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Chairman Roskam, Ranking Member Lewis and Members of the Subcommittee, thank you for inviting me to testify today. My name is David Lucca. I am a Research Officer at the Federal Reserve Bank of New York. In July, I co-authored, along with Taylor Nadauld of Brigham Young University and Karen Shen of Harvard University, a report entitled “Credit Supply and the Rise in College Tuition: Evidence from the Expansion in Federal Student Aid Programs.” My testimony today, which does not represent the official view of the Federal Reserve Bank of New York or any other part of the Federal Reserve System, will focus on the research and conclusions in that report.¹

Motivation for Our Research

My co-authors and I are not specialists in the field of economics of education, but rather, we are financial economists interested in understanding the role of credit in pricing. This is a longstanding topic in economic research that has recently attracted much attention in the context of the U.S. housing market. Researchers have attempted to establish whether the housing boom-bust cycle of the past decade could be explained by fluctuations in the availability of credit experienced in those years.

¹ The report is available at: http://newyorkfed.org/research/staff_reports/sr733.pdf. I have also appended to this testimony a detailed description of our research methods.

The rapid growth in student debt in recent years is reminiscent of the expansion in mortgage credit in the first decade of the 2000s. Despite the reduction in overall household debt in the aftermath of the Great Recession, according to data from the New York Fed, student debt outstanding has kept its pre-crisis upward trajectory, and at \$1.2 trillion, it is now the largest form of non-mortgage debt for households. These trends have, not surprisingly, captured much public attention. Understanding their implications is also a key research question because of the macroeconomic consequences.

Federal aid programs are a key source of student credit, with about 90 percent of all student loans in the U.S. originated under such programs. A standard economic rationale for governmental student loan programs is that education is a human capital investment. This investment can be hard to finance because human capital is an intangible good, which cannot be used as collateral by borrowers to promise to repay loans to private lenders. The government can circumvent these problems by either lending to students without additional guarantees or by other means, such as making loans non-dischargeable in bankruptcy or subject to wage garnishments. Most economists would agree that from the point of view of a single borrower, such lending programs can be beneficial.

But with a large group of borrowers, the effects of additional credit can be much more subtle. Access to more borrowing increases the spending capacity of each borrower, which generally boosts demand. This increase in demand for higher education will be partially reflected in higher tuition prices and margins at post-secondary education institutions, unless student enrollment capacity is promptly expanded and institutions compete away the rationing of college placements that give rise to tuition increases.

Obstacles to expanding enrollment capacity exist, either because entry of new institutions may take time, or because it may be hard for existing institutions to expand their teaching faculty and facilities. As a result, one should expect an increase in student credit to lead to a rise in tuition, at least in the short run. While economic theory suggests the likely existence of a price effect, it is silent on the actual magnitude. Our study is an attempt to find this evidence and provide such a measurement.

It is well known that the cost of post-secondary education has risen very sharply over the past years. After adjusting for inflation, average posted (or, as it is also referred to, sticker or published) tuition rose 46 percent between 2001 and 2012, increasing from \$6,950 to \$10,200, or about 3.2 percent per year.² But the contemporaneous increase in college tuition and availability of student loans is not, in itself, evidence of a causal effect of student credit on tuition. Other factors, such as a reduction in non-tuition sources of revenues, or an increase in the demand for higher education, could be boosting tuition cost and resulting in additional student borrowing—rather than the other way around.

Summary of Our Study

Our study aims at establishing a causal link from the expansion in student credit to tuition. It focuses on program changes to the subsidized and unsubsidized federal loan programs available to undergraduate students under Title IV of the Higher Education Act. The federal government pays interest on a subsidized student loan when a student is in school, while students are always responsible for interest payments in unsubsidized loans.

² Posted prices are more readily available to researchers, but universities engage in extensive price discounting based on merit and need. Data on effective prices charged by institutions display somewhat more muted trends, but even these prices have significantly outpaced the rate of inflation over the same years. For a review see, for example, Congressional Research Service Report R43692 (2014) entitled “The Relationship between Federal Student Aid and Increases in College Prices.”

Subsidized loans are offered depending on financial need. In addition, we also consider Pell Grants because they experienced program changes that partially overlapped with those on the loan programs. Pell Grants are also awarded to students in financial need, and unlike loans they do not need to be repaid.

We study tuition-setting between the 2007-08 and 2010-11 school years when per-student annual federal aid limits were increased.³ These aid limits determine the maximum amounts that a qualifying student can receive. We compare tuition-setting behavior of institutions as a function of the number of students receiving aid at the annual limits ahead of these policy changes. Institutions with a larger fraction of students borrowing at federal aid program limits were more affected by changes in federal aid policies, as compared to institutions that had fewer students receiving aid at these limits.

Our main empirical finding is that changes in subsidized loan amounts have been associated with sizable increases in posted tuition. Our estimates suggest that an additional dollar of per-student credit led to a 70-cent increase in posted tuition. We find smaller effects on tuition for additional Pell Grants and unsubsidized loans of about 55 cents and 30 cents on the dollar, respectively. Overall, these results are consistent with the so-called Bennett Hypothesis, according to which an increase in student aid can result in a higher cost of education.

One possible concern with our approach is that institutions where students are most dependent on aid may differ in many dimensions from institutions where students

³ The combined maximum subsidized-unsubsidized federal loan amount for freshmen rose in the 2007-08 academic year from \$2,625 to \$3,500, and for sophomores from \$3,500 to \$4,500; additional unsubsidized loan maximums rose by \$2,000 in the academic year 2008-09. Prior to those changes, federal loan limits had been unchanged since 1993. Pell Grant annual maximums rose gradually from \$4050 in the 2006-7 year to \$5,550 in the 2010-2011 school year. Our sample ends in 2012 and additional changes to annual aid limits, which are not considered in our study, have taken place since.

do not depend as heavily on aid. These other characteristics, rather than student exposure to federal aid, could coincidentally drive the differential tuition increases that we observe in the years of the changes in federal aid. In the study we attempt to account for a number of these characteristics such as state support, admission rates and program types. As a result of this analysis, it is hard to conclude whether Pell Grants and unsubsidized loan availability affect tuition at all. In other words, I am much more confident that subsidized student loans have an impact on tuition, as opposed to other forms of student aid like Pell Grants and unsubsidized loans.

Our study's sample includes a large number of public, for-profit private, and not-for-profit institutions. We find the likelihood that tuition will rise in response to the greater availability of student loans to be more pronounced among the more expensive private institutions offering 4-year degrees that are also among the more, but not the most, selective in terms of admission rates.

Interpreting the Results

Our research study aims at establishing a causal link between the expansion in student credit availability and tuition between the 2007-08 and 2010-11 school years. Our results suggest that this effect exists, especially for loans made under the federal subsidized loan program. We are currently revising the study to expand the sample of institutions and to address helpful comments and suggestions we have received, including some from a trade group represented on this panel. It is important to note that we do observe some variation in our estimates depending on the exact specification of our statistical model, but the approximate magnitude of the results does not change.

Our results are evidence of a causal link between student loan availability and tuition. They are not a comprehensive explanation of tuition trends over longer periods of time and are not informative about other, possibly more important factors in the rise of college tuition. These other factors could include (1) the decline in state contributions to public universities and (2) an increase in demand for higher education because of the secular rise in the college-wage premium or, more recently, because of the lower opportunity costs of attending college when the unemployment rate rose following the Great Recession.

Our study speaks to posted tuition rather than tuition net of institution discounts and grants, because sufficient, comprehensive measures of these discounts and grants for the years we are studying are unavailable to researchers. But we find that net prices typically move in tandem with posted prices, meaning that posted prices do ultimately matter to students. We also do not find systematic rebates by institutions in terms of grants to students around the policy changes. That said, studying the effects on effective (net) rather than posted tuition would certainly be preferable.

While as researchers we do not observe the tuition-setting process of institutions of higher learning, the availability of federal aid programs clearly matters for pricing at certain institutions. For example, transcripts of public discussions between market analysts and senior management at some publicly traded for-profit private institutions offer anecdotal evidence of the link between federal aid and pricing.⁴ These anecdotes

⁴ See, for example, the following excerpt from 2007:Q2 Earnings Call for the Apollo Education Group as accessed from Bloomberg LP Transcripts: **Operator:** Your next question comes from the line of Jeff Silber with BMO Capital Markets. **<Q - Jeffrey Silber>**: Close, it is Jeff Silber. I had a question about the increase in pricing at Axia; I'm just curious why 10%, why not 5, and why not 15, what kind of market research went into that? And also if you can give us a little bit more color potentially on some of the pricing changes we may see over the next few months in some of the other programs? **<A - Brian Mueller>**: The rationale for the price increase at Axia had to do with Title IV loan limit increases. We raised it to a level

should be taken as such. They show that some institutions directly price with an eye towards federal aid, which is consistent with our statistical findings, but they are not proof of broader tuition-setting practices in the post-secondary education industry.

Finally, while our study suggests that tuition price rises may be lowering the efficacy of some federal student aid, these are not the only factors that should be considered when evaluating the effectiveness of student aid. First, these programs could be essential for students of low-income families to access higher education. Further, long-term price effects may be smaller than what we estimate in the short run, as institutions boost student enrollment capacity over time. This expansion in enrollment might constitute a public benefit, as more students could access higher education in the long run. Indeed, we find evidence in our paper that over long periods of time, school enrollments have increased more at institutions where students are more dependent on student aid.

Thank you for your attention. I am happy to answer any questions you may have.

we thought was acceptable in the short run knowing that we want to leave some room for modest 2 to 3% increases in the next number of years. And so, it definitely was done under the guise of what the student can afford to borrow. In terms of what we will do going forward with regards to national pricing we're keeping that pretty close to the vest. We will implement changes over time and we will kind of alert you to them as we do it.

Appendix: Detailed Description of Our Research Methods

Short of randomized trials, which are typically unavailable to social scientists, economists have often relied on so-called natural experiments to measure causal effects. In a natural experiment, the group of individuals receiving a treatment, the “treated” and the remaining individuals, the “untreated” (or control group) are not randomly assigned and the experiments are not designed by the researchers. Instead, the treatments determination and experiment are observed in “nature,” which in economics often means observed as a result of a change in public policy.

Our study relies on a natural experiment provided by changes in the per-student aid limits in Title IV federal student aid programs. While changes in federal aid policies affect, in principle, all Title IV eligible institutions nationwide, their impact will vary depending on the characteristics of each postsecondary institution’s student body. This is because changes in the program caps only directly affect students that receive aid at the program maximums. The fraction of students at the program caps at each institution depends on an institution’s cost of attendance and the distribution of students’ financial circumstances. We use data from the National Postsecondary Student Aid Study (NPSAS) database, which is provided to researchers by the Department of Education, to sort the sample of all post-secondary education institutions in terms of the fraction of students that are at the cap for each student aid program.

Rather than assigning institutions to a treated or untreated group, all institutions are sorted on a continuous scale of more and less-exposed institutions. We first verify the validity of our sorting measure by comparing changes in per-student aid between the more- and less-exposed institutions. As expected, institutions that have more students exposed to the policy changes experienced significantly larger increases in aid around the policy changes. Having verified that our experiment appropriately identifies institutions whose students received more or less aid in response to policy changes, we then use the component of the aid increase predicted to be the result of the policy changes, and study its effect on posted tuition across institutions and around the policy changes. This comparison is what identifies in the statistical model the effect of more aid on tuition, just as in a randomized trial one would compare the average outcome for the treated and the untreated group.