

## The big freeze

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### Investigating the credit crisis and liquidity

Most introductory finance courses start by assuming that capital markets are perfect and that companies and banks are able to borrow and lend freely. In this hypothetical setting, corporate executives are free to make decisions that maximise the value of their companies and stock prices.

However, the reality is that capital markets are not perfect. There are significant obstructions that prevent companies from making optimal choices and maximising shareholder value. But just how severe are these imperfections? And how big an obstacle are real-world constraints in terms of limiting opportunities to corporate executives? These are hard questions to answer because, unlike medical scientists, economics researchers are rarely able to conduct controlled experiments that treat some companies while administering placebos to others. Instead, financial economists often study exogenous shocks to the corporate sector, to see how companies with different characteristics are affected, and to get a feel for the magnitudes and effects of real-world capital market imperfections.

As devastating as the current crisis has been to the livelihood of many, it also represents an enormous shock to the corporate sector that can aid economic research. We study this shock to learn about the ability of the sector to adapt to adverse circumstances, and to better understand how the availability of liquidity affects corporate decision making. Liquidity can be thought of as the oil that lubricates the economic machinery. When liquidity dries up, to what extent does this cause the economic infrastructure to seize up and destroy corporate value?

To better understand how the credit crisis has affected the corporate sector, in a joint effort last November with CFO magazine, we surveyed 1,050 chief financial officers in the US, Europe and Asia about how they were managing the liquidity needs of their companies. The results were striking: we found that financially constrained companies were quickly burning through their cash reserves and were having great difficulty finding new sources of funding. The current lack of liquidity is causing these companies to make drastic cuts to capital spending, hiring, and research and development, thereby threatening their very survival.

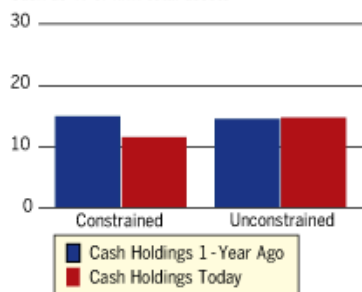
### Burning cash

We began by benchmarking how much cash companies had on their balance sheets in November 2008 versus how much cash they had in November 2007. In the US, the typical firm had cash and liquid assets equal to about 15 per cent of asset value in 2007. The crisis has not affected cash holdings of unconstrained companies, which remain steady at 15 per cent of asset value in 2008. In stark contrast, the cash reserves at financially constrained companies have fallen one-fifth, from 15 per cent to about 12 per cent of book assets. (We classify a company as being financially constrained if the CFO says it has been affected by the cost or availability of external financing.)

A similar pattern of cash burn for constrained companies is evident in Europe and Asia. In Europe, constrained companies typically hold less cash than in the US, while in Asia they hold more. Yet constrained companies' cash holdings fell about 23 per cent in Europe and 11 per cent in Asia. All of these patterns are depicted in Figure 1. This evidence implies that the credit crisis is affecting some (q: less profitable?) companies greatly, while having less of an effect on the most profitable companies in the economy.

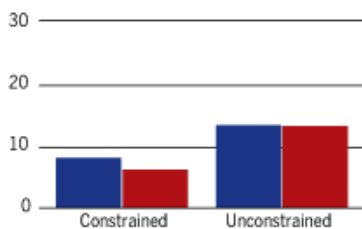
## US

Cash as % of firm total assets



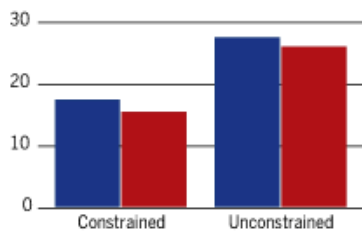
## Europe

Cash as % of firm total assets



## Asia

Cash as % of firm total assets



The speed with which constrained companies across the world are burning through cash reserves is alarming. This problem could become severe if these companies have limited access to other untapped sources of liquidity. We therefore investigated corporate access to bank lines of credit. It is generally difficult to gather representative data on line of credit (LC) access. Much of the data available is restricted to public US corporations, so this analysis is novel.

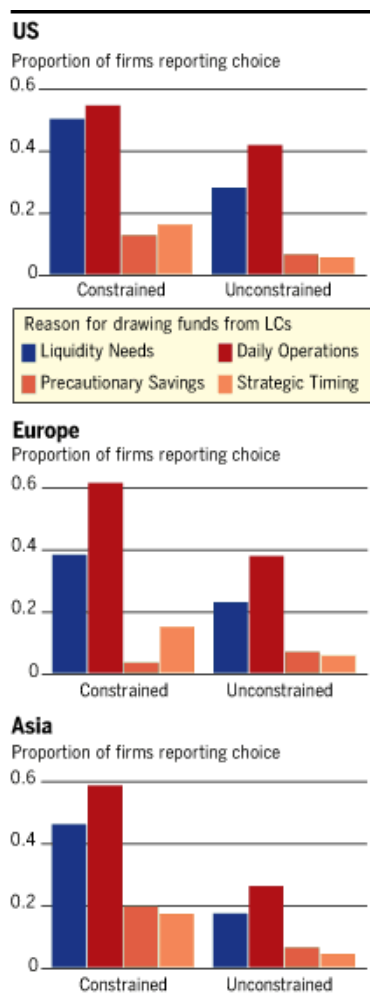
### Access to lines of credit

We asked financial executives about the size of the LCs to which they have access and compared LC access now in November 2008 to their lines of credit a year earlier. The typical firm in the US has a pre-arranged line of credit of approximately 19 per cent (unconstrained companies) to 27 per cent (constrained companies) of total book asset value. The differences are more dramatic in Europe and Asia, where constrained companies have committed credit lines of more than 30 per cent of asset value. We find no significant changes in the access to lines of credit in the US (across either constrained or unconstrained companies). In Europe, constrained companies are using 21 per cent more LCs than before while in Asia they are using 10 per cent less. Unconstrained companies in those non-US economies have not changed their use of LCs.

We next asked the companies what they do with the proceeds when they draw down lines of credit. Roughly half of the CFOs said they used the funds for daily operations or short-term liquidity needs. Companies that are financially constrained use their LCs significantly more than do unconstrained counterparts as a way of funding normal business activities.

More surprisingly, 13 per cent of constrained US companies indicated that they had recently drawn on their credit lines in order to have cash for future needs. This purely precautionary use of LCs hints at the following finding: one in six constrained US companies has drawn down on its credit line, in case its banks deny it a line of credit in the future. That is to say there has been a bank run on lines of credit, with many companies drawing on LCs in case they do not have access in the future. Harvard University professors Victoria Ivashina and David Scharfstein have shown that this run on LC borrowing has been large enough to offset the overall tightness of available funding pervading the financial sector. In other words, there has been so much "just in case" use of bank LCs by financially constrained companies that it appears to have crowded out normal borrowing opportunities, even though the total volume of borrowing remained high throughout 2008. This effect is slightly stronger in Asia, where 18 per cent of surveyed constrained companies reported this behaviour, while in Europe that proportion was 15

per cent. By comparison, only about 6 per cent of unconstrained companies in the US, Asia and Europe said they were drawing on their credit lines for fear that their banks would restrict access to their outstanding lines of credit. These patterns are depicted in Figure 2.



As robust as credit drawdowns have been, some companies have resisted using their LCs. We asked why. The most common explanation was that CFOs wanted to preserve borrowing capacity in case it was needed in the future. The second most common explanation for not fully drawing the LC was to maintain a strong reputation in the eyes of financial institutions. This explanation was significantly stronger among public companies and speculative US companies. In Europe, preserving reputation in the eyes of bankers was significantly stronger among financially constrained companies.

### Credit problems and investment decisions

So far, we have documented that financially constrained companies across the world have burnt through cash during the past year and have more actively managed lines of credit, including drawing down on them in case their banks limit future access to credit lines. We next examined the degree to which these credit problems have seeped into the real sector, affecting the operating and investment decisions of corporations, with a close eye on the effects on financially constrained companies.

To study this issue, we examined the pro forma plans of companies, conditional on whether they were financially constrained. We found that most companies planned to cut employment, research and development spending, capital investment, marketing expenditures, and (on average) dividends in 2009. The results were significantly worse for financially constrained companies. Constrained companies headquartered in the US planned to dramatically reduce employment (11 per cent), R&D spending (22 per cent), capital investment (9 per cent), marketing expenditures (33 per cent) and dividends (14 per cent) in 2009. Constrained companies in Europe intended to cut employment 8 per cent, R&D spending 5 per cent, capital investment 10 per cent, marketing expenditures 11 per cent, while their dividends were being slashed in half. We see similar patterns in Asia, except that no companies there (constrained and unconstrained) are forecasting cuts in employment.

We also studied the long-term value implications of slashing corporate investment. Most first-year corporate finance courses demonstrate how a company's managers can maximise stockholder value by choosing positive net present value projects. This means that if the returns on an investment out-earn the cost of capital required to fund the project, it creates value for the company. These value-enhancing investments in turn increase shareholder wealth as the stock market capitalises the increased value into the share price. Therefore, if the credit crisis is causing companies to cancel value-enhancing projects, this real world "constraint" is destroying shareholder value.

To investigate this, we asked companies about the extent to which credit constraints limit their ability to pursue positive net present value investments. We began by benchmarking how often companies say they have to bypass attractive (NPV > 0) investment projects because of financial constraints. In the US, in normal credit markets, 46 per cent of constrained companies say they pass up attractive investment opportunities due to financial constraints. These are companies that declared themselves to be constrained in late autumn 2008. Undoubtedly, some of these companies would be constrained, and others not, in normal times. One interpretation of our result is therefore that 46 per cent of these companies are constrained during normal times. The 46 per cent of self-declared constrained companies that say they pass up attractive investments is significantly greater than the 20 per cent of unconstrained companies that say the same. In Europe and Asia, more than twice as many constrained companies pass up value-enhancing projects due to credit constraints. In particular, 44 per cent of the constrained European companies in our survey said they bypassed profitable opportunities because of the cost or availability of credit, compared with only 18 per cent of the unconstrained companies. In Asia, the same comparison was 47 per cent for constrained companies versus 20 per cent for unconstrained ones.

Because we conducted our analysis during a severe credit crisis, we are able to investigate the effects of financial constraints on investment during extreme circumstances. A surprising 86 per cent of constrained US companies said they bypassed attractive investments during the credit crisis due to difficulties in raising external finance, about twice as great as the proportion of unconstrained companies that say the same. Again, these numbers are mirrored in Europe and Asia (80 per cent versus 36 per cent in Europe, and 69 per cent versus 29 per cent in Asia).

We next asked how companies fund attractive investments when they are unable to borrow in financial markets. About half of US companies said they relied on internally generated cash flows to fund investment under these circumstances, and about four in 10 said they used cash reserves. Notably, 56 per cent of constrained US companies said they cancelled investment projects when they were unable to fund them with external funds, significantly greater than the 31 per cent of unconstrained companies that said the same. Once again, we found the same results in Europe and in Asia. In Europe, for example, 69 per cent of the constrained companies in our survey said they would cancel their investment plans (compared with 33 per cent of unconstrained companies). In Asia, that same comparison suggested a cancellation rate of 41 per cent across constrained companies and only 16 per cent across unconstrained ones. To our knowledge, this is the first time that constraint-driven project cancellation has been documented in economic research.

These numbers dramatically illustrate that real-world constraints are a severe deterrent to the ability of companies to pursue value-maximising policies. We also found evidence of another significant disruption to optimal investment that is imposed by severely disrupted credit markets. Not only do companies cancel investment due to tight credit markets, some sell assets to obtain cash. We found that the vast majority of financially constrained companies sold assets in order to fund operations in 2008. Seventy per cent of the constrained respondents in our US survey said they were selling more assets in late 2008 than previously, compared with 37 per cent of the unconstrained respondents, in order to obtain funds. We also found evidence of heavy use of asset sales across constrained companies Europe (61 per cent) and Asia (43 per cent).

## **Conclusion**

The focus of the current credit crisis is on its immediate implications, such as reduced profits and increased unemployment. In contrast, we show that there are worrisome long-term economic consequences of the crisis through its effect on financially constrained companies.

Using a survey of more than 1,000 CFOs in the US, Europe and Asia, we found that organisations were cutting back or cancelling projects that they knew added to company value. The elimination of profitable projects were especially acute for companies that faced financial constraints.

One of the basic tenets of finance is that projects that enhance firm value should be pursued. Financial constraints potentially prevent the funding of these projects. The current credit crisis is an ideal setting to measure the impact of constraints on value creation.

Turning down or cancelling profitable projects is a lesser-known cost of the current financial crisis. In the scramble for short-term cash flow, companies are sacrificing long-term value. This implies lower future growth opportunities and lower future employment growth.

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