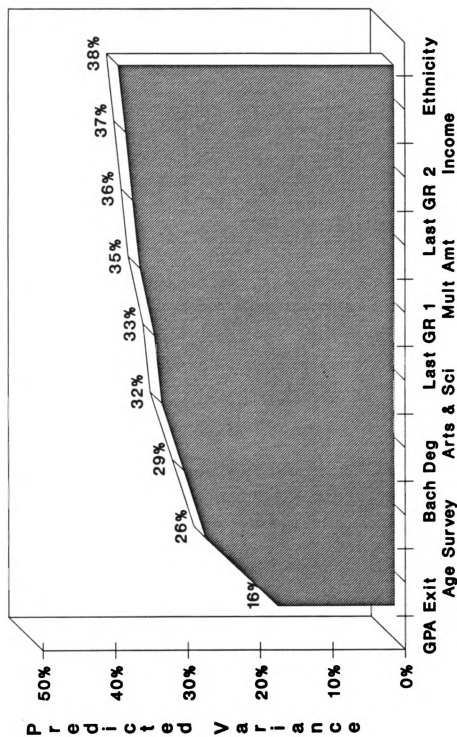
Figure 4.4: Prediction of high-risk borrowers with ethnicity in the ninth position.

Ethnicity, when controlled through two different methods, removed from the prediction equation or forced to the ninth position, was found to have a trivial contributive value to the prediction of the propensity to default. The null hypothesis was not rejected.

Research Question 3

How accurate is a prediction equation in identifying those who default on loan repayment?

Hypothesis 3: There are no accurate prediction equations identifying those who default on Stafford student loans.

The one-third verification subsample was used to test the three models developed for accuracy: (a) the primary model using all significant variables, (b) a secondary model using only front-end variables, and (c) a model controlling ethnicity as a variable. The default equations developed through the stepwise multiple regression were used to test the accuracy of the model. Thus, three values, one for each model, were created through the use of the equations. The risk coefficient was developed with a value that ranged from 0 = loan repayment and as the propensity to default increased, to 1 = default. For each subject, propensity-to-default values were created, based on the variables present. The subject's value was computed, based on the equation predicting his/her propensity to default. The subject's risk-predictor value was compared to his/her actual status as a repayer or defaulter to determine the accuracy of the equation. The findings of this analysis are presented in Table 4.17.

Table 4.17.--Relationship of the risk coefficient to the percentage of borrowers actually in default in the validation sample.

Risk Coefficient	MODEL 1 All Signif. Variables		MODEL 2 All Variables Excl. Ethnicity		MODEL 3 Front-End Variables	
	Total N	% Default	Total N	% Default	Total N	% Default
.90-High	14	85.7	12	83.3	7	85.7
.80-.89	10	90.0	13	92.3	5	40.0
.70-.79	14	71.4	13	61.5	9	66.7
.60-.69	16	62.5	17	82.4	19	57.9
.50-.59	19	73.7	16	56.3	39	64.1
.40-.49	19	68.4	20	65.0	47	51.1
.30-.39	21	33.3	23	43.5	18	38.9
.20-.29	19	21.1	21	14.3	15	26.7
.10-.19	21	14.3	15	20.0	6	0.0
Low-.09	16	25.0	19	21.1	4	25.0

Goodness-of-fit test:

Chi-square	23.72		23.70		9.13	
df	9		9		7	
Probability	p < .01		p < .01		p > .05	

As the findings presented in Table 4.17 are reviewed, the following should be noted:

1. Models 1 and 2, when tested, were found to be reasonably accurate predictors, with chi-square values of 23.72 and 23.70.

2. In comparing Model 1, which uses all significant variables, to Model 2, which is controlled for ethnicity, little difference is observable. The chi-square goodness-of-fit test in Model 1 is 23.72 and in Model 2 it is 23.70, reaffirming the insignificance of ethnicity.

3. Model 3, using only front-end variables, was found to be an invalid model, achieving a goodness-of-fit chi-square value of 9.13.

4. Valid Models 1 (all variables) and 2 (controlled for ethnicity) exhibited plateaus of accuracy. These are clearly observable in Figures 4.5 and 4.6. In Model 1, using all variables, subjects with low default-risk coefficients, between 0 and .39, actually repaid between 75% and 87.7% of the time and actually defaulted 14.3% to 25% of the time. Subjects with risk coefficients between .40 and .79 drew default levels of 62.5% to 73.7%. Subjects with a predicted high risk of default, coefficients between .80 and 1.0, defaulted between 85.7% and 90.0% of the time.

5. In Model 2, the predicted low risk coefficient of 0 to .29 drew actual default levels of from 14.3% to 21.1%, suggesting that between 85.7% and 78.9% with low predicted risk coefficients repayed. Risk coefficients ranging from .30 to .79 drew actual default levels of 43.5% to 82.4%. High risk coefficients of .80 to 1.0 actually defaulted between 83.3% and 92.3% of the time. Again, Model 2 formed three levels of accuracy with some less distinct lines to the mid-range.

6. The inconsistency of predictive ability is observable in Figure 4.7 relative to Model 3, using only front-end variables.

The null hypothesis was rejected. Two models tested found there to be, through the chi-square goodness-of-fit test, a relationship between the risk coefficient prediction and actual default behavior. This relationship was valid at the $p < .01$

Figure 4.5: Relationship of risk coefficient 1 to the percentage of borrowers actually in default in the validation sample. (Risk coefficient 1 uses all significant variables.)

Figure 4.6: Relationship of risk coefficient 2 to the percentage of borrowers actually in default in the validation sample. (Risk coefficient 2 uses all variables-- ethnicity excluded.)
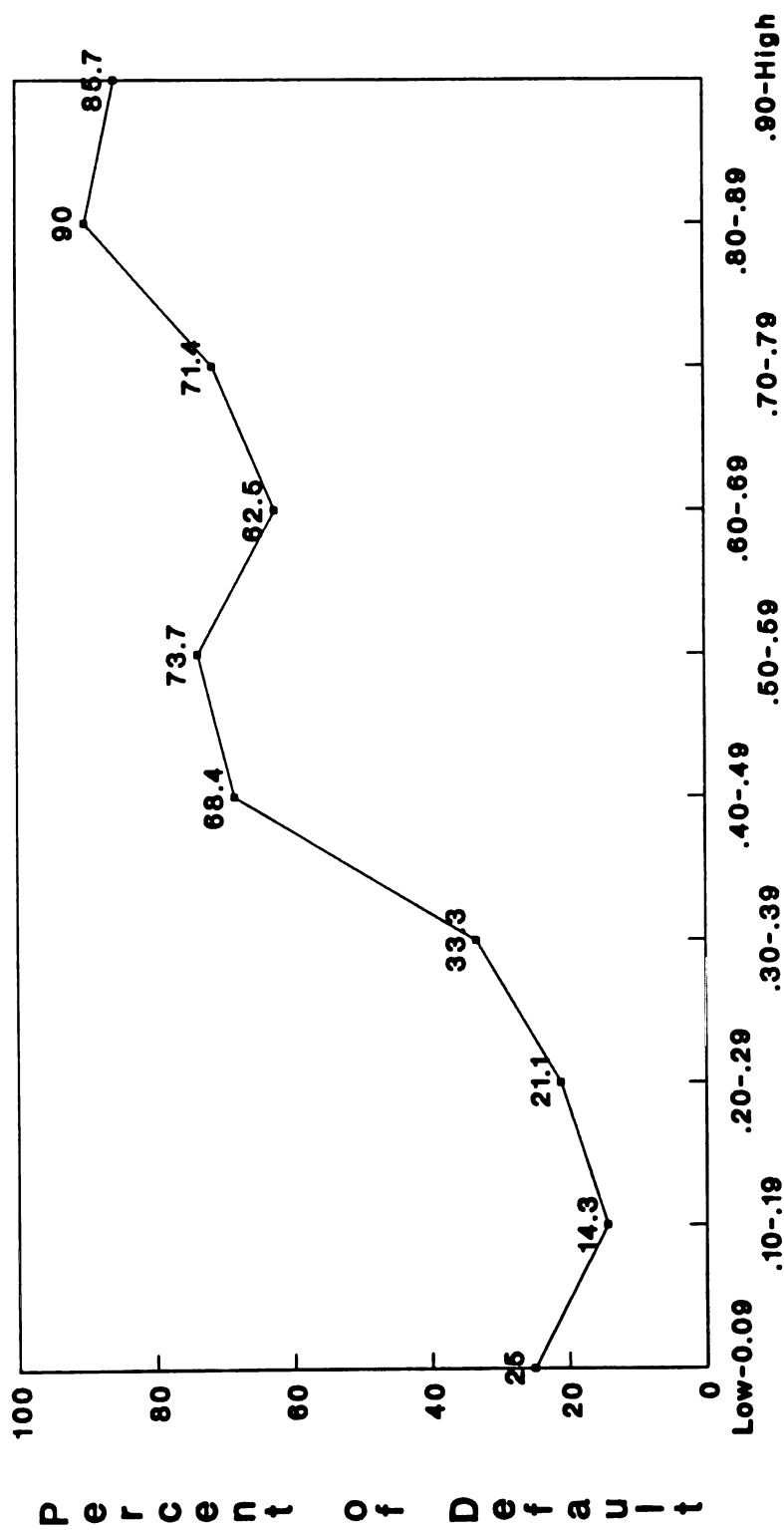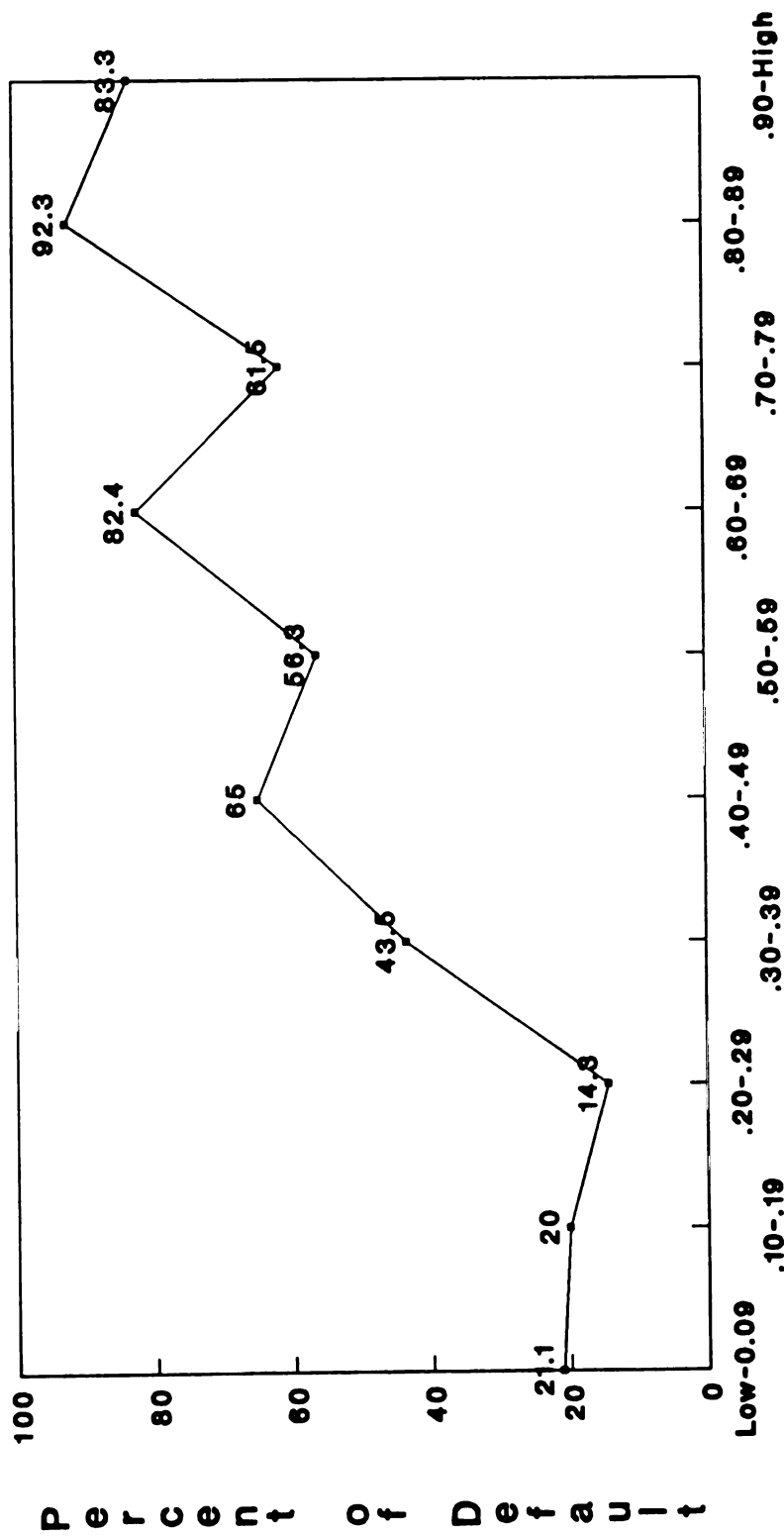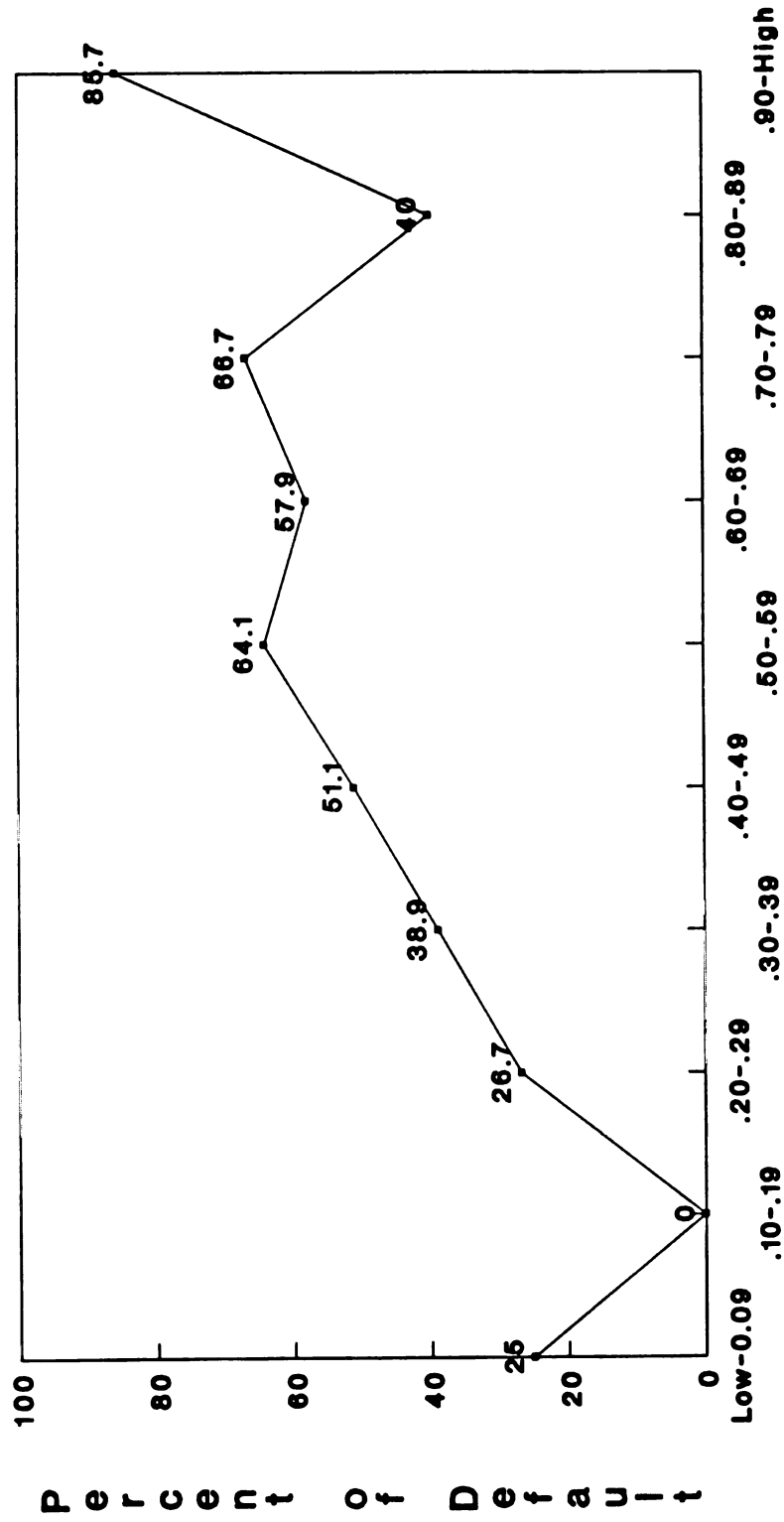
Figure 4.7: Relationship of risk coefficient 3 to the percentage of borrowers actually in default in the validation sample. (Risk coefficient 3 uses front-end variables.)

significance level. It should be noted, however, that the analysis revealed distinct plateaus of accuracy, which should be carefully considered before using the models for prediction purposes.

In the case of the third risk coefficient developed using front-end variables only, the chi-square values exceeded the critical value in the goodness-of-fit test at the $p < .05$ significance level. Thus, this model is not valid as a predictor of the propensity to default.

CHAPTER V

SUMMARY, CONCLUSIONS, OBSERVATIONS AND REFLECTIONS,

AND IMPLICATIONS FOR FUTURE RESEARCH

This chapter contains a brief summary of the study and the findings it produced. Conclusions and recommendations are made, based on these findings. Various observations and reflections are shared as the ramifications of the findings and conclusions are considered.

The primary purpose of the study was to examine the relationship of selected student borrower characteristics to the propensity to default on Stafford guaranteed student loans. The viability of an institutional model of default risk analysis was explored, using those selected characteristics found to have a relationship to default.

Summary

The Stafford student loan program is the principal source of student financial aid today. It represents 44.5% of all financial aid distributed for the purpose of assisting students with meeting basic educational costs (College Board, 1989).

In 1988-89, more than $9.1 billion in Stafford student loans was borrowed by students in postsecondary education. Borrowing has

been on the increase since the origin of the Stafford GSL program and today has reached unprecedented levels. As loan volumes have risen, so have default costs. The 1989 default costs were reported by the U.S. Department of Education at $1.8 billion and are projected to exceed $2.0 billion in 1990. Stafford student loan default has become a major government fiscal issue, a major institutional issue for colleges and universities across the country, and a fundamental student-access issue.

It is apparent by the size of the dollars at risk alone, on a national level, that Stafford loan default is of serious concern. Moreover, as the public concern relative to governmental efficiency persists, public pressure mounts to bring some level of resolution to the issue of Stafford student loan default.

On June 5, 1989, the U.S. Department of Education published regulations that codified the institution's role in Stafford student loan default. Federal regulation 34 CRF, parts 668 and 682 of the General Provision regulations, authorized limitation, suspension, and termination provisions for schools with excessively high default rates. Further, it required the implementation of new strategies to arrest and reduce institutional default levels. According to the U.S. Department of Education, in 1990, 1,118 colleges and universities have a default rate in excess of 20% and are thereby required to submit default-management plans as a condition of continued participation in federal financial aid programs. An additional 434 colleges will be limited in or terminated from their participation in federal student aid programs based on default rates

in excess of 40% (U.S. Department of Education, 1990). As these and other institutions deal with the issue of default, a need is evident for information that can provide, with reasonable surety, insight into methods that will be successful at lowering institutional default rates. As institutions consider alternatives, the fundamental issue of student access must be of paramount concern.

Can default levels be successfully curtailed without inhibiting a needy student's access to higher education? A number of opinions, recommendations, and positions recently have been expressed on this issue. The timing of the examination of this issue is particularly relevant, in that the federal government is on the verge of reauthorizing the existing student aid programs. During the federal reauthorization process of Title IV funds, information is solicited, problems reviewed, and program revision considered. Recommendations under review for the Stafford loan program range from minor revision to total program reform.

Altering the largest single program funding students in higher education today must be taken very seriously. There are widespread implications for a far-reaching population of students, colleges, and universities. Change must be based on empirical evidence that there is a reasonable likelihood the desired effect, in this case default reduction, will be achieved. Many aspects of the student loan default issue require further study before the value of recommendations for change can be accurately assessed.

A knowledge of the differences between repayers and defaulters and the exploration of the validity and reliability of default risk

prediction is one such aspect. Examining the viability of prediction of the propensity to default is an initial step in the discussion of default prevention.

This study was designed and performed to answer questions regarding the relationship of selected student characteristics to default and the ability to predict with reasonable accuracy the propensity to default.

The study was performed at Ferris State University on a stratified random sample of 504 Stafford loan borrowers whose loans matured between 1987 and 1988. The sample examined consisted of equal groups of repayers and defaulters. The study design was an ex post facto collection of student data through a survey of academic and student financial aid records. The literature was reviewed to ascertain which selected student characteristics had been found in previous research to have a relationship to default. This review resulted in the compilation and definition of those variables to be examined in the study.

Three research questions were developed to probe the issue of default relationship and prediction. Considered first in the study was what characteristics of student Stafford GSL borrowers are indicative of the propensity to default. ANOVA and chi-square tests were performed for each variable examined. Twenty-five variables were tested, of which eight were demographic in nature, nine were related to the subjects' academic performance and attendance, and eight were related to the subjects' acquisition of student financial aid.

The findings revealed, in examinations performed on a univariate level, significant differences between defaulters and repayers in terms of their age, ethnicity, family income, last grade level completed, program of study, whether students completed their degree program, the highest degree level completed, enrollment load carried, freshman grade point average, grade point average at exit, ACT scores, and the dollar level of student loans other than Stafford.

The defaulter was found to be an older student, on the average, with a mean age of 26.1, as compared to a mean age of 24.7 for the repayer. The defaulter's family income was substantially below that of the repayer at $10,200 per year, as compared to $16,055 annual income for the repayer--a difference of $5,855. Twenty-six and three-tenths percent of the defaulter group was minority students, comprised of African Americans, Latinos, and Native Americans, as compared to 9.6% of the repayers. The defaulters completed fewer years of study on the average than the repayers. The highest grade level completed for 24.7% of the defaulters was freshman year; 27.5% completed the sophomore year as their highest grade level, 15.3% the junior year, and 31.5% completed four years or more. The trend was distinctly different for the repayers. Sixty-five and two-tenths percent completed four years or more of study, 18.5% completed three years, 12.4% completed two years, and only 2.8% exited after their freshman year. Upon further analysis of highest grade level completed, the findings revealed that students with a higher risk of

default are those who have completed two years or less of their program of study.

Suggested from the inverse relationship between number of years completed in the subject's program of study and the propensity to default is the relationship between failure to complete a degree and the risk of default. The findings substantiated that a higher percentage of the defaulter group have not completed a degree program or completed a lower level of degree than did the repayers. Forty-five percent of the repayers completed a bachelor's degree or higher, as compared to only 15.7% of the defaulters. Nineteen and three-tenths percent of the repayers had completed an associate's degree, whereas 16.9% of the defaulters had completed the same degree. Thirty-five and seven-tenths of the repayers were unable to achieve any degree at Ferris, as compared to 67.5% of the defaulters. More of the repayers, 96%, had attended college predominantly on a full-time basis, as compared to 89.4% of the defaulters.

The two groups varied in type of academic program of study they were pursuing. The two most significant differences were in the number of students who majored in programs of study in Arts and Sciences and Technology. In both cases there was a higher percentage of students among the defaulter group. Thirty-four and nine-tenths percent of the defaulters majored in Arts and Science programs of study, as compared to 18.5% of the repayers. Twenty-five and nine-tenths percent of the defaulters majored in Technology, as compared to 23.3% of the repayers.

Academic achievement indicators, including freshman-year grade point average, cumulative grade point average, and ACT score, were significantly lower for the defaulters. Defaulters achieved a mean freshman year grade point average of 2.02, as compared to 2.62 for repayers. Cumulative grade point average at exit from college was at a mean of 1.95 for defaulters and 2.68 for repayers. Further, the mean grade point average for repayers increased from entry to exit, whereas for the defaulters it decreased, reflecting a decline in academic performance. The mean ACT score upon entry to college was 15.84 for the repayers as compared to 13.49 for the defaulters, showing a pattern of lower academic performance.

The only variable related to the students' acquisition of financial aid present at significantly different levels for defaulters and repayers was the amount of the students' loan debt beyond their Stafford loan. Defaulters had an average debt of $4,715.53 above and beyond their Stafford borrowing through other student loan mechanisms, as compared to $5,408.79 for the repayers. The difference may be a factor in the defaulters' shorter enrollment pattern; however, it is not possible to be certain without an annual analysis of debt level. In this study, the consideration of debt was limited to cumulative debt.

The strongest group of variables found to have a relationship to default was academic in nature. Eight of the 12 academic-performance indicators and attendance-pattern variables tested as significant on a univariate level. Three of the remaining

significant variables were demographic in nature, and one was related to the student's level of financial aid.

The second research question reexamined those 12 variables found to be significant on a univariate level through a multiple regression analysis to determine what set of characteristics was most effective at predicting high-risk borrowing. The analysis resulted in the creation of nine steps, which contributed to the predicted variance. The subject's cumulative grade point average at exit was the first and strongest contributor to the regression analysis; following in order of strength of predictive value were age, the subject's enrollment in an Arts and Science program of study, bachelor's degree or higher grade level, ethnicity, last grade level 1, multiple other loan amounts, last grade level 2, and family income. This analysis created an equation with the efficiency to predict 38% of the variance and a multiple R of .6176.

In the prediction equation resulting from the stepwise multiple regression, grade point average and income were negatively factored; thus, the lower the grade point average and income, the more likely the prediction of default. Failure to achieve a bachelor's degree also increased the likelihood of default.

Prediction equation of high-risk borrowers = -.152 * (GPA at exit) + .028 * (age at time of survey) + -.244 * (bachelor's degree) + .136 * (Arts & Sciences) + .154 * (ethnicity) + .284 * (last grade--level 1) + .00002 * (multiple other loan amount) + .161934 * (last grade--level 2) + -.000003 * (family income) + .018.

Two issues arose from development of the first prediction equation. Of the nine variables in the equation, six would not be known at the time the student enters college. This calls into question the potential utility of the risk-prediction model. Thus, the researcher conducted a second multiple regression using only those variables known at the beginning of the college experience, to investigate the strength of a front-end prediction equation.

The following prediction equation was developed as a result of the regression analysis of the front-end variables:

Front-end prediction equation of high-risk borrowers = -.020 * (ACT scores) + .223 * (Arts & Sciences) + -.000006 * (family income) + -.214 * (enrollment load) + .155 * (ethnicity) + .137 * (Technology) + .954)

This equation has a significantly lower predictive efficiency than that of the former risk-prediction model, with a multiple R of .4364 and a predicted variance of .1904.

Both models were tested through the use of a chi-square goodness-of-fit test on an independent subsample to determine their level of accuracy. Again, the model created through the use of all significant variables was found to be reasonably accurate at the $p < .01$ level. The front-end model, when tested for accuracy, was found to be an invalid model at a probability greater than .05. Therefore, although the researcher concluded that prediction of default is possible with a reasonable level of accuracy, it was further concluded that the prediction of default risk is not possible at the beginning of the college experience.

A review of the findings and conclusions also called to question the issue of ethnicity as a predictive variable for high-risk borrowing. Ethnicity presented in the fifth position in both of the regression analyses performed using all significant variables and using front-end variables. The researcher controlled for ethnicity through two methods to further examine ethnicity's true contribution to the prediction equation.

Ethnicity was controlled by removing it from the prediction model and observing the loss of predictive efficiency of the controlled model as compared to the uncontrolled model. When ethnicity was controlled, ACT score moved into the multiple regression model as the new ninth step, and each of the variables from fifth position, where ethnicity presented, moved up a step. The model's overall predictive efficiency was reduced by only .5%. Thus, to assure the validity of the analysis, the researcher created, through an alternate method, a second ethnicity-controlled model. In the second ethnicity-controlled regression, ethnicity was considered last in the regression by forcing it into the ninth step, thereby preventing the drawing in of any new variable that might skew the findings. In this analysis the change in the contribution of ethnicity specifically to predicted variance was observed. The reduction of ethnicity's contribution to predicted variance was from 1.8% to 1.2%. In conclusion, when all variables are equal, it was found that ethnicity's contribution to the prediction of high-risk borrowing was trivial.

Conclusions

What can be concluded from the study findings? Prediction of the propensity to default can be accomplished with reasonable accuracy and reliability. This occurs somewhere along the student's educational continuum when enough academic performance and pattern of attendance variables are apparent and are considered in concert with key demographic factors. It would be reasonable to assume that as the student proceeds from entry into college, where accurate prediction is not possible, through his/her period of study, the ability to predict default risk increases. Although outside the scope of this study, it would be useful to analyze the prediction of risk at various points throughout the student's period of study to ascertain whether the validity of prediction increases and at what point the prediction model becomes reasonably accurate. Clearly, the first and second years are critical in that, according to this and previous studies, many defaulters have exited college by the end of the first or second year.

Although default prediction cannot be accurately performed at the beginning of the student's college experience, using those factors considered in this study, it is apparent that there are some early indicators of the propensity to default. In the findings of this study, as well as in previous studies, freshman grade point average, family income, program of study, and enrollment load have consistently exhibited a relationship to the propensity to default. These factors could be used as early indicators or warnings to suggest intervention.

Conclusions can also be drawn from this study regarding the true relationship between ethnicity and the propensity to default. The findings support the conclusion that ethnicity is masking other socioeconomic variables in the prediction equation. For example, national and state demographic studies have revealed that the mean income for minorities is lower than that of majority families. This study revealed, and is consistent with previous studies, that family income has a relationship to propensity to default. Thus, lower family income and other variables presenting more frequently in minority students are more true in their association with default than is ethnicity itself. In conclusion, a majority borrower and a minority borrower with all socioeconomic and academic indicators equal will have virtually the same risk of default on Stafford student loans.

Observations and Discussion

The researcher used the occasion at the National Association of Student Financial Aid Administrators Annual Conference in July 1990 to review the study findings and discuss possible implications with a diverse group of financial aid professionals. This exercise assisted in validating some thoughts and observations for the purpose of discussion.

First, there appears to be a clear role for colleges and universities in default prevention. This role is defined on the basis of legislative mandate, but there is evidence of its necessity, suggested by the fact that colleges and universities are

privy to useful information in default prediction to which other program officials, such as lenders or guarantors, are not privy. This information includes student academic performance indicators, patterns of attendance information, and key demographic variables, which are instructive in the prediction of high-risk borrowing. A college may have the necessary information as well as the opportunity for intervention to lower the default risk level. This role in default prevention does not suggest a sole responsibility, but rather a supplement to default-reduction activities by lenders and guarantors.

At what point(s) might institutional intervention be most beneficial in lowering the risk of default? Currently, legislation suggests the points of necessary intervention are at the beginning of the educational experience, with a mandated entrance interview, and when the student exits the college, with a mandatory exit interview. Although these may be valuable points of contact, it is reasonable to suggest that intervention is appropriate as academic performance deficiencies become evident. The critical periods are during the freshman and sophomore years, before the point at which the potential defaulters realize their high probability for premature exit from their programs of study.

What type of intervention is suggested by the study findings merits discussion. Because the preponderance of the critical variables are related to academic performance, program, or attendance patterns, it is reasonable to assume that, as these

variables become evident along the student's educational continuum, strategies to improve students' performance or stabilize their enrollment pattern may be most effective in lowering risk. Moreover, it is reasonable to assume that as the student moves toward a strengthened grade point average and an increased likelihood of completion of his/her academic program, the likelihood of loan repayment increases. Intervention at the university level may be most effective if strategies employed focused on improving the student's chances of success in his/her academic program.

In discussing this observation with college and university financial aid officers, there was wide support for this notion. Colleges with high institutional default levels that have met with success in default reduction have made serious attempts to analyze their student populations and have implemented, in addition to loan counseling and other legislatively mandated actions, programs of academic support, counseling, remediation, or options for academic program alternatives that facilitate degree completion.

Further discussion even called into question the value of mandating entrance and exit loan counseling as currently structured and suggested academic support as a strategy with a greater chance of success in arresting default. Although it is important that a student understand the conditions and responsibilities of the loan, it is also important that college attendance has improved their financial capability to deal with the debt. Useful strategies to reduce default levels suggest a universitywide commitment if they

are academic support in nature. The financial aid office alone may be unable to effect change.

A final observation meriting discussion is the advisability of using the prediction of the propensity to default as a criterion for inclusion in or exclusion from the Stafford loan program. Front-end prediction of default risk was not found to be a valid, reliable model in this study. Thus, this creates serious reservations regarding proposals that suggest using high-risk student characteristics as a criterion for denying a Stafford student loan. Such proposals have been suggested in both the financial aid and legislative arenas. The U.S. Department of Education reported that a number of schools in danger of being limited, suspended, or terminated from the federal student aid programs have suggested limiting their borrowing population upon entry to college to students with high academic performance indicators or students in more economically productive majors. Although certain characteristics may be indicators of risk, the study findings revealed that they are not reliable to predict default early in the educational process. Use of this information may be productive as a catalyst for the initiation of academic support to improve the student's chances of repayment. The limitation of students from the Stafford program based on their predicted risk of default would jeopardize student access for those who may have the ability to benefit from a higher education. Exclusion is contrary to the established goal of federal financial aid, which is to educate those who have the inclination and ability to pursue a higher education, regardless of

their ability to pay. Our strategies for default management should complement our goals for higher education, not work at cross-purposes.

Implications for Future Research

The complexity of the administrative and financial structure of the Stafford GSL program and the multiplicity of issues surrounding default strongly suggest the need for widespread study and analysis. Herein are suggested topics for further study related to the relationship of selected student characteristics to default and/or the plausibility and utility of a reasonably accurate risk-prediction model.

As an institutionally based study, the findings and conclusions are particularly relevant to Ferris State University, its students, and perhaps like institutions. However, the study design may be replicated to implement similar studies and a parallel analysis at other institutions. This may be useful both to the specific institutions using the tool as a means to analyze their unique environment and to design specific strategies for their population. Further, it may provide insight into the default issue in a more global level, testing the universality, applicability, and consistency of the findings.

A second implication for further study is to collect academic performance data and perform a similar analysis at various points throughout each subject's college education continuum. The findings revealed that the validity and reliability of the risk-prediction

model varied greatly when using data available at the beginning of the student's college education and data available upon a student's exit from college. It may prove insightful to analyze the question of various points and using a range of additional variables in terms to ascertain when reasonably accurate risk prediction is possible. This may suggest an optimum point of intervention.

Finally, this study explored the ability to predict risk when specific information is known about the student. Clearly, further study which explores the effectiveness of strategies employed to lower the risk of default is an appropriate next step. Some thoughts were discussed regarding effective default management. A study that provides empirical data on the effectiveness or lack thereof of specific default-management strategies would be extremely useful. This type of study may lend itself to a controlled experiment in which a group of students identified as high risk through reasonably accurate prediction methods is divided into an experimental and a control group. Specific default-reduction activities could be employed on the experimental group and their effectiveness assessed. Results would assist in identifying effective default-management strategies.

APPENDIX

Propensity to Default Survey

Serial Number_____
Repayment Status: Repayment____   Default_____

When the Loan(s) Mature:_____
Name_____   Social Security # _____
Repayment/Default Date_____   Borrowing Years_____

Ethnicity: White____   Black____   Hispanic____   Asian____
            Native American____   Unknown_____

Gender: Male____   Female____

Age: At time of application_____
      At time of survey_____

Last Grade Level: 1st____   2nd____   3rd____   4th____   5&^____

Program of Study: Technology____   Business____   Arts & Sciences___
                   Allied Health____   Health Professions___

GPA: As freshman   __.__ __
          At exit   __.__ __
ACT Composite Score: _____

Graduated_____   No degree completed_____

Highest Degree Achieved: No degree_____
                            Associate_____
                            Bachelor_____

Enrollment Status: < 1/2____   1/2____   3/4____   FT____

Number of Curriculum Changes:_____

Student Status: Dependent_____   Independent_____

Family Size: _____
Marital Status: Single____   Married____
Income: _____

Aid Offered: Gifts: Yes____   No____
                Cumulative Gift Aid_____

                Work: Yes____   No____
                If yes: Accepted? Yes____   No____

                Loan: Total GSL Debt Level_____

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More Than One Guarantor: Yes____   No____
    Multiple Loans: Yes____   No____
    Amount: _____
               Include: NDSL, SLS, HPT, Nursing, Other

Date of Survey:_____

Sample Assignment: Test_____
                    Validate_____

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