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# RED BARONS OR ROBBER BARONS? GOVERNANCE AND FINANCING IN RUSSIAN FIGS

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**ABSTRACT**

Red Barons or Robber Barons? Governance and
Financing in Russian FIGS*

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 and/or 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 that 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. Specifically, we assess the quality of the investment process in group and non-group firms by regressing individual firms' investments on our measure of Tobin's Q. The result supports the notion that group firms allocate capital better than independent firms, although it does not rule out the possibility of private appropriation of value.

We then distinguish between bank-led groups, which are more hierarchical and industry-centred groups that may be more defensive arrangements. Investment is not significantly correlated with cash flow in industry-led group firms (unlike in independent firms), while the negative correlation is entirely due to bank-led group firms, suggesting a more extensive financial reallocation and the use of profitable firms as cash-cows. 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.

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# NON-TECHNICAL SUMMARY

There has been an increasing body of evidence about the efficiency of diversified conglomerates in developed countries. The leading explanations for under-performance 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 lesser-performing divisions.

In sharp contrast, industrial-financial groups persist and often prosper in many developing countries (Khanna, Tarun and Palepu, 1996), where diversified business groups often dominate private sector activity. Some theoretical rationales for corporate groups have pointed to the incentive 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. In such countries groups may have extensive governance functions. They may support contractual governance, ensure close monitoring of management decisions, as well as manage a privileged access to political favours, such as subsidized credit, favourable regulation and licensing and access to strategic resources. In conclusion, groups may emerge to capture scarcity rents or compensate for lack of markets. Thus, while concentrated ownership of firms can 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).

Russia seems a natural candidate for analysing the role of groups. Weak law enforcement makes arm-length contingent contracting impossible. Even during the Soviet era, directors of enterprises relied on relational contracting to ensure contract performance. This historical reliance on implicit contracting, the oligopolistic structure of industry, the segmented nature of information flows 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, via controversial loan-for-share deals, government provisions and insider-dominated privatization sales. The emerging corporate structure was termed the Financial-Industrial Group.

Executives of bank-centred groups have often claimed to play the same role in the Russian economy today as investment bankers did in the US economy at the turn of the century. Agency costs may be expected to be greater in Russia, where an undeveloped legal system coupled with unreliable

enforcement produce severe conflicts and informational asymmetries between investors and firms. External capital may then be not just costly but even unavailable, so that Russian firms may be forced to forgo valuable investment or restructuring opportunities. In the extreme case, only the availability of internal funds will permit investment. In such a context, an internal capital market may improve the allocation of cash flow to the best use.

The group structure may play a significant role. At the top of the command structure of some FIGs (which we term hierarchical FIGs) there is a holding company, often controlled by a bank, with the right to residual cash flow and control over the assets. In such a case, Stein (1997) argues that a controlling holding will reallocate resources efficiently across business units, even if they may over-expand relative to what minority investors may prefer. As a result, group firms should exhibit a more efficient investment profile.

Our empirical results indicate that at least the more hierarchical groups are engaged in extensive financial reallocation. The key question is whether this reallocation is efficient or purely opportunistic: a hierarchical group structure may lead to value extraction by the holding company. In a weak legal context, control becomes more important than formal income rights for the allocation of value (Modigliani and Perotti, 1997); entrenched insiders may then seek to maintain control rents at the expense of profitability, or transfer value to other companies in which they have a larger share of income rights.

Ultimately, the advantages and disadvantages of groups in different economic and legal contexts are an empirical question. We perform an empirical analysis of the relationship between internal finance and investment in both independent and group-affiliated Russian enterprises. We compare firms that 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 and/or management and employee control. Unfortunately, we need to rely on Russian accounting data, which is problematic.

We find that corporate investment is sensitive to internal finance flows for independent firms but not for groups firms, which can be interpreted as evidence of extensive financial reallocation across group firms. The interesting issue, naturally, is the interpretation of such a finding. One benign interpretation is that group firms have an internal capital market that facilitates access to finance for better 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).

Following Johnson (1997), who argues persuasively that FIGs should be distinguished in bank-led groups and industry groupings, we distinguish between bank-led groups, which are more hierarchical, and industry-centred groups which appear to be more defensive arrangements, possibly for market-sharing and lobbying purposes.

The distinction seems very important. 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. This suggests a more extensive degree of financial reallocation and the use of profitable firms as cash-cows.

The next critical question then is this: Does a group control structure lead to a better or worse overall quality of governance and investment allocation?

We assess the quality of the investment process in group and non-group firms by regressing individual firms' investment on our measure of Tobin's Q. The results support the notion that group firms allocate capital significantly better than independent firms. 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 does not appear to be less sensitive to cash flows. The negative sensitivity of cash flow to investment is attributed to those group firms whose shares have low liquidity. One possibility is that the Russian equity market may provide some informational signal and that more attention by investors limits the scope for financial reallocation. On the other hand, the significance of information in stock prices in such a thinly traded market should certainly not be overstated.

**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; conglomerate firms appear to practice some form of suboptimal reallocation of resources across divisions, moving funds from firms in high Q industries to support investment in lower Q sectors. They also 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.

In sharp contrast, industrial-financial groups persist and often prosper in many developing countries (Khanna, Tarun and Palepu, 1996), where private sector activity is often dominated by diversified business groups. Some theoretical rationales for corporate groups 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 legal enforcement in emerging market economies. In such countries groups may have extensive governance functions. They may support contractual governance, ensure close monitoring of management decisions, as well as manage a privileged access to political favors, such as subsidized credit, favorable regulation and licensing, and access to strategic resources. In conclusion, groups may emerge to capture scarcity rents or compensate for lack of markets.[2] Thus, while concentrated ownership of firms can lead to better corporate and contractual governance, in such a

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[1] For a review, 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. This suggests that theories of managerial entrenchment may be less appropriate in these cases.

context groups may also emerge as vehicles for well-connected individuals to capture the large rents associated with corporate control (asset-stripping).

Russia seems a natural candidate for analyzing the role of groups. Weak law enforcement makes arm-length contingent contracting impossible. Even during the Soviet era, directors of enterprises relied on relational contracting to ensure contract performance. This historical reliance on implicit contracting, the oligopolistic structure of industry, the segmented nature of information flows 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, via controversial loan-for share deals, government provisions and insider-dominated privatization sales. Taking advantage of limited competition by capital market investors, groups began to consolidate holdings in controlling blocks by 1994 (Johnson, 1997). The emerging corporate structure was termed the Financial-Industrial Group (henceforth FIG).

Executives of bank-centered groups have often claimed to play the same role in the Russian economy today as investment bankers did in the US economy at the turn of the century[3]. Agency costs may be expected to be greater in Russia, where an undeveloped legal system coupled with unreliable enforcement produce severe conflicts and informational asymmetries between investors and firms. External capital may then be not just costly but even unavailable, so that Russian firms may be forced to forgo valuable investment or restructuring opportunities. In the extreme case, only the availability of internal funds will permit investment. In such a context, an internal capital market may improve the allocation of cash flow to the best use.

The group structure may play a significant role. At the top of the command structure of some FIGs (which we term hierarchical FIGs) there is a holding company, often controlled by a bank, with the right to residual cash flow and control over the assets.[4] In such a case, Stein (1997) argues that a controlling holding will reallocate resources efficiently across business units, even if they may overexpand relative to

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[3] Ramirez (1995) shows that the involvement of J.P. Morgan bankers on the board of US firms around the turn of the century appears to have improved their access to capital, and argues that bank monitoring curtailed agency conflicts and reduced informational asymmetries. On the other hand, the concentration of power created by these arrangements was very unpopular and contributed to US legislation which separated banking and corporate ownership.

what minority investors may prefer. As a result, group firms should exhibit a more efficient investment profile.

Our empirical results indicate that at least the more hierarchical groups are engaged in extensive financial reallocation. The key question is whether this reallocation is efficient of purely opportunistic: a hierarchical group structure may lead to value extraction by the holding company. In a weak legal context, control becomes more important than formal income rights for the allocation of value (Modigliani and Perotti, 1997); entrenched insiders may then seek to maintain control rents at the expense of profitability, or transfer value to other companies in which they have a larger share of income rights.

There is no evidence for such a role of internal capital markets for Western conglomerate firms. The empirical evidence in Shin and Stulz (1996) indicates that there does not appear to be an internal reallocation of funds in favor of firms with better investment opportunities. In contrast, our empirical evidence indicates that the allocation of investment in hierarchical groups is more sensitive to measure of profitable investment opportunities than for the other firms. This seems to confirm a role for strong private ownership in Russian firms (Earle and Estrin, 1998).

Ultimately, the advantages and disadvantages of groups in different economic and legal contexts are an empirical question. We perform an empirical analysis of the relationship between internal finance and investment in both 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. Unfortunately, we need to rely on Russian accounting data, which is problematic.

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4  As we discuss later, not all Russian FIGs are hierarchical.

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).

Following Johnson (1997), who argues persuasively that FIGs should be distinguished in bank-led groups and industry groupings, we distinguish between bank-led groups, which are more hierarchical, and industry-centered groups which may be more defensive arrangements for market-sharing and lobbying purposes.

The distinction emerges clearly in the evidence. While investment is not 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 degree of financial reallocation and the use of profitable firms as cash-cows.

The next critical question then is: Does a group control structure lead to a better or worse overall quality of governance and investment allocation?

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## I        Methodology and Data

We employ the Q model of investment, developed by James Tobin. Tobin's 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. In a perfect capital market (defined as one in which the Modigliani-Miller theorem holds),

there are no obstacles to funding profitable investment; then Tobin's Q (a measure of the NPV of new investment) should be the sole determinant of investment. Thus introducing Q as a proxy for the profitability of prospective investment in the investment regression allows to isolate any additional effect of internal finance. Any significance of coefficients on internal finance variables can then be interpreted as evidence of financial constraints.

There are practical measurement problems for Q. Most measures of Q use share prices, which reflect the average Q of the firm, while the theoretically relevant variable is marginal Q. 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 may still indicate some structural difference on the relationship between financing and investment. We exploit this idea in this paper to assess the performance of group and nongroup firms in Russia.

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.[5] Hoshy, Kashyap and Scharfstein (1990) study investment in Japanese firms belonging to keiretsu groups against a control sample. In keiretsu firms, the sensitivity of investment to the cash flow appears insignificant, in contrast to non-affiliated firms.[6] They interpreted the evidence as stating that main bank monitoring mitigates information problems for Japanese enterprises.[7]

We use Russian accounting data, whose quality is certainly questionable. An attenuating factor is that our source is a consulting firm which restated the original balance sheets for the purpose of sale to Western investors.[8] On the other hand, the

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[5] 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. 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] A related result on the Chilean *grupos* following financial deregulation is in Hermes and Lensink (1997).

[8] A particular problem for this study is caused by the accounting values of total assets, commonly used as a scaling factor in panel data. In the Russian case we have little knowledge of how historical value

case in which we would have a significant problem of interpretation if the two subsamples of firms were to follow different styles of reporting.

### Sample Description

We use individual firm data on companies listed in the publication called "200 Largest Russian Enterprises, 1996", which is compiled by the Russian weekly economic journal "Expert". Some of the firms in the sample are audited, while others report according to Russian Accounting Standards. We obtain all financial statistics from Skate Kapital Press, which restates the financial accounts obtained directly from the firms or from their financial advisors for subsequent sale to Western analysts and 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 drop from our sample those firms which do not have an established secondary market for their shares. This is therefore not a representative samples: it is biased towards larger and possibly better Russian firms. We constructed a consistent sample after removing two outliers[9] in relevant variables for 71 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 AK&M[10] as of September 1, 1995.  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[11].

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, we classify as group firms those listed in the Industrial-

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of assets has been adjusted throughout the transition period and what is included into its definition. 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.

[9] All regressions as well as diagnostics tests were performed using STATA.

[10] AK&M is a Moscow-based trading system, which also provides capital markets data.

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

Financial Groups Registry Book for 1996; 12 firms were assigned based on this criterion. Secondly, we rely on information about ownership structure 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 14 firms. These are firms in which Menatep Bank, ONEXIM Bank, Yukos or Sidanco and their affiliates are major shareholders. Thirdly, we have included 11 utility firms, which form a group called Unified Energy Systems of Russia. We further classify group firms as belong to a bank-led or an industry-led group, depending on whether there is a dominant shareholders which is (or is affiliated to) a financial institution.

The non-group sample include firms where share-holdings are either dispersed or 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 I**
**The Distribution of Group and Non-Group Firms Across Sectors**

| Industry | Non-Group Firms | Group Firms |
|---|---|---|
| Oil and Gas | 13 | 12 |
|  | 38% | 32% |
| Utility | 3 | 8 |
|  | 9% | 22% |
| Non-Ferrous Metals | 1 | 3 |
|  | 3% | 8% |
| Steels | 5 | 4 |
|  | 15% | 11% |
| Machinery | 6 | 5 |
|  | 18% | 14% |
| Transport | 6 | 2 |
|  | 18% | 6% |
| Other | 0 | 3 |
|  | 0% | 8% |
| Total | 34 | 37 |
|  | 100% | 100% |

**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 | 34 | 37 |
| | | |
| Average cash flow-total assets ratio | 0.119 | 0.097 |
| *Standard deviation* | *0.187* | *0.233* |
| | | |
| Average investment-total assets ratio | 0.568 | 0.662 |
| *Standard deviation* | *0.569* | *0.758* |
| | | |
| Average total assets 01/01/95, $ mn | 647.2 | 2506.0 |
| Average total assets 01/01/96, $ mn | 1066.7 | 4666.1 |

**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 | 20137 | 15817 | 44350 | 68990 |
| Change in bank debt | 0.024 | 0.040 | 0.007 | 0.088 |
| Bank debt - total assets ratio | 0.019 | 0.027 | 0.046 | 0.081 |
| Change in accounts payable | 0.149 | 0.159 | 0.151 | 0.193 |
| Accounts payable - total assets ratio | 0.242 | 0.151 | 0.222 | 0.123 |
| Change in cash | -0.012 | 0.052 | 0.003 | 0.021 |
| Cash – total assets ratio* | 0.035 | 0.053 | 0.017 | 0.022 |
| Total liability - total assets ratio | 0.268 | 0.159 | 0.271 | 0.146 |
| Revenue - total assets ratio | 1.311 | 1.142 | 1.174 | 0.845 |

**Note 1:** Changes refer to the period January 1995-January 1996. Income statement 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. The distribution of the firms across different industrial sectors is not too different. Firms in both subsamples almost doubled the nominal value of their assets during the period. The value of gross investment is almost certainly overstated, as it contains some restatement of fixed asset value for inflation. While scaled investment is larger for group firms, the difference is not significant as their investment is more volatile. In itself, this variation is consistent with large infra-group financial flows.

The cash flow-capital ratio is statistically the same for both groups, although it is more volatile among the group firms.

There is only one significant difference (at the 10% level) in the financial statistics between the two samples: Table IIb shows that non-group firms tend to hold larger cash balances then group firms. Larger cash holdings may be an endogenous response to the existence of credit constraints.

Note from Table IIb that the payables to total assets ratio constitutes a much larger portion of liabilities than bank debt for both sets of firms. The fact that the level of bank debt is remarkably low is consistent with observations 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); the large difference in average employment is not significant.

Table III presents our proxy for Q, the market to book ratio, calculated as market capitalization as a proportion of book value of equity, as well as indicators of profitability and leverage. There does not seem to be an endogenous selection of firms in the two category according to these values: income-based profitability measures as well as market-book ratios are similar. Net income over revenues shows that profit margins are higher on average for group firms but this is not statistically significant.

If fixed assets-total assets ratios were a reliable measure of asset tangibility, they could proxy for the ability of the firms to attract credit; since their values are similar, the expected level of bank debt should also be comparable for both types of firms. In contrast, bank debt is larger for group firms, although there is too much variation for the difference to be significant. The two sets of firms are equally profitable, generate a comparable amount of cash flow and trade payables.

**Table III**
Financial Ratios for Group and Non-Group firms
The market to book ratio is 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 bank debt over equity book value.

|  | Non-Group Firms | | Group Firms | |
|---|---|---|---|---|
|  | Mean | Std. Deviation | Mean | Std. Deviation |
| Market capitalization – book Value of equity ratio | 0.336 | 0.367 | 0.286 | 0.348 |
| Net income - total revenue Ratio | 0.097 | 0.127 | 0.127 | 0.138 |
| Net income - total assets ratio | 0.145 | 0.190 | 0.150 | 0.152 |
| Total bank debt - equity ratio | 0.029 | 0.042 | 0.096 | 0.270 |
| Income before taxes - total assets ratio | 0.246 | 0.278 | 0.242 | 0.215 |
| Fixed assets - total assets Ratio | 0.565 | 0.177 | 0.536 | 0.189 |

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

In conclusion, firms in both categories are roughly of the same size and have similar cash flow and investment opportunities, but the non-group firms hold more cash, which can be interpreted as a buffer against sudden liquidity problems.

We next 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 ownership).

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. 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 introduce use a dummy variable GROUP indicating group status. Following our hypothesis on the importance of control, we distinguish here between bank-led and industry-led firm. We mostly use these dummy variables interactively to assess whether there is a significant difference in the sensitivity of investment to internal finance or to our proxy for Tobin's Q across the various subsamples.

We next define two other dummy variables. The TRADE dummy equals to 1 if stock of the firm is actively traded. The GOV dummy equals to 1 if government owns 20% or more. We use other dummies in later sections to control for various other qualitative features such as industry effects.

## II Estimation Results

Table IV presents a first estimate of the basic investment models, including financial variables, for group and non-group firms.

### Table IV
### Effects of Cash Flow on Investment

Dependent variable is investment - total assets ratio (I/K). Independent variables are $M_B$: 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 assets; DEBT/K: beginning of the year stock of debt – total assets ratio, CASH/K: beginning of the year stock of cash over assets, IBT/K: Income before tax over assets. GROUP is a dummy equal to 1 if the firm is a member of a group. TRADE: dummy equals to 1 if stock of the firm is actively traded, GOV: dummy equals to 1 if government owns 20% or more. Standard errors appear in parentheses. Number of observations:71

|  | 1 | 2 | 3 |
|---|---|---|---|
| (Constant) | 0.3269** | 0.2743** | 0.3720** |
|  | (0.1389) | (0.1182) | (0.1642) |
| $M_B$ | 0.7395*** | 0.7004*** | 0.6419*** |
|  | (0.2289) | (0.2251) | (0.2287) |
| CF/K | 0.2521 | -0.1086 | -0.1123 |
|  | (0.3821) | (0.4257) | (0.4256) |
| DEBT/K | 1.7743 | 1.9221 | 2.6677** |
|  | (1.2470) | (1.1945) | (1.2551) |
| CASH/K | -2.0897 | -4.0414* | -4.6190* |
|  | (2.0136) | (2.1958) | (2.3551) |
| IBT/K |  | 0.7240* | 0.8604** |
|  |  | (0.4155) | (0.4262) |
| GROUP | 0.0536 | 0.0088 | -0.0962 |
|  | (0.1557) | (0.1558) | (0.1608) |
| TRADE |  |  | 0.2229 |
|  |  |  | (0.1690) |
| GOV |  |  | -0.2999* |
|  |  |  | (0.1577) |
|  |  |  |  |
| F Statistic |  | 3.81*** | 3.01*** |
| Adj. R Sq. |  | 0.1674 | 0.1868 |

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

Our proxy for Tobin's Q is significant across various specifications and has the expected sign; also the profitability variable has a positive and significant sign. This is encouraging in terms of specification of the investment equation. This could suggest that the average investment decision in the best Russian industrial companies is correlated with the stock market view of its profitability. We will need to qualify this result later.

In this general formulation there is no evidence of any relationship between investment and internal cash flow. The coefficient on cash balances is significant and

negative; firms which invest more run down their cash holdings, or alternatively need less precautionary balances because they are less financially constrained. Firms under significant government ownership invest less. Finally, group membership does not seem to lead to higher average investment.

On this first measurement there seem to be no financial constraints to gross investment. In the Russian context this seems at best unlikely. We explore this issue further: in particular we want to measure the variation in sensitivity of investment to cash flow across groups (both hierarchical and horizontal) and relative to independent firms. Such separation allows to see if indeed there are structural differences between the two governance structures. It appears that indeed there is.

We introduce the group dummies as an interactive dummy on our proxy for Tobin's Q and cash flow. Results are in Table V.

The first new result from the expanded regression is that now cash flow is highly significant and positive, a sign of financial constraints. Intriguingly, its coefficient is quite close to one, which could imply a rather inertial investment strategy. The two group dummies by themselves are not significant, suggesting that investment is no higher in any of the subsamples after controlling for financial variables. Our proxy for Tobin's Q is not significant for the whole sample, although it is for a subset of firms; we come back to interpret this finding later.

**Table V**
**Differential Effects of Cash Flow on Investment**

The dependent variable and most regressors are as defined in Table IV. Independent variables include now the BLD dummy variable which equals "1" if a firm is a member of a bank led group and "0" otherwise; the ILD dummy equals "2" if a firm is a member of an industry led group and "0" otherwise. Standard errors appear in parentheses. Number of observations:71

|  | 1 | 2 | 3 |
|---|---|---|---|
| (Constant) | 0.4276*** | 0.4034*** | 0.4429*** |
|  | (0.1441) | (0.1416) | (0.1404) |
| $M_B$ | 0.2243 | 0.1251 | 0.1131 |
|  | (0.3467) | (0.3295) | (0.3326) |
| ILD*$M_B$ | 0.1825 | 0.2258 | 0.1965 |
|  | (0.2523) | (0.2477) | (0.2493) |
| BLD*$M_B$ | 1.2709** | 1.3353** | 1.4530** |
|  | (0.6163) | (0.6117) | (0.6124) |
| CF/K | 1.0995* | 1.0586 | 1.1266* |
|  | (0.6480) | (0.6458) | (0.6504) |
| ILD*CF/K | -0.2063 | -0.2132 | -0.1821 |
|  | (0.4190) | (0.4185) | (0.4220) |
| BLD*CF/K | -2.3509** | -2.3653** | -2.2406** |
|  | (1.0547) | (1.0534) | (1.0602) |
| DEBT/K | 1.7238 | 1.7927* |  |
|  | (1.2108) | (1.2072) |  |
| CASH/K | -1.8303 |  |  |
|  | (1.9678) |  |  |
| ILD | -0.0458 | -0.0447 | -0.0203 |
|  | (0.1166) | (0.1165) | (0.1164) |
| BLD | -0.1927 | -0.1929 | -0.2005 |
|  | (0.2557) | (0.2554) | (0.2578) |
| F Statistic | 2.70*** | 2.91*** | 2.94*** |
| Adj. R Sq. | 0.1956 | 0.1973 | 0.1817 |

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

The differentiation between groups and nongroup firms is striking. However, the real distinction in the sensitivity of investment to both investment quality and internal finance appears to be between hierarchical, bank-led groups and all other firms. The industry group firms do not appear much different from independent firms; for both subsamples the investment level is correlated to internal cash flow but not to Tobin's Q.

The difference in the cash flow coefficient between bank group firms and all other firms is large, negative and significant. What is more remarkable, a Wald test confirms that the total coefficient on cash flow for bank-led group firm is negative. Thus firms in bank-led groups invest less on average, the higher is their internal cash flow. This suggests that cash flow is strongly reallocated within the bank groups, and 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 enables Russian industrial firms to raise investment funding, while perhaps constraining the use of free cash flow by cash-rich firms. It is however also consistent with widespread asset stripping.

Interpreting the result that the total cash flow sensitivity of investment is negative for the bank-led groups is not obvious. A benign interpretation is that groups redistribute resources from cash-rich firms to support investment by cash-constrained companies. Alternatively, the result can be interpreted in terms of the popular belief in Russia that FIGs do not provide capital to member firms, but skim the cash generated by firms to strengthen their banks or simply channel resources for private benefit.

We seek additional insight into this question by looking at the difference in 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; therefore investment should respond quite strongly to Tobin's Q. The regression in Table V clearly indicate that the sensitivity of investment to Tobin's Q is positive and significant only for firms in the bank-led groups, implying a marked sensitivity to the market assessment of valuable investment opportunities. For the other firms the correlation is zero: that perspective profitability seems to have no impact on their investment decisions. This is a remarkable results: it suggests that firms in hierarchical groups have a better capital allocation decision than other firms. This could be interpreted as evidence that the controlling banks impose better criteria for the allocation of capital to investment, whatever their role in appropriating its return.

On the other hand, in insider-controlled independent and horizontal group firms the investment decision appears to be driven passively by the availability of internal finance with less concern for expected profitability. This may be a sign of weaker governance.

The estimated effect of bank debt is positive and marginally significant at the 10% level: a higher debt level is associated with more investment. 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.[12] Other variables we included, such as trading liquidity, various measures of profitability, employment and government ownership are not significant determinants of investment.

We also estimated other specifications without any change in the main conclusions: the pattern of investment/cash flow sensitivity is remarkably robust.[13] Note that once group status is included the coefficient of cash holdings is not significant. We also included industry dummies in the regression to check whether 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.

This section has indicated that concentration of ownership and participation by banks in corporate governance has a strong if not unambiguous effect on investment financing and its allocation. In the next section we investigate more in detail the role of government ownership as well as of the degree of attention by the stock market (proxied by the degree of secondary stock market trading) on the degree of financial constraints.

**The effect of share liquidity and government ownership**

Thus far we have established that bank group firms may be less cash constrained then independent firms or firms in horizontal groups. While group membership and the bank relationship may help firms escape liquidity constraints, there may be other factors which play an important role. Some Russian groups were formed by the government, others came about through asset consolidation. The same heterogeneity presumably holds for independent firms, which were privatized to different degrees and with different resulting insider ownership.

Because our sample consists only of firms which are publicly traded, this also begs the question of what role the stock market exercises monitoring on the firms and assesses their investment decisions. We thus investigate the volume of trading on the stock market as a proxy measure of market attention to firm performance. The

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[12] 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.

[13] 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 miss-specification was insignificant.

argument is that there is more public information about firms which are actively traded. Moreover, the role of the market may be important for non-affiliated firms.

A low liquidity of share trading does not directly imply that the firm has poor prospects; 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.

In any case this raises the issue of 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 share trading 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 group membership or close bank relationships, as they have better access to external financial sources. In this case investment will be less correlated with cash flow but more with share trading liquidity. Alternatively, firms with little visibility or poor access to alternative sources may be easily captured by (or yield to) a group. In general, given the thin trading in many Russian shares, we do not draw strong conclusions from this variables.

In general there are no differences in the results when we distinguish between hierarchical and horizontal FIGs, so we ignore the distinction here.

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

To control for state ownership and the group status, we create four dummies:

1) if a firm is Non-Group and Government ownership is between 0% and 25% -- 0
2) if a firm is Group and Government ownership is between 0% and 25% -- 1
3) if a firm is Non-Group and Government ownership is between more then 25% -- 2
4) if a firm is Group and Government ownership is more then 25% -- 3

We interact these dummies with cash flow as well as market to book ratio and run the regression used in Table V, column 3. Results are presented in Table VI.

Structural coefficients do not change substantially from previous estimates; to some degree cash flow and the stock of debt are still significant. However, coefficients on interactive dummies are significant only for group firms.

**Table VI**
**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. Number of observations: 71

| Variable | 1 | Variable | 2 |
|---|---|---|---|
| (Constant) | 0.3524*** | (Constant) | 0.2856** |
| | (0.1105) | | (0.1175) |
| $M_B$ | 0.1017 | $M_B$ | 0.1042 |
| | (0.3441) | | (0.3909) |
| Group&LowLiquid* $M_B$ | 0.2844 | Group&GovSh * $M_B$ | 0.1644 |
| | (0.5882) | | (0.1676) |
| NoGroup&HighLiquid* $M_B$ | 0.4324 | NoGroup&GovSh * $M_B$ | 0.2886 |
| | (0.4156) | | (0.3145) |
| Group&HighLiquid* $M_B$ | 0.2829** | Group&NoGovSh * $M_B$ | 1.2681** |
| | (0.1432) | | (0.5359) |
| CF/K | 1.0177* | CF/K | 1.9862 |
| | (0.7670) | | (1.2608) |
| Group&LowLiquid*CF/K | -1.6900* | Group&GovSh*CF/K | -0.4903 |
| | (1.0049) | | (0.4611) |
| NoGroup&HighLiquid*CF/K | -0.7271 | NoGroup&GovSh*CF/K | -0.9805 |
| | (0.7950) | | (0.7844) |
| Group&HighLiquid*CF/K | -0.1324 | Group&NoGovSh*CF/K | -2.4399* |
| | (0.3258) | | (1.4483) |
| DEBT/K | 2.8167** | DEBT/K | 1.7686 |
| | (1.3028) | | (1.2602) |
| F Statistic | 2.47** | F Statistic | 2.38** |
| Adj. R sq. | 0.1591 | Adj. R sq. | 0.1507 |

**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]

We can think of two candidate explanations 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 thus 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 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 or companies running the groups.

Results for the role of government ownership are reported in Column 2. The sensitivity of investment to cash flow interacted with government ownership (here not reported) is not significant per se: government ownership does not appear to relax financial constraint for independent firms. The results confirm that group membership is associated with more financial reallocation (and perhaps less financial constraints), since interaction terms controlling for group membership are significant and negative. However, this coefficient is significant only in the case of group firms where government has no meaningful ownership stake; the additional coefficient on cash flow is very negative and rather larger than the average coefficient on cash flow. The negative overall coefficient on cash flow rules out the notion that state ownership reduced credit constrains; it may instead be possible that financial reallocation is lower in firms where the government still has a significant stake. Perhaps there is still a role for state ownership in restraining owners' appropriation of assets.

**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 firms which are member of a hierarchical, bank-led group have a negative correlation between cash flow and investment. The result implies a clear empirical distinction is necessary between the so-called industrial alliance groups (horizontal FIGs), which have much weaker common control structure, and the hierarchically controlled groups, mostly with a

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

bank at the top of the control chain (vertical FIGs) structure. The horizontal FIGs appear to have much weaker resource reallocation.

When we perform a test of the impact of state ownership, we obtain some results when we interact it with group membership. It turns out that the sensitivity of investment to cash flow is lower for such firms but this is not significant. On the other hand, for group firms without large state participation financial reallocation is much lower for firms in which the state has retained a significant share. Perhaps the state has still a role in constraining asset stripping.

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 ?

Unfortunately, the interpretation of the evidence is not unambiguous. Financial reallocation may result from active monitoring by the controlling banks, which alleviates capital market imperfections. Perhaps the controlling bank has a sharper interest in future profits vis-a-vis size and is able to control management thanks to its concentrated shareholdings and ability to lend. Alternatively, this degree of financial reallocation may signal greater profit appropriation by the bank-led groups.

While we could not easily distinguish the two hypotheses, we have performed a test to assess the average quality of investment within the hierarchical and horizontal groups as well as for independent firms. Specifically, we estimate their the sensitivity of investment across the various subsamples of firms to the market's perception of profitability. It turns out that the investment by hierarchical 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 hierarchical 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.

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.

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