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Form of Ownership and Financial Constraints: Panel Data Evidence From Flow of Funds and Investment Equations

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Abstract. This paper analyzes the effects of the form of ownership on the substitutability between internal and external sources of finance in Italy. In particular, we test whether financial constraints are more severe for independent firms compared to members of large national business groups and subsidiaries of foreign multinational corporations. The results obtained from flow of funds and investment equations estimated for a panel of Italian companies imply that independent firms face more severe financial constraints. In fact, not only members of national groups and subsidiaries of multinational corporations find it easier to substitute cash flow with external finance when the former falls but they do not display excess sensitivity to cash flow and debt in their investment decisions.

Key words: Investment, financing constraints, ownership

JEL classification: E22, E44, G32

I. Introduction

Italian private firms can be classified, in terms of form of ownership, either as independent firms or as members of larger organizations, such as national business groups or foreign multinational corporations. Business groups are a pervasive form of organization in several countries, including Italy. They exist in a variety of types, ranging from hierarchical groups with a pyramidal structure to associative groups pursuing their common interest through a more informal system of co-ordinated decision making. In this paper we plan to analyze the role of group membership in alleviating capital market imperfections faced by firms in Italy. In this perspective, business groups and indeed multinational corporations can be seen as organizational forms that allow a mitigation of the information and contract enforcement problems that arise in accessing external financial resources. On the one hand, business groups allow the formation of an internal capital market that

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may partially replace the capital allocation function of the external market. A group can pool funds from different affiliates and reallocate them to the most profitable uses.[1] On the other hand business groups may also improve access to external capital markets. In some countries (e.g., Japan and Germany) groups are organically linked with banks that play an important role in financing, monitoring, and co-ordinating activities of member firms. The association with banks can be seen as another way to minimize information problems and to more closely align the incentives of borrowers and lenders. Multinational corporations play a similar role in creating an internal capital market and in facilitating their subsidiaries' access to external funds. When trying to obtain external finance, subsidiaries are very likely to benefit from the financial strength, reputation, geographical and (often) product diversification of the parent company.

In Italy most private firms are owned and controlled by families. Sometimes control is exercised over several separate companies through complex pyramidal organizational structures (hierarchical business groups) that allow a retention of control rights, while at the same time minimizing financial requirements to do so.[2] In any case, controlling coalitions tend to own a large fraction of the shares of the company.[3] National business groups operate in a context of underdeveloped capital markets, in which bank loans are the most common form of external finance.[4] Contrary to the experience of other bank-based countries, such as Japan and Germany, the role of banks in equity financing is marginal and it is unusual for bankers to sit on the boards of directors of industrial firms or to play an active role in influencing industrial firms' strategic decisions. It is however true that, partly for historical reasons, large business groups have special informal relations with national financial institutions. Some of the latter are considered to play an important role not only in financing but also in acting as exclusive clubs where mutual shareholdings are organized and, more generally, decisions on corporate control are taken.[5]

It is common wisdom in Italy that members of large national business groups are likely to face more favorable lending terms than independent firms. The existence of these informal links to financial institutions, together with the more diversified nature of business groups is perceived as a distinctive advantage in obtaining external funds for affiliated firms. Moreover, most firms quoted in the national stock market are members of the largest business groups, which enhances their advantage in obtaining funds from security markets.[6] Subsidiaries of foreign multinational corporations are also likely to enjoy favorable relations with domestic banking institutions, although perhaps not as good as affiliates to large national groups. Moreover they have a distinctive advantage in accessing international capital markets, either directly or indirectly through the parent company.

No systematic investigation has been conducted to date on the effect of the form of ownership on the substitutability between internal and external finance. The purpose of this paper is to fill this gap and to test whether financial constraints are more severe for independent firms vis-à-vis affiliated firms, and whether there are differences between members of national groups and subsidiaries of foreign

multinational corporations. One standard approach to assessing the substitutability of internal and external sources has been to investigate the sensitivity of investment to cash flow for different categories of firms.[7] In our paper we address this issue by investigating the role of cash flow in both flow of funds and investment equations. The advantage of this approach is twofold. First, the effect of the availability of internal finance on external financing decisions contains important information on the degree of substitutability between different sources of funds that should be exploited. Second, the joint empirical analysis of both decisions acts as a stringent consistency check on the conclusions one reaches on the existence and severity of financial constraints for different firms.

In our empirical work we make use of a novel dataset of Italian firms constructed at CERIS by merging balance sheet information on firms, published yearly by Mediobanca, with qualitative information on firms' form of ownership taken directly from company reports that permits us to classify firms as members of a national business group, subsidiaries of a foreign multinational corporation, or other national firms. Section 2 of the paper discusses the nature of the data set and summarizes the relevant descriptive statistics. Section 3 presents an empirical analysis of the determinants of firms' (change in) debt decisions, whereas in section 4 the effects of financial variables on fixed investment are tested. Concluding remarks are provided in Section 5.

II. Descriptive Statistics on Cash Flow and Financial Debt

In this section we provide both a brief description of the unbalanced sample of firms used in this paper and some descriptive evidence on the evolution of the financial variables used in our study. Real and financial data are available for 1229 firms over the period 1977–1990. The number of consecutive observations for each firm ranges from one to 14. In each year, firms are allocated to one of three categories: members of large national business groups, foreign subsidiaries, or other national firms.[8] Firms are classified as affiliates of large national groups if they are controlled, directly or indirectly, in the relevant year by the following 18 groups: Agnelli – Fiat, De Benedetti – Cir, Ferruzzi – Montedison, Fininvest – Mondadori, Pesenti – Italmobiliare, Pirelli, Barilla, Benetton, Cartiere Burgo, Falck, Ferrero, Gft, Lucchini, Marzotto, Merloni, Miroglio, Parmalat, and Smi. These groups represented the 'core' of the private national industrial sector in the eighties and most of them have been ranked in the top positions in terms of size since the first incomplete list of groups was published by Mediobanca in 1983. Furthermore, these are the only private groups with a consolidated turnover greater than 1,000 billion Lira in 1990. Firms are classified as foreign subsidiaries if the parent company is foreign, and as other national firms when they do not satisfy the requirements to be included in the first two categories. This category contains mainly independent companies, but firms affiliated to smaller and younger business groups are also included. We have grouped these two types of firms together for two

Table I. Descriptive statistics on size (number of employees)

	Mean	Number of firm-year observations
Full sample		
Full sample	1127.0	7633
Members of large national business group	2602.9	1489
Foreign subsidiaries	1057.0	2462
Other national firms	577.0	3682
Only firms with more than 3 consecutive observations		
Full sample	1043.6	6912
Members of large national business groups	2349.5	1278
Foreign subsidiaries	1023.9	2268
Other national firms	561.0	3366

reasons. First, information on the organizational structure of the smaller business groups is not very rich (especially in the first years of our sample period) and the decision to allocate some firms to a given business group (especially in the case of indirect control) would have been rather arbitrary. Second, the smaller business groups are more similar to the independent firms in our sample than to the large business groups in terms of size and diversification.

As can be seen from Table I, out of a total of 7633 firm-year observations, 1489 pertain to large national groups, 2462 to subsidiaries of multinationals and 3682 to firms not associated with either. The average number of employees is 1127 (1044 after excluding firms with fewer than 4 consecutive observations). However, this figure hides significant differences among our three sub-samples. In fact, the average size of firms that are members of large national business groups (2603 or 2350 employees, depending on the sample used) is much bigger than the average size of subsidiaries of multinationals (1057 or 1024 employees) and of other domestic companies (577 or 561 employees).

In the descriptive analysis that follows, we discuss the evolution of cash flow and indebtedness for the firms in each of the three categories. For both variables we compute and plot the median ($Q2$),the first decile ($D1$), the first quartile ($Q1$), the third quartile ($Q3$) and the ninth decile ($D9$).[9]

We start our analysis by focusing on the dynamics of internal finance over time. Pre-dividend cash flow divided by total assets (computed as the sum of the replacement value of fixed assets and the accounting value of gross working capital) is used as a proxy for internal finance.[10] Pre-dividend cash flow is computed by subtracting the sum of total labor costs, interest paid and taxes from value added. In Figures 1a, 1b and 1c percentiles are plotted for the sub-samples of members of large national business groups, affiliates to foreign multinationals, and other

national firms respectively. The data show that internal finance moves procyclically for all firms. It declines in the 1981–1982 recessionary period that follows the second oil shock and the tightening of monetary policy. Then, following the economic recovery which started in 1983, we observe a steady increase in internal finance up to 1987. Finally, cash flow declines again in the most recent years, partly anticipating the recession that occurred at the beginning of the nineties. The comparison between our three figures does not suggest any striking difference in either the dynamics or the levels of cash flow, even if firms affiliated to large national business groups seem on the whole less profitable than the others (this is particularly true for the lower tail of the distribution). The fact that firms that do not belong to national or foreign groups are at least as profitable as the other firms in the sample is a useful result since it suggests that differences that we may discover in their debt and investment choices are not due to independent firms' poor economic performance.

Figures 2a to 2c highlight some interesting aspects of the dynamics of total financial debt divided by total assets for the three sub-samples of companies.[11] Two remarks are in order. First, in Italy bank loans constitute the bulk of financial debt. Although our sample does not contain separate information for bank and non-bank debt, additional aggregate information on 779 large firms and 191 smaller firms suggest that bank loans represent 79.2% of the total for the former and 85.4% for the latter. Second, for affiliated firms the data do not allow us to distinguish the portion of debt obtained from the parent company or from other members of the group. There is a sense in which this is not fundamental for the object of our investigation. In fact belonging to a group relaxes financial constraints for member firms both because it creates an internal capital market and because it enhances the access to funds external to the group. Moreover, the additional Mediobanca data referred to above suggest that intra-group financial debt represents an average of only 13.2% of total debt, so that debt external to the group constitutes the vast majority of financial debt.[12] This means that the flow of funds equations that we estimate very likely provide information about the substitutability between internal funds and financial resources external not only to the individual firm, but also to the group (national or foreign multinational).

It is apparent from Figure 2 that members of both large national business groups and other domestic companies are characterized by a higher leverage compared to the sub-sample of affiliates to foreign multinationals. There are two interesting differences in the dynamics of leverage that distinguish non-affiliated firms from the rest. First, we observe at the beginning of the 1981-82 recession an increase in the leverage of the median member of large national groups. Such an increase occurs for foreign subsidiaries (below the 3rd quartile) as well, but does not occur for non-affiliated firms. A possible interpretation is that, in the face of monetary tightening and recession, firms that are members of larger organizations can make up the shortfall in cash flow with access to external funds. This is consistent with the flight to quality hypothesis (Bernanke, Gertler and Gilchrist, 1996), whereby

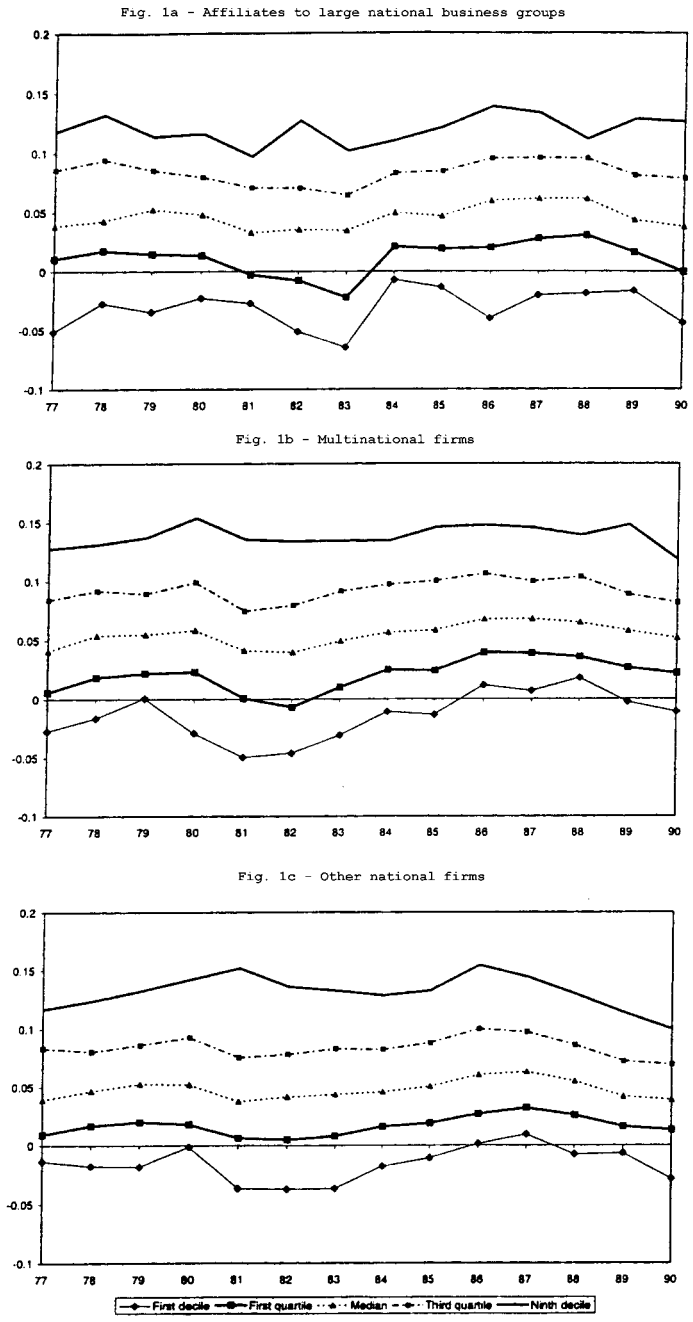

Figure 1. Pre dividend cash flow/total capital at replacement value: C/K.

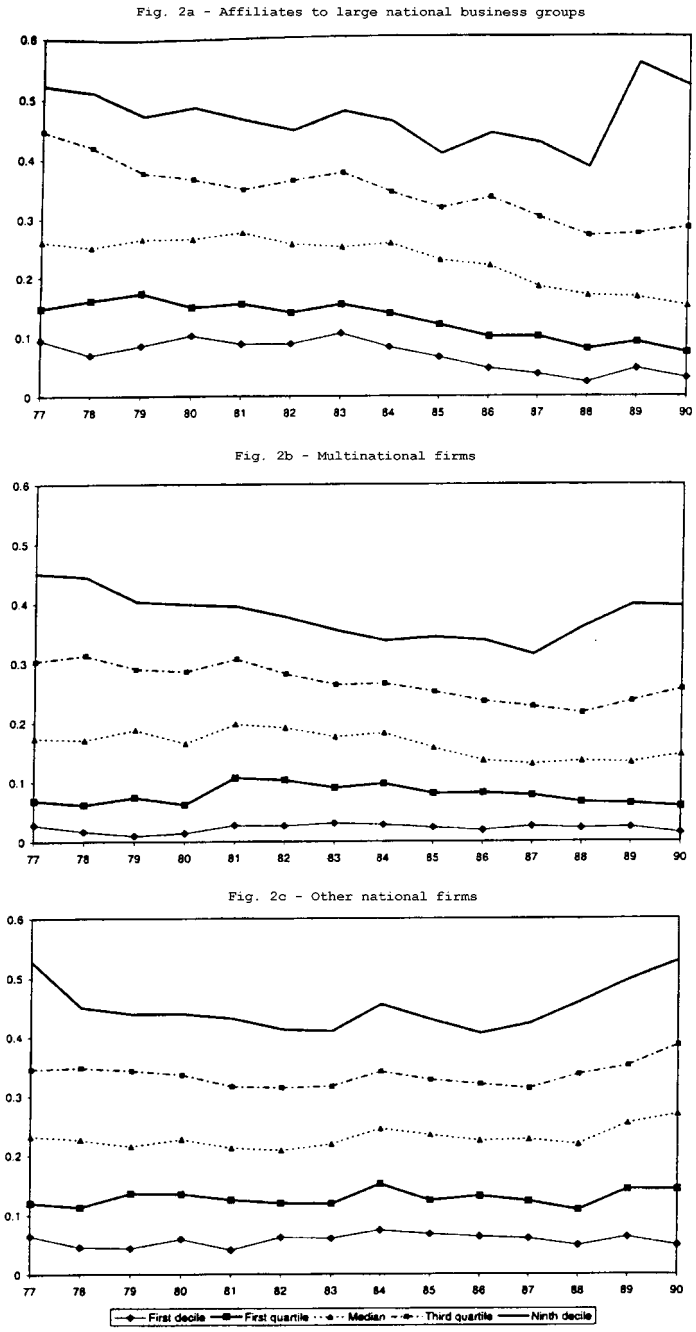

Figure 2. Total financial debt/total capital at replacement value: B/K.

in bad times investors concentrate their funding on those firms with lower agency costs due to asymmetric information and contract enforcement problems. Affiliated firms with low debt are prime candidates for external funding. Second, following the recovery (1983–1988), we observe a steady decline in leverage for affiliates to national groups and (although less pronounced) for subsidiaries of foreign multinationals whereas this trend is much less pronounced or absent in the sample of independent firms. A possible explanation for this finding is that affiliated firms were able to issue new shares in the years of recovery, which were used partly to repay debt. Unfortunately our data set does not contain information on new share issues. Another possible explanation is that the degree of centralization of financial management increased in business groups over the eighties, possibly inducing a reduction in the level of debt of affiliated companies.

III. Flow of Funds Equations and the Relation between Internal and External Finance

In the presence of asymmetric information between insiders and outside investors and contract enforcement problems, internal and external finance are not perfect substitutes in the sense that firms must pay a premium to obtain outside funds or, in some cases, they may be completely rationed.[13] Abstracting from tax considerations, firms have a preference to finance investment internally, then with debt. Only as debt becomes riskier, do firms finally issue equity. This is what Myers (1984) calls the "pecking order" theory of financing.[14] On the basis of this argument we would expect a negative association between the change in debt and internal finance for given investment opportunities. Since the severity of asymmetric information and contract enforcement problems is likely to vary across firms, the degree of substitutability between internal and external sources is also expected to differ across firms. In the context of a (change in) debt equation this means that we would expect a negative and larger in absolute value coefficient on cash flow (used here as a proxy for internal finance) for firms less affected by capital market imperfections. This can be most easily understood if we assume that cash flow decreases, while the expected profitability of investment remains constant. If a firm has to pay a premium for borrowing, it will replace cash flow with debt, but less than one for one. The greater the premium is, the smaller the increase in debt will be.

However, matters are more complicated than that. First, a change in cash flow may change expectations on future profitability and shift the demand for funds schedule. Second, a change in cash flow, if it is at least partly observed by outside investors and if it is thought to provide information about industry wide trends, may lead to a revised valuation of collateralizable assets. For instance a positive cash flow shock could increase the value of collateralizable assets and lead to a decreased premium on debt. Both these effects may weaken or even reverse the negative association between cash flow and change in debt. It has also been suggested (Jensen and Meckling, 1976) that debt helps mitigate the conflict

between managers and shareholders due to the former is bearing the full cost but is not capturing the entire gain from profit enhancement activities. In this situation managers may have an incentive to consume perquisites and invest less effort. Jensen (1986) suggests that debt constitutes a commitment to pay out cash, limits managers' discretion, and reduces the agency costs associated with the managers-shareholders conflict (the "free cash flow" hypothesis).[15] Also for this reason, one may observe a positive association between internal finance and the flow of debt (when cash flow is high the benefits of debt are also high), for a given level of investment opportunities. However, this last argument is unlikely to be important for independent Italian firms. Not only are most companies not quoted but top management positions are very often filled by members of the family owning the company, thus reducing agency costs. This problem is likely to be more severe for large national business groups and, particularly, for foreign multinationals. It is in fact in these larger organizations where the standard agency problems between shareholders and managers are more likely to occur.

In the light of the above discussion the relationship between cash flow and financial debt is essentially an empirical matter. Summarizing, asymmetric information considerations would lead to a negative relationship, given the state of expectations and the severity of agency problems between managers and shareholders. The negative association should be stronger the greater the substitutability between internal and external sources. In the absence of managers – shareholders agency problems, we can test for cross-firm differences in substitutability by allowing the coefficients to differ in flow of funds equations between firms that are expected to suffer less (affiliated firms) or more (independent firms) from information problems. Although expectational considerations may mitigate or reverse the negative relationship between debt and cash flow, there is no obvious reason why this importance should vary systematically across firms. However, as already mentioned, it is possible that differences in the cash flow coefficient may also reflect the agency problems between managers and shareholders. Since such problems are likely to be more important when cash flow increases than when cash flow decreases, we will allow the cash flow coefficient to differ, depending which of these two cases occurs. The coefficient is more likely to be negative when cash flow decreases because in this case the pecking order argument is more likely to dominate. Note that if we find in this case a coefficient which is negative and larger in absolute value for firms that are group members (or subsidiaries of multinationals), that is a clear indication that there is greater substitutability between internal and external sources of finance for those firms, compared to non-affiliated firms. Agency problems between managers and shareholders are surely more important for affiliates of national or foreign multinational groups than for independent firms. This would tend to make the cash flow coefficients less negative.

In this section we provide some econometric evidence on the relation between internal finance and changes in debt outstanding.[16] We use the following estimation strategy. As a benchmark, we start from a very simple equation where the ratio of

the flow of total financial debt to total assets, $(\Delta B/K)_t$ is explained in terms of the lagged debt to total assets ratio, $(B/K)_{t-1}$, the ratio between cash flow and total assets, $(C/K)_t$, and the contemporaneous and lagged changes in real sales, $\Delta \log Y_t$ and $\Delta \log Y_{t-1}$. In this section we have defined cash flow gross of interest payments to avoid introducing a spurious negative correlation between debt and cash flow, which could result if the latter was defined net of interest payments. Using appropriate firm type dummies, all the coefficients are allowed to differ between affiliates to large national groups, foreign multinationals and independent firms. We then interact $(C/K)_t$ with a dummy variable, D_t which equals one if the ratio between cash flow and total assets increases between time $t-1$ and t, and zero otherwise.

To eliminate time invariant firm specific characteristics that affect capital structure choices we estimate all the equations in first differences. To allow for the endogeneity of the regressors, estimation is carried out by the Generalized Method of Moments technique, using appropriately lagged variables as instruments.[17] Cash flow and sales growth are likely to be correlated with the error term, as well as the dummy variables used to define the regime of increasing (decreasing) cash flow. Assuming that the idiosyncratic component of the error is serially uncorrelated in the level equations, an error is generated with a moving average structure of order one in the equations in differences, so that once-lagged variables are also correlated with the error term. However, values of the regressors lagged twice or more will be legitimate instruments. To check the validity of the assumptions embedded in our model we calculate and report tests on both first and second order serial correlation on the residuals (M_1 and M_2 respectively) as well as the Hansen/Sargan test of the correlation of the instruments with the error term as a general test of mispecification. We also include three sets of year dummies (one for each sub-sample of firms) in all the equations, to allow for time effects common to each group of firms. Year dummies can capture, among other things, changes in expectations about demand or changes in the interest rate and in tax parameters that are common to all firms in each sub-sample.

In Table II we report the estimates of the specification of the flow of funds equation that does not allow for asymmetry in the cash flow coefficients. The Hansen/Sargan test does not suggest gross forms of mispecification. The M_1 and M_2 tests suggest that the error term has a moving average structure of order one, as one would expect in the differenced form of the equation, when the idiosyncratic component of the error term in the level equation is serially uncorrelated. Both tests suggest that variables lagged twice or more are legitimate instruments.[18]

The coefficient on lagged leverage is negative for all the sub-samples of firms. This implies that the change in debt to capital ratio is negatively related to the initial degree of leverage, as one would expect since more highly indebted firms face greater risks of bankruptcy and greater agency problems. More importantly for the purpose of this paper, the estimated cash flow coefficient is negative and significant for both firms affiliated to large national business groups and subsidi-

Table II. Flow of funds equation: basic model; dependent variable: $(\Delta B/K)_t$; sample period: 1980–1990; GMM estimates in first differences

	Members of large national business groups		Foreign subsidiaries		Other national firms	
$(B/K)_{t-1}$	−0.4262	(0.0339)	−0.3069	(0.0118)	−0.4139	(0.0501)
$(C/K)_t$	−0.2896	(0.1034)	−0.2731	(0.0515)	0.1778	(0.0786)
$\Delta \log Y_t$	0.0871	(0.0323)	−0.0598	(0.0323)	0.0571	(0.0271)
$\Delta \log Y_{t-1}$	0.0193	(0.0146)	0.0193	(0.0145)	0.131	(0.0107)
M_1	−4.880	[763]				
M_2	−0.968	[692]				
Sargan test	213.97	[177]				

[1] Instrument list: All included variables lagged twice and three times.
[2] Sub-sample specific time dummies included.

aries of foreign multinationals (−0.289 and −0.273). It is in contrast positive and significant (0.178) for independent firms. These results are consistent with a smaller degree of substitutability between internal and external finance for independent firms compared to affiliated firms.[19] Finally, the overall effect of a firm's growth rate is negative for subsidiaries of foreign multinationals and positive for the other two sub-samples of firms. A negative effect is likely to capture the fact that there is more potential for managers to invest in value decreasing projects when there is a lack of growth opportunities. In this situation, the benefits of debt in bonding managers are higher. Moreover, it is reasonable to assume that this particular agency problem is more severe for foreign multinationals than for nationally owned firms. This is certainly true in the case of non-affiliated firms where management and ownership basically coincide, but it is also true (relative to foreign subsidiaries) for members of large national groups. As a result, the role of sales growth in capturing greater actual investment and hence a greater need for finance dominates in these cases.

In the context of a flow of funds equation, a more rigorous test of the asymmetric information hypothesis is to focus only on the cases where a decrease in cash flow has occurred. In fact, for given investment opportunities it is when cash flow falls that firms are more in need of external financial sources. Furthermore, a decrease in cash flow, if observed by creditors, is likely to enhance agency problems between borrowers and lenders. For this purpose, in Table III, the cash flow coefficient is allowed to differ depending whether cash flow increases (D_t = 1) or decreases (D_t = 0). Basically, all our previous results are confirmed. The coefficients on cash flow are negative and significant in both regimes for the samples of both affiliates to large national groups and subsidiaries of foreign multinationals. In contrast, the coefficients are positive (and significant only in the "increasing" regime) for independent firms.

Table III. Flow of funds equation: model with asymmetric effect of cash flow; dependent variable: $(\Delta B/K)_t$; sample period: 1980–1990; GMM estimates in first differences

	Members of large national business groups		Foreign subsidiaries		Other national firms	
$(B/K)_{t-1}$	−0.4328	(0.0319)	−0.3299	(0.0099)	−0.4027	(0.0426)
$D_t(C/K)_t$	−0.1431	(0.0800)	−0.2530	(0.0470)	0.1756	(0.0734)
$(1-D_t)(C/K)_t$	−0.1999	(0.1012)	−0.1893	(0.0612)	0.0142	(0.0759)
$\Delta \log Y_t$	0.0797	(0.0261)	−0.0794	(0.0280)	0.0519	(0.0263)
$\Delta \log Y_{t-1}$	0.0394	(0.0137)	0.0190	(0.0106)	0.0131	(0.0105)
M_1	−4.987	[763]				
M_2	−0.965	[692]				
Sargan test	229.18	[237]				

[1] $D_t = 1$ if $(C/K)_t > (C/K)_{t-1}$; $D_t = 0$ otherwise.
[2] Instrument list: All included variables lagged twice and three times.
[3] Sub-sample specific time dummies included.

IV. The Effects of Financial Factors on Investment

In the previous section we found evidence that is consistent with the idea that external finance is a very imperfect substitute for internal finance for independent firms while the degree of substitutability is higher for affiliated firms. The next step is to test whether imperfect substitutability has an impact on firms' real policies. We estimate a simple accelerator model of company investment[20] with the ratio of investment to fixed capital stock, $(I/K^F)_t$ as the dependent variable.[21] In addition to the lagged investment rate and the contemporary and lagged changes in real sales, we also include the ratio of cash flow to fixed capital stock, $(C/K^F)_t$ and the ratio of total debt to fixed capital stock, $(B/K^F)_t$ as regressors. The cash flow variable in this section has been defined net of interest payments, as in most recent empirical papers on investment.[22] As suggested by Fazzari, Hubbard and Petersen (1988) differences in the size of the cash flow coefficients provide information on the importance of liquidity constraints. This approach has been used to assess the effects of group membership in Japan by Hoshi, Kashyap and Scharfstein (1991). They found that firms that are members of an industrial/financial group are less sensitive to cash flow fluctuations.

Obviously, a significant positive cash flow effect on investment does not necessarily reflect the presence of financing constraints, but may simply depend upon the fact that cash flow conveys information on expected profitability. However, as already mentioned, we minimize the risk of misinterpreting our empirical results by focusing on differences in the coefficients on cash flow among sub-samples of firms. In this case, if differences are found it is rather implausible to attribute them to differences in expectations formation.[23]

Table IV. Investment equation: model with debt; dependent variable: $(I/K^F)_t$; sample period: 1980–1990; GMM estimates in first differences

	Members of large national business groups		Foreign subsidiaries		Other national firms	
$(I/K^F)_{t-1}$	0.0055	(0.0003)	0.2296	(0.0118)	0.0276	(0.0135)
$(C/K^F)_t$	0.0206	(0.0002)	0.0089	(0.0046)	0.3081	(0.0244)
$\Delta \log Y_t$	0.0043	(0.0130)	0.0852	(0.0165)	0.0079	(0.0123)
$\Delta \log Y_{t-1}$	0.0014	(0.0069)	0.0145	(0.0076)	−0.0046	(0.0046)
$(B/K^F)_t$	−0.0003	(0.0000)	0.0003	(0.0004)	−0.0291	(0.0054)
M_1	−4.404	[763]				
M_2	−0.776	[692]				
Sargan test	251.14	[237]				

[1] Instrument list: All included variables lagged twice and three times.
[2] Sub-sample specific time dummies included.

As in the previous section, all estimates are carried out in first differences to eliminate firm specific characteristics, using GMM estimation techniques to allow for the endogeneity of the regressors. In all the reported equations three sets of year dummies are included, to allow time specific effects to differ between the three sub-samples of firms.

We start from a specification which includes the lagged dependent variable, $(I/K^F)_{t-1}$, the contemporaneous ratios of cash flow to fixed capital, the contemporaneous and lagged rates of change in output and the ratio between total financial debt and fixed capital (Table IV). The inclusion of this variable is meant to capture the concept that the premium on external finance is an increasing function of leverage. We would therefore expect a negative relationship between the degree of leverage and investment. What is more important in our framework however, is that the coefficient should be more negative for those types of firms characterized by more severe asymmetric information or contract enforcement problems.

The coefficients on cash flow for non-affiliated and affiliated national firms are both positive and significant but the former is ten times bigger than the latter. The coefficient for multinationals does not differ significantly from zero.[24] This indicates that the availability of internal funds for firms that are either group members or subsidiaries of foreign multinationals is less important for investment decisions, since their group association makes it easier to tap the external capital market, as well as the capital market internal to the group.[25] Also, the coefficient of leverage is negative, large in absolute value and significant for non-affiliated firms. For instance, when $(B/K^F)_t$ increases from the first quartile (0.265) to the third quartile (0.875), the investment to fixed capital ratio decreases by 0.018, which corresponds to a 14.6% decrease relative to the average value over the period (0.123). The coefficient on leverage is not significantly different from zero for subsidiar-

ies of multinational corporations. Although we can reject the hypothesis that the coefficient is zero for firms affiliated to large national groups, it is so minuscule (-0.0003) that it is not economically significant. Finally, as expected, the coefficients on the rates of growth in sales are positive and significant in most cases. Interestingly the sales coefficients are larger for multinational firms, suggesting that they respond more strongly to demand stimuli, whereas the point estimates for affiliated and independent national firms are remarkably similar.

To check the robustness of these results we reran the equation in Table IV, after including lagged cash flow. We have also performed other experiments by allowing more dynamics in our basic equation with the introduction of twice lagged regressors for all the variables in the model. We do not report these results for reasons of space. The basic conclusions do not change and, in any case, the coefficients on the additional lags do not differ significantly from zero. We have also replaced the rates of change in output either with the levels of output or with the ratios of the change in output to fixed capital, and we have also added the rates of change in industry output to the equation. Our basic findings were not altered in any of these alternative specifications.

Finally, as we have done for the flow of funds equations, we allow the cash flow coefficient to vary depending whether cash flow increases ($D_t = 1$) or decreases ($D_t = 0$). The dummy, D_t can be interpreted as a discrete and firm specific indicator of business cycle conditions, signalling respectively their improvement or worsening.[26] If asymmetric information or contract enforcement problems are more likely to occur in bad times, we would expect a positive and greater in absolute value for the coefficient on cash flow when $D_t = 0$. As can be seen from Table V, this indeed occurs for independent firms that are neither members of national large groups nor foreign affiliates. In fact, the coefficients for independent companies are not only both significantly greater in absolute value than the coefficients for the other types of firms but the coefficient when cash flow decreases is 2.7 times greater (and significantly so) than the coefficient for the cases when cash flow increases (0.41 versus 0.15). The effect of cash flow is very small in both regimes (although statistically different from zero) for subsidiaries of multinational corporations and members of domestic groups.[27]

V. Conclusions

In this paper we provide an integrated approach to the analysis of capital market imperfections at the firm level by analyzing the role of cash flow both in investment and in (change in) debt equations. We apply our methodology to a large unbalanced panel of Italian private companies, categorized by form of ownership. We find strong empirical evidence from the flow of funds equations to support the hypothesis that being part of a national business group or being affiliated to a foreign multinational alleviates capital market imperfections. Domestic firms that are not

Table V. Investment equation: model with debt and asymmetric effect of cash flow; dependent variable: $(I/K^F)_t$; sample period: 1980–1990; GMM estimates in first differences

	Members of large national business groups		Foreign subsidiaries		Other national firms	
$(I/K^F)_{t-1}$	0.0089	(0.0003)	0.2300	(0.0104)	−0.0056	(0.0077)
$D_t(C/K^F)_t$	0.0702	(0.0003)	0.0086	(0.0034)	0.1491	(0.0259)
$(1-D_t)(C/K^F)_t$	0.0250	(0.0002)	0.0185	(0.0032)	0.4088	(0.0174)
$\Delta \log Y_t$	−0.0061	(0.0116)	0.1076	(0.0141)	0.0373	(0.0051)
$\Delta \log Y_{t-1}$	0.0008	(0.0040)	0.0124	(0.0060)	−0.0015	(0.0031)
$(B/K^F)_t$	−0.0006	(0.0001)	0.0007	(0.0004)	−0.0238	(0.0041)
M_1	−5.269	[763]				
M_2	−1.168	[692]				
Sargan test	337.79	[297]				

[1] $D_t = 1$ if $(C/K^F)_t > (C/K^F)_{t-1}$; $D_t = 0$ otherwise.
[2] Instrument list: All included variables lagged twice and three times.
[3] Sub-sample specific time dummies included.

part of large national business groups have more difficulty in substituting internal with external finance.

The different degree of substitutability between cash flow and debt has implications on firms' real choices. In fact we find that investment decisions of non-affiliated firms are much more sensitive to the availability of cash flow, confirming the crucial role that internal finance plays for them. Moreover, there is evidence of an interesting asymmetry, in the sense that the effect of cash flow is greater when the latter decreases than when it increases. Finally, members of domestic groups and subsidiaries of multinational corporations show little or no excess sensitivity to cash flow. Thus, the results obtained from the investment equations are consistent with those from the debt equations and provide a stringent consistency check on the conclusions based on the standard investment equations approach.

The overall pattern of results emphasizes the problems of the financial system in making external finance accessible to non-affiliated firms throughout the eighties. Moreover, it is also possible that our results actually underestimate the problem since firms that make our sample of non-affiliated companies represent the upper tail of the size distribution of the total population of non-affiliated firms and are less likely to face unfavorable lending terms than do even smaller firms. Finally, the evidence we have presented lends support to the idea that business cycle shocks may have important distributional consequences across various types of firms, characterized in our case by different forms of ownership.

Notes

1. Williamson (1975) discusses this issue in the context of conglomerates. For a theoretical analysis of costs and benefits of internal versus external capital markets in allocating financial funds see Gertner, Scharfstein and Stein (1994).
2. In the early eighties new groups were set up and existing groups were expanded by splitting single companies in several legally independent units because of fiscal benefits.
3. In 1990 the three main shareholders of quoted and unquoted joint stock companies owned on average respectively 71% and 91% of total equity (Cannari, Marchese and Pagnini, 1993).
4. See Mayer (1990) for comparative evidence on financing patterns across countries.
5. Mediobanca, by far the most important investment bank in Italy, is defined by the economic press as the "salon of Italian capitalism".
6. Notice that the stock market plays on the whole a very limited role in Italy. For instance the ratio of the market value of quoted companies to GDP in 1991 was 102.3% in the UK, 61.4% in the US, but only 14.8% in Italy (FIBV – Fèdèration Internationale Bourses des Valeurs – Statistics, 1992). However, in the second half of the eighties some of the business groups members were able to use the stock market as a source of funds. See also Section 2.
7. See Fazzari, Hubbard and Petersen (1988) for a seminal contribution in this area. See also Hoshi, Kashyap and Scharfstein (1991) for an analysis of the implications of group membership in Japan.
8. A detailed data appendix is available from request from the authors. In the econometric estimates firms with less than 4 consecutive observations have been excluded.
9. The figures that follow are obtained using the unbalanced dataset. In order to check that our descriptive evidence is not contaminated by changes in the sample composition we have also calculated the percentiles for a balanced sample of firms. The results are very similar and are not reported here.
10. Since we compute our measure of cash flow by subtracting nominal interests, it incorporates the component of interests which represents an advance on loan repayment. Since the data set does not contain information on dividend payments, we cannot calculate retentions.
11. Trade debt is not included in total financial debt.
12. See Mediobanca, Dati Cumulativi di 1790 Società Italiane (1992). Transfer of financial resources between associated firms could also occur through transfer prices. However there is no way, using our data, to quantify the importance of this channel.
13. On rationing, see Stiglitz and Weiss (1981).
14. See also Myers and Majluf (1984).
15. See also Stulz (1990) for a formal model of financial structure based on the disciplinary role of debt, in which debt payments reduce free cash flow.
16. The empirical literature on the determination of capital structure is vast. See for instance Titman and Wessel (1988) and the extensive references in Harris and Raviv (1991) for the US. There are few papers on Italy with the exceptions of Bonato and Faini (1990), and Faini, Galli and Giannini (1991). A good survey on both theoretical and institutional aspects in the Italian context is Bonato, Hamaui and Ratti (1993).
17. See Arellano and Bond (1988, 1991).
18. These comments also apply to the equations in Tables III through VI.
19. The cash flow coefficient for independent firms is significantly different at the conventional statistical level from those for both multinationals and affiliated firms.
20. The importance of capital market imperfections for investment decisions can be investigated using a different approach based on the Euler equation for the capital stock. See Whited (1992) for

panel data evidence for the US, Bond and Meghir (1994) for the UK, and Galeotti, Schiantarelli and Jaramillo (1994), and Rondi, Sembenelli and Zanetti (1994) for Italy.

21. Note that the median value of $(I/K^F)_t$ is 0.104 for the sample of affiliates to large national groups, 0.100 for the sample of foreign subsidiaries, and 0.102 for the other national firms.
22. The results are very similar if cash flow is defined gross of interest payments.
23. Gilchrist and Himmelberg (1995) present evidence that the mechanism of expectation formation does not differ significantly among US firms.
24. The cash flow coefficient for non-affiliated firms is significantly different, at conventional levels, from the one for members of national business groups (t = 8.15) and for foreign subsidiaries (t = 8.60).
25. It is well known (see Carpenter (1995) and Kathuria and Mueller (1995)) that a positive cash flow coefficient in investment equations is consistent with both the asymmetric information and the managerial discretion hypothesis. For the reasons stated above affiliated firms are in principle more likely to suffer from agency problems between shareholders and managers. The fact that we find a positive coefficient only for independent firms suggests that we can safely interpret our results as evidence in favor of the existence of capital market imperfections in Italy.
26. The hypothesis that financial constraints are more likely to affect fixed investment decisions in a recession is tested for US firms in Gertler and Hubbard (1988) and Oliner and Rudebusch (1994) using aggregate indicators of business cycle conditions.
27. The hypothesis that the cash flow coefficients are different in the two regimes cannot be rejected at conventional levels for these two types of firms, but this is of little economic significance, given the small size of the coefficients.

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