

# New Evidence Firms Are Financially Constrained

By Donald P. Morgan

Financing investment may not be a problem for large, well-known firms. If GM or IBM cannot finance a promising project with internal funds, they can turn to banks or outside investors for funds. But many analysts believe that smaller, less well-known firms sometimes find it difficult to finance worthy projects. Banks and outside investors may be reluctant to fund unfamiliar firms, forcing these firms to finance their investment internally. As such, these firms can be defined as *financially constrained*.

The implications for the economy are serious if firms are financially constrained. By forcing firms to finance their own investment, financial constraints can make the economy less stable. Indeed, some analysts blame the current sputtering economy on financial constraints. And over the longer run, reduced investment spending on plants and machinery can slow economic growth.

A growing body of evidence suggests many firms in the economy are financially constrained. This article adds to the evidence, finding that firms without a bank loan commitment, such as a line of credit, appear to be more financially constrained than firms with a bank loan commitment. Bank loan commitments loosen financial constraints in two ways. First, a loan commitment provides liquidity to a firm when its internal funds are low. Second, a loan commitment from a bank provides information to outside investors about the firm's creditworthiness. This information may then enable the firm to tap nonbank sources of funds.

The first section of the article discusses how financial constraints affect the economy and how such constraints arise. The second section reviews past evidence of financial constraints. The third section presents new evidence based on bank loan commitments.

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## ***Financial Constraints and the Economy***

Financial constraints affect both the stability and growth of the economy. By making investment spending more volatile, financial constraints make the economy more volatile. And by slowing investment spending on plant and machinery, financial constraints slow the economy's long-term growth.

### ***Why financial constraints matter***

By making firms dependent on the availability of internal funds, financial constraints make business investment spending more volatile. Aggregate investment spending in the economy fluctuates much more than any other major component of national spending. Some of these ups and downs just reflect changes in firms' investment prospects, which wax and wane on their own. But if firms are financially constrained, some of these ups and downs may also reflect fluctuations in firms' internal funds. That is, firms may be forced to reduce investment when their cash flow declines, even if their investment prospects have not changed.

More volatile investment spending aggravates the business cycle. When business is booming, firms are flush with cash and banks and investors are eager to provide funds. This liquidity boosts investment spending and further speeds the economy. On the downside, when business is slowing, outside funds may be scarce and firms' internal funds dwindle. This illiquidity reduces investment spending and further weakens the economy. Thus, a firm's financial condition influences investment spending over the course of the business cycle. In fact, business analysts have long observed a systematic relationship between economic activity and financial variables such as bank lending and liquidity over the postwar business cycle (Eckstein and Sinai).

The effects of financial constraints, however, were most apparent in the prewar business cycle. Bernanke, for example, investigated the effect of financial constraints in the Great Depression. The banking crisis during that episode sharply curtailed bank lending, while the stock market crash effectively ruled out issuing shares to raise funds. Thus, external sources of funds dried up as the ongoing depression squeezed firms' internal funds. Such tight financial constraints prolonged and deepened the depression.

Aside from aggravating the business cycle, financial constraints also slow long-run growth in the economy. Firms forced to finance their own investments will invest more slowly than if external funds are available. Slower investment spending means a slower increase in firms' capital stock of plant and machinery which, in turn, slows economic growth.

### ***What causes financial constraints?***

Financial constraints arise when banks and investors have incomplete information about a firm's investment project. What information do banks and investors need? First, they need information about the competency of the firm's management. They also need to know about the project itself. How risky is it, how much will it cost, how long will it take, among other things. Lacking complete answers to such questions, banks and investors may refuse to fund the project. Or they may charge so much for funds that the firm abandons the project unless it can be financed internally. Either way, the firm is financially constrained because internal funds are its cheapest or only source of funds.

Some firms may be more tightly constrained than others. Small and medium-sized firms may be unable to raise funds directly from investors in public debt and equity markets. These firms may instead rely on lending by financial intermediaries, such as banks, who are

expert in determining the creditworthiness of companies through screening and monitoring. But banks may charge such a high premium that the firm still forgoes investment projects it cannot finance internally.

Other firms might be unable to borrow from banks at all. Very small firms, for example, may have inadequate collateral to secure a bank loan. Or very new firms may not have the track record needed to convince bankers they are a good credit risk. Consequently, banks may refuse to grant a loan to such firms, forcing them to finance their own investment.

Even large firms that issue publicly traded stock and debt might be financially constrained to some extent. To be sure, the very fact that these firms can tap the capital market suggests they are less constrained than firms which cannot. Publicly traded firms have the option to pick and choose among alternative sources of funds until they find the cheapest. Still, investors may have lingering uncertainty about the prospects for even publicly traded firms. This uncertainty will make external funds to the firms expensive, leading the firm to rely solely or in part on internal funds.

### ***Past Evidence Firms Are Financially Constrained***

Evidence of financial constraints dates back to some of the earliest research on investment spending. Over 30 years ago, Meyers and Kuh found aggregate investment spending increased when cash flow increased and decreased when cash flow decreased. The positive correlation between investment and cash flow could reflect that firms relied on internal cash flow to finance their investment. For example, firms were forced to reduce investment spending when cash flow decreased even if their investment prospects were still good. Conversely, when cash flow increased, firms

could afford to invest in good investment projects that went begging when cash flow was low. Under this interpretation, the correlation between cash flow and investment suggested that many firms in the economy were financially constrained.

Meyers and Kuh's findings were open to a second interpretation, however. Investment spending might have declined when cash flow declined, not because firms relied on cash flow, but because the decline in cash flow signaled that firms' investment prospects were not as good. If investment prospects had diminished, firms would have reduced investment even if they were not financially constrained. Likewise, investment spending might have increased when cash flow increased because the increase in cash flow signaled that firms' investment prospects had improved. Viewed this way, the correlation between investment and cash flow had nothing to do with financial constraints. Instead, investment was correlated with cash flow because cash flow was correlated with investment prospects.

One way to rule out this alternative interpretation is to control for investment opportunities with a variable other than cash flow. In a recent study, Fazzari, Hubbard, and Petersen controlled for investment prospects with a variable termed  $q$ . Loosely speaking,  $q$  is the ratio of benefits and costs of investing—thus, when  $q$  is high the firm should increase investment. More precisely,  $q$  is the market value of a firm's capital stock divided by its current replacement value. If the ratio ( $q$ ) is larger than one, the firm should invest because the increase in the firm's value from investing exceeds the cost of doing so.

Using this approach, Fazzari, Hubbard, and Petersen found strong evidence that firms were financially constrained. In a sample of several thousand manufacturing firms, cash flow and investment were strongly correlated even when

the authors controlled for investment prospects with  $q$ .

To the extent that  $q$  fully measures firms' investment prospects, the correlation between cash flow and investment must reflect that firms were financially constrained. But  $q$  may not perfectly measure firms' investment prospects.<sup>1</sup> If not, their findings may be subject to the same alternative interpretation as Meyers and Kuh: investment and cash flow may be correlated because cash flow contains information about investment prospects not contained in  $q$ .

To provide evidence against this interpretation, Fazzari, Hubbard, and Petersen divided their sample according to the firms' history of retaining earnings. Firms that retain the most earnings, they reasoned, may be those that find external finance most expensive. In particular, firms that are financially constrained in equity markets may find it cheaper to finance investment with retained earnings than to issue new shares. Consistent with this view, the authors found investment by firms with a history of high retained earnings depended more on cash flow than did investment by firms with historically low retained earnings. This finding is evidence against the view that cash flow and investment were correlated only because cash flow captured information about investment prospects not measured by  $q$ . While  $q$  may not fully measure prospects, it is hard to imagine why the mismeasurement would be worse (and thus cash flow more important) for firms with high retained earnings.

Fazzari, Hubbard, and Petersen's research launched a number of related studies.<sup>2</sup> Others followed the strategy of identifying the firms thought to be most constrained and testing whether those firms behaved accordingly. For example, Whited tested whether firms without a corporate bond rating were more financially constrained than firms with a bond rating. She reasoned that a bond rating would provide

liquidity to firms by giving firms access to corporate debt markets. In addition, a bond rating provides information to investors in other capital markets about the firm's creditworthiness. This information might give the firm easier access to other sources of finance, such as the stock market. Consistent with this reasoning, Whited found unrated firms appeared to postpone profitable investment to a greater extent than rated firms. That is, unrated firms were more financially constrained.<sup>3</sup>

### *New Evidence Using Bank Loan Commitments*

In recent years, a growing number of businesses have sought loan commitments from banks. Loan commitments, such as a line of credit, might be expected to loosen financial constraints in two ways. First, they may provide liquidity to a firm whose internal funds are low. Second, a commitment from a bank may inform outside investors about the firm's creditworthiness, thus enabling the firm to tap nonbank sources of funds. Consistent with this reasoning, this section finds that firms appear more financially constrained when they do not have a bank loan commitment.

#### *Loan commitments and financial constraints*

All bank loan commitments promise the holder a loan up to some limit for some length of time. The most common type of commitment is revolving credit agreements. These are formal, long-term contracts committing the bank to lend to the holder for several years. Confirmed lines of credit are another, less common commitment. These are informal, short-term agreements, usually running a year or less.

Bank loan commitments of either type relax financial constraints by providing a source of liquidity to a firm. If a firm is low on cash, it

can draw on its line of credit and avoid reducing investment. In contrast, firms without a line of credit may need to reduce their investment when they are illiquid. The liquidity provided by a loan commitment is especially important during a credit crunch, when banks may refuse to lend to borrowers without a commitment (Morgan). In a 1988 Federal Reserve Board survey, senior loan officers ranked "protection from a credit crunch" as one of the most important reasons why firms obtain loan commitments (Duca).

A bank loan commitment may also relax financial constraints by providing information. Like a corporate debt rating, a loan commitment provides information to outside investors about a firm's creditworthiness. Indeed, a bank's willingness to lend to a firm could be even more informative than a corporate debt rating because banks are considered experts at determining the creditworthiness of firms. Thus, by granting a loan commitment, a bank sends a strong signal to capital markets about the firm's creditworthiness. For example, firms cannot borrow in the commercial paper market without obtaining a bank loan commitment (Calomiris). And in the equity market, a firm's share price rises when it receives a bank loan commitment and falls when it loses or retires the commitment, suggesting the commitment provides information to stock market investors (James).

If commitments relax financial constraints, why do some firms not have a commitment? Based on the 1988 survey of senior loan officers, Duca concluded bankers are reluctant to commit to smaller firms. And drawing on experience as a corporate treasurer, Kastantin observed that a bank's willingness to grant a commitment depends on its experience with a borrower and number of years the borrower had been in business. Thus, small start-up companies often have difficulty persuading a bank to approve a commitment.

Whatever the reason, many firms in the economy do not have a commitment. In a 1990 Federal Reserve survey, 73 percent of small firms did not have a loan commitment. Among medium-sized firms, 40 percent of those surveyed did not have a commitment (Ellihausen and Wolken).<sup>4</sup>

### *New evidence*

To the extent commitments provide liquidity and easier access to outside funds, firms in the economy without a bank loan commitment will be forced to finance more of their investment internally. In other words, these firms will be more financially constrained than firms with commitments. To test this possibility, commitment data were collected on a sample of 130 small manufacturing firms.<sup>5</sup> A sample period from 1980 to 1984 was chosen because it included a credit crunch in 1980 and recessions in 1980 and 1981-82.<sup>6</sup> Thus, the sample covered a period in which financial constraints might be especially tight.<sup>7</sup>

Some firms had a bank loan commitment in some years but not in others, which presented an issue of how to divide the sample. One possibility was to separate firms that never had a commitment from those with a commitment at least once over the sample period. However, a commitment arguably provides liquidity and information only in the year a firm actually had a commitment. That is, the benefits may not carry over into other years. Accordingly, firms were sorted according to whether they had a commitment in a given year. Under this sorting scheme, the observations were not firms but *firm-years*: a given firm in a given year. Of the total of 650 (130x5) observations, there were 579 firm-years with commitments and 71 firm-years without commitments.<sup>8</sup>

Differences in the two groups' average behavior across the sample period suggest firms

Table 1

**Investment, Liquidity, and Prospects: Averages Over 1980-84**

	All firm-years	Firm-years with commitments	Firm-years without commitments
Cash flow/K	.131	.12	.227
Cash stock/K	.207	.177	.451
Investment/K	.114	.115	.103
q	1.36	1.2	2.64
Capital (K) in 1980	88.86	91.53	68.21
Number of observations	650	579	71

## Variable definitions:

K = replacement value of capital stock of property, plant, and machinery in 1982 dollars.

Cash flow = income after all expenses, special items, and income taxes, but before dividends.

Cash stock = all liquid assets such as cash, checking deposits, and Treasury securities.

q = market value of firms' capital stock divided by replacement value of capital stock (K).

Investment = expenditures on property, plant, and machinery.

were more constrained when they did not have a loan commitment. As shown in Table 1, firms on average invested slightly less when they did not have a commitment even though their investment prospects ( $q$ ) were much better.<sup>9</sup> Low investment in the face of good investment prospects is a telltale sign of financial constraints.

If firms are more financially constrained without a commitment, their investment should depend more on internal funds than firms with commitments. To determine if this was the case, the following investment equation was estimated for the whole sample and separately for each of the two groups:

$$\text{Investment} = \alpha + \beta_1(q) + \beta_2(\text{cash flow}) + \beta_3(\text{cash stock})$$

By controlling for investment prospects with  $q$ , this equation isolates the liquidity effect of internal funds (cash flow and cash stock) on investment.

The results of estimating the equation are shown in Table 2.<sup>10</sup> The first column of regres-

sion results indicates that all firms in the sample were financially constrained to some extent. Investment was positively and significantly related to changes in cash flow even when controlling for firms' investment prospects with  $q$ . Thus, firms appeared to rely in part on internal cash flow to finance their investment, suggesting they were financially constrained. Investment was not significantly correlated with changes in their stock of cash, however.

Comparing the second and third columns of regression results suggests that firms were more constrained when they did not have a commitment.<sup>11</sup> Specifically, firms' investment depended more on both liquidity measures when they did not have a commitment. Investment was about twice as responsive to changes in cash flow for the group without commitments. For this group, a dollar decrease in cash flow corresponded to a 38-cent decrease in investment. For firms with a commitment, a dollar decrease in cash flow corresponded to a

Table 2

**Investment, Liquidity, and Prospects: Regression Results**

	All firm-years	Firm-years with commitments	Firm-years without commitments
q	.008 (.003)	.01 (.003)	-.006 (.004)
Cash flow	.2 (.03)	.193 (.029)	.383 (.109)
Cash stock	.001 (.018)	-.012 (.018)	.066 (.028)
R-squared	.18	.16	.29
Number of observations	650	579	71

Notes: The dependent variable is investment. Coefficients are shown for each explanatory variable q, cash flow, and cash stock, with standard errors in parentheses. Regression estimates are for 1980-84. To eliminate differences across time, year dummies were included (not reported). To eliminate fixed differences across firms, all variables were expressed as deviations from firm-year averages. All variables are scaled by beginning-of-period capital stock.

19-cent decrease in investment. Likewise, investment was responsive to changes in the stock of cash only when firms did not have a loan commitment. A dollar decrease in these firms' stock of cash was associated with about a 7-cent decrease in their investment spending.

Taken together, the results in Table 1 and Table 2 provide evidence firms were more financially constrained when they did not have a bank loan commitment. On average over the sample period, firms invested slightly less when they did not have a commitment, even though they appeared to have much better investment prospects. And the regression results reveal that liquidity and investment were more correlated when firms did not have a loan commitment, suggesting such firms relied more on internal funds to finance their investment.<sup>12</sup>

**Summary**

If outside investors and banks have incomplete information about a firm, they may be reluctant to finance the firm's investments. By slowing investment and making it more volatile, such financial constraints slow economic growth and make it more volatile. A growing body of evidence suggests many firms in the economy face financial constraints. This article adds to the evidence by examining the link between bank credit commitments and investment for a sample of firms from 1980 to 1984. The results suggest that firms appear more financially constrained when they do not have a bank loan commitment.

## Endnotes

<sup>1</sup> In the case of imperfect competition or increasing returns to scale,  $q$  may not perfectly measure firms' investment prospects.

<sup>2</sup> Other research on financial constraints is collected in *Asymmetric Information, Corporate Finance, and Investment*, edited by R. Glenn Hubbard.

<sup>3</sup> Whited uses an alternative method to test for constraints that does not require using  $q$ .

<sup>4</sup> Small firms were defined as those with 49 or fewer employees. Medium-sized firms were those with 49 to 500 employees. Larger firms were not included in the survey.

<sup>5</sup> The data are from the financial notes to firms' annual reports (form 10-K) to the Securities and Exchange Commission. The author thanks Herb Baer of the Federal Reserve Bank of Chicago for pointing out this data source.

<sup>6</sup> The Federal Reserve imposed credit controls briefly in 1980.

<sup>7</sup> In an extension of Fazzari and others, Gertler and Hubbard found firms' investment was more sensitive to cash flow during recessions than during expansions, suggesting firms are more constrained during recessions.

<sup>8</sup> Loan commitments are either short-term lines of credit or long-term revolving lines of credit. Of the 71 firm-years without commitments, 40 observations were on eight firms that never had a commitment over the entire five-year sample period. The remaining 31 observations were on 17 firms that had a commitment in some years and not in others.

<sup>9</sup> Data on cash stocks, cash flows, and investment are from Standard and Poor's Compustat Database. The variable  $q = (V + B - N)/K$ , where  $V$  = market value of firm's shares

(common and preferred) at the beginning of the year,  $B$  = book value of short-term and long-term debt,  $N$  = market value of inventories, and  $K$  = replacement value of firm's capital stock at the beginning of the period. The author thanks Fazzari, Hubbard, and Petersen for providing the  $q$  and  $K$  series; see their appendix for details on the construction of these series.

<sup>10</sup> The equations were estimated by ordinary least squares using RATS.

<sup>11</sup> In another experiment, firms were sorted into those that never had a commitment over the sample period and those that had a commitment one or more years. The regression results were roughly the same except the differences across these groups were significant at only about the 10 percent level. There were no significant differences when firms were sorted by the size of their commitment loan limit.

<sup>12</sup> These findings are consistent with Hoshi, Kashyap, and Scharfstein. They investigated whether Japanese firms were more financially constrained when they did not have a close relationship with a bank. As they explained, the Japanese industrial giants, such as Mitsubishi and Fuji, are organized as huge industrial conglomerates called Keiretsu. At the center of each Keiretsu is a bank that maintains a very close working relationship with the member firms. For example, banks hold both debt and equity of the member firms. The authors found Keiretsu firms were not financially constrained, while non-Keiretsu firms lacking such a close relationship appeared financially constrained.

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