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Student Loan Debt: Exploring the Economic Influences on Federal Student Loan Default for Students that Attended Public, Two-Year Institutions

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STUDENT LOAN DEBT:
EXPLORING THE ECONOMIC INFLUENCES ON FEDERAL STUDENT LOAN DEFAULT FOR STUDENTS THAT ATTENDED PUBLIC, TWO-YEAR INSTITUTIONS

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Education
at the University of Kentucky

By
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2024

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ABSTRACT OF DISSERTATION

STUDENT LOAN DEBT:
EXPLORING THE ECONOMIC INFLUENCES ON FEDERAL STUDENT LOAN DEFAULT FOR STUDENTS THAT ATTENDED PUBLIC, TWO-YEAR INSTITUTIONS

Over the past 30 years, a shift occurred in higher education that saw more of the burden for paying for postsecondary education placed on students. Combined with rising tuition and fees, this has led students to take on increasing amounts of student debt. Despite the historic rise in student loans, surprisingly little attention has focused on those students who default on their student loans. Additionally, the academic literature on student loans has predominately focused on traditional students at four-year institutions, despite the fact that nearly half of all undergraduates attend public two-year institutions. Finally, those studies that include economic factors as predictors of federal student loan default tend to use state-wide measures, such as the state unemployment rate. However, public two-year institutions are closely coupled to their local communities, so local labor market variables may be better predictors than state-wide variables.

KEYWORDS: Student Loan Default, Student Loans, Cohort Default Rate, CDR, Two-Year Institutions

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DEDICATION

For Kathryn & Maddie

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CHAPTER ONE

Do employment outcomes matter as they relate to student loan default? More specifically, is a student who earns a short-term certificate more likely to default on their student loans than students earning diplomas or associate degrees? Additionally, how do domestic labor markets impact the likelihood of default? Given the recent rise in student loan debt, and the potential consequences of default, these are critical questions facing all stakeholders, from student borrowers to school administrators, and eventually national policymakers. Additionally, as discussed in greater depth later on in this dissertation, there is a lack of research to guide community colleges on managing their federal student loan cohort default rate, despite enrolling nearly a third of the undergraduate population. This study addresses these questions and shortcomings using data derived from the Kentucky Community and Technical College System.

Public community colleges occupy a unique space in American postsecondary education, including in Kentucky. Originally tasked with providing the first two years of coursework towards a baccalaureate degree, their missions have expanded considerably over the years (Hanson, 2010). Remedial education for underprepared students, career and technical education, and workforce development have all become part of the broad mission of modern community and technical colleges. Another feature of these institutions, which differentiates them from their four-year peers, is that most are open access; unlike four-year institutions that have admissions criteria, two-year colleges enroll any student who wishes to do so, regardless of past educational experiences or qualifications. In addition to having broad missions and being open-access, public community colleges offer the most affordable path in American higher education; in-

district tuition for a community college in 2015–16 was about a third of the in-state tuition at a four-year institution (Ma et al., 2017). As their name implies, community colleges serve much smaller geographic areas than their four-year counterparts. For example, in Kentucky nearly 95% of residents live within a 30-minute drive of a campus of one of these colleges.

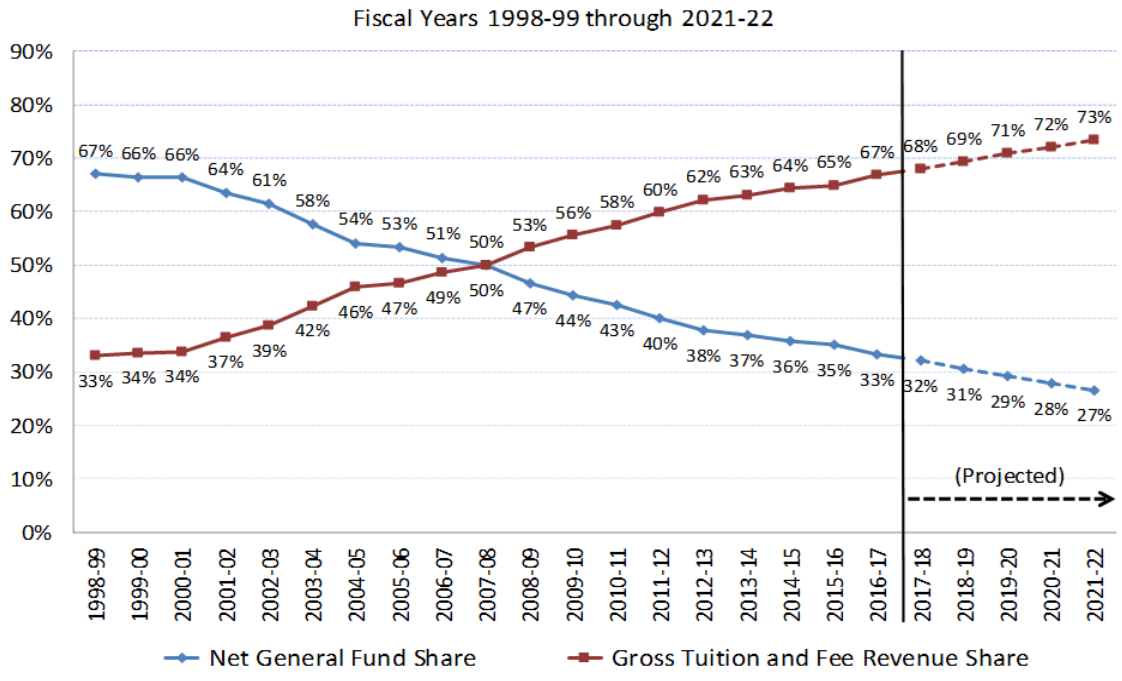
These factors may help explain why nearly 8.5 million students enrolled at a public, two-year postsecondary institution during the 2017–18 academic year, which represented 32% of the total undergraduate population for that period. However, a shift occurred within public higher education over the past several decades as state support of postsecondary education decreased. According to the Center on Budget and Policy Priorities, overall state funding for both two- and four-year public higher education institutions was $6.6 billion lower in 2018 than it was a decade before, after adjusting for inflation. Faced with declining state support, postsecondary institutions—including community colleges—raised tuition in order to offset the losses in state revenue, thus shifting the burden of paying for a postsecondary education from the public to the individual (Mitchell et al., 2019). Figure 1 shows how the public share of the total postsecondary funding in Kentucky shifted from 67% in 1998–99 to 33% in 2016–17. This shift led to a dramatic rise in student borrowing over that timeframe, as students sought to cover the increasing cost of their postsecondary education.

Over a 20-year span, from academic year 1993–94 to 2013–14, the number of student borrowers for both subsidized and unsubsidized student loans more than doubled, from 4.1 million to 9.3 million (Bastedo et al., 2016). In the decade that lapsed between academic year 2006–07 to 2016–17, federal loans grew 31% (Baum et al., 2017).

According to the Federal Reserve Bank (2017), students borrowed $119.9 billion, adjusted for inflation, in federal education loans during the 2016–17 academic year alone. While this is a drop from the peak of $ 153.8 billion, again adjusted for inflation, a few years earlier, total outstanding student debt at the end of 2017 was $1.72 trillion adjusted for inflation, second only to mortgage debt, and accounted for 10% of all outstanding debt. Due to this dramatic rise in student loan debt, along with the fact that federal student loans are tax dollars, policy makers have become increasingly concerned in recent years about defaulting on federal student loans.

Figure 1

Kentucky Public Postsecondary System: Change in State and Student Shares of Total Public Funds



Note. Adapted from "Program Review and Investigations Committee," by A. Thompson, 2018, [PowerPoint slides]. https://cpe.ky.gov/news/presentations/110818-affordability-tuition.pdf

Another concern for policy makers is that students at public, two-year institutions who take out federal student loans default on those loans at higher rates than students at other institutions do. According to the most recent cohort default rate data, the metric calculated by the U.S. Department of Education to monitor student loan default at institutions participating in the Title IV programs, 18.3% of students at two-year institutions who took out federal student loans and entered repayment in fiscal year 2014 entered default by fiscal year 2017 (U.S. Department of Education, 2017c). Title IV Federal Student Aid Programs refers to the financial aid programs for postsecondary students which were originally authorized under Title IV of the Higher Education Act of 1965. Nationally, 11.5% of all student borrowers at all levels of postsecondary institutions for that cohort defaulted over the same timeframe, compared to only 7.5% of student borrowers at public four-year institutions who defaulted.

Defaulting on these federal student loans has serious consequences for both students and the institution according to the U.S. Department of Education (2017b). For example, loans that enter default could have outstanding interest capitalized and collection fees added, which would increase the loan balance. Additionally, the defaulted loans are reported to the credit bureaus, which could cause long-term damage to the student borrower's credit score, impairing their ability to secure a mortgage or car loan in the future (U.S. Department of Education, 2017b). Furthermore, student borrowers may have their wages lowered via garnishment and/or federal income tax refunds seized. Finally, a student who defaulted on their student loans would be ineligible for additional federal student aid while the loan is in default. Institutions, meanwhile, could be prevented from participating in federal student aid programs, a critical source of revenue

for many institutions; in 2014–15, 73% of students at public two-year institutions received some form of federal aid. The consequences of not being able to access Title IV funding do not only damage the institution and the communities it serves, however; they also prevent students from accessing additional federal financial aid, including Pell grants—a critical source of aid for many community college students (Wiederspan, 2016).

Because of the potential costs to borrowers, institutions, and taxpayers, the U.S. Department of Education (2017a) has worked with institutions participating in Title IV programs to enact various default prevention measures. As detailed later, these prevention measures are meant to be "effective, easy-to-implement tools that reduce defaults, promote student and school success, help preserve the integrity of the loan programs, and reduce costs to taxpayers" (U.S. Department of Education, 2017b, p. 2). The preventative measures can vary by institution, but the Department of Education encourages activities such as entrance and exit counseling and monitoring satisfactory academic progress (U.S. Department of Education, 2017b).

With the increase in student loan debt, heightened attention has likewise focused on the financial outcomes of different academic programs or majors, given the stark differences in both the entry and median wages of different academic majors. Carnevale et al. (2015) found that over a lifetime, top-paying college majors earn $4.1 million, adjusted for inflation, more than the lowest-paying majors. Not surprisingly, the top-paying majors graduate from STEM (science, technology, engineering, and mathematics), health, and business tracks, which lead to average annual entry wages of $37,000, rising to an average annual wage of $65,000 over a lifetime. On the other end,

the majors with the lowest median incomes are early childhood education, human services and community organization, studio arts, social work, teacher education, visual and performing arts, theology and religious vocations, elementary education, drama and theater arts, and family and community service. All of these have median incomes ranging from $39,000 to $45,000.

This wide disparity in financial outcomes has led to questions regarding the value of some academic programs. Abel and Deitz (2014) noted that while the benefits of college still outweigh the costs for most, "not all college degrees are an equally good investment" (p. 2). They noted that during the period from 1970–2013, the average wage for someone with a high school diploma was $54,000 (in 2024 dollars)—more than someone who majored in one of the ten lowest-paying majors mentioned above. However, this focus solely on wage outcome may not tell the whole story, as noted by Whitfield et al. (2016):

> Wage and employment outcomes are key metrics for college graduates, but they are not exhaustive. With so much attention being paid to college completion in particular fields of study, the postsecondary policy community sometimes fails to acknowledge that students make choices about their college major, and these choices may lead to professions that are perceived to have high levels of societal value but yield low earnings. Early childhood education, social work, and (in many states) primary and secondary teaching fall into this category. (p. 55)

Thus, some students may be choosing to pursue postsecondary education in a field that will not yield significant financial outcomes in the form of higher wages, but that may be socially valuable. One factor that may play a role in students' decisions to enter lower-paying fields is demand.

According to the Kentucky Education and Labor Cabinet, of the twenty fastest-growing occupations within the Commonwealth requiring some postsecondary education,

but less than an associate degree, thirteen have an average annual wage less than $40,180 , which was the median wage for all occupations in Kentucky in 2023 (see Table 1).

However, because of the lack of research into student loan default, it is unclear whether students taking out federal student loans to get the necessary postsecondary education to enter these high-demand, but lower-wage occupations, are more likely to default than their peers entering high-wage occupations. These types of nuanced research questions concerning student loan debt are the types that policy makers need investigated so they can respond to them accordingly (Hillman & Orosz, 2017). Additionally, Hillman and Orosz (2017) pointed out that there is no "typical student loan" problem and that each situation calls for its own set of solutions.

Table 1

Twenty Fastest Growing Occupations Requiring Less Than an Associate Degree

SOC	Occupation	Percent change	Average annual wage
31-1014	Nursing Assistants	46.10%	$26,832
31-9097	Phlebotomists	35.83%	$29,141
29-2055	Surgical Technologists	32.22%	$39,458
31-9092	Medical Assistants	28.75%	$28,600
31-9011	Massage Therapists	28.55%	$37,315
29-2061	Licensed Practical Nurses	27.33%	$38,875
29-2071	Health Information Technicians	26.78%	$36,109
29-2041	Emergency Medical Technicians and Paramedics	26.50%	$29,994
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	24.80%	$41,475
15-1115	Computer User Support Specialists	23.31%	$43,181
29-9099	Healthcare Practitioners, All Other	23.14%	$52,291
31-9091	Dental Assistants	20.78%	$34,050
25-9041	Teacher Assistants	18.45%	--
49-2094	Electrical & Electronics Repairers, Commercial and Industrial Equipment	17.75%	$54,683
33-2011	Firefighters	17.50%	$33,342
39-5094	Skincare Specialists	17.39%	$29,848
39-5012	Hairdressers, Hairstylists, and Cosmetologists	16.22%	$25,168

Table 1 (Continued)

33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	15.28%	$51,605
49-2011	Computer, Automated Teller, and Office Machine Repairers	14.80%	$32,656
25-4081	Library Technicians	14.62%	$29,016

Note. SOC = Standard Occupational Codes.

Problem and Significance

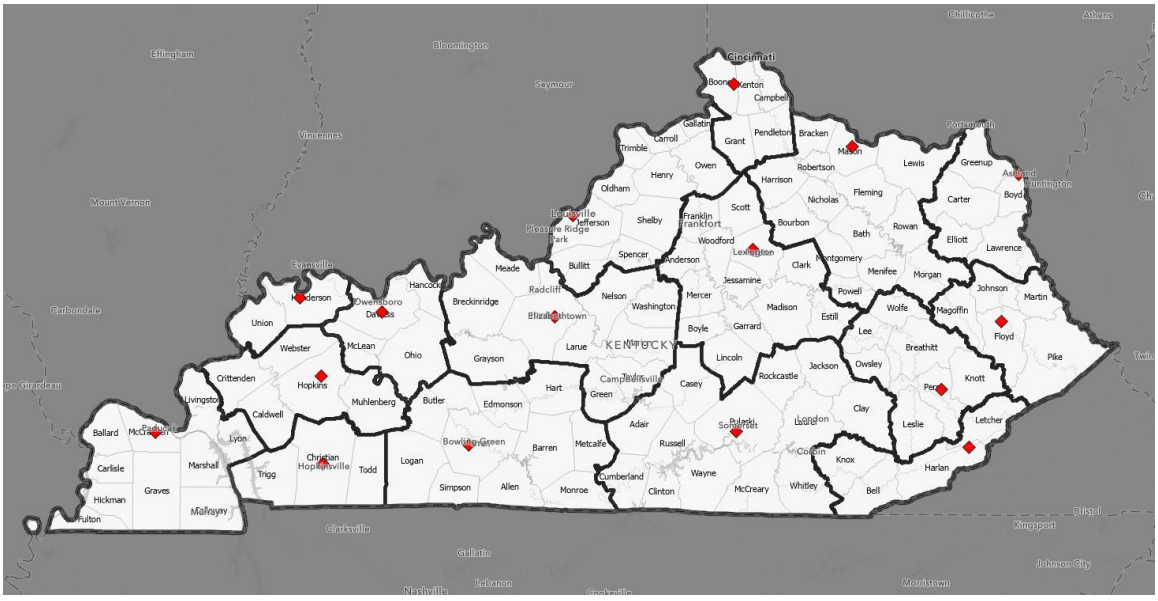
As discussed in the next chapter, most of the research on student loan default has focused on students attending traditional, residential four-year institutions. This body of research has largely focused on the individual demographic variables and institutional characteristics as predictors of default (Hillman, 2014; Webber & Rodgers, 2014). While being a student at a two-year institution is almost always shown to be a significant predictor of default, this may not be surprising. As noted earlier, two-year institutions are open-access and therefore serve a different population than four-year institutions. A study by the Program Review and Investigations Committee (2019) in Kentucky found significant differences between students enrolled in a public, two-year institution, and those enrolled in one of the state's public universities. The two-year students were more likely to be a first-generation student (55% vs. 33%), be academically underprepared for college coursework (53% vs. 14%), have children (34% vs. 8%), and have an income of less than $23,873 adjusted for inflation (35% vs. 18%). More research that focuses on two-year students is needed to better understand how variables like these influence student loan default.

Additionally, this study addressed the lack of labor market indicators that have been included in the existing literature on student loan default. While some economic

variables were included as predictors of default in the models, these have generally been at the state level with the most common variable being the statewide unemployment rate (Ishitani & McKitrick, 2016; Kelchen & Li, 2017). However, two-year institutions, such as community colleges, focus on serving much smaller geographical areas than most four-year institutions. While KCTCS does not divide the state into traditional service regions, they do divide the state into "enrollment clusters" as shown in Figure 2. These enrollment clusters are based on the KCTCS students from each county; whichever KCTCS institution that has the majority of the county's enrollment claims that county as part of their enrollment cluster. For example, if the majority of KCTCS students from Woodford County are attending Bluegrass Community and Technical College (BCTC), then Woodford County would be part of BCTC's enrollment cluster.

Figure 2

KCTCS 2023 Enrollment Clusters



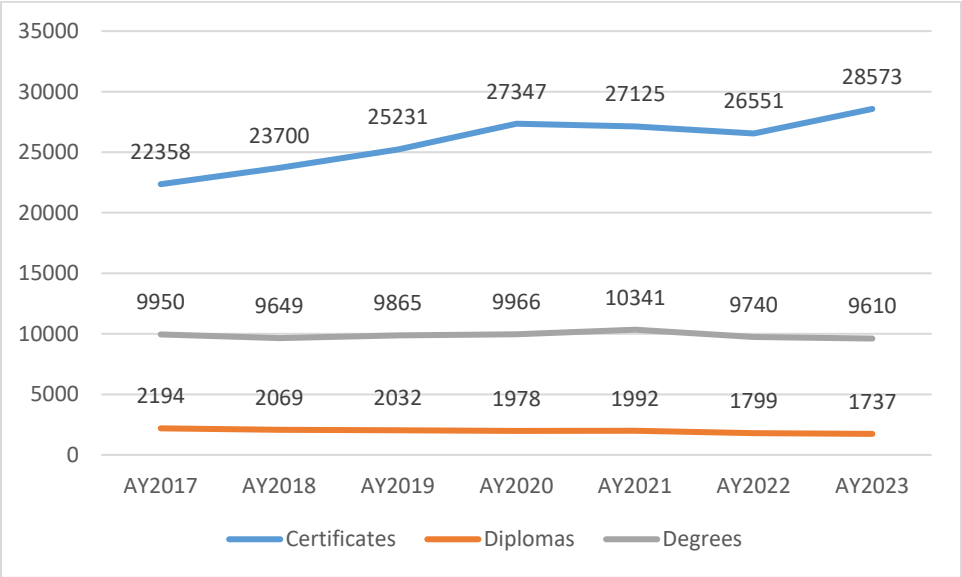
Note. Red diamonds show the main campus of the sixteen KCTCS colleges. Adapted from the Kentucky Education to Workforce GIS Application. https://orpa-gis.kctcs.edu/

In contrast to the sixteen community and technical colleges serving the one hundred and twenty counties of the commonwealth, there are six comprehensive universities and two research universities serving the same geographic area. Because of that, more nuanced labor market indicators from the local economy may be a better predictor of student loan default for two-year institutions than board, statewide ones.

Finally, because prior research has focused on students at four-year institutions, there is limited information on the differences between completers at two-year institutions that earned different credentials. This has important policy implications as the emphasis on credentials has grown in recent years. As shown in Table 2, the number of certificates awarded to KCTCS students from academic year 2016-17 to 2022-2023 increased 27.8%. Over that same period, however, the number of degrees and diplomas awarded decreased 20.8% and 3.4% respectively. It is unclear, however, whether all credentials are leading to the expected employment outcomes or if certificate earners are more at risk for defaulting on their student loans than other two-year completers.

Figure 3

Kentucky Community and Technical College System: Credentials Awarded 2016-17 to 2022-23



Note: Adapted from KCTCS factbook by the Office of Research & Policy Analysis, 2024. https://public.tableau.com/app/profile/orpa/viz/CredentialsGraduates/Title

Research Questions

This study aimed to answer three research questions:

RQ1: What does a model of student loan default for students at two-year institutions in Kentucky look like using predictors from the existing literature?

RQ2: How do regional labor market indicators affect student loan default?

RQ3: How does the credential (certificate, diploma, or degree) earned impact student loan default?

As noted earlier, research on student loan default has failed to include students at two-year public institutions. Therefore, an examination of the current state of default for students that attend two-year public institutions in Kentucky will provide a baseline for stakeholders. Similarly, labor market indicators have generally been left out of models

looking at predictors of loan default. The few studies that have included a metric have used the statewide unemployment rate. Given that public, two-year institutions are tightly coupled to their local communities, it is hypothesized that regional labor market indicators will be a better predictor of student loan default than the statewide unemployment rate. As noted later, there has been an increased focus on sub-associate level credentials in recent years as a way of getting more people postsecondary education. However, little research has focused on the whether students that earn these certificates are more likely to default than students that earn diplomas or degrees instead. With research showing a declining risk of student loan default with an increase in education, it is hypothesized that earning a certificate will increase the probability of default compared to earning a diploma or degree.

Summary of Methodology

To answer RQ1, an exploratory logistic regression was conducted using predictors identified in the literature review. Logistic regression models estimate the probability of a dichotomous event as a function of the independent variable; the outcome variable of interest in this study is dichotomous (a borrower either did or did not default on their federal student loan). As such, logistic regression analysis is the proper technique for examining the probability of a borrower experiencing one of the two outcomes (Cabrera, 1994). To answer RQ2, a logistic regression was conducted, adding regional labor market variables to the predictors. To answer RQ3, a logistic regression was conducted for those borrowers who completed a credential (certificate, diploma, or degree).

Educational Significance

As detailed in this chapter, and expanded on in Chapter 2, despite the high cost of student loan default, there is a lack of peer-reviewed research to guide efforts of various stakeholders in addressing the issue. Moreover, even though students at public two-year institutions make up a significant portion of the undergraduate population and default on Federal student loans at a higher rate than their peers at four-year institutions, they are underrepresented in the research literature on student loan default. Given the limited resources many postsecondary institutions face, two-year institutions would benefit from an expansion in the academic literature focused on their students, which could potentially inform loan default interventions.

Additionally, the inclusion of labor market indicators at a local level has not been adequately addressed in the literature. The current study addressed both of those areas; its results may push stakeholders to rethink the relationship between student loans, credentials, and employment outcomes. Institutions may need to provide additional financial counseling for students earning different credentials while policymakers may need to rethink the ways institutions are held accountable for former students who default on their student loans based on their local economic environment.

Theoretical Perspective/Conceptual Framework

Much of the research on student loan default relies on Becker's human capital theory as a theoretical framework (Greene, 1989). Human capital theory assumes that a student chooses to invest in higher education because the future financial gains outweigh the current direct and indirect costs (Becker, 1993). Direct costs include things like tuition, books, and fees while the indirect costs include lost wages from not working

(Volkwein & Szelest, 1995). This theory assumes that individuals considering pursing a postsecondary education have full knowledge of the economic environment; that is, someone thinking about pursing a given postsecondary credential has enough information to make an informed decision on the future return on investment. However, as discussed later, this may not always be the case. With short-term certificates in particular, it is unclear if they all provide meaningful entry points into the workforce.

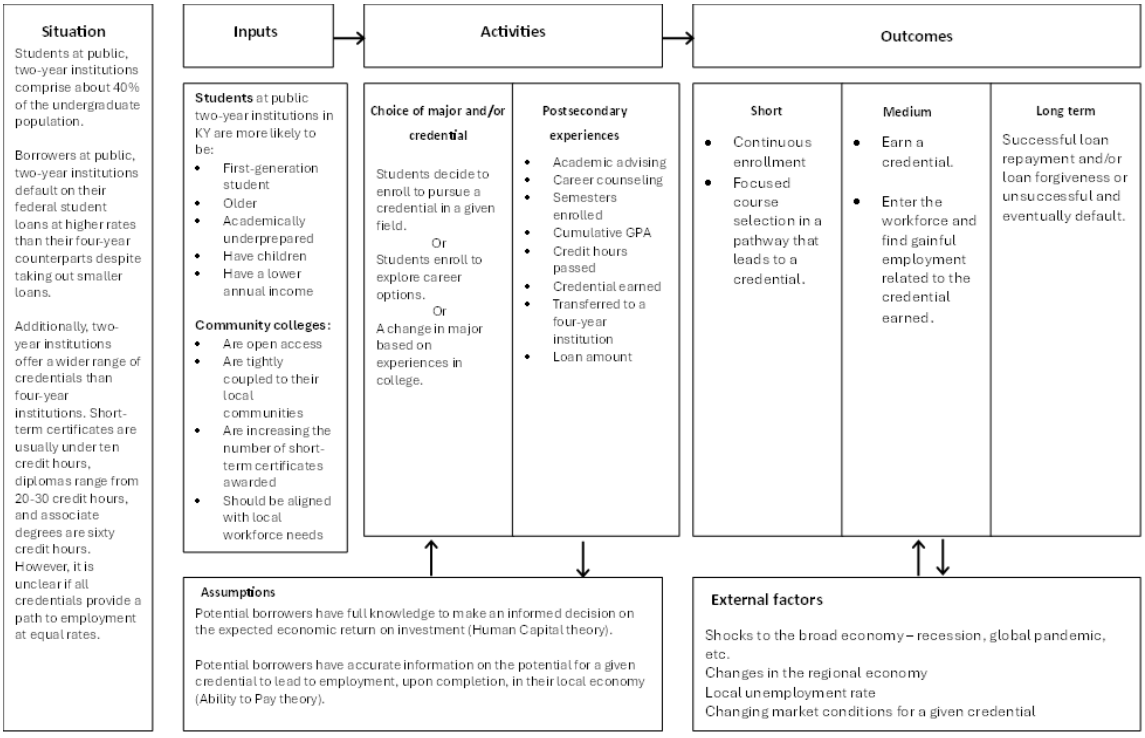
Another economic-based theory that has been used to understand student loan default is ability to pay. Unlike human capital theory, it addresses both making and collecting loans (Flint, 1997). The premise of the theory, as it relates to student loans, is that the first priority for borrowers in repayment is meeting essential needs (e.g., housing, food, clothing, transportation, etc.) before addressing other needs, including student loans (Wright et al., 2013). However, Flint (1997) noted that a major limitation to this theory was the inability to explain the high-income borrowers who could afford to repay their student loans but chose not to. Conversely, there were those borrowers who always repaid their loans, even when their income indicated they would be at risk of default. This potential limitation is highlighted by a split in the literature, where some authors (e.g., Christman, 2000; Hakim & Rashidian, 1995; Kelchen & Li, 2017; Volkwein & Szelest, 1995; Woo, 2002) have found that income was strongly related to student loan default, whereas others (Volkwein et al., 1998) did not.

One potential explanation for this seeming paradox is that employment may be more important than income in predicting loan default. Within the broader loan default literature on mortgages, credit cards, and auto loans, income is not viewed as a strong predictor of default (Agarwal & Liu, 2003; Gyourko & Tracy, 2014; Lopes, 2008).

Instead, there is a focus on "income shocks," such as job loss. Thus, the potential for gainful employment, not income, may be a more useful predictor of student loan default. For example, in a study on mortgage default, Gerardi et al. (2018) found that 80% of borrowers with seemingly very low ability to pay do not default on their loan. Specifically, those households that must cut spending to subsistence levels to remain current on their mortgage overwhelmingly do so. Additionally, Gyourko and Tracy's (2014) study of mortgage default found a significant relationship between regional unemployment rates and default when they controlled for attenuation bias in the regional unemployment rates. Thus, from an ability to pay perspective, we would expect to see no differences between different levels of credential earners, assuming all the credentials are leading to gainful employment. Finally, there is some anecdotal evidence, which suggested that students who choose certain low-wage occupations with a strong service component may have similar personality traits to borrowers who seemingly lack the resources to repay their loan, but so do anyway (Campbell, 2019; Hall, 2016).These theories helped to guide the study in a few ways. First, they provided a framework for understanding the motivations on why individuals decide to pursue postsecondary education, especially given the increasing cost of doing so in recent years. Next, they also helped me understand events that may contribute to future student loan defaults, which in turn helped inform both the research questions and the specific analyses related to them. The logic model presented in Figure 4 attempts shows how these theoretical perspectives integrate with other factors to potentially influence student loan default, and how the overall model influenced this project.

Figure 4

Logic model for student loan default



It is important to note that a number of assumptions are being made in the model. The first assumptions are around why a student chooses to enroll in a postsecondary institution. Next is the assumption they are either enrolling to pursue a given credential or are picking a major based on early college experiences. There are then assumptions around the academic advising and career counseling a student receives that, theoretically, are informing their choices while enrolled.

Conclusion

This chapter briefly covered the purpose and general outline of the current study. The following chapter is a review of the relevant literature, which explores a brief history of student loans in the United States and the metric used to monitor it, the literature

concerning the factors influencing loan default, as well as incorporates a review of different types of capital.

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CHAPTER TWO

A Brief History of Federal Student Loans

Following the Soviet launch of the satellite Sputnik, and the fear of Soviet technological superiority that ensued, Congress passed the National Defense Education Act of 1958 that included, for the first time, loans for students (Flemming, 1960; Gladieux, 1995; Looney & Yannelis, 2015). These initial student loans, as most that would follow, were low-interest but also included a provision for debt cancellation for students who became teachers. Prior to this, the federal government provided limited financial assistance to students except for special populations, such as veterans. To compensate for this lack, state governments subsidized public institutions in order to hold down tuition costs, and it was the responsibility of students and their families to pay for their postsecondary education (Mumper, 1993). Not surprisingly, Gladieux (1995) noted that both scholarships and need-based grants were still considered "beyond the pale" (p. 2) at the time the National Defense Education Act passed. Just seven years later, however, the Higher Education Act (HEA) of 1965 ushered in a new era in student financial aid, one that would initially rely heavily on grant aid while also setting the stage for the expansion of student loans previously mentioned.

Passed in the midst of the social upheaval of the 1960s, the HEA established the new role of promoting equal opportunity for the federal government, including removing financial barriers to pursuing postsecondary education, as part of President Johnson's Great Society program (Keppel, 1987; Mumper et al., 2016). The HEA was comprised of eight parts or titles, the majority of which focused not on individual students and their needs, but rather on institutions and their needs. Title IV, however, created a three-

pronged approach to providing federal student aid comprised of grants, loans, and work-study plans, whose framework persists to this day (Green, 2005; Keppel, 1987; Mumper et al., 2016).

The priorities of the Act, due to its enactment in 1965, were reflected in where the monies were directed—68% of the $1.1 billion authorization for the HEA was for institutional support or capacity building with the remainder devoted to student aid. Over the next twenty or so years, however, the aforementioned shift occurred and by the time the HEA was reauthorized in 1986, 90% of the $11.9 billion authorized was directed at the student aid programs (Keppel, 1987). Since its initial passage, the HEA has been reauthorized eight times—1968, 1972, 1976, 1980, 1986, 1992, 1998, and 2008—although not all of them included major changes or updates.

The first major reauthorization for the HEA came in 1972 and introduced several provisions that would have lasting consequences related to student loans. First, Congress expanded the range of postsecondary options that qualified for student financial aid with the intent to highlight that postsecondary education was not limited to pursuing a bachelor's degree at a four-year institution. This directly benefited traditional two-year institutions, such as community colleges, which focused on what is now perceived as career and technical education (Gladieux, 1995). However, it was not just public, two-year institutions that benefited.

It is important to recognize that the target of both the HEA of 1965 and 1972 were students with high financial need. The Middle Income Student Assistance Act of 1978 sought to provide some relief for students and families that failed to qualify for financial aid but still struggled with college costs. The Middle Income Student Assistance Act

expanded eligibility for Pell Grants for low-income students, and allowed all students, regardless of financial need, to access subsidized guaranteed loans to pay for postsecondary expenses (Gladieux, 1995; Green, 2005).

Congress reauthorized the HEA of 1965 again with The Higher Education Amendments of 1992, which continued the shift from grants to loans by creating the Federal Direct Loan program (Looney & Yannelis, 2015). In addition to raising the maximum amount that students could borrow, the 1992 legislation also created the unsubsidized student loan, which was not restricted by criteria of financial need (Gladieux, 1995). This new unsubsidized loan was directed at middle-income families that found themselves bumping up against the eligibility requirements for the subsidized guaranteed loans (Gladieux, 1995). Thus, these changes increased the number of potential borrowers while also increasing the total amount students could borrow and continued the trend of shifting the cost of postsecondary education to the student and their family.

The HEA was last comprehensively reauthorized in 2008 (Hegji, 2016). However, other than some rules regarding the relationship between postsecondary institutions and student borrowers, the 2008 reauthorization did not address the federal student loan programs (American Council on Education, 2008). Since most of the HEA programs were only authorized through federal fiscal year 2014 (and have only been extended since then), the HEA is long overdue for another comprehensive reauthorization. To that end, The Promoting Real Opportunity, Success, and Prosperity through Education Reform Act (PROSPER Act, 2017) was introduced in the U.S. House of Representatives in 2017 and proposed major changes to the way postsecondary institutions are held accountable for students that default on their student loans.

An Introduction to the Cohort Default Rate

Because of the potential costs to borrowers, institutions, and taxpayers, the U.S. Department of Education monitors the rates at which students default on their federal student loans. A single metric, the cohort default rate (CDR), has been used to monitor student loan default on federal student loans for the past few decades (Kelchen & Li, 2017). Introduced in the Omnibus Budget Reconciliation Act of 1990, the cohort default rate initially eliminated student aid eligibility at institutions with a default over 35% for three consecutive years. The metric and the default threshold have changed over the years, however.

The current CDR, complied by the U.S. Department of Education, looks at federal student loan default at the institutional level and is based on a group of students at a single institution that enter repayment in a given fiscal year. For institutions with more than 30 borrowers entering repayment in a fiscal year, the institution's CDR is the percentage of their student borrowers who entered repayment on certain Federal Family Education Loans and/or William D. Ford Federal Direct Loans (Direct Loans) during that fiscal year and then defaulted within the cohort's default period (U.S. Department of Education, 2017a). The "cohort default period" is a three-year window that begins on October 1st of the fiscal year when a borrower enters repayment and ends on September 30th of the second fiscal year following the fiscal year in which the borrower entered repayment (U.S. Department of Education, 2017a). For example, the students included in the FY2014 CDR entered repayment during federal fiscal year 2014 (October 1, 2014–September 30, 2015) and were subsequently counted as defaulters if they defaulted before the end of federal fiscal year 2016 (September 30, 2017).

As mentioned earlier, the cohort default rate calculation includes both subsidized and unsubsidized Federal Stafford Loans as well as Direct Stafford/Ford loans; it does not include any type of Parent Loan for Undergraduate Students (PLUS) loan, federal insured student loans, or Perkins loans (U.S. Department of Education, 2017a). The Department of Education uses data from their National Student Loan Data System (NSLDS) to compile the CDR for all Title IV institutions; the NSLDS data comes from a variety of sources including participating institutions. Most loans enter repayment following a six-month grace period that begins when the borrower separates from their institution, by either completion or withdrawal, or their enrollment falls below half-time. If a student in the cohort becomes 270 days delinquent on the loan in either the beginning fiscal year or the following two fiscal years, they are considered in default. An institution can lose access to Title IV funds, federal financial aid directed to students, if their three-year CDR is over 30% or over 40% in any single year.

Default Prevention Measures

Due to the potential negative consequences resulting from student loan default, the Department of Education has implemented a multistage approach to assist institutions in managing their student loan default rate. First, they required institutions that have participated in the Federal Family Education Loan and Ford Federal Direct Loan programs for the first time (or that have undergone a change in ownership) to follow a default prevention and management plan (U.S. Department of Education, 2017b). The Department provided a sample plan consisting of nine activities, which these institutions could use to fulfill the requirement; they also strongly encouraged other participating institutions to implement some, or all, of these monitoring activities. Additionally, all

institutions participating in the Title IV programs must follow a minimum standard for monitoring student loan default that includes both entrance and exit counseling, monitoring satisfactory academic progress, and timely and accurate reporting (U.S. Department of Education, 2017b).

In addition to the proactive steps above, institutions that have a cohort default rate of 30% or higher in a given year must submit a default prevention plan to the Department of Education in accordance with §668.217/section 435(a)(7) of the HEA. To produce the default prevention plan, the institution must establish a task force that creates a plan to: (1) identify factors causing the default rate to exceed 30%, (2) establish measurable objectives to reduce the default rate, and (3) outline measure to be implemented to improve student loan repayment. Should the institution's CDR meet or exceed 30% in the following year, they must then revise and resubmit their default prevention plan.

Concerns About the CDR

Despite these mandatory measures, institutions—especially two-year community colleges—have become increasingly concerned about the cohort default rate. One concern has been that the CDR lumps all an institution's borrowers into a single cohort with no distinction between academic programs. Another concern is that it can represent a relatively small number of the total student population, especially at relatively low-cost institutions, such as community colleges, where grant aid, such as Pell, can still cover a significant portion of the cost of attendance.

To address these concerns, the U.S. House of Representatives proposed eliminating the current CDR metric and replacing it with a program-level default metric in the PROSPER Act (2017). The proposed metric would have disaggregated an

institution's borrowers by academic program or major while retaining many of the other provisions regarding when a borrower is considered in default. The result would have been that students within individual programs at the institution could lose access to federal financial aid, as opposed to all of the institution's students losing access. The assumption, then, appears to be that some academic programs or majors pose a higher risk of default than others do. However, research on student loan default may not be as robust as needed to draw such a conclusion (Hillman, 2014).

An additional concern is whether all institutions should be judged on the same criteria. Under the current rules, a rural, two-year public community college is judged the same as a selective research university that serves a vastly different student population. So a public, two-year institution that is required to be open access and serve anyone that walks in the door and is also prohibited from limiting the amount of loans students can take out, is subsequently punished when some of those students default after leaving the institution.

Another issue is that the current CDR rules also do not take any economic differences into account when looking at an institution's default rate. In Kentucky, for example, the sixteen colleges of KCTCS serve vastly different economic areas. The so-called "golden triangle" comprised of Lexington, Louisville, and Norther Kentucky is the economic center of the state. It contains the two research universities, three of the KCTCS colleges, major employers such as Toyota, FedEx, Amazon, and others. On the other end of the economic spectrum are the former coal fields in Eastern and Western Kentucky. And in the far west, there is an entire economy around the river industries that

simply does not exist in other parts of the state. Yet the CDRs for all the postsecondary institutions do not reflect these very real economic differences of the areas they serve.

Implications of the COVID-19 Pandemic

During the COVID-19 pandemic, federal lawmakers along with the U.S. Department of Education (ED) implemented a number of initiatives aimed at providing relief for federal student loan borrowers. In Mach of 2020, Congress passed the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) which suspended interested accrual, payments, and collections on federal student loans through September 20, 2020 (Hegji, 2023). The CARES Act provisions would be extended over the course of the pandemic and then in the years following, eventually ending with the passage of the Fiscal Responsibility Act of 2023 which bought the interest and payment suspensions to an end that fall (Hegji, 2023).

The federal government took several additional actions during and after the pandemic to support student loan borrowers. In October of 2021, ED created the Public Service Loan Forgiveness (PSLF) Limited Waiver to provide relief from student loans to those serving their communities such as teachers, nurses, and first responders. The PSLF Program was designed to forgive the remaining balance after ten years of public service, and the changes allowed borrowers to count payments from all federal loan programs and repayment plans toward forgiveness, including loans and payments previously not eligible. As a result of these changes, nearly half a million borrowers saw $32.8 billion in student loans forgiven by the spring of 2023 (Hegji, 2023).

Additional student loan forgiveness occurred in 2022 when ED made changes for borrowers with income-driven repayment (IDR) plans to allow them to receive additional

credit towards forgiveness. The changes included allowing borrowers to receive credit for months when they may not have made a payment. Borrowers who had accumulated 20 or 25 years of time in repayment, even if they were not in an IDR plan, saw their loans forgiven (Hegji, 2023).

So how were borrowers impacted by the COVID-19 pandemic? In the fall of 2021, the Federal Reserve Board asked a nationally representative group of Americans how they were doing financially compared to 2019 using their annual Survey of Household Economics and Decision-making (Chingos and Cohn, 2023). Nearly half of the respondents with student loan debt reported doing better, with about twenty-eight percent the same, and twenty-four percent reporting they were worse off. Not surprisingly, as reported household income rose, so did the percentage reporting they were doing better. Of those reporting household income under $25,000, 38% said they were better off than in 2019, while 58% of those with household income over $100,000 saying so.

Chingos and Cohn (2023) also state that prior to the pandemic, 33% of adults with student loan debt had subprime credit scores but that number dropped to 24% by August of 2022. Interestingly, this improvement in credit score applied across age, income, race, and loan amount. Goodman, Hannon, Isen, and Mezza (2023) also report that student loan borrowers that were eligible for federal pandemic-related student loan relief, including those in higher-risk groups, were able to improve their credit scores. However, despite the aforementioned measures the government took during the pandemic to ease the burden of student loan debt, however, a quarter of borrowers had other, non-student loan debt, in collection by the fall of 2022 (Chingos and Cohn, 2023).

Review of Loan Default Literature

This study has built on the existing literature regarding the factors that influence student loan repayment and default. The literature on student loan default could be broadly organized by precollege, college, and postcollege experiences (Flint, 1997; Lundgren, 2013). Those areas consist of factors such as student demographics, socioeconomics factors, academic experiences, postcollegiate employment, and institutional characteristics (Gross et al., 2009). Importantly, most of the existing literature has focused on traditional college students: borrowers who attended residential, four-year institutions while under 24 years of age. As noted earlier, however, this measure did not accurately represent the population of two-year institutions, which makes up over a third of the undergraduate population. The few studies that did focus on two-year institutions and their borrowers were addressed at the end of this chapter.

Precollege Experiences

Race/Ethnicity

Differences in the likelihood of default between racial and ethnic groups is perhaps the most widely studied topic within the student loan default literature (Gross et al., 2009). The findings are also some of the most consistent; researchers have consistently found that borrowers of color are more likely to default than their White peers (Dynarski, 1994; Flint, 1997; Hillman, 2015b; Knapp & Seaks, 1992; Volkwein et al., 1998; Wilms et al., 1987; Woo, 2002). In a study of over 30,000 Californian student borrowers, which included both two- and four-year institutions, Woo (2002) found that African American borrowers were 127% more likely to default, while Hispanic borrowers were 46% more likely to default than their White peers.

As Knapp and Seaks (1992) have noted, however, the differences in default rates between racial groups directly reflected the differences in socioeconomic circumstances experienced by members of different groups. In one of the first studies to use a national database, Volkwein et al. (1998) examined the factors associated with student loan default among five different ethnic groups: African Americans, Native Americans, Asians, Hispanics, and Whites. While they found significant variation in the default rates across these racial and ethnic groups, Volkwein et al. (1998) noted that the impact of the variables that increased or decreased the likelihood of default was larger for the minority groups. For example, they found that socioeconomic status, institution type, grade point average (GPA), and study major were less important than degree completion, marital status, and number of dependent children. Among their sample, Black and Hispanic borrowers had lower levels of degree attainment, lower GPAs, and nearly twice the number of dependent children and rates of divorce or separation.

Likewise, Hakim and Rashidian (1995) found that, after controlling for economic variables, race appeared to be a weak predictor of student loan default. Hakim and Rashidian (1995) noted that other studies, which had failed to include measures of economic change, may have incorrectly assumed that Caucasians and people of color were impacted by those economic conditions equally, despite a large body of research suggesting otherwise.

Age

Several studies (Flint, 1997; Volkwein & Szelest, 1995; Woo, 2002) have found that older students are more likely to default than younger students. Woo (2002) speculated this may be due to weaker parental ties, meaning these students' families may

have been less willing, or able, to assist in the event of a financial need. In their study of students at two- and four-year Missouri institutions, Podgursky et al. (2002) found that each year of age increased the likelihood of default, whereas Flint (1997) found that each year of age beyond 21 increased the rate of default by 3%. These findings may be particularly relevant to two-year institutions, which typically serve an older population than four-year institutions.

Sex

The findings on sex have been mixed. Some studies have found no difference between men's and women's proclivity to loan default (Dyl & McGann, 1977; Knapp & Seaks, 1992; Pattillo & Wiant, 1972; Volkwein & Szelest, 1995). Others, however, have found men more likely to default hat women (Flint, 1997; Podgursky et al., 2002; Spencer, 1974).

Two examples highlight this seeming contradiction. In their study looking at how race impacts student loan default, Volkwein et al. (1998) found lower default rates for females, but noted that the impact was larger for minority women than white women (−7.1% vs. −4.6%). Hakim and Rashidian (1995), in contrast, found that women were significantly more likely to default on their loans than men. However, they noted two potentially important contributing factors: many of the households in poverty were headed by single mothers, and there was wage gap between men and women in the marketplace.

Socioeconomic Status

Generally, researchers from both the education and economic literature have found that students with lower family incomes were at a greater risk of defaulting on their

student loans (Hakim & Rashidian, 1995; Kelchen & Li, 2017; Knapp & Seaks, 1992). However, there may be stronger predictors of default after controlling for background characteristics, such as socioeconomic status (Hillman, 2015a). Additionally, as noted earlier in this chapter, there are a number of systemic challenges facing individuals coming from lower socioeconomic backgrounds that impact all aspects of their lives, including student loan repayment.

Volkwein and Szelest (1995) found that students coming from families with incomes under $11,000 (in 1986 dollars, or approximately $30,500 in 2023) were nearly twice as likely to default than those with family incomes in the next lowest bracket (41.4% vs. 25.8%). In their study of two-year students in California, Wilms et al. (1987) found that for dependent students, family income was significantly related to their probability of default. Using data from the NSLDS's Student Loan Recipient Transcript Survey (SLRS) for cohort years 1993–1995, Christman (2000) found that family income played a significant role in default for students at a two-year institution offering the Associate of Applied Science (AAS) degree. In a series of regression models also using data from the NSLDS's SLRS, Dynarski (1994) concluded that, among other factors, students from low-income households were more likely to default on their student loans. For students at two-year institutions, those coming from households with annual incomes of less than $35,765, adjusted for inflation, defaulted at a rate of 40.4%, while those coming from households with annual income over $63,100, again adjusted for inflation, defaulted at a rate of 26.6%. In one of the more recent studies, Kelchen and Li (2017) used a national survey comprised of data gathered from the Integrated Postsecondary

Data System (IPEDS) College Scorecard and found that higher family incomes decreased the likelihood of default for both dependent and independent students.

However, Flint (1997) found no predictive power for family income in any of the models he created using national data from the SLRS of the 1987 National Postsecondary Study Aid Study (NPSAS:87). This is notable since the overall model was able to correctly predict repayment status in approximately 87% of the cases. Similarly, in their study utilizing the NPSAS:87, Volkwein et al. (1998) concluded that socioeconomic status played a less important role in student loan default, for all races and ethnicities, than did completing a degree, students' marital status, or whether they had children.

Family Dynamics

Some of the earliest research on student loan default conducted by Dyl & McGann (1977) and Spencer (1974) found that married students were less likely to default than unmarried students; these findings were subsequently not supported by later studies, which had found no significance for marital status in predicting student loan default (Christman, 2000; Dynarski, 1994; Flint, 1997; Hakim & Rashidian, 1995).

Having dependent children has also apparently contributed to increasing the chance of default (Dynarski, 1994; Volkwein et al., 1998; Volkwein & Szelest, 1995). Volkwein et al. (1998) found that having dependent children combined with also being unmarried (single, divorced, separated, or widowed) pushed default rates above 40%; an earlier study by Volkwein and Szelest (1995) put the rate for that population at 50%. Woo (2002) noted that having any dependents to support, other than a spouse who could potentially contribute to household earnings, increased the likelihood of default by 3.44%. In one of the few studies to look at the number of dependents, Dynarski (1994)

found having one or two children nearly doubled the default rate (24.1% vs. 13.1%) from a nationally representative sample of Guaranteed Student Loan borrowers from the NPSAS SLRS; adding a third child increased the default rate to 31.5%. At least one study, however, found no predictive power for having dependents (Christman, 2000).

Academic Preparedness

Due to their open-door policies, students enrolling at public two-year postsecondary institutions have exhibited chronically low levels of preparedness for college-level academics. According to a recent report from the U.S. Department of Education on first-time students enrolled in postsecondary education in 2003–04, 68% of two-year students took at least one remedial course, compared to 39.6% of the four-year student cohort (Chen, 2016). Additionally, the average two-year student took nearly three remedial courses compared to two for the average four-year student (2.9 vs. 2.1).

Despite the problem's prevalence, none of the studies reviewed here included a measure of academic preparedness, as measured by testing into a remedial or developmental course, or by the number of remedial courses taken. This may be a significant oversight, however, since lack of program completion is one of the strongest predictors of student loan default.

College Experiences

Degree Level and Attainment

Failure to complete a program of study and earn a credential is one of the strongest predictors of student loan default (Dynarski, 1994; Hillman, 2014, 2015c; Knapp & Seaks, 1992; Pattillo & Wiant, 1972; Podgursky et al., 2002; Volkwein et al., 1998; Wilms et al., 1987; Woo, 2002). Looking at data from the NPSAS SLRS, Dynarski

(1994) found declining default rates with each increase in degree level. Those who did not complete a program had a default rate of 32.6% while those with a doctoral degree had just a 2.6% default rate. Even at the two-year level, there was a sharp decline between those with a two-year of less certificate (28.5%) versus those with an associate degree (13.2%). Hillman (2014) found that borrowers who earned degrees were 20% less likely to default than those who left before earning a degree.

Logically, this makes sense; taking out loans but failing to obtain a credential, which should equate with higher levels of employment and income, leaves students in the worst possible situation. This is particularly important for public, two-year institutions for several reasons. First, as mentioned earlier, most two-year institutions are open access and cannot control who enrolls in them. Second, federal student aid (e.g., loans) cannot be limited by an institution of higher education; a student is eligible to receive the full amount they qualify for, even if it exceeds their cost of attendance. Finally, public two-year institutions struggle to get students through to completion. According to the most recent data available in the IPEDS, the average six-year graduation rate for public two-year institutions is 34.1%, while the median is 30%.

Wilms et al. (1987) suggested that failing to complete a program of study is indicative of personality traits that might play role in the higher default rates for noncompleters, such as a lack of persistence, poor motivation, and low expectations. Likewise, Knapp and Seaks (1992) suggested that the same intangible student characteristics that enabled students to persist and complete a program of study may also cause them to be more attentive to other responsibilities such as loan repayment.

Academic Success

Given that program completion is such a strong predictor of student loan default, it is no surprise that academic success, as measured by cumulative GPA, has also been found to be a strong predictor as well (Dyl & McGann, 1977; Flint, 1997; Volkwein & Szelest, 1995; Woo, 2002).

Using a national sample of both two- and four-year borrowers, Volkwein and Szelest (1995) found a negative correlation between cumulative GPA and default rate, ranging from a 37.5% default rate for those with less than 2.0 GPA, to 6.3% for those with a 3.5 GPA or higher. Woo (2002) also found a negative correlation between GPA and student loan default; each increase in the standard deviation of GPA reduced the chance of default by 13.5%. In a study of two-year students in California, Christman (2000) found that over half (55.4%) of borrowers with less than a 2.0 GPA defaulted. Only one study was found which included GPA in a model of student loan default and did not find it a significant predictor of default (Hesseldenz & Stockham, 1982).

Institutional Level

Do higher education institutions play a role in students' default? Are some institutions, such as community colleges, "predisposed" to high default rates due the students they serve? Most studies that have examined the institutional role in student loan default have concluded that, after controlling for differences in student populations, institutional level or type, concluded that it did not significantly impact student loan default (Dynarski, 1994; Flint, 1997; Hakim & Rashidian, 1995; Knapp & Seaks, 1992; Volkwein & Szelest, 1995).

Knapp and Seaks (1992), using a probit model, examined data for over 1,800 student borrowers at 26 colleges in Pennsylvania, who were enrolled in the mid-1980s. Included in their models were dummy variables for both public two-year colleges and private four-year colleges, neither of which proved to be a significant predictor of loan default. Podgursky et al. (2002) used a data sample comprised of 4,711 first-time, full-time, degree-seeking students who entered Missouri public two- or four-year institutions in the fall of 1992. Their results found no difference in the default rates for students who attended a two-year or nonselective four-year institution. Those who attended a selective, four-year institution were 48% less likely to default, however. While Volkwein and Szelest (1995) did not find institutional level to be a significant predictor of loan default, they noted that "greater institutional revenue and investment in student instruction and support is significantly correlated with lower loan default behavior" (p. 54).

Several studies, however, have found that enrollment in a for-profit, proprietary institution was a predictor of default (Hillman, 2015c; Wilms et al., 1987; Woo, 2002). In a study of students who attended proprietary and community colleges in California in 1982–83, Wilms et al. (1987) found that after controlling for student background characteristics, the only insignificant institutional variable related to default was enrollment in a proprietary institution. Hillman (2015c) examined the institutional factors associated with student loan default for nearly 4,500 institutions using 2008 data from the IPEDS, combined with the institution's 2008 CDR and their accrediting body. Hillman (2015c) found that after accounting for enrollment profiles and various institutional characteristics, for-profit institutions, institutions accredited by career/vocational agencies, as well as institutions with low graduation rates and high minority enrollment

had the greatest chance of facing Title IV sanctions due to cohort default rates greater than 30%.

Policymaker's desire to hold institutions accountable for student loan default may be misguided. As Knapp and Seaks (1992) noted:

> No one would blame a hospital for a high mortality rate without conditioning the death rates on the complexity of its cases and the difficulty of its surgery. As one would expect a trauma center to have a higher death rate, a university that serves high-risk students is likely to have higher default rates. (p. 411)

Volkwein and Szelest (1995) put it this way:

> In the name of educational opportunity and access, government policy encourages campuses and proprietary schools to grant loans to risky borrowers … while punishing the very institutions that serve these risky borrowers. It seems both counterproductive and unfair to blame institutions for loan default behavior that is a consequence of government encouragement and that may occur years after students have left campus. (p. 64)

Instead of asking "who's fault is default" and analyzing student loan default as an issue of morality or blame, perhaps it should be viewed as one of economics (Monteverde, 2000). That is, perhaps researchers should focus on how institutions at all levels can better assist the students they serve so they graduate, and graduate with credentials in fields that help them get employment (Hillman, 2015c).

Continuous Enrollment

Since program completion is one of the strongest predictors of student loan default, it is not surprising that researchers have also found continuous enrollment to be a predictor as well. This may be especially important for two-year institutions, however, since their student populations are more likely to drop in and out of the institution.

In a study of two-year students, Christman (2000) found that being enrolled less than two semesters, as well as withdrawing during a semester, were significant predictors

of default. Students enrolled for less than two semesters had a default rate of 35.8% while those enrolled more than six semesters had a default rate of 16.2%. That fell to 9.2% for those who graduated.

Looking at both two- and four-year students, Podgursky et al. (2002) found a tipping point of enrollment of six of more semesters to be a significant predictor of repayment. Even after controlling for the effect of graduation, students who enrolled for six or more semesters but did not complete their program were nearly half as likely to default (56.8%) as those that dropped sooner. It is important to note that Podgursky et al.'s (2002) sample included only first-time, full-time students; a sample that is not representative of the student populations of two-year institutions. Additionally, Podgursky et al. (2002) noted that despite their findings showing a strong relationship between continuous enrollment and default risk, it did not mean that continuous enrollment caused lower default rates. Instead, it may have simply reflected that unobserved characteristics such as effort or responsibility were associated with both an increased likelihood of persistence and decreased propensity to default. Podgursky et al. (2002) attempted to control for these covariates, however, by including in their model six individual characteristics, most of them significantly related to default risk. Doing so only lowered the estimated rate of repayment by six percentage points.

Academic** Field/**Program of Study

Drawing on analytical techniques from the broader loan literature, Dyl and McGann (1977) applied discriminant analysis to determine "good" versus "bad" loans for both graduate and undergraduate students at a four-year university. They included 38 applicant characteristics including college, major, total income, monthly payment,

estimated summer income, and parental income along with several other demographic variables. Among their findings, engineering students were more likely to repay than all other majors. They speculated that this significance was at least partially due to the job market for engineering majors during the timeframe of the study. Dyl and McGann (1977) added that this possibility "demonstrates the need to update the model every few years, since certain conditions, such as the job market, do change over time" (p. 38).

Stockham and Hesseldenz (1979) and Hesseldenz and Stockham (1982) categorized majors as hard or soft, pure or applied, and life or nonlife for their studies of National Direct Student Loan borrowers at the University of Kentucky from 1971 to 1974. While they did find significant differences between the groups in income, the major of study appeared to play no significant role in predicting default.

Volkwein et al. (1998) included a dummy variable for major in their study of the NPSAS:87 data set, which included borrowers who began their postsecondary education in the period from 1973–1985. They simplified the eight-category Biglan classification of majors into a science and technology dummy variable. Overall, they found little support for the influence of study major on loan default. However, for White students, majoring in a science or technology field reduced the probability of default by 3.6%. In an earlier study, Volkwein and Szelest (1995) failed to find significance for the same variable but left it in their model because it improved model fit, thus suggesting an indirect influence on default related to personal characteristics of the students those majors tended to attract. A similar finding was that students who studied business or computers were 9.5% less likely to default, but the variable (0.0555) bordered on insignificance (Woo, 2002).

Wilms et al. (1987) did find a significant relationship between program of study and default for community college and proprietary students. They categorized the program of study as business, trade, health, cosmetology, and other (used only for community college students in mostly transfer programs). Students in trades had the lowest level of default (17%), while cosmetology had the highest (32%).

Loan Amount

Intuitively, students borrowing more money would constitute a higher default risk than those borrowing less, especially if they were pursuing a credential in a lower paying field. A few early studies seemed to confirm this (Dyl & McGann, 1977; Spencer, 1974). Later studies by Knapp & Seaks (1992) and Flint (1997), however, did not appear to support that theory, but rather its opposite. Researchers have generally found that lower loan amounts were associated with a higher degree of default, while higher loan amounts were associated with a decreased risk (Hillman, 2014; Stockham & Hesseldenz, 1979; Volkwein et al., 1998; Woo, 2002).

Volkwein et al. (1998) found that students with the lowest default rates included those with the highest amounts of loan debt, perhaps indicating more years of education and/or borrowing. Stockham and Hesseldenz (1979) used discriminant stepwise analysis to examine the role of personality data on student loan default. Of the 32 variables included in the analysis, 16 were deemed significant, with loan amount at Step 5. Loan amount, along with the other top five predictors (GPA, ACT composite score, a measure of anxiety, and a measure of complexity) correctly identified 94.5% of defaults in the sample. Using one standard deviation as the confidence interval, the size of loans for students who did not default ranged from $2,066–$10,792 while the range for the

defaulters was $661–$6,162(all in 2023 dollars). Academic persistence was noted as an explanation as to why higher loan mounts were associated with a lower risk of default. Stockham and Hesseldenz (1979) noted that "high debt, for most borrowers, is a harbinger of success, not failure" (p. 15). Findings from Hillman (2014), however, suggested that rather than being linear, the relationship between debt and default may have a gradual u-shape; those students who dropped out prior to graduation have had less time to accumulate debt, while those who continued on simply have had more time to accumulate debt.

Postcollege Experiences

Economic Conditions

Institutions of higher education are embedded in their state economies and are highly affected by macroeconomic factors, such as unemployment or average household income (Hensley et al., 2013; Ishitani & McKitrick, 2016; Koedel, 2014; McArthur, 2011). As Webber and Rodgers (2014) had claimed, "The nature of the labor market … can be assumed to create differences in general economic conditions and unemployment by region of the country" (p. 109).

Dyl and McGann (1977) noted early on that economic conditions could play a role in student loan default after noticing that no engineering majors in their sample had defaulted. They attributed this, in part, to the strong market for engineers during that time. They also noted that, if that were in fact the case, it would mean that models of student loan default would need to be updated every few years to account for the changing economic conditions. A similar finding was reported by Webber and Rodgers (2014) in their study of institutional characteristics that influence defaults where they

found some regions of the country to be significantly related to default using a stepwise regression model. Webber and Rodgers (2014) were unsurprised by the result and noted that recovery from the Great Recession of 2007–2009 was still underway and varied from region to region. This could be critically important to two-year institutions, which tend to serve much smaller geographic regions than their four-year counterparts. In Kentucky, for example, there are sixteen community and technical colleges spread across the state, while there are just six regional and two research universities serving the same geographic area. Thus, more nuanced labor market indicators may be needed in models of student loan default to account for the smaller geographic regions served by two-year institutions.

Unemployment

As noted earlier, completion of a credential is perhaps the best overall predictor of student loan default. However, that is contingent upon graduation opening employment opportunities and raising earnings (Hillman, 2014; Knapp & Seaks, 1992; Looney, 2011). Dai (2013) noted that the combination of a weak labor market and high unemployment would likely lead to an increase in student loan default. Institutions might be able to better inform student borrowers if they had a better understanding of regional variations in unemployment and managed to align academic programming better to meet local demand (Looney, 2011). Flint's (1997) finding that greater incongruence between undergraduate major and current employment was a risk factor for default appeared to support this idea. Looney (2011) noted that colleges that failed to produce graduates who were able to gain employment and/or who were not working to match graduates with the job market will likely have higher default rates.

Ishitani and McKitrick (2016) included state unemployment rate in their multilevel model that examined institutional factors that influenced cohort default rates. Variance in the unemployment rate was the only state-level variable found to significantly influence an institution's cohort default rate, with each percentage point increase in unemployment raising the cohort default rate by 0.36 percentage points. Hillman (2014) also employed a multilevel model in a study that used individual default as the outcome variable. Hillman (2014) found that borrowers who were unemployed were nearly twice more likely to default than those employed.

One of the earliest studies examining student loan default used a stepwise regression to build a model that financial aid staff could use to better predict loan default, and the final model included a binary indicator of employment (Spencer, 1974). Woo (2002) found that filing for unemployment increased the probability of default by 83%. Woo (2002) noted, however, that borrowers experiencing unemployment were entitled to a loan deferment that entailed a paused payment on the principle, and in some cases even the interest. A deferment variable created to indicate whether a borrower had ever used forbearance or deferment for unemployment or economic hardship reduced the original chance of default by −91%. Woo (2002) speculated that borrowers organized enough to utilize a deferment program might also be better able to handle repayment in general.

In a study utilizing the NPSAS SLRS, Dynarski (1994) noted that unemployment was the most cited reason for default among students at proprietary (83%), two-year (74%) and four-year (64%) institutions. Hakim and Rashidian (1995) also utilized NPSAS data in their study of how economic variables and the general business cycle influenced student loan default. They found national unemployment to be the primary

cause of default but noted that economic variables did not appear to impact all races equally. During a recession, for example, they found Caucasian borrowers were less impacted than non-Caucasian borrowers. Volkwein et al. (1998) seemed to confirm this in their study that also utilized the NPSAS SLRS data set. Seventy percent of Black and Hispanic defaulters reported that unemployment was a very important reason for their defaulting, while only 53% of White and 33% of Asian borrowers said so. In a finding similar to Hakim and Rashidian (1995), Monteverde (2000) found that each percentage point increase in regional unemployment for new attorneys was associated with a 4.7% increase in the likelihood of default for law school students.

Income

Over the past decade, public attention has become focused on the different outcomes experienced by students in different majors (Whitfield et al., 2016). Specifically, public awareness that salaries differ significantly across majors has increased (Harrast, 2004). Intuitively, borrowers who earn larger salaries should have an easier time repaying their loans. However, research on both student loan debt, as well as other types of debt, is mixed. For students at two-year institutions this is further compounded by the different levels of credentials within certain majors. Since the cost is generally the same per credit hour, this can result in students with similar debt loads beginning their careers with vastly different salaries. Another factor is the time it takes for graduates in certain academic fields to establish themselves in the labor market. A gradate in construction field might need to complete additional on-the-job training or might need to establish their business before realizing the types of monetary gains a graduate in nursing, for example, might achieve upon entering the labor market.

Additional research could better inform stakeholders, including students and their families.

Several studies have suggested that increased annual income leads to a decreased risk of defaulting on student loan debt (Wilms et al., 1987; Woo, 2002). Dynarski (1994) found that both two- and four-year students reported that insufficient funds was one of the top two reasons they defaulted on their student loans. Dynarksi (1994) also found default fell as income rose; 35.43% of all borrowers with annual earnings less than $20,691 (inflation adjusted to 2023 dollars) defaulted, while only 9.3% of borrowers earning more than $51,728defaulted. The results of the logit model found that a doubling of wages from $22,760to $45,520 (inflation adjusted to 202 dollars) resulted in a 30% decrease in the probability of default. Volkwein and Szelest (1995) found results similar to Dynarksi (1994); as income rose, the probability of default decreased significantly. Woo (2002) found that a one standard deviation increase in wages resulted in a 36% decrease in the likelihood of default. Woo (2002) noted that this "emphasizes the risks of students who take out loans for college to enter careers with low-paying prospects, especially without some other safety net" (p. 17).

Flint (1997) did not include annual income in their model but did find that a measure of disposable income was a significant predictor of default. However, that is in direct contrast to Woo (2002), who found no significant differences between the disposal incomes of borrowers who defaulted and those that did not, commenting that "the only conclusion that could be reached was that the defaulters have chosen not to repay their loans" (p. 12).

Volkwein et al. (1998) did not find annual income to be a significant predictor of default using a national data set containing both two- and four-year college borrowers. Ishitani and McKitrick (2016) included average household income in their model but did not find that it significantly influenced the probability of default. It is important to note their study only included four-year institutions, however.

One of the earliest articles pertaining to student loan default is a correlational study of four-year college students in Texas who received a Texas Opportunity Plan Loan during the 1966–67 academic year (Pattillo & Wiant, 1972). Looking at 44 different variables, Pattilo and Wiant (1972) concluded that: (1) students who graduated were more likely to repay their loans, (2) that "school-year" estimated income was not significantly correlated with default, and (3) that family socioeconomic status was negatively correlated with student loan default.

Spencer (1974) used a step-wise multiple regression model to look at 25 variables and identified eight that explained about 80% of the variance: unmarried male, 17 years of age, in his first semester, with a large loan, an old car, who did not have a phone, and was unemployed. Spencer (1974) also noted the difficulty for institutions making student loans to assess the risk of the borrower. First, unlike a traditional loan, there was no collateral; education not being a tangible good, there was no way for the institution to repossess it to recoup its investment if the borrower defaulted. Next, most students were young, with little to no credit history. Finally, most were full-time students and thus, unemployed.

Recent Research

In recent years, research has focused less on identifying the predictors of default and more on the federal policy plays, including how existing repayment options could be better utilized by borrowers. In an analysis on the impact of increased borrowing limits over the past two decades, Lee et al. (2020) found no effect on student borrowing. They did find, however, that students and families moved away from higher interest private loans as additional federal options with better terms became available. It is also worth noting that their sample did not include students at two-year institutions.

Looney and Yannelis (2022) analyzed the impact of federal policy on student loan default from 1970–2014 with a particular focus on policy changes in the mid-1980s and early 1990s, which expanded access to older borrowers and those without a high school degree. While these policy changes expanded access, they also increased the borrowing limit, leading to an increase in the number of postsecondary institutions serving these populations, most notably in the for-profit sector. Looney and Yannelis (2022) found that the variation in default rates over time was a direct result of the composition of borrowers, something that was driven by the policy changes. For example, following the expansion of eligibility in the 1980s, nationwide default rates exceeded 30% in 1989. This led to the creation of the CDR, which in turn led to an exodus of mostly for-profit institutions that eventually drove down the nationwide default rate.

A pair of reports from the U.S. Government Accountability Office (GAO) in 2015 and 2019 highlighted the lack of participation in the available income-driven repayment (IDR) plans, noting the participation rate for eligible borrowers at 13% in 2014. This may be in part due to the default repayment plan being a 10-year fixed payment, much like a

typical mortgage. The typical IDR plan, however, requires the borrower to pay between 10%–15% percent of their income above the 150% of the federal poverty line towards their loan (Yannelis & Tracey, 2022). Cox et al. (2020) found that changing the default repayment plan, combined with providing borrowers better information on expected earnings, significantly increased enrollment in an income-driven repayment plan. Abraham et al. (2020) investigated the framing effects on IDR selection for undergraduate students at a four-year institution and found a significant increase in IDR selection when the insurance aspects of the plan were emphasized. Additionally, the students most likely to select IDR when informed of the insurance aspects where those entering low-wage or low-demand jobs. They also noted that while simple changes in the framing of IDR plans could significantly reduce defaults, there would be a minimal impact on cost to the federal government.

A few recent articles have focused on student loan debt among community college students. Barr et al. (2021) implemented a text message campaign aimed at helping community college students make better decisions regarding their student loan borrowing. While they found the treatment group borrowed about 7% less than the control group, the treatment group were also 2.5 times more likely to default. Barr et al. (2021) noted that this may be related to the treatment group being less likely to stay enrolled and taking, and earning, fewer credits in the year following the intervention. In their study of 240,000 community college borrowers, McKinney et al. (2021) found borrowers more likely to be female, unmarried, of lower socioeconomic status, and enrolled full-time, while defaulters were more likely to be male, first-generation students, enrolled in workforce or applied associate degree, and noncompleters. With 75% of the

defaulters in their sample having left their institution prior to earning a credential, the authors noted the complicated relationship between borrowing and persistence.

Relevance and Currency

Given the length of time it took to complete this project, several realities need to be acknowledged. First, the primary literature review is not a current as one might hope. However, many of the strongest predictors of student loan default, such as completion, have remained consistent over time and it is unlikely those findings would have changed.

Literature Summary

This literature review presented an overview of the student loan default literature, focusing on the factors most commonly associated with default. Hillman (2015a) suggested the need to think of student loan default research in two generations: the first found default to be a "preexisting condition" (p. 42), where students' socioeconomic status, demographics, and academic performance were the strongest predictors of default. The second generation of research, however, has found that failure to complete a credential, postcollege unemployment, and attending a proprietary, for-profit college were the strongest predictors of default. This study has built on the body of second-generation research.

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CHAPTER THREE

The purpose of this study was to conduct a statistical analysis of student loan default, with a focus on the predictive value of local economic indicators. The data for the study was derived from the Kentucky Community and Technical College System (KCTCS) and this chapter includes details sufficient to enable the study to be replicated. As noted in Chapter 1, this study aimed to answer three research questions:

RQ1 What is the current state of student loan default for students at public, two-year institutions in Kentucky?

RQ2: How do regional labor market indicators affect student loan default?

RQ3: How does the credential (certificate, diploma, or degree) earned impact student loan default?

While two-year students account for nearly half of the undergraduate population, and default at higher rates than their four-year counterparts, little research on student loan default has focused on them to date. As noted in the previous chapter, few models have included labor market indicators as potential predictors of student loan default. Those that have typically included a statewide metric, such as the unemployment rate. It is hypothesized that since two-year institutions serve smaller geographic areas and are tightly coupled with their local labor markets, more granular unemployment data should be a better predictor of default since it better reflects that relationship.

Setting and Institutional Description

As noted earlier in this section, the data for this study comes from the KCTCS. Kentucky is a mid-size border state located along the Ohio River Valley between the

Midwest and the South of the United States. According to the U.S. Census Bureau, in 2019 Kentucky's population size of 4,467,673 ranked 26th out of the 50 states.

In 1997, Kentucky had two separate systems of public, two-year institutions. There were 14 community colleges under the governance of the University of Kentucky and another 15 technical colleges that formed KY Tech, which were under the state's Cabinet for Workforce Development. Neither of these governance structures was ideal; the lack of flexibility inherent in a large, slow-moving university prevented the community colleges from responding to local employer needs in a timely manner, while the technical colleges were bogged down in the bureaucracy of state government (Lane, 2008). To address these issues, then Governor Paul Patton called an Extraordinary Session of the General Assembly in summer 1997 to pass House Bill 1, which merged the two systems into the KCTCS (Lane, 2008). This merger created a quasi-system; the newly formed colleges of KCTCS would be independently accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC)but share a governing board, the KCTCS Board of Regents, and system president, an organizational structure still in place today. As an example of why I refer to KCTCS as a quasi-system, SACSCOC does not recognize KCTCS – they only recognize the sixteen individually-accredited colleges; as far as SACSCOC is concerned, there is no KCTCS.

As the largest provider of postsecondary education in the state, KCTCS currently operates more than 70 campuses that serve all 120 counties and more than 40% of the state's undergraduates (Program Review and Investigations Committee, 2019). Enrollment grew more than 40% from academic year 2000–2001 to 2019–2020, when it reached an all-time high of 107,547. Perez & Ruley According to the most recent data

available, KCTCS ranks eighth overall for credentials awarded by a public two-year institution and ranks second overall per capita (Perez & Ruley, 2020). Following a national trend, KCTCS' production of certificates doubled from 2005–2006 to 2018–2019; in recent years, nearly 2.5 certificates were awarded for each associate degree (Darolia & Kim, 2021). This trend is particularly relevant to this study since these short-term certificates do not qualify for federal financial aid such as Pell grants. So, while there is some state aid available, students may be more likely to use student loans to cover the cost of these programs including tuition and fees as well as cost of attendance expenses (such as books and transportation) and for cost-of-living expenses.

Data Resources and Collection

This study used preexisting, de-identified student data from the KCTCS. The project used borrowers included in the FY2014 official CDR, as identified on the Department of Education Loan Record Detail Report (LRDR), as the basis for the data file. Borrowers included on the FY2014 CDR entered repayment on a federal student loan during the federal FY2014 (October 1, 2013–September 30, 2014). Any borrower who subsequently defaulted on one of their federal student loans in either federal FY 2014, 2015, or 2016 was noted as having defaulted on the LRDR for the purposes of the institution's official CDR.

A request was submitted to the Human Subject Review Board of KCTCS to get a file comprised of all the borrowers in the FY2014 CDR along with the data included on the LRDR from the NSLDS combined with demographic and academic records from KCTCS' Decision Support System database. The request noted that because this project used preexisting data that would be de-identified, it should be eligible for an exemption

under 45 CFR 46.101(b)(4) since it would not involve human subjects. Once the request was approved by the KCTCS Chancellor, the University of Kentucky's Internal Review Board was contacted, and it agreed with the finding by KCTCS that the study was exempt. At that point, the KCTCS Financial Aid Office was contacted to begin the data collection.

As the only office with access to the LRDR from the NSLDS, staff in the Financial Aid Office downloaded the initial file containing all the borrowers included in the official FY2014 CDR for the 16 colleges comprising KCTCS. This file was then passed to the Office of Research and Policy Analysis (ORPA) for the demographic and academic data to be added. Again, this was the only office with access to the academic and demographic records contained in KCTCS's Decision Support System database. Based on the literature review, the following variables were requested: sex, race, age, academic preparedness, semesters enrolled, classification (freshmen, sophomore, nondegree), cumulative GPA, credit hours passed, whether students had transferred to a four-year institution, and highest earned credential.

The initial file provided by the Financial Aid Office included duplicate records since a borrower may have more than one loan, and each loan was listed on a single row. At my direction, the duplicate rows were removed by making the loan amount a sum of all a borrower's loans and making the flag for having defaulted on loan to be "yes" if the borrower defaulted on any of the loans. ORPA staff matched the students to academic records based on the last semester the student was enrolled. The data file received included 21,529 students. As noted later in this chapter, two colleges, Ashland CTC and

Hopkinsville CC, appear to be underrepresented in the data based on their enrollment. The enrollment breakdown is presented in Table 2.

Table 2

Home College of Borrower

College	Defaulted		Did not default	
	N	*%*	*N*	*%*
Ashland	0	0.00%	15	100.00%
Big Sandy	269	28.83%	664	71.17%
Bluegrass	826	19.85%	3336	80.15%
Elizabethtown	367	19.16%	1548	80.84%
Gateway	301	21.88%	1075	78.13%
Hazard	179	24.59%	549	75.41%
Henderson	111	23.82%	355	76.18%
Hopkinsville	1	5.56%	17	94.44%
Jefferson	666	18.63%	2909	81.37%
Madisonville	150	19.74%	610	80.26%
Maysville	221	23.24%	730	76.76%
Owensboro	200	21.81%	717	78.19%
Somerset	537	24.42%	1662	75.58%
Southcentral	290	24.83%	878	75.17%
Southeast	420	33.79%	823	66.21%
West Kentucky	268	24.30%	835	75.70%
Grand Total	4806	22.32	16723	77.68

Variables Used

The variables selected for this study were based on the literature review presented in Chapter Two, and were categorized as precollege, college, and postcollege experiences. Precollege variables included sex, race, age, and level of academic preparedness prior to entering college.

The average borrower in the data set was White (77.3%), female (64.5%), and between the ages of 18–34 (73.8%). For those with data on preparedness for college-level coursework, 16.7% were not prepared for English, 17.2% were not prepared for reading,

and 25.9% were not prepared for math. The demographic and precollege characteristics of the borrowers are presented in Table 3.

Variables pertaining to a borrower's college experience included semesters enrolled, cumulative GPA, credit hours passed, whether they transferred to a four-year institution, and the highest credential completed. Most borrowers in the data set were enrolled for four semesters or less (59.3%), passed no more than 60 hours (75.6%), did not transfer to a four-year institution (82.4%), and did not earn a credential (69.5%). Of those who did complete a credential, 62.3% earned an associate degree. The college experience variables are presented in Table 4.

Of the total cohort, nearly two-thirds (65.5%) have loans totaling $10,000 or less. Just over a third borrowed less than $5,000 including 43% of those that defaulted. Additionally, 65.5% borrowed than $10,000 and 77.7% borrowed less than $15,000. Of the 21,529 borrowers, 4,806 (22.3%) defaulted between October 1, 2013 and September 30, 2016. The full loan and default data are presented in Table 5.

Table 3

Demographic and Precollege Characteristics of Borrowers

Characteristic	Defaulted		Did Not Default		Full data set	
	n	*%*	*N*	*%*	*n*	*%*
Sex						
Male	2087	43.42	5508	32.94	7595	35.28
Female	2701	56.20	11190	66.91	13891	64.52
Unknown	18	0.37	25	0.15	43	0.20
Race						
American Indian	25	0.52%	66	0.39%	91	0.42%
Asian	18	0.37%	81	0.48%	99	0.46%
Black	835	17.37%	2546	15.22%	3381	15.70%
Hispanic	98	2.04%	337	2.02%	435	2.02%
Native Hawaiian	4	0.08%	16	0.10%	20	0.09%
Nonresident alien	0	0.00%	3	0.02%	3	0.01%
Two or more races	85	1.77%	259	1.55%	344	1.60%
Unknown	24	0.50%	145	0.87%	169	0.78%
White	3717	77.34%	13270	79.35%	16987	78.90%
Age*						
Under 18	11	0.23%	25	0.15%	36	0.17%
18–24	1813	37.72%	6562	39.24%	8375	38.90%
25–34	1764	36.70%	5748	34.37%	7512	34.89%
35–44	870	18.10%	2852	17.05%	3722	17.29%
45+	347	7.22%	1530	9.15%	1877	8.72%
Unknown	1	0.02%	6	0.04%	7	0.03%
Academic Preparedness						
English						
Ready	1218	25.34%	3773	22.56%	4991	23.18%
Not ready	1317	27.40%	2273	13.59%	3590	16.68%
Unknown	2271	47.25%	10677	63.85%	12948	60.14%
Reading						
Ready	1206	25.09%	3458	20.68%	4664	21.66%
Not ready	1279	26.61%	2420	14.47%	3699	17.18%
Unknown	2321	48.29%	10845	64.85%	13166	61.15%
Math						
Ready	791	16.46%	2486	14.87%	3277	15.22%
Not ready	1791	37.27%	3780	22.60%	5571	25.88%
Unknown	2224	46.28%	10457	62.53%	12681	58.90%

Note. While age is treated as a continuous variable in all statistical analyses, it is presented here as a categorical variable for simplicity.

Table 4

College Experiences of Borrowers

Characteristic	Defaulted		Did not default		Full data set	
	n	%	*n*	%	*n*	%
Classification						
Freshman	3392	70.58%	7091	42.40%	10483	48.69%
Sophomore	1381	28.73%	9363	55.99%	10744	49.90%
Nondegree	28	0.58%	260	1.55%	288	1.34%
High school	5	0.10%	9	0.05%	14	0.07%
Semesters enrolled						
1	1220	25.38%	2193	13.11%	3413	15.85%
2	1229	25.57%	2713	16.22%	3942	18.31%
3	717	14.92%	2225	13.31%	2942	13.67%
4	467	9.72%	1994	11.92%	2461	11.43%
5	315	6.55%	1770	10.58%	2085	9.68%
6	229	4.76%	1510	9.03%	1739	8.08%
7	228	4.74%	1376	8.23%	1604	7.45%
8	168	3.50%	1192	7.13%	1360	6.32%
9	133	2.77%	929	5.56%	1062	4.93%
10	58	1.21%	494	2.95%	552	2.56%
11+	42	0.87%	327	1.96%	369	1.71%
Cumulative GPA*						
0.00–0.99	1613	33.56%	2192	13.11%	3805	17.67%
1.00–1.99	1190	24.76%	2629	15.72%	3819	17.74%
2.00–2.99	1315	27.36%	6009	35.93%	7324	34.02%
3.00–3.99	637	13.25%	5493	32.85%	6130	28.47%
4.0	49	1.02%	387	2.31%	436	2.03%
Unknown	2	0.04%	13	0.08%	15	0.07%
Credit hours passed*						
0–10	2523	52.50%	4223	25.25%	6746	31.33%
11–20	653	13.59%	2193	13.11%	2846	13.22%
21–30	428	8.91%	1714	10.25%	2142	9.95%
31–40	251	5.22%	1359	8.13%	1610	7.48%
41–50	199	4.14%	1222	7.31%	1421	6.60%
51–60	187	3.89%	1330	7.95%	1517	7.05%
61–70	219	4.56%	1542	9.22%	1761	8.18%
71–80	142	2.95%	1187	7.10%	1329	6.17%
81–90	88	1.83%	760	4.54%	848	3.94%
91–100	43	0.89%	441	2.64%	484	2.25%
101–110	35	0.73%	281	1.68%	316	1.47%
111–120	20	0.42%	213	1.27%	233	1.08%
>120	16	0.33%	245	1.47%	261	1.21%
Unknown	2	0.04%	13	0.08%	15	0.07%

Table 4 (Continued)

Characteristic	Defaulted		Did not default		Full data set	
	n	%	*n*	%	*N*	%
Highest credential earned						
Associate degree	325	41.67%	3812	65.81%	4137	62.95%
Diploma	47	6.03%	327	5.65%	374	5.69%
Certificate	408	52.31%	1653	28.54%	2061	31.36%
Transferred to 4-year						
No	4406	91.68%	13336	79.75%	17742	82.41%
Yes	400	8.32%	3387	20.25%	3787	17.59%
Completer						
Yes	780	16.23%	5792	34.63%	6572	30.53%
No	4026	83.77%	10931	65.37%	14957	69.47%

Note. Both Cumulative GPA and Credit hours passed are presented as categorial variables for presentation purposes but are continuous variables in all statistical analyses.

Table 5

Loan Characteristics of Borrowers

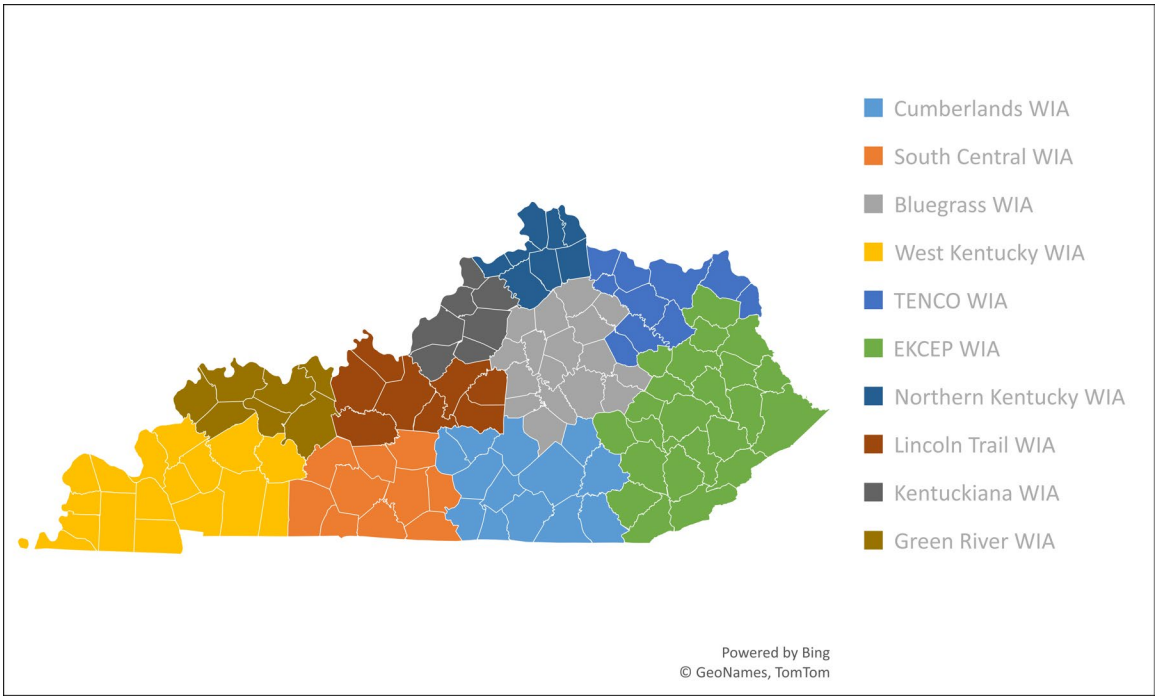
Characteristic	Defaulted		Did not default		Full data set	
	n	%	*n*	%	*N*	%
Loan Amount						
$1–$5,000	2058	42.82%	5938	35.51%	7996	37.14%
$5,001–$10,000	1524	31.71%	4591	27.45%	6115	28.40%
$10,001–$15,000	473	9.84%	2152	12.87%	2625	12.19%
$15,001–$20,000	322	6.70%	1312	7.85%	1634	7.59%
$20,001–$25,000	178	3.70%	842	5.03%	1020	4.74%
$25,001–$30,000	112	2.33%	599	3.58%	711	3.30%
$30,001–$35,000	59	1.23%	319	1.91%	378	1.76%
$35,001–$40,000	35	0.73%	233	1.39%	268	1.24%
$40,001–$45,000	20	0.42%	125	0.75%	145	0.67%
$45,0001–$50,000	6	0.12%	79	0.47%	85	0.39%
>$50,000	19	0.40%	533	3.19%	552	2.56%
Defaulted						
Yes					16723	77.68%
No					4806	22.32%

Note. Loan amount is a continuous variable in all statistical analyses.

Local labor market variables (LMI) came from the Kentucky Center for Statistics (KYSTATS), which collects and publishes a variety of workforce and education data for policy makers and other stakeholders to use, and from the unemployment insurance match done by KCTCS. All the LMI from KYSTATS is reported by workforce investment areas (WIAs); Kentucky was broken into ten workforce investment areas, each reflecting its own unique economic and social conditions. Figure 5 shows the WIAs by county.

Figure 5

Kentucky's Workforce Investment Areas



Two different reports from KYSTATS were used: the 2015 occupational wage data and the 2012–2022 occupational outlook data. The occupational outlook file contains the state's occupational projections for the specified timeframe, disaggregated by WIA and occupation. Data points included the median annual income and occupational growth or decline. Additionally, the unemployment rate for each of the WIAs for the timeframe of October 2014 to September 2016 was pulled from the KYSTATS website. These data are presented in Table 6.

Table 6

Local Labor Market Information by WIA

WIA	% Change 2012–2022	Annual median wage (inflation adjusted to 2023 dollars)	Unemployment rate
Bluegrass	5.97%	$43,600	4.60%
Cumberlands	6.41%	$36,002	7.03%
The Eastern Kentucky Concentrated Employment Program (EKCEP)	1.66%	$38,374	11.19%
Green River	15.27%	$38,996	5.48%
Kentuckiana Works	7.60%	$45,900	4.93%
Lincoln Trail	1.29%	$39,462	5.56%
Northern Kentucky	5.43%	$44,685	4.69%
South Central	11.39%	$37,638	5.03%
Ten County (TENCO)	3.33%	$39,034	7.76%
West Kentucky	2.48%	$40,916	6.34%

For all borrowers, the overall unemployment rate for their WIA was added along with the overall estimated occupational change from 2012–2022 and annual median wage.

While this dataset is dated, given the length of time the project took to complete, it may not matter as it relates to understanding the role of credentials earned and regional

economies on student loan default. It is important to note that economies change over time. Since this project began, for example, the I-65 corridor in Kentucky has seen exponential growth and development. Likewise, postsecondary institutions, particularly two-year ones, should be aligning their course offerings to make the local labor market needs. Thus, over time, we should see different credentials rise and fall as the labor market shifts. So, if a similar dataset was developed today, we would likely see that reflected in the local labor market indicators and the credentials earned. However, the broad conclusions drawn would likely not change, we would potentially just see a shift in which colleges and credentials have higher default rates, results tied to their changings local economies.

Methods of Analysis

All the statistical analyses in this study were done with the IBM® Statistical Package for the Social Sciences® (SPSS) version 29 software platform. As previously stated, the three research questions for this study were:

RQ1: What does a model of student loan default for students at two-year institutions in Kentucky look like using predictors from the existing literature?

RQ2: How do regional labor market indicators affect student loan default?

RQ3: How does the credential (certificate, diploma, or degree) earned impact student loan default?

To answer RQ1, the full data set was used to assess the relationship between student loan default and predictors identified in the literature review using binary logistic regression. Logistic regression models estimate the probability of a dichotomous event as a function of the independent variable, and the outcome variable of interest in this study

is dichotomous (a borrower either did or did not default on their federal student loan). As such, logistic regression analysis is the proper technique for examining the probability of a borrower experiencing one of the two outcomes (Cabrera, 1994).

Prior to running the analysis, the data set was checked for collinearity. One concern with regression analysis is multicollinearity, which occurs when some of the independent variables correlate with one another and not just with the dependent variable. One way to measure multicollinearity is the variance inflation factor (VIF), which assesses how much the variance of an estimated regression coefficient increases if the predictors are correlated (Thompson et al., 2017). Because SPSS cannot include categorial predictors in the calculations of the VIF, dummy variables were created for race (0 = White, 1 = all others) and completion (0 = completed a certificate, diploma, or associate degree, 1 = did not complete a credential). The VIF was then calculated for the predictors sex (0 = female, 1 = male), race (0 = White, 1 = all others), age, English ability (0 = prepared, 1 = underprepared), math ability (0 = prepared, 1 = underprepared), reading ability (0 = prepared, 1 = underprepared), semesters enrolled, credits passed, GPA, completion status (0 = completed a certificate, diploma, or associate degree, 1 = did not complete a credential), transfer status (0 = did not transfer, 1 = transferred), and loan amount.

A binary logistic regression analysis was then run with sex (0 = female, 1 = male), race (0 = White, 1 = all others), age, English ability (0 = prepared, 1 = underprepared), math ability (0 = prepared, 1 = underprepared), reading ability (0 = prepared, 1 = underprepared), semesters enrolled, GPA, completion status (0 = completed a certificate, diploma, or associate degree, 1 = did not complete a credential), transfer status (0 = did

not transfer, 1 = transferred), and loan amount as the independent variables. The rationale for coding the dummy variables the way they were was based on both on the literature review and to aid in the interpretation of the findings. Regarding credentials, certificates were coded as 1 and all others as 0 since this study was most interested in the influence of short-term certificates on student loan default. Regarding coding race as 0 equaling White and 1 All Others, the number of minorities in the sample that are not African-American was so small, that aggregating the minorities seemed to make interpretation easier.

To answer RQ2, the full data set was used again to assess the relationship between student loan default and regional unemployment rate. In addition to the predictors used in the first logistic regression analysis, the local labor market variables of regional unemployment rate, regional job growth, and regional annual median income were added. Prior to running the regression analysis, the VIF was calculated for predictors with the categorical variables having the same values as before.

To answer RQ3, the data set was limited to those borrowers who completed a credential and then used to assess the relationship between student loan default and credential earned. Since the data set was limited to borrowers that completed a credential, the predictors were limited to sex (0 = female, 1 = male), race (0 = White, 1 = all others), age, semesters enrolled, credential earned (0 = associate degree or diploma, 1 = certificate), transfer status (0 = did not transfer, 1 = transferred), regional unemployment rate, regional job growth, and regional annual median income. Prior to running the logistic regression analysis, the data set was checked for collinearity by calculating the VIF for the predictors.

Limitations

This study had several limitations due to the nature of the system of KCTCS as well as the data itself, which are explored further in this section. Two colleges, Ashland Community and Technical College and Hopkinsville Community College, appear to be underrepresented in the data received based on their enrollment. Several attempts were made to clarify this issue with staff in KCTCS's Office of Financial Aid, but no sufficient answer was received. It appears there was an error in downloading the files from the NSLDS, but this is speculation. Since the data for the other colleges appeared complete, and there was no way to verify the data for the two colleges was, in fact, incomplete, the decision was made to proceed with the file as received.

Furthermore, KCTCS is not a single, unified institution; rather, it is a "quasi-system" comprised of 16 semi-autonomous institutions that submit the data included in this study to a centralized location. As in generally the case, the data are only as good as the collection methods, which was a factor I was unable to control in this study. Due to the way the KCTCS data-collection system is designed, it is possible for some data (e.g., phone number, date of birth, etc.) to be entered in different formats by different colleges.

Additionally, much of the data that the individual intuitions enter were, at some point in the process, done manually, thus allowing for data-entry errors to occur. The most problematic issue caused by these data-entry errors was Social Security and/or student identification number. These errors could prevent data from being correctly matched to the various academic and demographic records. In this case, 1,155 rows were removed from the final data file received from ORPA due to a lack of academic and

demographic data, all of which could be attributed to an inability to match the row to a specific student in the records.

These factors highlight a severe limitation of this project, namely, that the data was completely inaccessible to stakeholders outside of KCTCS's internal institutional research staff. Consideration should therefore be given to the formation of a state-level research database. The state's postsecondary institutions already share much of this data with the Kentucky Center for Statistics, whose stated goal is to collect and integrate education and workforce data so that policymakers, practitioners, and the public can make the best-informed decisions possible.

Ethics (Human Subject Review Board (HSRB)/ Institutional Review Board (IRB)

As noted earlier in this chapter, since the final data file handed off to me was comprised of preexisting, deidentified data, it qualified for an exemption under 45 CFR 46.101(b)(4) requirements since it did not involve human subjects.

Summary

This chapter provided an explanation of the data-collection methods, the variables used in the study and the source of those variables, and the statical analyses performed. Results of the analyses are provided in the following chapter.

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CHAPTER FOUR

This chapter presents the results of the statistical analyses, as previously outlined in Chapter Three. The following Chapter Five includes a discussion of the results as well as opportunities for future research.

Research Question 1

General recommendations for interpreting the results of a variance inflation factor analysis are that predictors with a factor of 5–10 are a moderate concern while any with a factor of 10 or greater are of serious concern (Thompson et al., 2017). A variance inflation factor analysis was preformed to see whether the first data set met the assumption of collinearity indicated that multicollinearity was a concern moderate concern (credits passed, tolerance = .170, VIF = 5.87; GPA, tolerance = .268, VIF = 3.73). Full results are presented in Table 7.

Table 7

Variance Inflation Factor

Predictor	Collinearity statistics	
	Tolerance	VIF
Sex	.962	1.039
Race	.943	1.061
Age	.883	1.132
Underprepared–English	.724	1.381
Underprepared–Math	.840	1.191
Underprepared–Reading	.749	1.335
Semesters enrolled	.446	2.242
Credits passed	.170	5.866
GPA	.268	3.735
Completer	.669	1.495
Transferred	.968	1.033
Loan amount	.739	1.354

Based on the results, the predictor “credits passed” was removed and the test was rerun. The results of the second test indicated that multicollinearity was not a concern with no predictor having a VIF exceeding 1.62; full results are presented in Table 8.

Table 8

Variance Inflation Factor

Predictor	Collinearity statistics	
	Tolerance	VIF
Sex	.974	1.027
Race	.943	1.060
Age	.883	1.132
Underprepared–English	.726	1.378
Underprepared–Math	.840	1.190
Underprepared–Reading	.752	1.329
Semesters enrolled	.617	1.620
GPA	.892	1.121
Completer	.738	1.355
Transferred	.975	1.026
Loan amount	.740	1.351

With the assumption of collinearity met for the data set, a binary logistic regression was run to explore the relationship between defaulting on federal student loans and the predictors listed above, which were identified through the literature review. As noted in the literature review, the most commonly used labor market indicator is the statewide unemployment rate. Because this project only used data from a single state, this predictor was unable to be included since the value would have been the same for all borrowers. This analysis, as a result, had no predictors related to economic conditions.

The results were in line with those expected, based on the literature review. The odds of males defaulting were 32% higher then femails, while the odds of default for borrowers underprepared for English and math were nearly 25% and 24% higher, respectively. Age was also positively associated with student loan default, with a nearly

2% increase in the odds of default for each year increase in age. Of the predictors negatively associated with default, borrowers who transferred to another institution saw their odds of default drop nearly 51% compared to those who did not transfer. The odds of default for those who completed a credential were 35.5% less, and for each additional semester they were enrolled, borrowers' odds of default were 12% less. Neither reading preparedness ($\beta = .09$, $x^2 = 2.12(1)$, $p = .146$) nor the loan amount ($\beta = .000$, $x^2 = 2.43(1)$, $p =$. 199) were significant predictors of a borrower defaulting on their federal student loans. The Hosmer & Lemeshow test was used to test model fit. The test assesses the model's goodness-of-fit by comparing the observed and expected frequencies of the outcome. A large p-value suggests that the model fits the data well, while a small p-value ($p < .05$) suggest poor model fit. In this case, the Hosmer & Lemeshow test suggests a poor model fit ($p < .038$). The decision was made to not report the pseudo R-squared value. Unlike linear regression, pseudo R-squared does not denote the amount of variance explained by the model. That, combined with pseudo r-squared values being lower than the true R-squared, can result in misinterpretation. The full results of the analysis are presented in Table 9.

Table 9

Logistic Regression Analysis With No LMI Predictors

Predictor	β	S.E.	Wald	df	*p*	Exp(β)	95% C.I. for Exp(β)	
							Upper	Lower
Constant	−.581	.100	.34.031	1	<.001	.559		
Sex***	.325	.053	37.997	1	<.001	1.384	1.248	1.535
Race**	−.170	.065	6.853	1	.009	.844	.743	.958
Age***	.018	.003	37.490	1	<.001	1.018	1.012	1.024
Underprepared–English***	.221	.060	13.605	1	<.001	1.248	1.109	1.404
Underprepared–Math***	.213	.059	12.899	1	<.001	1.237	1.101	1.389
Underprepared–Reading	.086	.059	2.119	1	.146	1.090	.971	1.224
Semesters enrolled***	−.129	.017	54.667	1	<.001	.879	.849	.909
GPA***	−.341	.026	166.013	1	<.001	.711	.675	.749
Completer**	−.265	.089	8.929	1	.003	.767	.645	.913
Transferred***	−.706	.112	39.799	1	<.001	.494	.397	.615
Loan amount	.000	.000	2.434	1	.119	1.000	1.000	1.000
Test								
Overall model evaluation***				11	<.001			
Goodness-of-fit test								
Hosmer & Lemeshow*				8	.038			

*$p < .05$. **$p < .01$. ***$p < .001$

Research Question 2

The results of the VIF for the data set used to answer RQ2 indicated that multicollinearity was not a concern with no predictor having a VIF exceeding 1.69; full results are presented in Table 10.

The result of the binary logistic regression, which included all the previous predictors as well as three new labor market indicators, is presented in Table 11.

Table 10

Variance Inflation Factor for Research Question 2

Predictor	Collinearity statistics	
	Tolerance	VIF
Sex	.973	1.028
Race	.846	1.182
Age	.881	1.135
Underprepared–English	.724	1.380
Underprepared–Math	.839	1.192
Underprepared–Reading	.749	1.335
Semesters enrolled	.616	1.623
GPA	.889	1.124
Completer	.737	1.357
Transferred	.973	1.028
Loan amount	.737	1.357
Regional unemployment rate	.724	1.382
Regional job growth 2012–2022	.775	1.291
Regional annual median income	.592	1.690

Table 11

Logistic Regression Analysis With LMI Included

Predictor							95% C.I. for Exp(β)	
	β	S.E.	Wald	df	*p*	Exp(β)	Upper	Lower
Constant	−.191	.517	.137	1	.711	.826	--	--
Sex***	.326	.053	37.896	1	<.001	1.385	1.249	1.536
Race	−.051	.069	.547	1	.459	.950	.830	1.088
Age***	.019	.003	39.610	1	<.001	1.019	1.013	1.025
Underprepared–English***	.208	.060	11.905	1	<.001	1.231	1.094	1.385
Underprepared–Math***	.202	.059	11.600	1	<.001	1.224	1.090	1.375
Underprepared–Reading	.064	.059	1.165	1	.280	1.066	.949	1.198
Semesters enrolled***	−.133	.018	57.553	1	<.001	.876	.846	.906
GPA***	−.343	.027	165.894	1	<.001	.709	.673	.747
Completer**	−.278	.089	9.827	1	.002	.757	.636	.901
Transferred***	−.689	.112	37.840	1	<.001	.502	.403	.625
Loan amount	.000	.000	1.515	1	.210	1.000	1.000	1.000
Regional unemployment Rate**	.051	.018	8.507	1	.004	1.053	1.017	1.089
Regional job growth	−.001	.008	.006	1	.936	.999	.983	1.016
Regional annual median income	.000	.000	2.971	1	.085	1.000	1.000	1.000
Test								
Overall model evaluation***			1020.292	14	<.001			
Goodness-of-fit test								
Hosmer & Lemeshow			8.901	8	.351			

*$p < .05$. **$p < .01$. ***$p < .001$

Of the three local labor market variables included, only the regional unemployment rate was a significant predictor of default with each percentage increase corresponding to a 5.3% decrease in odds of default. This suggested that local economic conditions may be more important in understanding student loan default than previously recognized. In particular, the availability of local employment opportunities may be of particular importance to community college students who are more likely to remain in the area following school than traditional students at four-year institutions. That said, completing a credential remains a significant predictor as well, with the odds of those earning any credential proving to be 36.4% less than those who left college without

earning a credential. Relatedly, semesters enrolled were again negatively associated with default, presumably because staying enrolled increased the likelihood of completion of course of study. The nearly 50% reduction in odds of default for borrowers who transferred may signal that the credential earned is of interest.

As in the first analysis, loan amount and being underprepared for English were not significant predictors of default. More interestingly, race was no longer a significant predictor of default with the inclusion of the regional labor market variables. This is possibly related to higher minority populations in the urban and metro areas in the state, which also have stronger economic standing than the rural areas.

Research Question 3

The analysis for RQ3 began by calculating the VIF for the data set; the full results are presented in Table 12.

Table 12

Variance Inflation Factor for Completers' Data set

Predictors	Collinearity statistics	
	Tolerance	VIF
Sex	.988	1.012
Race	.937	1.067
Age	.937	1.067
Semesters enrolled	.833	1.201
GPA	.978	1.023
Credential	.836	1.197
Transferred	.894	1.118
Loan amount	.898	1.114
Regional unemployment rate	.455	2.198
Regional job growth 2012–2022	.687	1.457
Regional annual median income	.592	1.690

While the VIF for the regional unemployment rate was just under 2.2, the highest of all predictors, it still fell within the acceptable range. Therefore, multicollinearity was

not deemed a concern. The association between student loan default and the regional economy for borrowers earning a credential was then analyzed while controlling for sex, age, semesters enrolled, GPA, credential earned, and transferring to another institution, using binary logistic regression. The full results of the regression are presented in Table 13.

Table 13

Logistic Regression Analysis for Completers

Predictor	β	S.E.	Wald	df	*p*	Exp(β)	95% C.I. for Exp(β)	
							Upper	Lower
Constant	−1.721	.865	3.962	1	.047	.179		
Sex***	.387	.084	21.196	1	<.001	1.473	1.249	1.738
Race	−.039	.121	.106	1	.745	.962	.759	1.218
Age***	.028	.004	46.698	1	<.001	1.029	1.021	1.037
Semesters enrolled	.004	.017	.056	1	.813	1.004	.971	1.038
GPA***	−.669	.068	96.326	1	<.001	.512	.448	.585
Credential***	.712	.093	58.988	1	<.001	2.038	1.699	2.444
Transferred	.043	.104	.176	1	.675	1.044	.853	1.280
Loan amount	.000	.000	.617	1	.432	1.000	1.000	1.000
Regional unemployment rate**	.070	.026	7.489	1	.006	1.072	1.020	1.128
Regional job growth 2012–2022	−.004	.013	.112	1	.738	1.000	1.000	1.000
Regional annual median income	.000	.000	.015	1	.902	1.000	1.000	1.000
Test								
Overall model evaluation***			323.728	11	<.001			
Goodness-of-fit test								
Hosmer & Lemeshow			12.719	8	.122			

*$p < .05$. **$p < .01$. ***$p < .001$

Earning a short-term certificate instead of a diploma or associate degree increased the odds of default by 103.8%. Being male increased the odds of default by 47.5%, while each additional year of age increased the odds of default by 2.1%. The only labor market indicator that was a significant predictor of default was the regional unemployment rate,

with each percentage increase leading to a 7.2% increase in the odds of default. Race, semesters enrolled, transferring, and loan balance were not significant predictors of default.

Summary

This chapter provided the results of the statistical analyses used to answer the primary research questions of the study. In line with the existing literature, completion of a credential was a significant predictor of default. However, looking at just completers, credential level earned was also a significant predictor of default, suggesting differences between earning a certificate, diploma, and a degree. Of the local labor variables included as predictors of student loan default, only the regional unemployment rate was significant. Although race was a significant factor without any labor market variables included, it was not a significant predictor once the regional employment rate was added; a result that held when just looking at completers as well.

The following chapter includes a discussion of the results, potential policy implications, areas of consideration for future research, and a summary of the study.

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CHAPTER FIVE

Despite comprising around a third of the postsecondary, undergraduate enrollment, borrowers that attended public, two-year institutions are underrepresented in the existing literature on student loan default. As noted earlier, students that attend these institutions differ from the traditional undergraduate at a four-year residential institution. They also pursue different academic credentials, from short-term certificates to terminal Associate of Applied Science degrees to the Associate of Arts and Associate of Science degrees designed to for transfer to a four-year institution. Additionally, the unique relationship between public, two-year institutions and their local communities, and economies, and the potential implications of that relationship on student loan default has not been explored.

The purpose of this study was to explore student loan default among students at two-year public institutions by answering the following research questions:

RQ1: What does a model of student loan default for students at two-year institutions in Kentucky look like using predictors from the existing literature?

RQ2: How do regional labor market indicators affect student loan default?

RQ3: How does the credential (certificate, diploma, or degree) earned impact student loan default?

In this chapter I discuss the findings related to the existing literature on student loan default, what role the regional economy may have played in student loan default, the value of short-term certificates in the marketplace, and what implications may be useful to postsecondary administrators, legislators, students, and other stakeholders for better

understanding student loan default. Also included is a discussion on limitations, areas for future research, and a brief summary.

Interpretation of Findings

Research Question 1

Nearly one-quarter (22.3%) of the borrowers from KCTCS who entered repayment from October 1, 2013 through September 30, 2014 defaulted by September 30, 2016. The results of the first binary logistic regression, which did not include any labor market indicators, largely supported the consensus in the existing literature. Sex, race, and age were all significant predictors along with borrowers of color, males, and older borrowers, and all placed these demographic groups at significantly higher risk of default. Interestingly, race dropped off as a significant predictor when the labor market variables were added in, while the others did not. A potential explanation may be that communities of color in Kentucky are concentrated in the urban and metropolitan areas, which also have stronger local economies than the rural areas of the commonwealth.

Completion of course of study, and the behaviors and attributes related to it, were all significant predictors of borrowers defaulting on their federal student loans even after adding in regional labor market variables. Therefore, it is perhaps even more concerning that less than a third (30.5%) of those borrowers entering repayment in federal FY2014 earned any credential. That means that nearly 70% of the students in this cohort took out student loans to pay for a postsecondary education, which resulted in no credential—not even a short-term certificate. That number is even worse for men, with a full 75.5% of men in the cohort failing to earn a credential. Looking at the racial makeup of the cohort, Black borrowers made up 15.7% of the cohort, but only 8.7% of the completers.

Postsecondary institutions should continue to work on closing the completion gap for these groups. Institutions may also need to reevaluate their admissions and advising processes to ensure that students are getting the information and resources they need to be successful. Along those lines, future researchers exploring this topic could look at using qualitative methods to better understand the barriers that prevented former students from earning a credential. A better understanding of the reasons that prevented students from being successful could allow institutions to do more targeted interventions which could lead to lower default rates by increasing completion rates.

Data on the number of certificates offered by KCTCS during the time this cohort was enrolled were unavailable. However, KCTCS currently offers 473 certificates, which is a good indication of the scope offered at the time. So, in theory, a student who earned more than 10 or so credits should have had a good chance of earning a credential. However, the data revealed a very different picture. Of the students in the cohort who earned some number of credits, 82.9% failed to earn a credential. If the students who earned 10 or fewer credits are eliminated, 56.1% of those who earned more than 10 credits still failed to earn any credential. Finally, 7.5% of those who earned credits but failed to earn a credential earned more than sixty credits—the number usually required to earn an associate degree, the highest offered by KCTCS.

These numbers raise questions about how students have been enrolling both in programs and individual courses, as well as what type of guidance they have been receiving prior to enrolling each semester. As noted earlier, public two-year colleges serve a different student demographic than their four-year counterparts, particularly residential institutions. In Kentucky, KCTCS' students are more likely to be a first-

generation student, academically underprepared, a parent, and over 25 years old, relative to the university students. These differences may mean two-year students, on average, are less savvy actors in the postsecondary space. For example, students may be taking courses without fully understanding how a particular sequence of courses leads to a credential, or they may be discounting the importance of earning a certificate or diploma on their way to earning an associate degree. This may help explain how interventions that were intended to reduce student loan default resulted in less retention, less completion, and more default (Barr et al., 2021); while the intent was good, the messaging around making better decisions regarding borrowing may have pushed some students to view any borrowing as bad, leading them to leave the institution. As policymakers consider ways to address student loan default, they may need to carefully consider how to educate less financially savvy students on the responsible use of credit broadly before broaching the use of student loans. The unintended consequence of pushing these students away from the institutions after they have taken the initiative to enroll may be more detrimental than the risk of them potentially defaulting in the future since their potential for earning a credential drops to zero if they leave the institution. Policymakers should also consider if measures like the CDR are the appropriate tool, or if holding institutions accountable for completion rates might be better from an accountability standpoint. It is clear from the existing literature, and seemingly confirmed in this study, that taking out student loans and failing to earn a credential is the strongest predictor of future default. That being the case, perhaps institutions should be held accountable for that metric, which is also something they have more control over, than whether former students later default after leaving the institution.

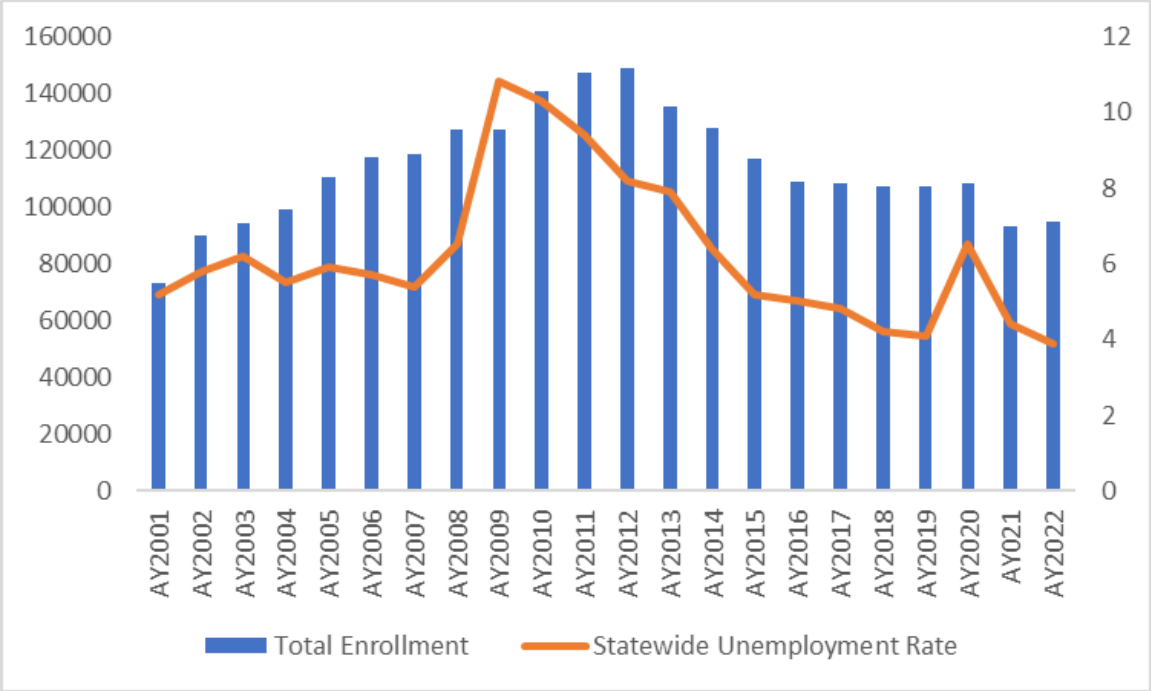
Research Question 2

Of the three labor market indicators included in the analysis, only the regional unemployment rate had a significant influence on student loan default. Neither projected job growth nor median annual income in the region were significant predictors of default. This appeared to confirm the existing literature that cites employment, not income, as more significant to repaying student loans (Dai, 2013; Hillman, 2014; Ishitani & McKitrick, 2016). However, institutions should still be working to align their academic offerings with the local business community. Those with a better understanding of the regional job market ought to be better equipped to assist students in making informed decisions related to borrowing (Looney, 2011). It is important to note, however, that public, two-year institutions should not just be preparing students to enter existing jobs upon completion of their programs. These institutions, especially those serving economically distressed areas such as Eastern Kentucky, should also be preparing students to create new, local economic opportunities. Examples could include working to provide entrepreneurial training to interested students in career and technical programs that may want to start a business or working with students in new and emerging areas such as artificial intelligence. The end result, however, should be institutions encouraging students to stay in the area and help create the next generation economy.

This finding directly relates to trends in community college enrollment. Namely, that they have typically seen enrollment surge during downturns in the broader economy as people return to postsecondary institutions. Total enrollment at KCTCS along with the state unemployment rate over the past two decades is presented in Figure 6.

Figure 6

Enrollment and Statewide Unemployment AY2001–AY2022



Note. Enrollment data derived from KCTCS; unemployment rate derived from the Federal Reserve Bank of St. Louis.

As seen in Figure 6, from the start of the Great Recession during the 2008 academic year, total enrollment at KCTCS increased from 127,050 to 148,604 by the 2012 academic year, an increase of 21,554 or 25.5%. Then, as the economy continued to recover, enrollment fell from the high of 148,604 in academic year 2012 to 93,016 by academic year 2021, a decline of 37.4%. The only increase in enrollment during that time period coincided with the COVID-19 pandemic, which resulted in the lockdown recession.

What does all this mean for student loan default? As discussed throughout this dissertation, two-year colleges serve a different student population; one that is more likely to be impacted by economic downturns. Two-year colleges are therefore more

likely to see increased enrollment when their regional economy falters, of students who will likely be reliant on student loans. While institutions of higher education are unable to prevent students from borrowing the maximum amount of loans they qualify for, institutions may want to consider what guidance they provide to students during these times as it relates to borrowing and future employment potential. Policymakers should consider how this economic relationship could, or should, be reflected in the CDR. Instead of a flat default rate that never changes, perhaps the percentage of the cohort that defaults should be linked to their local economic conditions during the three-year period. In better economic times, institutions might be held to a higher standard while seeing it relaxed during economic downturns. This economic relationship also suggests that institutions should be working with local employers during economic downturns to try and understand what their needs will be coming out of the downturn. In theory, students could start preparing for jobs that might not currently exist, but likely will when they enter the workforce in a few years.

One of the more interesting findings of the study was that race became a nonsignificant predictor of default once the labor market predictors were added. While this may reflect people of color in Kentucky living in the urban and suburban areas like Lexington and Louisville, it seems somewhat at odds with the literature. Hakim and Rashidian (1995) found Caucasian borrowers were less impacted than non-Caucasian borrowers during a recession while Volkwein et al. (1998) noted that Black and Hispanic borrowers were significantly more likely to cite unemployment as a very important reason for defaulting, compared to White and Asian borrowers who did not. Additional

research focusing on students at the colleges that serve these and other areas of the state with strong, growing economies is needed.

Research Question 3

In the final analysis, my findings appeared to confirm the findings of Dynarski (1994) who found declining default rates with each increase in degree level. In this study, borrowers who earned a certificate had odds of default 104% higher than those that earned an associate degree or a diploma. This has important policy implications since the Council on Postsecondary Education, Kentucky's coordinating body, has established a goal of 60% of residents attaining a postsecondary credential by 2030. Given that certificate earners comprised approximately one third (31.4%) of the completers but over half the defaulters (52.3%), however, there appears to be an issue with simply assuming any credential will provide a return on investment to the earner.

Currently, KCTCS lists on its website a staggering 473 certificates, with limited information available to prospective students on which of these may be more in-demand than others. Additionally, there is no distinction made between those certificates that truly provide an entry point into the workforce and those that appear to be more applicable to those already employed in a given field. For example, the Medicaid nurse aide certificate leads to the state registered nurse aide exam, which provides a clear pathway into the healthcare field (KCTCS, 2024). It is also an embedded certificate that allows students to return and continue their education and earn either their diploma in licensed practical nursing or degree in registered nursing (KCTCS, 2024). Those who earn their AAS in registered nursing can then continue on to earn their bachelor of science in nursing. In contrast, the certificate in green building technology (KCTCS, 2024a) might be valuable

to someone already in the construction management field looking for a promotion but might have limited value to a recent high school graduate with no experience in the field. However, this is difficult to determine since very little information is available on the website other than the required courses. Additionally, it is unclear whether the courses in the certificate count towards any higher-level credential.

Policymakers should consider requiring postsecondary institutions to provide more information on workforce demand and outcomes for each credential offered. In addition to the obvious data points such as median salary, this data should encompass things like the expected demand for the credential over the coming years, if it is a credential that offers entry into the workforce, or is better for someone already in the field, and what the current openings-to-graduates, from all postsecondary providers in the region, is. Institutions have access to this type of data already, so they could start providing this type of data to prospective students even without any action from policymakers. From a human capital theory perspective, providing more detailed information would provide students a more complete picture, which would allow them to make a more informed choice on how to invest in their education to maximize their expected return. That being the case, providing more data to potential students could help lower future default rates. Institutions could also benefit from future research could using qualitive methods to explore things like expectations versus actual experiences for students that earned a certificate and later defaulted. A better understanding why these students who earned a credential but still defaulted could highlight issues, such as a misalignment with the workforce needs, that institutions could use to lower their default rates.

As noted throughout, the students served by public two-year postsecondary institutions differ significantly from those served by four-year, residential institutions. Despite this, the metric currently used to monitor student loan default, the cohort default rate, is a rather blunt instrument; it makes no allowances for the types of students served by the institution even though different types of institutions serve different student populations. This is a point several researchers have made over the years (Knapp and Seaks, 1992; Monteverde, 2000; Volkwein and Szelest, 1995) and one bolstered by the findings of this study. Therefore, policymakers should explore new metrics for holding institutions accountable. As noted earlier, it may be more effective to focus on increasing completion rates rather than default rates. Should policymakers want to continue with the CDR, they could adjust it to account for differences between two- and four-year institutions as well as for regional economic differences. The current system effectively punishes our public two-year institutions, especially those in economic distressed areas, for providing the services to their communities that these same policymakers require them to. Policymakers need to recognize that their public two-year institutions will never have similar outcome metrics that their selective, four-year counterparts will. That said, it does not mean that those two-year institutions are not fulfilling their mission; instead, it simply recognizes they have a different mission, one that serves a markedly different student population.

Additionally, this study suggested that student loan default was significantly related to the local economy. Policymakers should consider ways in which more nuance could be added to a metric on student loan default that accounted for differences in student populations served, as well as different economic conditions. For example, a two-

year institution serving a rural area with a weak local labor market should not be expected to have the same default levels as a two-year institution in a metropolitan area with a strong economy. Policymakers should also consider whether student loan default is a metric of the greatest importance; it may be that more attention ought to be given to completion rates with credentials that lead to employment, especially for public two-year institutions. This mirrors the recommendation from Hillman (2015c) who suggested institutions pay more attention to ensuring students graduate with credentials in fields that help them get employment. Instead, policymakers currently want to have their cake and eat it too. They want our public, two-year institutions to be open access and serve anyone that walks in the door, but they limit their ability to restrict the student loans they can take out. Then, they hold the threat of losing access to Title IV funding, the very funding most of their students rely on, over the heads of the institution if too many of those high-risk students end up defaulting on the students loans the institutions has no control over. This paradox directly hampers an institution's ability as it relates to their mission of regional stewardship.

In a more perfect, or balanced, world, public two-year institutions would not be solely focused on preparing students for the existing job market in their region. Instead, they would also be developing the next generation of entrepreneurs that would graduate and create the next generation economy. Most importantly, they would not leave their local area to do so; they would stay and be part of the reimagining of what the new economy will look like for regions like the coal fields in Eastern and Western Kentucky. In order for that to happen, however, policymakers will have to move past the punitive nature of the current CDR. We often hear the reason for measures like the CDR is that

student loans are public tax dollars and therefore, measures are needed to ensure they are responsibly used. On the surface this is a reasonable argument. However, there are other programs that effectively offer tax dollars for higher education without any oversight. An example is the Work Ready Kentucky Scholarship mentioned earlier. Participants can receive up to an Associate's degree in a high demand field without any strings attached; there is no obligation to work in Kentucky for a specified period and no penalty for using the scholarship but failing to earn a credential either for students or institutions. Since tax dollars are already being used to fund postsecondary education without any potential negative consequences for postsecondary institutions, serious consideration should be given to revamping the existing CDR metric to provide more flexibility to public, two-year institutions in order for them to be better serve their local communities. However, if policymakers at the federal level fail to change the current CDR metric, there is a potential way for Kentucky policymakers to better position its community and technical college system to live with it – single accreditation. As previously mentioned, the current governance system results in each of the sixteen KCTCS institutions having their own CDR since they individually accredited institutions. Should a merger happen to create something like the Kentucky Community and Technical College, there would be a single CDR for the state. Thus, the campuses serving the rural areas would be, to some extent, be offset by the larger, urban college in the golden triangle in terms of potential student loan default.

Additional Policy Implications

While some recent research has focused on the potential value of IDR plans (Abraham et al., 2020; Cox et al., 2020; Yannelis & Tracey, 2022), this study did not find

income to be a significant predictor of default. Employment, however, did appear to play a critical role in default. Since IDR plans require the monthly payment to be a percentage of a borrower's discretionary income, switching the default repayment plan to some version of an IDR plan could benefit borrowers at two-year institutions, particularly those going into high-demand but lower-income fields such as home health and teacher aides. Additionally, for most of the current IDR plans, discretionary income has been defined as adjusted gross income that exceeds 150% of the federal poverty guidelines; the poverty guidelines are published annually and are based on family size and geographic location. Given the role that regional labor markets have apparently played in student loan default, moving to an IDR plan could benefit borrowers in areas with weaker labor markets. Policymakers should also consider if all credentials should have the same IDR plan. There could be a social benefit from allowing students entering high-demand but lower paying fields to pay a smaller portion of their income toward their student loans.

Limitations

Much has been made of the reproducibility crisis in the social sciences over the past decade (Guttinger, 2020; Heino et al., 2017; Pashler & Wagenmakers, 2012). While a full discussion of the reproducibility crisis is beyond the scope of this chapter, it is relevant considering the issues faced in gathering the data for this project. That is, in an ideal world, the data set used for this project would be easy for another researcher to create or obtain; however, that is not currently the case. In order to create the data set for this project, numerous steps were taken by individuals with access to the raw data to connect different data while I had to take additional steps after obtaining the de-identified

data set. All of this makes it unclear, if not unlikely, that another researcher would be able to obtain the same data set used here.

However, this does not need to be the case. Kentucky already has an existing statewide longitudinal data system that brings together data from key areas including early learning, K–12, postsecondary education, and workforce participation (including actual earnings) managed by a state agency, the KYSTATS. The data on workforce participation would be of particular interest to researchers in this area since it would include individual level data on unemployment and wages from the unemployment insurance data.

There are some limitations to the unemployment insurance data, however. First, the data only reflects individuals employed by a company who were working in Kentucky; it does not contain federal employees working in the state, those who are self-employed, or those working in another state. Each of these facets presented a unique limitation. Second, Kentucky is home to two federal military bases, both of which have a KCTCS college in the community. As federal employees, these individuals would not be captured in the existing unemployment insurance data. Third, 12 of the 16 KCTCS colleges are located on or near a border with a neighboring state, which means fewer of their graduates are captured in the unemployment insurance data. Finally, some of the technical programs, such as cosmetology and construction have high rates of self-employment. Despite these limitations, the labor market information that could be gleaned from the unemployment insurance data for borrowers would greatly improve future projects examining student loan default.

Unfortunately, access to this information is currently severely limited. State lawmakers should consider mandating researchers' easier access to existing, de-identified data that include variables related to demographic and family information, high school and postsecondary attendance, credential attainment, and workforce participation and salary. Doing so would not only address the reproducibility issue, but it might also encourage more research by removing barriers to the data.

Future Research

While this study highlighted the potential risk of leaving college with a certificate in lieu of a diploma or degree, additional research is needed to explore the differing outcomes among various certificates. Do some certificates lead to a higher default rate than others? If so, do they entail different employment outcomes? While some appear to offer a legitimate entry point into the workforce, future longitudinal studies should explore whether that is indeed the case. For example, did students earning certificates in the allied health field stay in the field? Did they go on to earn higher level credentials later? In contrast, what were the employment outcomes for those students who earned certificates that appeared to be more limited in their application?

Another question is how various incentives, such as performance-based funding, may motivate institutions to promote certificates over higher-level credentials. Kentucky began phasing in performance-based funding starting in 2016 with the following goals: (1) increasing retention and progression of students, (2) increasing the number of degrees and credentials earned, (3) increasing completion in science, technology, engineering, mathematics, and health (STEM+H) programs and high-wage/high-demand fields, and (4) closing achievement gaps. It is unclear, however, whether significant weight was

given to higher-level credentials in the formula to offset the potential gain for an institution by encouraging students to focus on short-term certificates instead. The current study highlighted the potential limitations of some certificates to provide the employment outcomes that stakeholders may be expecting. Policymakers may need to revisit whether their state's goals, objectives, and incentives are aligned with research to encourage the best possible outcomes for students.

Finally, leaving college without a credential is consistently one of the strongest predictors of student loan default. Future qualitative research focused on noncompleters could offer insights that policymakers and educational administrators could use to improve completion rates. Additionally, institutions could also employ qualitative research to better understand what issues caused those students who earned a certificate to default. Of particular interest would be the students' anticipated employment opportunities and outcomes versus their actual experience.

An emerging area of potential research relates to efforts made in recent years to provide scholarships that cover tuition and fees for the first two years of postsecondary education. Kentucky currently runs the Kentucky Work Ready Scholarship, which provides up to 60 credit hours in the top five in-demand industry sectors for those residents who do not have an associate degree. Introduced by an executive order in 2016, it was codified during the 2019 legislative session. It currently applies to student pursuing a credential in healthcare, advanced manufacturing, transportation/logistics, business services/IT, or construction; a student working towards a degree in any other field or working on a transfer degree does not qualify for the scholarship. It is also a last-dollar scholarship, meaning that a student must complete the Free Application for Federal

Student Aid (FAFSA) and any federal aid they receive, such as a Pell grant, is applied before the Kentucky Work Ready Scholarship is applied. One question for future research will be whether programs such as these reduce the numbers of borrowers or if students are still borrowing at similar rates. It seems possible that borrowing may not decrease much since students might use student loans to replace working while enrolled. Even if that is the case, however, it may help increase completion rates, which in turn might drive down default rates. Another thread of research related to these types of scholarships will be on enrollment shifts. If scholarship programs such as the Kentucky Work Ready Scholarship are nudging more students to earn credentials in high-demand fields, this may help address student loan default since those students would be less likely to experience unemployment.

Another avenue for future research would be to explore how well two-year institutions are at matching their academic programming to their local economic needs. Based on the current research, institutions that are doing a better job of aligning with local needs should see it reflected in lower unemployment rates of completers and in lower default rates for borrowers. While there is much talk about alignment between postsecondary institutions and workforce needs among various stakeholders, it seems much less clear what it actually looks like in practice. Research that could provide best practices to administrators could in turn help lower default rates in the long term.

Summary

This study sought to examine the current state of student loan default for borrowers who attended a public two-year institution in the state of Kentucky, and to examine the role that regional economy has played in loan default. The results suggested

the strength of the regional economy, particularly as it pertained to employment opportunities, was a significant factor that influenced whether a borrower defaulted or not. Since this study was unable to include actual wage information, future research should try to include this metric to better understand whether income also plays a role in default. This study also highlighted a potential issue with the singular focus on completion of a credential since it appeared that some certificates may not be yielding the expected outcomes in the labor market. Given the vast number of certificates offered by the institutions included in this study, further research is needed to determine which certificates are leading to different employment outcomes—and default status.

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Presentations

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Measuring the social utility of occupations. Presentation at the Kentucky Association for Institutional Research.

Program Alignment: Connecting Academic Programs to Labor Market Information. Presentation at the Kentucky Association for Institutional Research.

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Improving Perkins reporting with an online manual. Presentation at the National Association for Career and Technical Education Information conference.

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Determining "Social Utility" in Academic Programs. Presentation at the Kentucky Association for Institutional Research.

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Implementing Models for Civic Health. Presentation at the Kentucky Engagement Conference.

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