Investment Financing in Russian Financial-Industrial Groups

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Abstract

We study whether Russian Financial-Industrial Groups facilitate access by Russian firms to investment finance. We compare firms which are members of official Financial Industrial Groups and/or are owned by a large Russian bank with a control set of large firms categorized by dispersed ownership or/and management and employee control. We find that investment is sensitive to internal finance for the second set of firms but not for the first. This is consistent with extensive reallocation of resources within the groups to overcome capital constraints.

One interpretation is that group firms have an internal capital market which facilitate access to finance. We test this view against the alternative possibility that financial reallocation hide opportunistic value transfer across firms. Specifically, we assess the quality of the investment process in group and non group firms by regressing individual firms' absolute and relative investment on our measure of Tobin's Q. The result supports the notion that group firm allocate capital better than independent firms.

We then distinguish between bank-led groups, which are more hierarchical, and industry-centered groups which may be more defensive arrangements. While investment is not significantly correlated with cash flow in industry-led group firms (unlike in independent firms), there is a **negative** significant correlation for bank-led firms, suggesting a more extensive financial reallocation and the use of profitable firms as cash-cows. Most intriguingly, the greater sensitivity of group firms' investment to Q is entirely to be attributed to firms in bank-led groups, where the controlling bank may have a stronger profit motive and authority to reallocate resources.

Non-Technical Summary

There has been an increasingly skeptical view in developed countries about the efficiency of diversified conglomerates. Following the onset of privatization in 1993, new Russian banks have taken large equity positions in the Russian industrial sector: the emerging corporate structure was termed the Financial-Industrial Group (FIG). Russia seems a natural candidate for analyzing the role of groups. Some theoretical rationales for corporate groups have pointed to their potential ability to resolve scarcity in the capital and intermediate product markets. The emergence of such groups may also be a function of the weak legal enforcement in emerging market economies. While concentrated ownership of firms may lead to better corporate and contractual governance, in such a context groups may also emerge as vehicles for well-connected individuals to capture the large rents associated with corporate control (asset-stripping).

We study the governance role of Russian Financial-Industrial Groups (FIG) and their impact on financing of investment. We compare member firms of a group with a control set of large firms categorized by dispersed ownership or/and management and employee control. We find that investment is sensitive to internal finance for the second set of firms but not for the first; in fact, we find that cash flow is negatively correlated with investment in the FIG group firms. This is consistent with extensive reallocation of resources within the groups. One interpretation is that groups have an internal capital market which redirects finance to firms with better investment opportunities. We test this view against the alternative possibility that financial reallocation hide opportunistic value transfer across firms. The result supports the notion that group firm allocate capital better than independent firms, although it does not rule out the possibility of private appropriation of value.

Keywords: Corporate groups, financial constraints, investment, Russia, corporate governance, financial transition

Introduction

There has been an increasingly skeptical view in developed countries about the efficiency of diversified conglomerates. The evidence points at the fact that Western diversified groups tend to trade at a discount relative to a portfolio of independent firms in related industries firms; they have on average a lower Tobin's Q; they tend to be broken up, and their share price significantly increases when that occurs.[1]

The leading explanations for such underperformance have focused on the agency conflict between investors and empire-building managers (Jensen, 1986). More recently, some authors have argued that internal power conflicts force inefficient redistribution of resources to less performing divisions. Rajan and Zingales (1997) and Scharfstein and Stein (1997) both show that in a conglomerate with diffuse ownership there are biased incentives which may lead strong divisions to subsidize investment in weak divisions. Scharfstein (1997) studies investment patterns in divisions in conglomerate firms, and conclude that they appear to practice some form of suboptimal "socialist" reallocation of resources across divisions, moving funds from profitable firms in high Q industries to support investment in lower Q sectors.

In sharp contrast, industrial-financial groups persist and often prosper in many developing countries (Khana, Tarun and Palepu, 1996), where private sector activity is often dominated by diversified business groups. Some theoretical rationales for such corporate structures have pointed to the incentive to resolve scarcity in the capital and the intermediate product markets. The emergence of such groups may also be a function of the weak institutional environment in emerging market economies of Asia, Latin America, and Eastern Europe. In countries with weak law enforcement, unstable regulatory system and corruption, groups may have extensive governance functions. They may support internal trade, ensure close monitoring of management decisions and manage a privileged access to political favors, such as subsidized credit, favorable regulation and licensing, and access to strategic resources. In conclusion, groups emerge to capture scarcity rents or compensate for lack of markets.[2]

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[1] For a reviw, see Rajan and Zingales (1997).

[2] A difference with the Western experience may be that corporate control in developing countries is more concentrated, often in the hand of family holding companies or banks.

In Russia, an historical reliance on implicit contracting, the oligopolistic structure of industry and underdeveloped capital markets has given additional scope for the development of business groups. Following the onset of privatization in 1993, new Russian banks have taken large equity positions in the Russian industrial sector. Most groups got hold of their assets through debt-equity swap programs, government provisions and privatization sales. Taking advantage of the limited competition offered by capital market investors, they began to consolidate holdings in controlling blocks by 1994 (Johnson, 1997)

The emerging corporate structure was termed the Financial-Industrial Group (henceforth FIG). FIGs were sometimes officially constituted by the government or have been formed spontaneously. An official recognition of FIGs came in December 1993 by presidential decree. Under this decree, FIGs receive a number of benefits, such as the right to receive blocks of shares in privatized enterprises from GKI, preferential reserve requirements from the central bank, and preferential access to licenses and permits.[3]

Given Russia's history of development and its current market conditions, such institutions may constitute an optimal organizational structure. Weak law enforcement makes arm-length contingent contracting impossible. Russia never experienced a form of capitalism based on reliable contractual relations of the Anglo-Saxon style. During the Soviet era the directors of enterprises relied on relational contracting to ensure contract performance. High transaction costs associated with segmented information and poor contractual enforcement in Russia may suggest that centralized ownership of assets can lead to both better corporate and contractual governance. On the other hand, groups may emerge as vehicles for well-connected individuals to capture the large rents associated with corporate control (asset-stripping).

Executives of many bank-centered groups routinely claim that they and other banks play the same role in the Russian economy today as investment bankers did in the US economy at the turn of the century[4]. In this paper we investigate this argument.

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[3] Although in December 1995 these benefits were confirmed in the Law On Financial-Industrial Groups, this has not led to visible explicit concessions for the FIGs.

[4] Ramirez (1995) shows that the involvement of J.P. Morgan bankers on US firms' Board of Directors around the turn of the century appears to have improved their access to capital, and argues that bank monitoring curtailed the principal-agent conflict and diminished informational asymmetries between investors and managers.

We start by an empirical analysis of the relationship between internal finance and investment in independent and group-affiliated Russian enterprises. We compare firms which are members of official Financial Industrial Groups and/or are owned by a large Russian bank with a control set of large firms categorized by dispersed ownership or/and management and employee control. We find that investment is sensitive to internal finance flows for the second set of firms but not for the first.

Such results can be reinterpreted as evidence of extensive financial reallocation across group firms. The interesting question, naturally, is the interpretation of this finding. One interpretation is that group firms have an internal capital market which facilitate access to finance for good projects by reallocating resources across firms. An alternative view may be that reallocation is driven by the desire of the controlling shareholders to shift resources around in order to appropriate them better (for instance, by shifting them to firms in which their equity interest is greater)..

In order to test these competing views, we assess the quality of the investment process in group and non group firms. We do so by regressing individual firms' absolute and relative investment on our measure of Tobin's Q. The result supports the notion that group firms allocate capital better than independent firms.

Following Johnson (1997), who argues persuasively that FIGs should be distinguished in bank-led groups and industry groupings, we then distinguish between bank-led groups, which are more hierarchical, and industry-centered groups which may be more defensive arrangements. While investment is not significantly correlated with cash flow in industry-led group firms (unlike in independent firms), there is a **negative** significant correlation for bank-led firms, suggesting a more extensive financial reallocation and the use of profitable firms as cash-cows. Most intriguingly, the greater sensitivity of group firms' investment to Q is entirely to be attributed to firms in bank-led groups, where the controlling bank may have a stronger profit motive and authority to reallocate resources. Finally, investment by independent firms with significant stock market trading appear also to be less sesnitive to cash flows. This may mean that the Russian equity market may already provide a positive informational function, or that more attention by equity investors limits the scope for fianncial reallocation.

I   Measurement of Capital Constraints in the Russian context

Financial distress costs are likely to be greater in the Russian context, where an undeveloped legal system coupled with unreliable enforcement imply severe agency and informational problems between investors and firms. External capital may be not just very costly but simply unavailable, and Russian firms may ultimately be forced to forgo valuable investment or restructuring opportunities. The availability of internally generated funds will then have an effect on the ability to invest.

In addition, the quality of investment may also be affected by the institutional context. When parties have to rely on incomplete or implicit contracts, the allocation of control becomes more important than income rights (Modigliani and Perotti, 1997); entrenched insiders seek to maintain control rents at the expense of profitability. In such cases, a hierarchical structure dominated by external investors may be necessary to enforce restructuring and redirecting resources to better investment opportunities.

In the command structure of most FIGs there is a holding company, either a bank or a company, with the right to residual cash flow and control over the assets. In such a case the corporate headquarters reallocate resources efficiently across their controlled business units and monitor managerial decisions, even if they may overexpand relative to what external investors may prefer (Stein, 1997).

Ultimately, the advantages and disadvantages of groups across countries are an empirical question. Most tests for the efficiency of investment financing across different sets of firms has been conducted within the context of the Q model of investment, developed by James Tobin. Q is defined as the ratio of the market value of the firm to the replacement value of its capital assets, and is therefore a shadow value of an additional unit of capital. If market expectations about profitability of investment are summarized by the market evaluation of the firm, introducing Q in an investment regression allows to isolate any effects of internal finance on investment. If Q is a good proxy for the profitability of prospective investment, the significance of the coefficients on other financial variables can be interpreted as evidence of financial constraints, since it implies that the availability of internal finance does seem to affect the level of investment. This makes it possible to test empirically the importance of financial factors across different governance arrangements.

There are practical measurement problems for Q even using Western accounts. Measures of Q necessarily use share prices, which reflect the average Q of the firm,

while the theoretically relevant variable is marginal Q. Moreover, traditional Q theory does not take into account other factors (such as irreversibility) associated with the investment. The classic solution in the literature is to compare the effects of internal finance across different sets of firms. If measurement errors are not systematically different for both sets of firms, then a significant difference in the effects of internal finance between the two samples indicates some structural difference on the relationship between financing and investment. In Fazzari, Hubbard and Petersen (1988) the division of the sample was based on the dividend pay-out policy: firms which retained most of their earnings were thought to be liquidity constraint. The appropriateness of this criterion in their sample has been challenged by Kaplan and Zingales (1997), who also raise doubts on the ability to interpret a higher positive coefficient on cash flow in investment equations as evidence of stronger liquidity constraints.[5]

Our approach is related to the empirical work of Hoshy, Kashyap and Scharfstein (1990) on Japanese firms belonging to keiretsu groups. They compare the strength of the relationship between the investment and measures of internal finance, such as cash flow, for firms who have strong relationship with banks against firms without such ties. Their evidence shows that for keiretsu firms sensitivity of investment to the cash flow was indeed insignificant, whereas non-affiliated firms experience more binding cash constraint.[6] They interpreted the evidence as stating that main bank monitoring mitigates information problems for Japanese enterprises.[7]

Our central question is whether group governance resolve capital constraints is important in the case of Russia, where enterprises are in great need for funds to finance restructuring. Moreover, the fundamental rules for a proper corporate governance system for public companies are either not in place or not effective, particularly in

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[5] Our results where one group of firms has a positive correlation of investment to cash flow while the other has a zero or negative correlation are not affected by this criticism.

[6] However, it is not clear that the result can be fully attributed to the role of the banks: Berglof and Perotti (1994) show that the dominant control configuration in the keiretsu group is horizontal, supported by corporate crossholdings. This is consistent with the finding that non-keiretsu firms with a main-bank relation appear to be credit constrained.

[7] Hoshi, Kashyap and Scharfstein (1995) find that keiretsu firms which weakened their ties to banks by raising money directly from capital markets became more liquidity constrained than before. A related result on the Chilean grupos following financial deregulation is in Hermes and Lensink (1997).

companies where rapid privatization has led to a strong degree of managerial self-control. This limits the role of capital market in financing.

III. Empirical Evidence

We employ the methodology described in the previous section to test the hypothesis that in the environment of poorly developed capital markets, where information and agency problems are severe, the Russian Financial-Industrial Groups help to relax firms' liquidity constraint.

As in recent empirical literature on information and agency problems in capital markets, we use accounting data. In the case of Russia the quality of this data is questionable. Particular problem for this study is caused by the accounting book values of total assets, because in empirical literature total assets are used as a scaling factor when working with panel data. In the case of Russian data there is little knowledge of how historical value of assets has been adjusted throughout the transition period and what is included into its definition as accounting standards change. To account for this problem, we have tried both total assets as well as total revenue to scale firm characteristics. As results are comparable, we focus here on total assets as a scaling factor.

Sample Description

We use individual firm data from companies listed in the publication called "200 Largest Russian Enterprises, 1996", which is compiled by the Russian weekly economic journal "Expert". Financial information in these publications is either directly collected from the Russian public companies or from their financial advisers.

One should treat this data with care due to the uncertain quality of reporting by Russian firms. Although some of these accounts are audited, some of the firms in the sample report their financial information according to Russian Accounting Standards. On the other hand, the financial statistics we use were obtained from Skate Kapital Press, which restates the financial accounts and sell them to Western investors. Financial analysts in Moscow believe these sources to be more reliable than the information supplied by the Russian Federation Statistical Agency.

Since it is necessary for the purpose of estimation to calculate a proxy for Tobin's Q, we had to drop from our sample those firms which do not have an established secondary market for their shares. We constructed a consistent sample with sufficiently complete financial indicators for 76 Russian public companies. For each firm it includes data from balance sheets for 01/01/95 & 01/01/96 and the income statement for the year of 1995. Price per share is from Skate Stock Data group as of February 1, 1997. All financial details are in Russian Rubles and are not adjusted for inflation; to account for inflation, all figures are converted into US Dollars at the historical rate[8].

Table I contains the distribution of group and non-group firms in the sample according to industry. We use three criterion to distinguish between the group and non-group firms. Firstly, firms which are listed in the Industrial-Financial Groups Registry Book for 1996 are classified as group firms. In our sample 14 firms were given a "Group" category based on this criterion. Secondly, we rely on information about ownership structure which is available from the Skate Kapital Press and "Expert". Firms where major shareholders are Russian banks and oil companies are classified as group firms. Although our ownership information is incomplete, it enabled us to include into a group status another 15 firms. These are firms in which Menatep Bank, ONEXIM Bank, Yukos or Sidalco and their affiliates are major shareholders. Thirdly, we have included 9 utility firms, which form a group called Unified Energy Systems of Russia.

Table I
The Distribution of Group and Non-Group Firms Across Sectors

Industry	Group Firms	Non-Group Firms
Oil and Gas	12	14
	31.6%	36.8%
Utility	9	3
	23.7%	7.9%
Non-Ferrous Metals	3	2
	7.9%	5.3%
Steels	4	6
	10.5%	15.8%
Machinery	5	7
	13.2%	18.4%
Transport	2	6
	5.3%	15.8%
Other	3	0

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[8] The type of adjustment (dollar versus PPI or CPI) has no impact on the results. In any event most our measurements are based on a single point in time.

	7.9%	0%
Total	38	38
	100%	100%

The non-group sample include firms where share-holdings are either dispersed with either the largest stake being less then 20% or being concentrated in the hands of government, management and employees. Most of the literature on corporate governance in Russia argues that firms with insider control and/or dispersed ownership tend to be more inertial and face severe agency costs in raising funding.

Table IIa
Descriptive Statistics

Cash flow is net income minus change in inventories minus change in accounts receivable plus change in accounts payable. Investment is change in fixed assets. All variables are scaled by total assets.

Statistic	Non-Group Firms	Group Firms
Number of firms	38	38
Average cash flow-total assets ratio	0.024	0.019
Standard deviation of investment - total assets ratio	0.591	0.925
Standard deviation of cash flow - total assets ratio	0.641	0.516
Average total assets 01/01/95	759.625	464.878
Average total assets 01/01/96	1133.218	816.973

Source: Authors' calculations based on samples selected from Skate Kapital Press data.
Note 1: Flow values are calculated for the 01/01/95 and 01/01/96. Stock variable are for the 01/0195.

Table IIb
Descriptive Statistics

Statistic	Non-Group Firms		Group Firms	
	Mean	Std. Deviation	Mean	Std. Deviation
Employment	20991.216	17324.736	42411.625	66659.857
Change in bank debt	3.877	10.283	0.769	3.235
Bank debt - total assets ratio	0.037	0.099	0.046	0.078
Change in accounts payable	0.636	0.642	0.673	0.861
Accounts payable - total assets ratio	0.237	0.147	0.294	0.480
Change in cash	0.924	2.963	1.338	4.547
Cash - total assets ratio**	0.033	0.052	0.017	0.022
Total liability - total assets ratio	0.281	0.179	0.340	0.482
Logarithm of total revenue	6.115	1.238	6.433	1.735
Revenue - total assets ratio	1.346	1.160	1.245	0.863

Note 1: Changes refer to the period 1995-96. Income statement statistics are for 1995.
Note 2: The stars indicate significance of the non-parametric independent sample T-test on the difference in sample means between the two sets of firms. ** Significant at the 10% level..

Table IIa shows some relevant statistics for the two sets of firms over 1995-1996. Investment normalized by initial total assets is larger for group firms. They tend to invest more and their investment is more volatile. The distribution of the firms across different industrial sectors is not too different. The cash flow-capital ratio is almost identical for both groups, although it is more volatile among the group firms. Both groups almost doubled the value of their assets during the period. [9]

Table IIb shows that non-group firms tend to hold larger stock of cash then the group firms; the difference is marginally significant. This strategy may be an endogenous response to the existence of credit constraints. Note that the payables to total assets ratio constitutes a much larger portion of liabilities than bank debt for both sets of firms. From Table II one can see that the bank debt-total assets ratio is remarkably low for both sets of firms. This is consistent with the fact noted by other researchers that Russian firms obtain little credit from the banking system. Firms in both categories are of roughly similar size (as measured by revenue).

Table III presents indicators of investment opportunities and profitability for both categories. Income-based profitability measures as well as market-book ratios are very similar for both categories of firms, as is the fixed asset to total assets ratio. Net income over revenues shows that profit margins are higher for group firms.

If fixed assets-total assets ratio were a reliable measure of asset tangibility, they could proxy for the ability of the firms to attract credit; then bank debt should be similar for both types of firms. In addition, the two sets of firms are equally profitable, generate a comparable amount of cash flow and have very large stocks and flows of trade payables. While group firms invest more, the difference is not significant since investment is also more variable in this category. In itself, this variation is consistent with the possibility of intra-group financial reallocation.

Table III

Financial Ratios for Group and Non-Group firms

The table presents our proxy for Q, the market to book ratio, calculated as market capitalization as a proportion of book value of equity; Net income as a proportion of the total revenue; Net income as a proportion of the total assets; Income before taxes as a proportion of the total assets; Fixed assets as a proportion of total assets. Leverage is total bank debt over equity book value.

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[9] A simple correlation analysis between investment and cash flow suggests that about one third of cash flow is spent on investment by the non-group firms, whereas for group firms the correlation is negative.

	Non-Group Firms		Group Firms	
	Mean	Std. Deviation	Mean	Std. Deviation
Market capitalization - book value of equity ratio	0.492	1.041	0.487	0.848
Net income - total revenue ratio	0.096	0.123	0.126	0.136
Net income - total assets ratio	0.143	0.189	0.153	0.150
Total bank debt - equity ratio	0.114	0.515	0.096	0.263
Income before taxes - total assets ratio	0.238	0.273	0.245	0.212
Fixed assets - total assets ratio	0.569	0.178	0.539	0.184

Source: Same as in Table I

Note 1: Income statement are for 1995 and the balance sheet statistics are for 01/01/95.

These statistics are consistent with the notion that the independent firms are cash constrained. Firms in both categories are roughly of the same size and have similar cash flow, but the non-group firms hold more cash, which can be interpreted as a buffer against sudden liquidity problems. Their lower level of investment is also consistent with this hypothesis, as the greater variation in the investment-capital ratio The recent higher increase in bank debt is on the other hand not consistent. In any case these comparisons are only suggestive, as none of the differences in the average are statistically significant at 5% level and only a few are significant at 10% level.

We test a standard investment model augmented by various measures of internal finance (such as measures of cash flow and stock of liquid assets) and others relating to potential agency conflicts (leverage, profitability, share trading liquidity, and measure of government ownesrhip).

While usually agency costs are assumed to be increasing in debt, the theory is ambiguous on this point; leverage may constrain excess investment by forcing management to pay out cash-flow (Jensen, 1986). In any event, bank lending is quite low in Russia, as a result of high inflation and an underdeveloped financial market. We thus tend to interpret higher bank lending as an indicator of better access to credit.

To eliminate the effects of scale all the variables other then a proxy for Tobin's Q are normalized by the beginning of the period total assets.

Our basic equation is as follows:

$$\frac{I_t}{K_{t-1}} = \beta_1 + \beta_2 M\_B + \beta_3 \frac{CF_t}{K_{t-1}} + \beta_4 D * \frac{CF_t}{K_{t-1}} + \beta_5 \frac{DEBT_{t-1}}{K_{t-1}} + \beta_6 \frac{IBT_t}{K_{t-1}} + \beta_7 \frac{CASH_{t-1}}{K_{t-1}}$$

We use both cash flow and beginning-of-period stock measures of internal liquidity. Cash flow (CF/K) records the inflow of cash to the firm during the period of

investment: it is defined as after-tax income less change in inventories and accounts receivable plus the change in accounts payables. The stock measure of cash (*CASH/K*) measures the stock of cash at the beginning of the period when a firm decides on its investment. The stock of debt (*DEBT/K*) is included in the regression with no strong prior; in the literature a high level of debt may affect agency conflict; at the low level typical of the Russian context, we are rather incline to interpret it as a sign of access to scarce credit. As a proxy for Tobin's Q we use the market value of equity over the book value of equity (*M_B*). It is here calculated at the beginning of the period; we later use also the end-of-period value. Investment (*I/K*) is measured as the change in fixed assets. We also include income before taxes-total assets ratio (*IBT/K*) as a proxy for profitability, because this measure may be related to sales and production.[10] We do not use sales directly in our regression because the correlation coefficient between revenue and cash flow is greater than the regression R^2 and thus may endanger the accuracy of the inference.

To condition on whether the firm is part of an industrial-financial group or an independent one, we use an interactive dummy variable times the cash flow (Group *D*CF/K*), where D is a dummy indicating group status. This tests whether the coefficient on a cash flow variable is different for two groups. We will use other interactive dummies in later sections to control for various other qualitative features such as industry effects.

Estimation Results

Table IV presents estimates of the investment models, including financial variables, for group and non-group firms. Column 1 shows the estimates of the basic regression, which is the most closely related to the Q model of investment. Our proxy for Tobin's Q is highly significant and has the expected sign. In addition, all financial variables have large significant coefficients, suggesting that internal finance does matter for investment.

The main result of Table IV is that the availability of internal funds has a positive effect on investment, presumably because of credit constraints. The other main result is that the sensitivity of investment to cash flow is substantially different for

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10   In the literature production is included into the regression for practical reasons. Since liquidity and production are correlated, liquidity might proxy for accelerator effects, which appear to

group and independent firms: the estimated difference in the cash flow coefficient between group and non-group firms (the coefficient on the group dummy times cash flow) is negative and significant. These results are consistent with the hypothesis that non group firms are financially constrained, while the sensitivity of investment to the cash flow for the group firms is zero (or perhaps even slightly negative). This suggests that cash flow is strongly reallocated within the group, to the point that investment is uncorrelated with individual firms, or in the case of a negative coefficient, that some firms which tend to be cash-rich act as cash cows for the group as a whole. This may imply that a close relationship with a bank or/and group structure resolves agency or market imperfections and enables some Russian industrial firms to raise investment funding, while perhaps constraining the use of free cash flow by cash rich firms.

The estimated effect of bank debt is positive and significant at the 10% level. In the case of Russia, bank debt is quite low relative to assets, and due to the high past inflation, it is largely newly accumulated debt. Thus firms with higher debt are perhaps those which have been able to raise it. If those are generally firms with better investment opportunities, a positive sign is not surprising. Since the significance is only marginal, we hesitate to interpret this result further. [11] Other variables we included, such as trading liquidity, profitability, employment and government ownership are not significant determinants of investment.

Table IV
Effects of Cash Flow on Investment

The Dependent variable is investment - total assets ratio (I/K), where I is defined as a change in fixed assets and K is beginning-of-period total assets. Independent variables include M_B: Market value of equity divided by the beginning-of-period book value of equity; CF/K Cash flow during the investment period as a proportion of beginning-of-period total assets; DCF/K: dummy variable times the CF/K, dummy is equal to "1" if a firm is a member of a group and "0" otherwise. DEBT/K: beginning-of- period stock of bank debt as a proportion of the beginning-of-period total assets; CASH/K: stock of cash as a proportion of the beginning-of-period total assets. IBT/K: a proxy for profitability calculated as income before taxes as a proportion of the beginning-of-period total assets. ShLiquid: a dummy variable which equals "1" if a firm's shares "moderately" or "actively traded" and "0" otherwise; GOV: equal to "1" if State Property Fund owns more then 20% in a firm. Employment size was included in all regressions. Standard errors appear in parentheses. Several outliers in Debt and Investment are removed. Number of observations:76

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be important in the empirical investment literature. This point is discussed in Fazzari et al.(1988) and Hoshi et al. (1994).

[11]   As many firms in the sample have increased their leverage, we also tried including the change in bank debt; the coefficients were again positive but not significant at the 10% level.

	1	2	3	4	5
(Constant)	0.3991***	0.4051***	0.3147**	0.2984**	0.4372***
	(0.1039)	(0.1154)	(0.1231)	(0.1224)	(0.1238)
M_B	0.2071**	0.2079**	0.1595*	0.1697**	0.1886**
	(0.0813)	(0.0821)	(0.0846)	(0.0843)	(0.0836)
CF/K	0.5728**	0.5767**	0.4459*	0.4584*	0.6112**
	(0.2358)	(0.2395)	(0.2452)	(0.2454)	(0.2374)
D*CF/K	-1.2743***	-1.2787***	-1.1535***	-1.1604***	-1.3639***
	(0.3255)	(0.3297)	(0.3305)	(0.3311)	(0.3286)
DEBT/K	2.1555*	2.1608*	1.7806	1.86221	2.7144**
	(1.1946)	(1.2038)	(1.1992)	(1.1992)	(1.2455)
CASH/K	...	-0.2406	-2.5432	...	...
		(1.9494)	(2.2703)		
IBT/K	...	...	0.7612*	0.5182	...
			(0.4035)	(0.3408)	
ShLiquid	...	...	...	...	0.2194
					(0.1861)
GOV	...	...	...	...	-0.2184
					(0.1547)
EMPLOY	1.1E-06	1.1E-06	1.2E-06	1.3E-06	7.4E-06
	(1.5E-06)	(1.5E-06)	(1.5E-06)	(1.4E-06)	(1.6E-06)
F Statistic	5.0052***	4.1149***	4.1663***	4.6344***	4.0470***
Adj. R Sq.	0.211	0.199	0.228	0.225	0.2214
Wald Test F-Statistic Coefficients Restrictions Null Hypothesis.: c(3)+c(4)=0	11.730***	11.577***	12.196***	11.966***	12.506***

Note 1: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

In our view the regression reported in Column 1 of Table IV is the most sensible[12]. We did, however, estimate several other specifications without any change in the main conclusions: the pattern of investment/cash flow sensitivity is remarkably robust across different specifications. In Table IV we add a proxy for productivity with no substantive difference in the results. We also tried to add the stock of cash to the regression;, but its coefficient is insignificant.

Column 5 introduces two dummy variables. The first is a dummy for firms in which the Russian Federation State Property Committee has a substantial stake (over 20%), to control for the possibility of a different investment pattern under government ownership. Moreover, to test whether firms which are traded actively on the stock market are better appreciated by investors and are therefore able to invest more. We

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[12] We have conducted a few diagnostic tests. A Lagrange-Multiplier test for serial correlation was not significant. No evidence of heteroschedasticity was found, using both ARCH and White tests. The RESET test on functional form mis-specification was insignificant.

add a dummy for firms with a high trading volume. There are no evidence in support of these effects as both dummy variables are insignificant.

We also tried to include industry dummies in the regression, to see if the result is driven by firms in high cash flow industries. None of the coefficients on the dummy variables were significant, and we do not report them.

At the bottom of the table we report the result of a Wald test to determine whether the coefficient on cash flow in the investment equation is significantly different from zero. The result of the test suggests that the total cash flow sensitivity of investment for the group firms is negative; this would imply that firms with larger cash flow have less investment.

The interpretation of this result is very important to assess the impact of group memberships. A benign interpretation is that groups redistribute resources from cash-rich firms to support investment by cash-poor companies. Alternatively, this result is also consistent with the popular belief that Financial-Industrial Groups in Russia do not provide capital and proper governance to member firms, but skim the cash generated by the firms to strengthen their banks or simply channel the money for their private needs. Later we will conduct an explicit test of these alternative hypotheses.

These results are qualitatively very interesting. In particular, we are surprised by the strength and significance of our proxy for Q in the investment patterns of Russian industry. An interpretation is that stock market prices in Russia are starting to be informative about the quality of firms, an hypothesis that we study further later.[13]

We next separate the group sample in a bank-led group category and an industry-led group category, to see whether indeed there are structural differences between the two governance structures. It appears that indeed there are.

Table V
Effects of Cash Flow on Investment
Differentiating Between Industry-Led Groups and Bank-Led Groups

All variables are as in Table IV (a) except BL*CF/K: dummy variable BL times CF/K. The BL dummy is equal to "1" if a firm is a member of a Bank-Led group and "0" otherwise; IL*CF/K: dummy variable times the CF/K, dummy is equal to "1" if a firm is a member of an Industry-Led group and "0" otherwise. Standard errors appear in parentheses. Several outliers in Debt and Investment are removed. Number of observations:76

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[13] Of course, using accounting book values may have distorted the results; however, we see no reasons to believe that there would be systematic differences between group and non-group firms in this respect.

	1	2	3
(Constant)	0.2502	0.2479	0.5179
	(0.1370)	(0.1315)	(0.0857)
M_B	0.1611*	0.1740**	0.2328***
	(0.0837)	(0.0829)	(0.0802)
CF/K	0.4914**	0.5334**	0.3134*
	(0.2374)	(0.2344)	(0.1685)
IL*CF/K	-0.5924***	-0.6078***	-0.4866***
	(0.1616)	(0.1608)	(0.1349)
BL*CF/K	-2.6370***	-2.6293***	-1.7593***
	(0.9078)	(0.9046)	(0.8520)
DEBT/K	1.9899*	2.1970*	
	(1.1588)	(1.1438)	
CASH/K	-2.4598		
	(2.2991)		
IBT/K	0.8208*	0.5441	
	(0.4173)	(0.3420)	
EMPLOY	1.13E-06		
	(1.53E-06)		
IL	0.0078	0.0526	
	(0.0977)	(0.0907)	
BL	0.2185	0.2510	
	(0.1966)	(0.1937)	
F Statistic	3.5933***	4.3034***	6.1097***
Adjusted R-Sq.	0.2569	0.2606	0.2142
Wald Test F-Statistic Coefficients Restrictions Null Hypot.: c(2)+c(3)=0	0.4362	0.2429	1.6513
Null Hypot: c(2)+c(4)=0	6.0563**	5.8267**	2.9879*

Note 1: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

This set of regressions confirms our view that there are structural differences between bank-led and industry-led groups. In the case of industry-led group firms, there is no sensitivity of investment to cash flow, as the Wald test attests. In contrast, the total coefficient on bank-led group firms is negative and significant. This confirms a much stronger degree of redistribution from cash-rich firms to cash-poor firms. Intuitively, this type of financial reallocation is possible only within groups with a strong governance structure, where a holding company has controlling blocks of equity.

What can we conclude ? Are bank groups actively moving funds to better investment opportunities, constraining high cash flow firms not to overspend ? Or are they just skimming cash from profitable firms ? We try to answer this question in the next set of regression.

Table VI reports results from regressions in which we eliminate all financial variables to measure the sensitivity of investment to Q across different types of firms.

The Q theory of investment implies that the higher is Q, the higher should be the level of investment, as the stock market values more highly the present value of new capacity. We also attempted to use other variables of performance variables, which were not significant, so we leave them out. In Column 1 the general regression reports that investment is positively correlated with our Q proxy for the whole sample. This suggests that the average investment decision in the best Russian industrial companies is correlated with the stock market view of its profitability. The regression in Column 2 shows that group firms investment is more sensitive to the Q proxy, implying a greater sensitivity to the market assessment of valuable investment opportunities. We interpret this as evidence of a better capital allocation decision within the groups than outside. Perhaps in the insider-controlled independent firms the investment decision is only driven by availability of internal finance and less dependent on expected profitability, while inside the group the controlling shareholders, who have a sharper interest in future profits vis-a-vis size are able to control the process better. The regression in Column 3 shows that if we differentiate between industry-led groups and bank-led groups, the bank-led groups coefficient is clearly larger and significant. In fact, there is no evidence that in industry-led groups investment has a greater correlation with Q than for independent firms.

Table VI

Sensitivity of Investment to our Q measure

The dependent variable is investment - total assets ratio (I/K), where I is defined as a change in fixed assets and K is beginning-of-period total assets. Independent variables include M_B: Market value of equity divided by the beginning-of-period book value of equity. Group* M_B: Group dummy times M_B, where Group is equal to "0" if a firm is independent and "1" otherwise. BL* M_B: dummy variable BL times the M_B, dummy is equal to "1" if a firm is a member of a Bank-Led group and "0" otherwise. IL* M_B: dummy variable times the M_B, dummy is equal to "2" if a firm is a member of an Industry-Led group and "0" otherwise. Standard errors appear in parentheses. Several outliers in Debt and Investment are removed. Number of observations:76

Variable	1	2	3
Constant	0.5135***	0.5006	0.4709
	(0.0917)	(0.0902)	(0.0899)
M_B	0.2271**	0.1030	0.1239
	(0.0869)	(0.1059)	(0.1043)
Group*M_B		0.3026*	
		(0.1530)	
IL*M_B			0.1039
			(0.0772)
BL*M_B			1.0186***
			(0.3839)
Adjusted R-Sq.	0.0721	0.1071	0.1406
F-Statistic	6.8246**	5.5018***	5.0903***

Note 1: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

In the next section we investigate the role of government ownership as well as the impact of stock market trading and valuation on the degree of credit constraints.

The effect of share liquidity and valuation

Thus far we have established that group firms tend to be less cash constrained then the independent firms. We interpret this result within a framework of imperfect information and agency problems in capital markets; group membership helps the firms to escape their liquidity constraints. However, other factors might play an important role. Some Russian groups were formed by the government, others came about through asset consolidation by banks. The same heterogeneity presumably holds for independent firms.

Our sample consists only of firms which are publicly traded. This begs the question of what role the stock market exercises on monitoring the firms and influence their investment decisions. We thus investigate the volume of trading on the stock market and relative market valuation as measures of attention to the firm performance. The rational for this distinction comes from the possibility that there is more public

information about firms which are actively traded. In particular, the role of the market may be more important for non-affiliated firms.

A low liquidity of share trading does not directly imply that the firm has poor prospects; however, its owners may prevent circulation of shares and information for control considerations, or be unable to communicate credibly with financial investors. Thus it is possible that a firm whose shares are actively traded has a lower investment-cash flow sensitivity because of either control or information considerations.

Controlling for these various effects also implicitly tests for the endogeneity of group membership; factors that lead a firm to join or to be captured by a group may be correlated with factors that would make liquidity more informative about investment opportunities. For example it is possible that firms that do not join a group are firms with better investment opportunities who do not need membership to communicate with the market, as they have better access to other sources. In this case investment will be less correlated with cash flow. Alternatively, firms with little visibility or poor access to alternative sources may be easily captured by (or yield to) a group.

To explicitly control for both trading liquidity of the shares and the group status, we create four dummy variables:

1) if a firm is Non-Group and its share have Low Liquidity – 0

2) if a firm is Group and its share have Low Liquidity – 1

3) if a firm is Non-Group and its share have High Liquidity – 2

4) if a firm is Group and its share have High Liquidity – 3

We interact these dummies with cash flow and run the regression models used in Table V. Results are presented in Table VII.

Structural coefficients do not change substantially from previous estimates. Cash flow and the stock of debt are still highly significant. The coefficients on interactive dummies are significant only for group firms. Specifically, the interactive dummy for group firms with low liquidity of shares is highly significant, large and negative.

Table VII
The Impact of Trading Volume of Shares and Ownership.
The dependent variable is investment - total assets ratio (I/K); all variables are as defined before.

Variable	Coefficient
(Constant)	0.2513*
	(0.1464)
M_B	0.0635
	(0.0909)
CF/K	0.6061**
	(0.2417)
IBT/K	0.4627
	(0.3299)
DEBT/K	2.7771**
	(1.2040)
Group&LowLiquid*CF/K	-1.5180***
	(0.3382)
NoGroup&HighLiquid*CF/K	-0.2507
	(0.7020)
Group&HighLiquid*CF/K	0.0326
	(0.2178)
Group&LowLiquid	0.0769
	(0.1734)
NoGroup&HighLiquid	0.0469
	(0.1446)
Group&HighLiquid	0.1394*
	(0.0723)
F Statistic	4.0156***
Adj. R sq.	0.287

Note 1: *** Significant at 1% level; ** Significant at 5% level; *Significant at 10%

The main conclusion we can draw is that while being in a group reduces the sensitivity of investment to cash flow of member firms, the effect is particularly significant for the subset of group firms with low trading liquidity, which account for most of the reduced correlation.[14]

There are two prime candidate explanation for the significance of trading liquidity for investment sensitivity within the groups. The first suggests that the groups tend to invest in firms neglected by the stock markets, and to contribute to an improved access to finance via an internal financial market. If indeed liquidity of shares is an exogenous factor, then group status may help those firms that need it most (as information problems are presumably more severe for firms whose shares are not actively traded). It is also possible that their shares are less liquid due to their

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[14] Recall that trading volume was not significant by itself in the basic regression.

membership in a group. For instance, when a bank holds a controlling stake the firm may be less transparent. The main alternative explanation in our opinion is that that the negative correlation may reveal that firms less monitored by the stock markets are used as "cash cows" by the banks running the groups.

Industry Effects

Thus far we can strongly reject the hypothesis that the effect of internal fiannce on investment is the same for independent and group firms. However, our comparison between the two samples may be biased if independent firms operate in higher growth industries, where internal cash flow may proxy for the value of the investment opportunities, whereas group firms may be operating in low growth industries. This would induce a positive bias on the coefficient for nongroup firms.

In Table VIII we control for sectorial effects. We introduce industry dummies and interact them with cash flow in the basic regression. Our prime suspects would be the power, oil and metal industries: these sectors are the most profitable in Russia and are very cash rich, and may drive the investment/cash flow sensitivity. However, none of the interactive dummy coefficients are significant. The conclusion holds for the group as well as for the independent firms. Finally, the difference between cash flow coefficients for group and non-group firms are similar to previous estimates within each sector. On balance there is no evidence that industry factors drive our results.

Table VIII

Effects of Cash Flow on Investment: Industry Effects

The dependent variable is investment over total assets (I/K); all variables are as before except the industry dummy which is equal to "1" if a firm is a member of a group and "0" otherwise. Standard errors in parentheses.

	1	2	3	4
(Constant)	0.4257***	0.4237***	0.4099***	0.4179***
	(0.1040)	(0.107)	(0.1029)	(0.1037)
M_B	0.2047**	0.2099**	0.2086**	0.2096**
	(0.0808)	(0.0808)	(0.081)	(0.0808)
CF/K	0.6218**	0.6161***	0.5961**	0.6156**
	(0.2335)	(0.2354)	(0.2392)	(0.2347)
D*CF/K	-1.8013**	-1.3376***	-1.3236***	-1.3428***
	(0.7072)	(0.321)	(0.3246)	(0.3217)
DEBT/K	2.4093*	2.2139**	2.194*	2.258*
	(1.2016)	(1.1747)	(1.1971)	(1.1792)
POWR*CF/K	0.2496	...	...	...
	(0.3321)			
OIL*CF/K	...	-0.3092	...	...
		(0.7146)		
MET*CF/K	...	...	0.0212	...
			(0.3332)	
TRANS*CF/K	...	...	...	-0.1084
				(0.2314)
F Statistic	4.913***	4.895***	4.858***	4.951***
Adj. R Sq.	0.225	0.220	0.218	0.221

Note 1: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Market valuation effects

In this section we explore how market perceptions of the firm affects firms' ability to raise investment finance. We also want to test how important is market valuation of the firm for group and non-group firms. Generally, firms which have high market to book ratio are perceived by the market to have good investment prospects. This should make it easier for them to raise investment capital. This should be especially true for independent firms, while in the case of group firms market valuation may not be as important as they have alternative sources of capital finance.

To explore this idea we divide the sample of firms again. As a proxy for firms' future prospects we use the market-to-book ratio, the indicator usually employed in the empirical literature. Thus we regard firms with a market to book ratio above (below) the sample median as having better (worse) investment prospects.

Table IX reports the regression results for the set of group and non-group firms. In addition to the variables used in the previous regressions we add an interaction term which is cash flow times the dummy which equals "1" if firms market to book ratio is above the sample median.

Table IX
Effects of firms' market valuation on financial constraints

The dependent variable is investment - total asser ratio (I/K), where I is defined as a change in fixed assets and K is total assets in he beginning of the perioud. Independent variables include M_B: Market value of equity divided by the beginning-of-period book value of equity; CF/K Cash flow during the investment period as a proportion of total . DEBT/R: beginning-of-period stock of bank debt as a proportion of total assets. Interaction dummy, High M_B*CF/K: Cash flow times the dummy variable (High M_B), which is equal to "1" if M_B is above the sample median.

Variable	Non-Group Firms	Group Firms
(Constant)	0.3051**	0.4059**
	(0.1176)	(0.2622)
M_B	0.0213	0.4422***
	(0.1094)	(0.1385)
CF/K	3.0427**	-1.3368
	(1.2330)	(0.9957)
High M_B dummy*CF/K	-2.2435*	0.6243
	(1.1959)	(1.0254)
DEBT/K	3.9556	2.9105*
	(2.4537)	(1.4984)
F Statistic	3.1307**	5.5909***
Adj. R Sq.	0.1872	0.3378
Wald Test on Coefficients restrictions: F-Statistic Null Hyp.: c(3)+c(4)=0	4.8494**	

Note 1: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

The results indicate that the coefficients on the interaction term for the independent firms is negative and significant: the investment of high market to book ratio firms is less sensitive to cash flow for the low Q firms. This points to an interesting conjecture, namely that a positive assessment by the equity market allow stand alone firms to be less capital-constrained. At a minimum, this suggests some ability by the market to identify independent firms who can successfully fund their best investment.

In all likelihood, these coefficients are not precisely estimated given the small sample size; however we believe that the results are suggestive. Note also that running two separate regressions as opposed to using dummy variables to separate between group and non-group firms largely preserves our previous findings.

The cash flow variables are insignificant for the group firms. For the group firms a high valuation does not affect financial constraints, while for independent firms it seems to be very important in order to reduce financial constraints.

This is consistent with the hypothesis that for group-affiliated firms financing is governed within the group, while other firms depend more on market valuation.

Conclusions

The main hypothesis investigated in this paper is whether the specific governance structure of the Russian Industrial-Financial Groups favors a better allocation of resources. We test this hypothesis using the prevailing methodology employed in the corporate finance literature for detecting financial constraints.

We report strong evidence that firms associated with FIGs exhibit much greater financial reallocation; in fact there is evidence that member firms have a negative correlation between cash flow and investment. Another result is the clear empirical distinction is necessary between the so-called industrial alliance groups (horizontal FIGs), which have much weaker common control structure, and the hyerarchically controlled groups, mostly with a bank at the top of the control chain (vertical FIGs) structure. The horizontal FIGs appear to have much weaker resource reallocation.

The interpretation of this evidence is not unambiguous. Financial reallocation may rtesult from active monitoring by the controlling banks, which alleviates capital market imperfections. Alternatively, it may signal a greater degree of profit appropriation by the groups.One explanation is that groups rely on an internal capital market rather than on internal funds to finance investment, unlike unaffiliated companies; another possibility is massive asset stripping from the cash-richer firms.

While we could not easily distinguish the two hypotheses, we perform a direct test to establish the sensitivity of investment in group and nongroup firms to market measures of expected profitability. It turns out that the investment by group firms shows much greater sensitivity to our proxy for Tobin's Q than independent firms, which appear to act rather inertially, simply investing from their cash flow. This results represents evidence on a positive role played by the hyerarchical structure of Financial-Industrial Groups in terms of corporate governance, although it is unclear the extent to which these groups take advantage of cash flow from profitable firms for more private uses.

Furthermore, investment by group firms with low trading liquidity of shares depends less on internal funds then of group firms with actively traded shares.

In general, although the results are very suggestive, the quality and limited scope of the data suggests that much more research in the ownership structure and investment performance of these firms is necessary before the overall merit of groups structures can be assessed.

Appendix A
(All variables scaled by revenue)

Descriptive Statistics: Trading Volume of Shares.

Statistics	Firms:		
	Group/Low Liq.	Group/High Liq.	All Non-Group and Group/High Liq.
Stock of Cash-Revenue	0.02	0.02	0.02
Debt-Revenue	0.08	0.04	0.03
Net Income-Revenue	0.11	0.15	0.11
IBT-Revenue	0.17	0.22	0.2
Cash Flow-Revenue	0.08	-0.03	0.03
Market-Book	0.19	1.07	0.64
Investment-Revenue	0.71	0.95	0.54
Growth of Debt	0.82	1.07	3.07
Number of Cases	24	13	48

Descriptive Statistics: Impact of State Ownership

Statistic	Firms:		
	Group/No Gov.	Group/Yes Gov.	All Non-Group and Group/Yes Gov.
Stock of Cash-Revenue	0.02	0.01	0.02
Debt-Revenue	0.1	0.03	0.02
Net Income-Revenue	0.09	0.17	0.12
IBT-Revenue	0.15	0.24	0.21
Cash Flow-Revenue	0.12	-0.07	0.01
Market-Book	0.24	0.87	0.6
Investment-Revenue	0.92	0.6	0.45
Growth of Debt	0.89	0.59	2.95
Number of Cases	24	15	50

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