
FRBSF WEEKLY LETTER

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Corporate Cash Flow and Investment

Annualized after-tax profits among nonfinancial corporations fell by about \$18½ billion from the fourth quarter of 1988 to the fourth quarter of 1989. This represents a decline of 14 percent. The resulting decline in nonfinancial-corporate cash flow (tax accounting basis) also was large: \$15¼ billion, or a drop of about three percent, compared with a rise in cash flow of 7½ percent in both 1987 and 1988.

Many believe that these declines in corporate profits and cash flow foreshadow a slowing in the growth rate of business fixed investment. The reason for this connection is a matter of debate, however. The traditional or so-called neoclassical view is that movements in profits and cash flow do not cause investment to change, but instead, are themselves determined by changes in the same factors that determine investment, namely, the cost of capital and aggregate output. Under this view, then, changes in financial factors are symptoms that merely foreshadow changes in investment.

An alternative view is that lower profits and cash flow can create financing constraints that directly influence the level of business investment. The importance of these financing constraints for aggregate investment is a point of considerable debate. To contribute to this debate, this *Letter* discusses how a firm's cash flow can influence investment, and examines some empirical evidence concerning the effect of cash flow on business fixed investment.

Influences on investment

Over the past three decades, macroeconomic models of investment have emphasized the effects of the cost of capital and aggregate output on investment. These models have shown that business fixed investment can be explained to a large extent by the behavior of variables like interest rates and final sales that proxy for the cost of capital and the level of output. These models, moreover, have tended not to

include financial variables like profits or cash flow (which is the sum of after-tax profits and depreciation) in part because of the work by Modigliani and Miller in the 1950s, which established the benchmark that in perfect capital markets the method of financing used by a firm does not affect the level of its investment.

However, numerous articles since Modigliani's and Miller's original work have examined the conditions under which the sources of financing would affect a firm's value and investment behavior. Most of these articles focus on the effects of the choice between debt and equity financing, but more recently, several economists have developed formal models in which the availability of "inside" (as opposed to "outside") funds has a direct bearing on the investment decisions of individual firms.

The basic premise of these models is that insiders (those who manage the firm) know more than outsiders do about the true *ex ante* investment opportunities of the firm as well as about the true *ex post* return. This presents problems when funding is provided by outsiders because the insiders have incentives to overstate the *ex ante* prospects of the firm and to understate the *ex post* returns when there are net losses.

Recognizing this fundamental problem with "information asymmetry," insiders and outsiders enter into contracts and undertake monitoring to limit insiders' ability to "cheat" when obtaining funds from outsiders. These efforts, however, are costly and limited in their effectiveness, creating financing constraints on firms subject to these information asymmetries. Since inside and outside funds are not close substitutes for these firms, changes in the availability of funds from insiders will not be offset one-for-one by funding from outsiders, and, thus, fluctuations in the supply of inside funds will affect investment. An increase in inside funds will increase investment

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while a drop in inside funds will reduce investment.

Cash flow and inside funds

Some have suggested that corporate cash flow provides a measure of the supply of inside funds available for investment. However, it is likely that cash flow is a better measure of inside funds for some firms than it is for others. For example, it generally is thought that cash flow corresponds better to the concept of inside funds for smaller businesses than for larger businesses. At small businesses, the owners usually are insiders in the sense that they also manage their firms. Consequently, cash flow, which is a form of owner equity, represents a supply of inside funds available for investment in these firms.

At large firms, in contrast, equity holders frequently are not the managers, and are instead outsiders *vis a vis* the firms they own. In this case, cash flow is not a good measure of inside funds. At the same time, the problems associated with information asymmetries likely are smaller in magnitude at large firms than at small firms since more information is publicly available regarding the financial condition of large firms than of small firms.

Accordingly, studies that examine the effect of financial factors on the investment decisions of individual firms distinguish among firms depending on whether information asymmetries are likely to create financing constraints. These studies typically find that cash flow has a greater effect on investment at the firms that are judged to have larger problems with information asymmetries, suggesting that the supply of inside funds is an important determinant of investment for these firms.

Specifically, these studies find that cash flow affects investment more at smaller firms than it does at larger firms. They also find that investment is more sensitive to cash flow at firms that retain a relatively large portion of their earnings. In this case, a high earnings-retention rate may indicate that internally generated funds for these firms cannot easily be replaced with new equity or debt financing.

Some doubts

The evidence at the firm level, then, provides some support for investment being related to cash flow for some corporations, though it re-

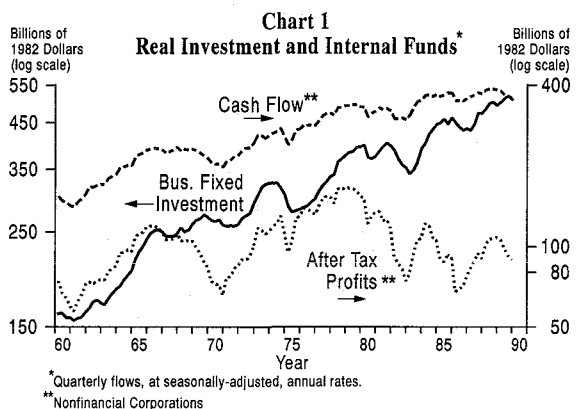
mains inconclusive as to whether the effects stem from financing constraints associated with information asymmetries. However, even if information asymmetries are important for some firms, many analysts question their importance for aggregate business investment. First, because there is reason to doubt that cash flow is a source of inside funds at large corporations, investment by these corporations should not be closely linked to cash flow (at least not because of information asymmetry). At the aggregate level, this could make the relationship between cash flow and investment relatively loose.

Second, firms that do not face financing constraints in terms of raising outside funds would be expected to take advantage of profitable opportunities passed up by firms that are constrained in their ability to raise outside funds. Thus, although a drop in cash flow might force constrained firms to pass up profitable opportunities, other firms not constrained by problems related to information asymmetries likely would increase investment more than otherwise.

Evidence

The behavior of corporate profits and cash flow relative to investment in the 1980s also raises doubts about any simple relationship between these financial variables and the level of business fixed investment. Chart 1 shows that real corporate profits, cash flow, and investment moved together until the 1980s, when profits and investment clearly diverged. The relationship between cash flow and investment also changed, though less dramatically.

One reason for the lower levels of corporate profits and cash flow is the increased emphasis

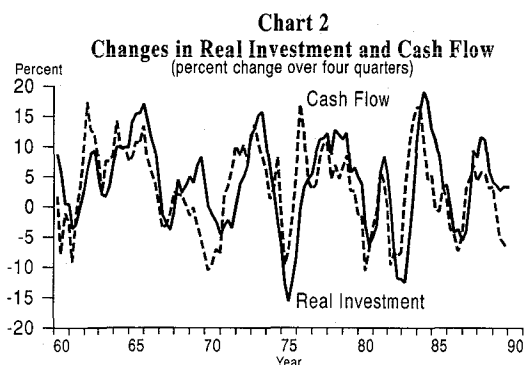


on debt financing. With a larger share of income needed to cover interest expenses, it follows that corporate profits and cash flow would be lower at any given level of gross income.

What these portfolio adjustments suggest is that many firms have flexibility in how investment is financed. This means that the level of business fixed investment may not be limited significantly by the level of profits or cash flow. Indeed, formal statistical tests indicate that investment is not tied to the level of profits or cash flow over the long run.

Changes in cash flow and investment

Although the *levels* of cash flow and profits are not related to the *level* of investment, it may still be the case that *changes* in the levels of profits, cash flow, and investment are related. Chart 2 suggests that this indeed has been the case, even in the 1980s. Moreover, since changes in profits and cash flow are highly correlated, either one should offer an adequate proxy for internal financing constraints. In the statistical analysis described below, we used cash flow.



To obtain a measure of the effect of internal financing constraints on aggregate investment, our statistical analysis controlled for the other factors that affect investment, including interest rates (the corporate bond composite rate) and real final sales. The results from this analysis suggest that there is a long run relationship between investment and final sales, as the more traditional models of investment also have found.

The findings also suggest, however, that financial factors cannot be ignored. Changes in cash flow

have a statistically significant and positive effect on changes in investment. This result is consistent with the view that financing constraints play a role in determining aggregate investment.

The magnitude of this effect is somewhat difficult to pinpoint, however, since changes in real final sales and changes in cash flow tend to move together. Nonetheless, it is possible to estimate a range of values for the impact of financing constraints. We can obtain a lower-bound by attributing the common information between sales and cash flow to sales, and an upper-bound by attributing the common information to cash flow. This exercise suggests that at a minimum, cash flow accounts for about 23 percent of the variation in the forecast error of investment, and at a maximum, it accounts for 35 percent. Sales account for 23 percent under the first scenario, and only 12 percent under the second scenario.

These results suggest that cash flow does have an important direct effect on investment. Previous studies, in contrast, generally conclude that cash flow has only a marginal influence on aggregate investment. Those studies, however, subject cash flow to a more stringent test. In our analysis, the comparable test is to attribute all the contemporaneous shocks affecting investment and cash flow to investment. Using this approach, we find that cash flow accounts for only about 13 percent of the variation in the forecast error of investment. It is possible, then, to obtain statistical results that lessen the impact of changes in cash flow on investment. Taking all the evidence together, however, there is good reason to conclude that cash flow has an important, direct effect on business fixed investment.

Conclusion

Most analysts agree that the declines in corporate profits and cash flow recorded in 1989 are likely to be followed by a reduction in the growth rate of business investment this year. Our findings suggest that financing constraints resulting from the decline in the availability of inside funds may be an important direct channel through which the weaker corporate cash flow will affect investment.

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