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Are Student Loan Default Rates Linked to Institutional Capacity?

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By Terry T. Ishitani and Sean A. McKitrick

As more undergraduates have taken out loans to attend college, the number of borrowers who fail to repay their student loans has increased. While previous research has focused on students' likelihood to default, this study employed institutional cohort default rates (CDRs) as an outcome variable. Using Integrated Postsecondary Education Data System, this study investigated the association between institutional effectiveness and CDRs. Coupled with multilevel modeling, the study also observed the effects of state-level factors, such as state appropriation and unemployment, on CDRs. The results showed that institutional characteristics—e.g., proportion of minority students, admission test scores, retention rates, and instructional expenses—are strongly associated with institutional CDRs. This suggests that institutional default rates are mainly a function of the students that institutions enroll, and future studies should include institutional as well as student factors to provide policy makers and researchers with a more comprehensive understanding of institutional CDRs.

T he realities surrounding the issue of student loan default are sobering. Since fiscal year (FY) 2000, average undergraduate tuition and fees have increased by 50%, and the average federal student loan has increased by 39%. As of 2013, overall student loan indebtedness in the United States was well over 1.2 trillion dollars (National Center on Education Statistics [NCES], 2013). Perhaps most concerning, of all students who entered repayment in FY2012, 11.8% defaulted (NCES, 2015). A growing chorus of financial analysts and higher education economists warn that inaction toward addressing these trends could lead to consequences, including increased instability of the U.S. economy in future years should repayment requirements become more onerous and overall default rates rise (Elliott & Lewis, 2015). In response to these trends, policy makers have put increasing pressure on institutions to manage student loan default rates so that they do not exceed certain levels. Pressure on institutions comes in many forms, such as proposals to restrict student access to Title IV funding at these institutions among other sanctions (Hauptman, 2008; Williams, 2014).

Holding institutions accountable for default reduction is therefore not a fad to be waited out in the hope that it will pass. "Risk sharing," in which institutions share responsibility with students for loan repayment, has taken many forms, including requirements that institutions with cohort default rates above certain levels establish default prevention taskforces to identify factors causing higher default rates, develop measurable objectives to lower rates, and specify actions that they can take to improve student loan repayment (Chitty, 2010; Field, 2015; U.S. Department of Education [USDE], 2012; Webber, 2015). Regional accreditors are also paying more attention to institutional accountability for successfully managing cohort default rates.

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Some now require institutions to assess and report on how they evaluate services and programs associated with students' incurring debt as part of an overall process of maintaining institutional accreditation (Higher Learning Commission, 2015; Middle States Commission on Higher Education, 2015).

This continuing focus on the responsibility of institutions to successfully manage student loan default requires more inquiry about the *capacity* of institutions to apply default reduction strategies successfully. For the purposes of this study, we define institutional capacity as an institution's ability to leverage resources, achieve student success, and adopt strategies to achieve elements of institutional mission specific to an institution's student population and unique characteristics (Powell & Rey, 2015; Jokelainen, Jamookeeah, Toosavainen, & Turunen, 2011). Not taking into account factors generally associated with an institution's capacity to respond to external policy mandates and to achieve key institutional goals, such as the reduction of cohort default rates (CDRs), can lead to ill-designed strategies that are counterproductive and impractical. We therefore react to Gross, Cekic, Hossler, and Hillman's (2009) observation, in their own study of CDRs, that research on this topic rarely includes areas of institutional focus, and we pose the following question: Taking into account contextual settings within which institutions are placed, are student loan default rates associated with measures of institutional capacity?

Approaches Linking Institutional Capacity and Cohort Default Rates

The few studies that relate institutional capacity to the management of cohort default rate efforts employ at least one of three approaches. The first considers default management from a problem-solving perspective and studies the strategies that key institutional stakeholders employ in working with students to increase the likelihood of loan repayment. Researchers using this approach often utilize case studies, either single-case or comparative in form, to provide insights about how institutional stakeholders work together to develop student loan default reduction strategies (Association of Community College Trustees & The Institute for College Access and Success, 2014; Lacey, 2014a). Studies such as these provide best practices that institutions might adapt to their own context and mission in the interest of successfully managing student loan default.

The second approach holds that the capacity to reduce CDRs relies on institutional leaders' ability to understand preferences and goals learned through the study of aggregate student characteristics such as percentages of students from various racial and ethnic groups, sectors, geographical locales, and socioeconomic statuses (Gross et. al, 2009; Hillman, 2014; Woo, 2002). This approach considers institutions as the appropriate unit of analysis by comparing like institutions or differentiating aggregate student characteristics across institutions in order to make inferences about how to most effectively advise groups of students (often by race and ethnicity or socioeconomic status) about avoiding student loan default. For example, Harrast (2004) found that Hispanic students were more likely than other students to default, and Flint (1997) found that African Americans were 21% more likely than other students to default, whereas they were 62% more likely to do so in Woo's (2002) study. African Americans were also more likely to default in others' studies (Herr & Burt, 2005; Jackson & Reynolds, 2013). Researchers have used this approach to assist institutional leaders in differentiating their student loan default prevention strategies according to varying student characteristics, thus improving the effectiveness of their efforts. Current resources available to institutions of higher education appear even scarcer since the 2008 recession (National Association of Student Financial Aid Administrators, 2013; Toutkoushian, 2003). As a result, policymakers and the public seem unconvinced that a mere focus on variances in aggregate student characteristics, such as race, ethnicity, and academic preparation, play the only role in an institution's capacity for managing student loan default. A third approach therefore holds that, in addition to aggregate institutional characteristics, an institution's capacity to manage student loan default is a function of its ability to expend resources effectively and enable students to succeed. Researchers taking this approach agree that including aggregate

institutional characteristics as the prior two approaches do is important because significant variance exists among the many different institutions in the United States. However, they also insist that including factors associated with institutions' resource expenditure, the efficiency with which they approach key institutional goals, and their effectiveness in achieving these goals paint a more accurate picture for institutional leaders and their stakeholders when responding to accountability mandates (Hauptman, 2008; Looney, 2011; Williams, 2014). In particular, graduation and retention rates have been examined most frequently in the research about CDRs. Strong associations have been found between these student success measures and higher post-graduation salaries as well as lower probabilities of student loan default (Head & Johnson, 2011; Manning, 2011; Romano, 2012).

In this paper, we explore more fully the relationship between factors associated with institutional capacity and cohort default rates in an effort to shed some light on strategies institutions might use to keep these rates low or reduce rates that are higher than desired. We organize our presentation by first discussing the conceptual framework to be used in this study. We then explain the methodologies we employ, present the study results, and conclude by discussing the results and what they suggest for institutions as they endeavor to manage student loan default successfully.

Conceptual Framework

We rely broadly on a framework developed by Powell, Gilleland, and Pearson (2012), who note that few institutional leaders fully understand how variances in expenditure levels affect their capacity for achieving important outcomes. Remarking that the days are gone when institutional leaders can merely argue that their institutions must be fully funded to achieve outcomes, they assert that obtaining a fuller understanding of relationships among varying levels of expenditures and institutional characteristics, among other interactions, is necessary to respond effectively in an ever-growing culture of accountability. In their view, four factors will provide leaders and policy makers with such an understanding. We list these factors below with Powell et al.'s suggested measures for each in parentheses:

1. Institutional characteristics (size, locale, etc.),
2. Expenditures and revenues (revenue from tuition, academic support, instructional costs, etc.),
3. Efficiency and productivity (e.g., student-faculty ratios), and
4. Institutional effectiveness (e.g., retention and graduation rates).

Most noteworthy about this framework is that these four factors mesh well with what are understood to be elements usually associated with the concept of institutional capacity, defined above as having to do with the leveraging of resources, student achievement, and institutional context. Although Powell et al.'s specific purpose was to study interactions between expenditures and institutional characteristics on one end of a continuum and efficiency and institutional effectiveness on the other, along with possible interactions among these, their framework both *implicitly* asserts that differences among institutions (e.g., their characteristics, student achievement, the way they allocate resources, etc.) affect the ways they might address key goals and accountability initiatives and *explicitly* defines factors associated with achieving these goals and initiatives. For the purposes of this study, then, we utilize this framework by taking each of the four factors noted in the framework of Powell et al. as those associated with an institution's capacity to successfully manage cohort default rates. Below, we explain each of the four areas of the conceptual framework with reference to current research literature.

Institutional Capacity Factor 1: Institutional Characteristics

Much of the research on CDRs already suggests associations with institutional characteristics, such as Carnegie classification, racial composition of the student body, percentage of undergraduate population with federal aid, and academic qualifications of the aggregate student body, because these characteristics eventually impact the way resources are expended and account for differing institutional preferences (Christman, 2000; Harrast, 2004; Herr & Burt, 2005; Lohfink & Paulsen, 2005; Volkwein & Szelest, 1995). Moreover, specific institutional characteristics, such as the percentage of undergraduate students receiving federal aid, may impact an institution's capacity to manage CDRs because the CDR is often considered an indicator of aggregate socioeconomic status (Young & Johnson, 2004).

Institutional Capacity Factor 2: Expenditures and Revenues

Institutional revenues and expenditures are important factors that shape an institution's capacity to utilize resources under its control to achieve key goals and objectives relating to mission (Dowd, 2005; Pike, Kuh, McCormick, Ethington, & Smart, 2011). For example, an institution's expenditures on instruction, academic support, and student services relate directly to students as they pursue collegiate credentials (Toutkoushian, 2003). How effectively an institution allocates costs is an important aspect of overall institutional capacity because it affects the overall student experience, including teaching and learning opportunities. Variances in expenditures and revenues also reflect the choices institutions make when challenged to make decisions about resources, particularly when resources are scarce (Clagett, 2004; Volkwein, 2009; Webber & Boehmer, 2008). Overall, the choices institutions make with regard to expenditures and collecting revenues may affect the propensity for default because they involve student access to resources that directly affect learning, overall achievement, and student success after graduation (Capaldi, 2011; Fowles, 2014).

Institutional Capacity Factor 3: Efficiency

Whereas institutional expenditures and revenues reflect institutional priorities and mission and can affect the quality of student learning, measures commonly associated with institutional efficiency such as student-faculty ratios and enrollment intensity (defined as the percentage of students taking a full load during each academic term) are associated with an institution's ability to achieve economies of scale, to adapt, and to pursue institutional priorities and mission through the appropriate allocation of resources (Ashraf, 2012; Dowd, 2005). Given that efficiency is important in successfully allocating increasingly limited resources for the purpose of achieving institutional priorities, it is also an important factor associated with institutional capacity because the efficient use of resources affects how effectively resources and expenditures are deployed so that students can succeed (Dynarski & Scott-Clayton, 2013; Toutkoushian, 2003). For example, the efficient use of resources might affect the extent to which students are enabled to be fully engaged in their educational experiences because of more extensive access to faculty or because they are able to pursue collegiate courses on a full-time basis.

Institutional Capacity Factor 4: Institutional Effectiveness

The ultimate effectiveness of an educational institution is almost always defined in terms of student achievement indicators such as graduation and retention rates. For the purposes of this study, institutional retention rates are good indicators of institutional capacity because they reflect student progression toward graduation during a time when institutional resources in the form of academic support services are being expended (Ewell, 2011; Powell et al., 2012), and graduation rates are good indicators of overall student success because high rates signify an appropriate goal of overall institutional achievement (Bailey, 2006). With regard to CDRs in particular, it is more likely that students who graduate from college will enjoy the monetary benefits associated with earning collegiate credentials in the form of post-graduation salaries

(Avery & Turner, 2012; Jenkins & Belfield, 2014). We therefore anticipate that measures of student achievement, such as graduation and retention rates, are associated with CDRs, even when controlling for state-level economic data, such as unemployment rates and household income.

Data and Methodology

Study Institutions

We selected the institutions included in the study based on several criteria. We first limited our study to public institutions based on our observation that three-year cohort default rates between FY2010 and FY2012 have decreased the least in the public sector, which accounts for approximately 49% of all student loan defaults (USDE, 2015; Romano, 2012). Second, we limited our study to institutions utilizing the same accounting standard and based on observations in the research literature that there are key differences between public and private institutions with regard to those reporting standards (Cheslock, 2006; Koedel, 2014; Schuh, 2002). Third, we further limited this study to four-year institutions due to the observation that two-year public institutions' revenue and expenditure structures often rely more on revenue provided by local governments in exchange for a higher degree of public service involvement, producing a stark difference between the two types of institutions that could inadvertently mask significant amounts of the variance between institutional effectiveness and cohort default rates (Xie, 2010). Fourth, the availability of federal loans in the two-year public sector varies substantially by race and location. For example, more than 250,000 students who were enrolled in community colleges in California did not have access to federal student loan programs in 2010-11 (The Institute for College Access & Success, 2014). Finally, we chose not to include for-profit institutions because they, as noted above, also tend to utilize different accounting standards. Application of these selection criteria resulted in a total sample of 479 public four-year institutions.

Measures

We incorporated data from four different sources for analysis in this study: federal student loan default data, the Integrated Postsecondary Education Data System (IPEDS), the State Higher Education Finance Report by State Higher Education Executive Officers, and State Population Estimates from the United States Census Bureau.

The dependent variable is the three-year CDR average during the period in which borrowers entered repayment between 2009 and 2011; the U.S. Department of Education Office of Federal Student Aid provided institution-specific student loan default rates. The database contained aggregate data of undergraduate students, identified by institution, who took out federal Direct Subsidized Loans and Direct Unsubsidized Loans.. We computed the default rate as the number of borrowers who defaulted divided by the number of borrowers who entered repayment for a fiscal year at an institution. Students with loans enter repayment after a six-month grace period that starts when they graduate, withdraw, or drop below half-time enrollment. The study data included the average institutional default rate for the three-year period (2009 to 2011, the most recent years for available data) in which borrowers entered repayment. Table 1 presents the overall default rate in the study data and average default rates by institutional classification. The overall default rate was 6.09%, whereas average default rates for research universities, master's colleges, and universities were found to be 4.69%, 6.54%, and 7.89%, respectively.

Table 1. Loan Default Rates by Institutional Type

Carnegie Classification	Average Default Rate	SD
Research universities	4.69	2.29
Master's colleges & universities	6.54	3.31
Baccalaureate colleges	7.89	4.26
Grand total/average	6.09	3.34

All the continuous explanatory variables in the data contained averaged numerical values based on data from 2005 to 2007, listed in Table 2. The lagged nature of the data was designed to approximate matriculation periods for students who were included in 2009 to 2011 average student loan default rate estimations. We took variables for institutional characteristics from the IPEDS database with the exception of flagship status. While most states have clearly identifiable flagship state institutions, naming a single flagship institution is rather challenging in several states. In our study, we designate flagship institutions as suggested by Carey and Dillon (2011) in the states where flagship institutions are unclear. For example, Indiana University, Bloomington and Purdue University are identified as flagship institutions for Indiana. Similarly, we consider both the University of California at Berkeley and at Los Angeles as flagship universities. As for New York, we include the University at Buffalo, Stony Brook University, the University at Albany, and Binghamton University as main state institutions.

We collected variables for expenses and revenues, the second factor in the conceptual framework, from the IPEDS database. We used variables such as tuition and fees as a percentage of core revenues, state appropriations as a percentage of core revenues, and expenses per FTE student for instruction, academic support, and student services. This is consistent with studies that have utilized variables such as those identified in the conceptual framework for this study as well as other studies that have utilized IPEDS finance data (Bailey, 2006; Powell et al., 2012; Schuh, 2002).

For the third factor, efficiency, both student-faculty ratio (calculated by dividing total FTE students by total FTE faculty), and enrollment intensity (calculated by dividing total FTE students by total student headcount), were the most relevant measures of efficiency in the IPEDS database (Dowd, 2005; Powell et al., 2012). Student-faculty ratios assess the extent to which instructional resources and staff can be efficiently leveraged for each additional dollar of expenditure. Enrollment intensity assesses economies of scale as students earn credits toward graduation. For the purposes of this study, however, we choose to include enrollment intensity and not student-faculty ratio for a number of reasons. First, student-faculty ratio can be calculated several different ways; NCES has only recently developed a consistent method of calculating it (Schenker-Wicki & Inauen, 2012). Second, enrollment intensity is considered a measure of both productivity and efficiency in the sense that it is both a measure of how directly students move toward graduation and how efficiently public funds are used to achieve such a goal, something that is increasingly valued in discussions about shared responsibilities between institutions and students in the area of financial aid (Ashraf, 2012).

With regard to the final factor in our conceptual framework, student achievement, two variables in particular appear relevant because they relate to two primary goals of both institutions and policy makers: achieving high retention and graduation rates. However, these two variables are highly intercorrelated, making it difficult to conduct an appropriate analysis when including both in the same analysis (Pike et al., 2011). We therefore elected to include only retention rates in this study, both for this reason and because the calculation of institutional default rates includes repayment by students who earn credentials and those

Table 2. Sample Descriptive Statistics

Explanatory Variable	Label	Mean	SD	Count	%
Institutional level					
Institutional characteristics					
Flagship state institution	Flagship			55	11.5
	Non-flagship *			424	88.5
Carnegie Classification	Research & doctoral universities			164	34.2
	Master's colleges & universities			250	52.2
	Baccalaureate colleges *			65	13.6
Institutional size	500 - 4,999			122	25.5
	5,000 - 9,999			130	27.1
	10,000 - 19,999 *			118	24.6
	20,000 and above			109	22.8
Locale	City			230	48.0
	Suburb *			71	14.8
	Rural/town			178	37.2
Proportion of Asian students	Continuous	4.84	7.57		
Proportion of African American students	Continuous	14.63	21.62		
Proportion of Hispanic students	Continuous	8.38	11.84		
ACT 25th percentile score	Continuous	19.51	2.73		
Percent of undergraduate students receiving loan	Continuous	51.3	13.6		
Expenditures and revenues					
Tuition and fees as a percent of core revenues	Continuous	27.93	10.90		
State appropriations as a percent of core revenues	Continuous	35.16	11.39		
Instruction expenses per FTE (in $1,000)	Continuous	6.45	2.72		
Academic support expenses per FTE (in $1,000)	Continuous	1.60	0.96		
Student service expenses per FTE (in $1,000)	Continuous	1.28	1.21		
Efficiency					
FTE/headcount ratio	Continuous	0.79	0.12		
Achievement					
First-year retention rate	Continuous	74.03	9.72		
State level					
State higher education expenditures per capita in dollars	Continuous	252	66		
Average household income in dollars	Continuous	52,031	7,516		
Unemployment rate	Continuous	8.87	1.77		
Census region	Northeast			86	18.8
	Midwest			103	22.5
	South			193	42.1
	West *			76	16.6

* reference group in the regression

who drop out of college, underscoring the importance of retention rates as a measure of institutional achievement (Christman, 2000; Gladieux & Perna, 2005; Wei & Horn, 2013).

In addition to our explanatory variables, it is important to incorporate economic variables relevant to the state economies in which the institutions included in this study are embedded in order to contextualize our study of relationships between institutional capacity and CDRs. State institutions of higher education are highly affected by the economies of the states in which they operate due to tuition dependency as well as the effects of macro-economic factors, such as unemployment or average household income (Hensley, Galilee-Beifer & Lee, 2013; Koedel, 2014; Lebeau & Bennion, 2014; McArthur, 2011). Because this study covers the timespan between 2009 and 2011, variables such as state-level expenditures on higher education, average household income, unemployment rate, and regional location are important to include as controls for the economic variations that occur during times of significant economic downturn, the last of which occurred around the time the data were collected for this study (Barone, 2006; Chitty, 2010; Fitzgerald, 2004; Fogg & Harrington, 2012). We therefore include these variables, taken from the State Higher Education Executive Officers and U.S. Census Bureau databases, and match institutions with the states where they are located.

Research Design

The resulting data set contains nested variables, meaning that one group is contained, or "nested," within another group. In this case, institutions are nested within individual states, introducing level of analysis problems associated with interpreting the independent effects of the variables in this study. In order to address this level of analysis problem, we employed a multilevel regression technique known as two-level hierarchical linear modeling (HLM). This particular approach is most appropriate for nested data because estimations for state-level variables (such as unemployment rate) are adjusted by the number of states, not by the number of institutions, resulting in more robust findings for the state-level variables used in this study.

Limitations

This study has four primary limitations. First, NCES has recently provided more specific guidance regarding definitions of student-faculty ratios, but this guidance does not consistently apply to the years covered in this study. We did not feel comfortable including student-faculty ratio in this study because of this inconsistency in calculating ratios across institutional type. In addition to the limited number of factors for efficiency and achievement in the IPEDS, we found certain variables such as retention and graduation rates to be highly correlated in the study data. As a result, we limited the scope of measuring efficiency and achievement to one factor.

Second, although good integrity is achieved in the IPEDS data due to mechanisms requiring institutions to report inconsistencies in data reporting before they submit their data, there is room for interpretation by institutions with regard to the data they report (Bailey, 2006; Dowd, 2005). Third, a few institutions had aggregated default rates for both main and regional campuses, despite that significant differences existed between the main and regional campuses. This study excluded such institutions, which decreased the sample size.

Finally, as noted above in our description of the conceptual framework for this study, we refrained from examining the interactions between expenditures and institutional characteristics on one hand and measures of institutional efficiency and effectiveness on the other, as Powell et al. do. We made this decision because our interest was in examining the role of each of the institutional capacity factors independently rather than producing a more complex model.

Results

We begin this discussion about the results of this study with a reminder that we include variables at both institutional and state levels. The null model, which includes no explanatory variables, indicates that 66.3% of the total variance in CDRs was associated with the various institutional characteristics, whereas 33.7% of the variance in CDRs was related to state characteristics. This supports the argument that variances in CDRs have more to do with institutional factors than the characteristics of states in which institutions are embedded and also lends credence to the underlying assumption of the conceptual framework that variances in institutional capacity matter when it comes to addressing a key goal such as lowering CDRs. Given this initial observation, we conducted our analysis in two parts, represented in Table 3. In the first part of the analysis, labeled Model 1, we include all the institutional effectiveness variables in order to observe their relationship to our dependent variables, three-year cohort default rates, depicted in the form of unstandardized (labeled "Coeff.") and standardized (labeled "Z") coefficients. In the second part of our analysis, labeled "Model 2," we include our state-level explanatory variables to observe associations between the variables, including economic and regional associations with cohort default rates. In Table 3, negative coefficients indicate associations with decreasing cohort default rates and positive coefficients indicate associations with increasing rates. In our presentation of the results below, we review the results of Model 1 and Model 2 in turn.

Model 1: Institutional Capacity Factors without State-Level Data

Model 1 represents the results of our study without state-level regional and economic indicators, organized by the four areas of our conceptual framework: institutional characteristics, expenditures and revenues, efficiency, and student achievement. Model 1 explained 78.2% of the institution-level variance associated with the default rate in the null model (66.3%) when only the institutional effectiveness variables were included in the equation. With regard to the variables assigned to the first of these (i.e., institutional characteristics), factors such as flagship status, institutional size, and percentage of undergraduate students receiving loans were not significantly associated with institutional default rates. However, other institutional characteristics, namely race, locale, and academic qualifications of the student body, were significantly associated. A 1% point increase in the proportion of African American students on campus was associated with a 0.06 percentage point increase in the default rate, and a one-point increase in the 25th percentile ACT score was associated with a 0.24 percentage point decrease in the institutional default rate. With regard to geographic location, institutions situated in town or rural areas were associated with higher student default rates. On average, such institutions had default rates that were 0.33 percentage points higher than those of institutions located in suburbs.

We likewise found mixed results for our second institutional capacity factor: expenditures and revenues. State appropriations for higher education and institutional expenses per FTE in the areas of academic support and student services were not significantly associated with variances in institutional default rates, but tuition and fees as a percentage of institutional revenue and instructional expenses per FTE were. For every $1,000 increase in instructional expenses per FTE, there was an associated reduction in the default rate by 0.09 percentage points. A 1% point increase in tuition and fees as a percentage of core revenues was associated with a decrease of 0.02 percentage points in the institutional default rate.

Our third factor, efficiency, which was operationalized as a measure of enrollment intensity, was not significantly associated with variances in institutional default rates. But our fourth factor, student achievement (measured by student retention) was significantly associated with CDRs, consistent with earlier research on this topic. For every 1% point increase in retention, there is a 0.07 percentage point decrease in the institutional default rate.

Table 3. Multilevel Analysis Results

Variable	Label	Model 1				Model 2			
		Coeff.	SE	z	Sig	Coeff.	SE	z	Sig
Institutional Level									
Institutional characteristics									
Intercept		6.246	0.277		***	6.248	0.271		***
Flagship state institution	Dichotomous	0.209	0.241			0.252	0.229		
Carnegie classification	Research & doctoral universities	-0.283	0.470			-0.385	0.478		
	Master's colleges & universities	-0.073	0.464			-0.151	0.461		
Institutional size	500 - 4,999	0.214	0.233			0.224	0.229		
	5,000 - 9,999	0.065	0.228			0.092	0.235		
	20,000 and above	0.004	0.141			-0.041	0.133		
Locale	City	0.016	0.151			-0.030	0.155		
	Rural/town	0.333	0.183	0.048	*	0.299	0.182	0.043	*
Proportion of Asian students	Continuous	-0.055	0.038			-0.054	0.037		
Proportion of African American students	Continuous	0.061	0.010	0.379	***	0.060	0.011	0.377	***
Proportion of Hispanic students	Continuous	0.095	0.088			0.107	0.089		
ACT 25th percentile score	Continuous	-0.238	0.089	-0.185	***	-0.237	0.091	-0.185	**
Percent of undergraduate students receiving loan	Continuous	0.001	0.005			0.001	0.005		
Expenditures and revenues									
Tuition and fees as a percent of core revenues	Continuous	-0.021	0.010	-0.069	**	-0.023	0.010	-0.076	**
State appropriations as a percent of core revenues	Continuous	0.000	0.009			0.002	0.008		
Instruction expenses per FTE	Continuous	-0.085	0.045	-0.069	*	-0.096	0.047	-0.078	**
Academic support expenses per FTE	Continuous	0.012	0.099			0.035	0.107		
Student service expenses per FTE	Continuous	-0.031	0.043			-0.026	0.046		
Efficiency									
FTE/headcount ratio	Continuous	-0.007	0.012			-0.009	0.013		
Achievement									
First-year retention rate	Continuous	-0.069	0.017	-0.201	***	-0.064	0.017	-0.187	***
State Level									
Expenditure per capita in $100	Continuous					-0.269	0.214		
Average household income in $1,000	Continuous					-0.019	0.017		
Unemployment rate	Continuous					0.357	0.170	0.091	**
Northeast region	Dichotomous					-0.224	0.285		
Midwest region	Dichotomous					-0.145	0.360		
South region	Dichotomous					0.009	0.364		

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

Table 3 also includes standardized coefficients, which are useful in ranking the statistically significant coefficients. The largest influence was the proportion of African American students on campus, in which a one-standard-deviation increase in the proportion of African American students was associated with increasing the default rate by a 0.38 standard deviation. The second most influential characteristic was the first-year retention rate, followed by the 25th percentile ACT score.

Model 2: Institutional Capacity Factors with State-Level Data

Model 2 includes all the variables above but adds the state-level regional and economic variables, including state higher education expenditures per capita, average household income, and unemployment rate and census region. The addition of state-level variables resulted in explaining 54.8% of the state-level variance associated with the study dependent variable in the null model (33.7%). Variance in unemployment rate was the only state-level variable found to be statistically significant. For every 1% point increase in the state unemployment rate, the institutional default rate increased by 0.36 percentage points. All the institutional effectiveness variables found to be statistically significant in Model 1 retained their significance in Model 2, with very little shift in coefficient values.

Summary

We summarize the standardized coefficients found in Model 1 and Model 2 in Table 4, which ranked the relative strength of those variables found to be significant. The table shows that institutional characteristics associated with race (African American students), academic preparation, and locale remain significantly associated with cohort default rates although the first two of these are quite strong compared to the other significant variables in the model, with the exception of our chosen measure of student achievement, retention. Nonetheless, instructional expense per FTE student and tuition dependency are significant even when we include state-level economic and regional variables.

Discussion and Implications

State-level Variables and Institutional Characteristics

In our initial null model that included no explanatory variables, we found that state-level variables explained less of the variance in CDRs than institutional-level variables. Unemployment rates were the only state economic or regional factor significantly associated with cohort default rates, consistent with prior studies on these relationships (Hillman, 2015; Wei & Horn, 2013). Also consistent with current research on CDRs, our findings show those institutions with larger African American populations tend to have higher CDRs, and institutions that admit academically better prepared students have lower rates.

While consistent with prior research on this topic, these results suggest that continued caution is warranted when considering policies proposing tighter sanctions against those institutions that have higher rates without considering differences among the institutions or, perhaps to a lesser degree, to the economic or geographical contexts in which they operate. The finding that variables associated with locale and ethnicity are significantly associated with CDRs even after attempting to control for state economic and regional factors suggests that a full understanding of cause and effect is difficult to grasp (and we cannot suggest cause and effect exists with regard to any significant associations found in this study). It also indicates that a complicated calculus exists between socioeconomic factors, institutional characteristics, and CDRs.

Table 4. Summary of Significant Standardized Coefficients

Variable	Model 1	Model 2
Proportion of African-American students	0.379	0.377
First-year retention	-0.201	-0.187
ACT 25th percentile scores	-0.185	-0.237
State unemployment rates		0.091
Instructional expense per student FTE	-0.069	-0.078
Tuition and fees and percent of core revenues	-0.069	-0.076
Location in rural area or town	0.048	0.043

Caution in implementing sanctions against institutions with higher CDRs is also advised because of the differences that exist among institutions of higher education. For example, it should not be assumed that default management strategies ought to include a sole focus on enrolling more-qualified students, as such a strategy may increase disincentives to provide educational opportunities for less-prepared students, especially for those institutions that are on the margin of being sanctioned for high CDRs (Dillon & Smiles, 2010; Miles & Zimmerman, 1997). Such strategies, especially when resulting from broad assumptions or even from an understandable fear of restricted access to government funding, could create unintended perverse incentives, such as reduced access to financial aid by less-prepared students (Lahr, Pheatt, Doughtery, Jones, Natow, & Reddy, 2014).

Financial aid and enrollment management offices, in concert with state policy makers, will need to continue their efforts to find ways to minimize unwanted and unanticipated effects of any policies that hold institutions accountable for keeping rates below specific levels, particularly at institutions whose missions focus on serving less-advantaged or underserved populations. In making this point, we are not stating that accountability efforts are inappropriate but simply that care must be taken to avoid perverse incentives by understanding institutional differences and, perhaps, by working collaboratively to reduce CDRs.

Revenues, Expenses, and Institutional Capacity

We were surprised by the finding that academic support and student support expenditures were not significantly associated with CDRs. Current research asserts that these expenditures are important aspects of an institution's capacity to reduce student loan default because such expenditures are associated with institutional efforts to shape students' attitudes about student loans and their repayment, such as in student affairs initiatives to address this issue (Christman, 2000; Looney, 2011; Muella, 2014). Other studies have shown that such expenses are also associated with retention rates (Ehrenberg & Webber, 2010), which are themselves strongly associated with default rates. However, we could not find compelling evidence in this study that institutional expenditures for student or academic services are themselves significantly associated with the probabilities of lower CDRs. Future researchers might consider unraveling these relationships more closely or studying the utility of specific actions taken by institutions, such as requiring students to pledge to take out only minimal amounts of student loans.

In contrast to this last finding, institutions with higher instructional expenses per FTE student were significantly more likely to have lower cohort default rates. An initial argument for this is that instructional

quality enhances students' employability and therefore their ability to pay back their student loans (Volkwein, Szelest, Cabrera, & Napieski-Prancl, 1998). But these results also suggest that successful default management requires a focus on students' interactions with institutional staff beyond financial aid offices, and the quality of those interactions in shaping students' attitudes and beliefs about entering repayment is an important consideration in implementing default rate reduction efforts (Lacey, 2014b; McKibben, La Rocque, & Cochrane, 2014). If institutions have the capacity to shape student attitudes about student loan default, then it makes sense that leveraging student interactions with multiple individuals, such as faculty and academic advisors, could impact students' attitudes about entering repayment and eventual full repayment of student loans. Along these lines, although some institutions are reporting success in outsourcing their default rate management to third-party organizations (Lacey, 2014b), these findings suggest that institutions might consider developing and implementing strategies that leverage the social capital that instructional and administrative staff build with students (Logue, 2011). Future case studies might address or report on default management strategies that include academic affairs staff such as faculty, advisors, or other academic affairs professionals.

The significant association between higher tuition dependency and lower CDRs even when controlling for state-level household income (which was not significant in Model 2) was interesting. Conventional wisdom is that increases in tuition dependency have been responsible for increased costs to students in an age when students from lower-income families tend to be more sensitive to such increases. This suggests a tendency toward higher, not lower CDRs (Leslie & Brinkman, 1987; McPherson & Schapiro, 1991; Paulsen & St. John, 2002). However, very little information exists about the relationships between tuition dependency and student loan default, especially when factoring in household income.

In an effort to understand more about this finding, we examined the average default rates and the percentage of aid in the form of grants and loans by tuition quartile level using 2012 IPEDS data, which contained more detailed information on federal loans. Table 5 shows that institutions with higher tuition levels had lower default rates on average. A subsequent ANOVA analysis revealed a statistically significant F ratio ($F = 5.88$, $p < 0.01$). Furthermore, a post-hoc test indicated that institutions with high-middle and highest tuitions had statistically significantly lower default rates than institutions with lowest tuition.

Percentages and average amounts of federal student loans were not available in the 2005-2007 IPEDS data. However, a review of 2012 IPEDS data (see Table 6), which included more detailed information on federal loans and average Federal Pell Grant awards (often used as a proxy for proportions of students with financial need), indicates that while a greater number of students who attended institutions with higher tuition borrowed, their average loan amounts were not much different than those who attended institutions with lower tuition. As expected, the percentage of Pell Grant recipients decreased as tuition level increased, yet the average Pell Grant amount per student decreased very little, regardless of tuition quartile level.

These results suggest at least two additional directions for future research on associations between institutional effectiveness and CDRs. First, if it remains true that institutions with higher tuition dependencies tend to pass their costs on to students in the form of tuition and fees and therefore inadvertently increase the amount of student loans and the probability of default, then it appears that a focus on students at institutions at lower tuition levels is warranted given that default rates are higher at these institutions. Second, additional research is warranted with regard to the relative impact of tuition costs. For example, this study does not address the relationship of CDRs to costs of tuition discount rates or institutional grants and scholarships while controlling for the average household income of individual students. Factoring in these variables and employing such a control could enhance our understanding of the relative impact of discount rates on CDRs, specifically for students at lower tuition levels attending institutions of varying tuition quartile levels.

Table 5. Average Default by Tuition Quartile Level (2012 data)

Tuition	Counts of Institutions	Average Default Rate
Lowest (less than $20,000)	118	7.12
Low-middle ($20,000 - $27,299)	118	6.11
High-middle ($27,300 - $34,699)	123	5.71
Highest ($34,700 or higher)	120	5.45
Total	479	6.09

Table 6. Percentage and Averages of Student with Federal Loans and Pell Grants by Tuition Quartile Level (2012 data)

Tuition	% of Fed. Loans	Avg. Fed. Loan Amount	% of Pell Grant	Avg. Pell Grant Amount	% of All Grants	Avg. of All Grants Amount
Lowest (less than $20,000)	51.1	5479.3	44.6	4375.4	76.5	8135.4
Low-middle ($20,000 - $27,299)	56.8	5418.3	41.4	4307.9	74.0	7732.9
High-middle ($27,300 - $34,699)	57.2	5527.8	39.4	4255.1	73.1	7296.3
Highest ($34,700 or higher)	64.3	5631.8	35.1	4148.0	65.9	6706.6
Total	57.3	5515.1	40.1	4270.6	72.3	7461.0

Efficiency

Research suggests that institutions stressing full-time enrollment might also enroll students who are highly motivated to complete their collegiate credentials, thereby decreasing students' probability of default because they are more likely to enter repayment (Robb, Moody, & Abdel-Ghany, 2012). Yet our findings show no significant association between enrollment intensity and cohort default rates. In other words, our findings do not support the argument that encouraging students to complete more credit hours is associated with lowering CDRs. This may call into question policies proposing that Pell Grant formulas be changed to allow students taking more than 12 credits per semester to access more funding if such proposals primarily assume that increases in enrollment intensity will reduce the probability of default. Future researchers might focus on unpacking the complex set of institutional capacity factors related to efficient use of institutional resources. Studies that focus on relationships between CDRs, graduation rates, enrollment intensity, number of graduates per core expenditure, and other measures might be advisable, although such research would require more complex statistical approaches than utilized in this study.

Achievement

As expected, first-to-second-year retention is significantly associated with variances in CDRs, suggesting that institutions that succeed in this regard enjoy a higher capacity to successfully decrease CDRs. Because students who are not retained for the second year include a subset of students who never return to college, it is natural to suspect that their ability to pay back their student loans might be compromised. However, this measure does not include students who transfer to other institutions, so future researchers will need to assess the nature of this important student subpopulation. It will also be helpful to evaluate CDRs of students who did not complete a collegiate credential compared to those who did.

Because retention rates do not include in their calculations the number of students who return to study, it appears to be a worthy objective to observe the degree to which institutions work with students who are willing to re-enter an institution after being away. Financial aid options that are available to these students should be well communicated, along with clear pathways for interested former students to take.

Conclusion

This study inquired whether student loan default rates are associated with measures of institutional capacity and found that various institutional capacity factors affect CDRs, even when controlling for state-level regional and economic variables. In two words: institutions matter. An institution's characteristics, such as locale and the composition of the student body with regard to academic preparation and race, are significantly associated with variances in cohort default rates. Institutions in states with higher unemployment rates also tend to have higher CDRs. We also know that certain measures of institutional effectiveness, such as retention rates and instructional expenditures, are associated with lower CDRs, even when controlling for institutional characteristics and state-level economic and educational expenditure data.

Future research might shed light on what aspects of instructional expenditures are related to the probability for lower student loan default. This can be interpreted as meaning that higher amounts of instructional expenditures translate into a lower likelihood for student loan default simply because good instructional outcomes lead to lower propensity for student loan default. Or, more conceptually, future research and reflection might examine the extent to which institutions should include a wider array of institutional community members as a means to enhance their capacity to manage a CDR reduction campaign successfully.

Although significant associations exist with regard to institutional effectiveness measures that include retention, institutional characteristics, and instructional expenditures, our findings also support policymakers' efforts to engage in collaborative efforts with key institutional stakeholders to address the problem of CDRs. This is in contrast to using blunt instruments to judge institutions' worthiness to dispense Title IV funds through the mere use of aggregate measures such as debt-to-income ratios and post-graduation salaries. Failure to acknowledge differences in critical factors associated with institutional characteristics and measures of institutional capacity could result in missed opportunities to lower CDRs using sustainable and workable strategies within the institutional contexts where they are employed. Worse, perverse incentives could result when institutional capacity factors are not taken into account in a high-stress accountability environment, such as enrollment initiatives that attract only those students who are highly likely to repay their student loans without considering the needs of under-represented students whose default rates tend to be higher on average. A lack of collaborative efforts might exacerbate challenges associated with linking an institution's capacity for developing and implementing CDR reduction campaigns.

We nevertheless advise caution in interpreting these findings, primarily because they stress identifying significant associations and cannot be interpreted to infer causation between CDRs and those factors that this study has found to be significant. For example, these results should not lead to the conclusion that students of various racial and academic backgrounds or from different geographic areas should be treated differently. Our results indicate that further research is needed with regard to investigating variances in institutional costs, student achievement, and student characteristics and their association with variances in CDRs. This is especially true in a time when regulators increasingly hold institutions accountable when they do not meet certain CDR levels.

Along these same lines, a worthy area of research could be a focus on methods and strategies associated with building an institution's capacity for addressing goals such as student loan default reduction (Toma, 2010) or developing social capital within institutions to leverage interactions that effectively form student attitudes and goals associated with reducing student loan default (Aleksic-Maslac & Magzan, 2012). In addition, researchers might look into the direct and indirect roles of administrative costs and their association with an institution's capacity to reduce CDRs, such as whether automation efforts that are non-stakeholder-intensive might be effective or the involvement of a third party in such automation efforts, which were outside the scope of this study. All considered, we hope that these results will lead to further investigation about the role that institutional capacity plays in a policy issue as complex and challenging as managing the rapidly growing problem of student loan default.

Nexus: Connecting Research to Practice

- Higher instructional expenditures per FTE student are significantly associated with lower CDRs. This suggests that an institution's student loan default strategies should not rely on only one office or on outsourcing of the process. Institutions should consider strategies that include academic affairs staff and faculty, if not a wide representation of an institution's professional community.

- Policy makers should consider collaborating with institutions and avoid solely using sanctions against institutions, particularly those that serve underserved populations. Sanctions may have the unintended effect of causing fewer students from these populations to complete higher education.

- This study did not find any association between CDRs and academic support and student service expenditures. This may indicate that state and institutional policy makers should consider allocating funding specifically to develop effective default prevention programs in the area of academic support and student services.

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