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Article

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Campello's research has dealt with issues such as the impact of capital market imperfections on companies, the limits of the firm, product markets, corporate capital structure, monetary policy transmission, financial crises, financial development, and econometrics. His work has been discussed by policy authorities, cited in congressional hearings, and featured in the financial press. Campello earned his Ph.D. in finance from the University of Illinois in 2000, a M.Sc. in business administration from the Pontifical Catholic University of Rio de Janeiro in 1995, and a B.Sc. in economics from the Federal University of Rio de Janeiro in 1991. A native of (sunny) Rio de Janeiro, Brazil, Murillo lives in (snowy) Ithaca, NY. When he is not working, he is playing drums or parenting his two young sons.

Corporate Liquidity Management

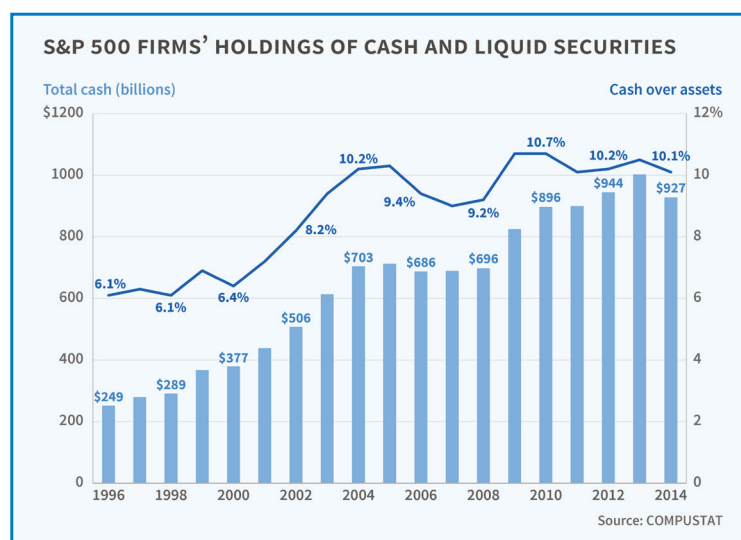
Murillo Campello

The global financial crisis drew fresh attention to the way firms manage liquidity, as credit markets dried up and internal savings became key to corporate survival.

Liquidity management is an old topic; it has been discussed at least since John Maynard Keynes' examination in the 1930s. It attracts much attention today, as large companies world-wide have amassed some \$4 trillion in "idle cash" on their balance sheets. Figure 1 depicts S&P 500 firms' holdings of cash and liquid securities over the last 20 years. The holdings of liquid assets are the highest both in absolute values as well as a fraction of total corporate assets since at least WWII.¹ Apple Inc., alone, has recently reported holding nearly \$180 billion in cash, enough to acquire the combined equity and debt values of its industry rivals, and comparable to the GDP of Portugal or Greece.

Academic work on corporate liquidity took off around 2000. The notion of corporate liquidity management has since evolved to encompass not only how firms administer their cash balances, but how they deal with credit lines, manage their debt capacity, and use derivatives for hedging. Central to this research is the idea that managers use liquidity as a way to maintain financial flexibility if their firms should face difficulties securing funds in the capital markets. In the corporate world, financial flexibility can be key to sustaining firms' real-side operations at close to optimal levels. In that regard, the broad conclusion is that cash remains "king," at least for certain groups of firms. Debt capacity does not provide the same degree of downside pro-

tection as cash, and derivative instruments can only help with a limited set of risks that are traded in the market. While credit lines are good all-around substitutes for cash, firms may still prefer cash when their liquidity risk is systemic in nature, and thus hard for banks to insure. The global financial crisis taught us



that, in bad times, banks are unable to insure against surges in corporate liquidity needs, as banks themselves may experience liquidity shortages too.

Is There an "Optimal Level" of Cash?

There is a general fascination with the level of cash companies carry on their balance sheets. Various figures are discussed in the media, among academics, practitioners, and even in Federal Reserve Board meetings. But this focus on—or search for—the optimal corporate cash level may be misplaced.

In practice, the literature's focus on cash has been driven by lack of data on alternative mechanisms of liquidity provision such as credit lines and derivatives-based hedging. Now, however, it is becoming possible to incorporate data associated with these other

mechanisms into the analysis of corporate liquidity. For example, recent studies have documented that the existence of undrawn credit lines can add substantially to a firm's liquidity. Firms that hold undrawn credit lines also hold some cash, but firms without access to credit lines hold significantly more cash.² Credit line facilities, too, add up to trillions of dollars nowadays and the message one should take from this is that the cash balances are a by-product of trade-offs that firms face in dealing with their liquidity needs. There should be less focus on observed cash balances per se, and more awareness that cash management is just one piece of a multi-faceted process.

In joint work, Heitor Almeida, Michael Weisbach, and I proposed looking beyond corporate cash levels to examine how firms handle their marginal savings decisions.³ We look at why firms may choose to save funds from operating cash flows, and which firms are likely to do so. We show that firms can engage in very active liquidity management processes independent of the level of cash shown on their balance sheets.

We model and discuss a concept that we dub "the cash flow sensitivity of cash." In essence, we isolate the fraction of incremental cash flows that firms retain as additional cash in each period. In our model, firms with easy access to fairly-priced external funds ("financially unconstrained firms") invest at first-best levels. As such, cash flow innovations have no effect on investment spending. Firms facing financial constraints, on the other hand, need to channel part of their cash flow into savings as a way to increase their ability to invest today and in the future. The fraction of cash flows that a firm retains will reflect management's view as to whether the firm is likely to have profitable investment opportunities and whether the capital markets will provide sufficient, fairly-priced financing for those investments.

We perform a number of tests of the hypothesis that a firm's cash balance depends positively on its cash flow, a situation that indicates the existence of financial constraints. Using a large sample of U.S. companies, we show that firms that are small, that do not pay dividends,

and that do not have rated bonds or commercial paper ("constrained firms") display a pronouncedly positive association between cash flows and cash savings. Financially unconstrained firms, in contrast, display no such savings sensitivity. These patterns have since been reported in a number of studies, including some analyzing data from other countries.⁴

Cash versus Debt Capacity

Firms can use external debt to fund their projects even when they face some financial constraints. In these situations, too, cash policy can be quite active, with corporate savings responding to firms' needs to optimize debt policy across time and economic environments. I studied this type of problem in work with Viral Acharya and Almeida.⁵ We look jointly at firms' cash and debt policies, identifying key differences between "savings" in the form of cash accumulation and in the form of built-up debt capacity. When facing financing constraints, firms may use up their debt capacity even when they have enough internal cash to fund current investments. The reason is that if constrained firms' future cash flows are low, they likely will be shut out of the credit markets, interrupting their investment plans. If they have conserved cash, on the other hand, firms are able to continue their investment plans over time. Our theory is substantiated by empirical analysis showing that cash is not equivalent to "negative debt" for firms facing financial constraints. Cash uniquely allows constrained firms to maintain financing capacity across good and bad states of the world.

Alternative Forms of Liquidity

The foregoing work shows that cash creates financial flexibility because it ensures liquidity. Other forms of financing that rely on spot contracting, such as equity issuance and commercial paper borrowing, share the same drawback as reliance on debt capacity: Access may not be there when firms need it most. However, cash is not the only way in which firms can access pre-

committed financing.

Derivative instruments can substitute for cash holdings in securing the continuity of the investment process because they transfer cash flows to states of the world in which liquidity is needed.⁶ In a 2011 study, Chen Lin, Yue Ma, Hong Zou, and I explore how hedging affects access to external funding and investment.⁷ We argue that when firms hedge with derivatives, they make commitments that lower the cost of financial distress and reduce their odds of going bankrupt, which enhances their access to bank credit. Consistent with this idea, we show that firms with active hedging programs in place face lower loan spreads. Importantly, the terms of their loan contracts become more lax, with credit facilities placing far fewer covenants on their investment decisions.

Bank credit lines can be structured so as to replicate derivative instruments that ensure corporate access to liquidity. The key feature of a credit line is that it allows a firm to access pre-committed financing up to a certain quantity in exchange for the payment of a commitment fee. Notably, the degree to which this insurance works in practice has limitations; for one thing, lines can be revoked by the bank if the situation at the firm materially deteriorates (MAC clauses). But, critically, credit line-based liquidity management relies on the ability of the banking sector to honor drawdowns. This can be problematic if corporate liquidity needs and banking sector shortages are correlated.

In a 2013 paper, Acharya, Almeida, and I use this insight to derive key predictions about the choice between cash and credit lines.⁸ We show that the most efficient liquidity allocation is one in which firms with idiosyncratic liquidity risk use more credit lines, while firms with more systematic risk exposure rely more on cash. The reason is that while banks are natural candidates to insure the liquidity needs of the first group of firms, they may at times be unable to insure the needs of the latter. Cross-sectional analyses using U.S. data over several decades yield results consistent with our predictions. Time-

series analyses further show that firms' cash reserves rise in times of high aggregate volatility. At such times, credit line initiations fall, their spreads widen, and maturities shorten.

The Role of Liquidity When Capital Markets Collapse

The relation between corporate liquidity and real activity came to the forefront of the academic and policy debate during the global financial crisis. The credit market breakdown started in 2008 and became acute in the spring of 2009. Firms' inability to obtain external funding allowed researchers to look at corporate liquidity management at a time of acute liquidity scarcity.

In the fall of 2008, as the crisis started to engulf the economy, John Graham, Cam Harvey, and I sent out survey questionnaires to thousands of CFOs in 39 countries asking them about their corporate plans for the coming year.⁹ These data provided us uniquely forward-looking information about corporate liquidity management, and they revealed that managers thought of internal liquidity as a way to guard against a crash that was about to happen. We found that, in anticipation of a severe liquidity contraction, financially constrained firms put together plans to cut their cash stocks by as much as 15 percentage points, compared to only 2 percentage points, on average, among financially unconstrained firms. These planned cuts in liquidity were accompanied by other major changes. In particular, constrained firms reported plans to reduce employment (by 11 percent), technology spending (by 22 percent), capital investment (by 9 percent), as well as cash dividend payments (by 14 percent) in the year ahead. Financially unconstrained firms, in contrast, reported much milder changes in their planned policies for 2009. Notably, firms reported plans to resort to their bank credit facilities — drawing unprecedented amounts of cash from their lines — as a way to insulate against the effects of the crisis.

After gathering information on how access to funds modulated corporate plans during the crisis, Graham, Harvey, and

I teamed up with Erasmo Giambona to assess how firms chose between different liquidity instruments.¹⁰ We used a new series of CFO surveys to gauge how firms' cash positions and cash flow impacted their access to credit lines and their plans with regard to saving. Pre-2008 cash positions proved to be of paramount importance. For firms coming into the crisis with healthy cash balances, cash flows had no bearing on their access to bank credit lines. Only the firms with low cash exhibited a positive correlation between operating cash flows and credit line access. Notably, firms with more cash had their investment plans boosted by greater access to credit lines. At the same time, lack of access to credit lines forced firms to choose between saving and investing. In the absence of pre-crisis savings, access to credit lines was crucial in allowing firms to invest and to survive in the years ahead. Our work extended to Europe, where bank-based economic systems made credit line access particularly important for corporate financing during the global downturn.¹¹ These analyses show that corporate liquidity management should not be restricted to the study of corporate cash, and that credit lines can play a fundamental role in insuring firms' access to liquidity in difficult times.

¹ J. Graham and M. Leary, "The Evolution of Corporate Cash," *Duke University Working Paper*, April 2015.

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³ H. Almeida, M. Campello, and M. Weisbach, "Corporate Demand for Liquidity," *NBER Working Paper No. 9253*, October 2002, and *Journal of Finance*, 59(4), 2004, pp. 1777–1804 (published as "The Cash Flow Sensitivity of Cash").

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⁴ See, for example, I. Khurana, X. Martin, and R. Pereira, "Financial Development and the Cash Flow Sensitivity of Cash," *Journal of Financial and Quantitative Analysis*, 41(4), 2006, pp. 787–808.

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⁸ V. Acharya, H. Almeida, and M. Campello, "Aggregate Risk and the Choice between Cash and Lines of Credit," *NBER Working Paper No. 16122*, June 2010, and *Journal of Finance*, 68(5), 2013, pp. 2059–2116.

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⁹ M. Campello, J. Graham, and C. Harvey, "The Real Effects of Financial Constraints: Evidence from a Financial Crisis," *NBER Working Paper No. 15552*, December 2009, and *Journal of Financial Economics*, 97(3), 2010, pp. 470–87.

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¹⁰ M. Campello, E. Giambona, J. Graham, and C. Harvey, "Liquidity Management and Corporate Investment during a Financial Crisis," *NBER Working Paper No. 16309*, August 2010, and *Review of Financial Studies*, 24(6), 2011, pp. 1944–79.

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¹¹ M. Campello, E. Giambona, J. Graham, and C. Harvey, "Access to Liquidity and Corporate Investment in Europe During the Financial Crisis," *Review of Finance*, 16(2), 2012, pp. 323–46.

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Student Borrowing: Debt, Default, and Repayment

Lance Lochner

Three significant economic trends in the United States and other developed countries have altered the landscape of higher education substantially in recent decades, with important implications for student borrowing and repayment behavior, Alex Monge-Naranjo and I argue in a series of recent papers.¹ First, the costs of college have increased markedly, even after accounting for inflation and expansions in student aid. Second, average returns to college (net of tuition payments) have increased sharply. Third, labor market uncertainty has increased considerably, highlighted by the Great Recession.

The first two trends, rising costs and returns to college, have contributed to a dramatic increase in demand for student loans. Annual student borrowing levels doubled in the 1990s and then again over the next decade.² Combined government and private student debt levels in the U.S. quadrupled from \$250 billion in 2003 to \$1.1 trillion in 2013, reflecting sizeable increases in both the incidence of debt and debt levels among borrowers.³

Figure 1 documents the changing distribution of cumulative debt among U.S. baccalaureate recipients since 1989–90. The fraction of college graduates borrowing less than \$10,000, including non-bor-

rowers, declined from over 70 percent to less than 40 percent, while the fraction of college graduates borrowing more than \$30,000 rose from 4 percent to 30 percent.⁴

The steady rise in student borrowing over the late 1990s and 2000s masks the fact that government student loan limits remained unchanged (in nominal dollars) between 1993 and 2008. Adjusting for inflation, this reflects a nearly 50 percent decline in value. In 2008, aggregate Stafford loan limits for dependent undergraduate students jumped from \$23,000 to \$31,000, although this value was still less than the 1993 limit after accounting for inflation. Not surprisingly, the share of full-time/full-year undergraduates that maxed out Stafford loans increased more than five-fold from 1989–90 to 2003–04.⁵ Undergraduates turned more and more to private lenders to help finance their education prior to the 2008 increase in federal student loan limits and contemporaneous collapse in private credit markets. Undergraduate borrowing from non-federal sources peaked at 25 percent of all undergraduate borrowing. Despite this increase in private lending, there are reasons for concern that a growing fraction of youth from low-income and even middle-income backgrounds are unable to access the resources they need to attend college.⁶

At the same time, there are concerns that many recent students are taking on too much debt. Growing levels of debt, coupled with rising labor market uncertainty and the last recession have led to a sharp increase in student loan default rates after more than a decade of decline. Borrowers who are 270 days or more (180 days or more prior to 1998) late on their Stafford student loan payments are consid-



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He serves as co-coordinator of the Markets Network of the Human Capital and Economic Opportunity Global Working Group, an international research network devoted to studying issues central to financing human capital investment. He is also an editor at the *Journal of Labor Economics* and associate editor at the *Journal of Applied Econometrics*.

Lochner's research is largely devoted to the study of human capital formation throughout the life-cycle and to understanding criminal behavior. Previous and current research explores the interaction between human capital and criminal behavior; financial returns to schooling; human capital acquisition from birth to retirement; the evolution of earnings, skills, and inequality; and issues related to financing education, with a particular emphasis on the role of student loans.

Lochner received his Ph.D. in economics from the University of Chicago in 1998. He lives in London, Ontario, with his wife and nine-year-old daughter, and enjoys playing tennis, biking, and travel adventures with his family.

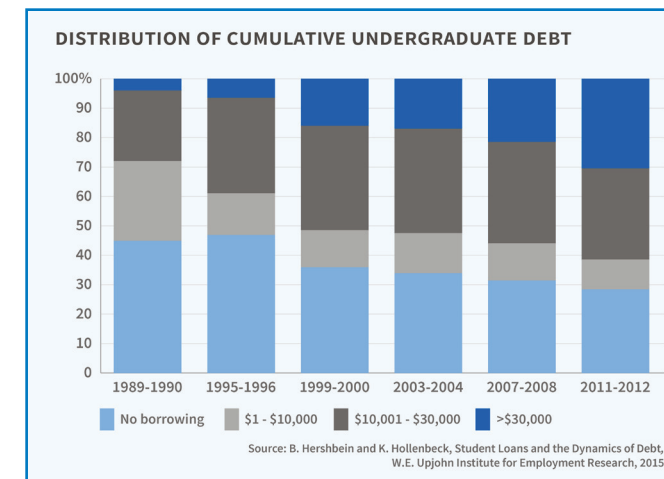


Figure 1