The Deep-Pocket Effect of Internal Capital Markets[*]

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Abstract

We provide evidence suggesting that incumbent firms' access to group deep pockets has a negative impact on entry in product markets. Relying on a unique French data set on business groups, our paper shows that entry in manufacturing industries is negatively related to the cash reserves hoarded by incumbent-affiliated groups. In line with theoretical predictions, we find that the impact on entry of group cash holdings is more important in environments where financial constraints are pronounced and in more financially dependent sectors. Our findings suggest that internal capital markets operate within corporate groups and affect the product market behavior of affiliated firms by mitigating financial constraints.

Keywords: Business Groups, Cash Holdings, Internal Capital Markets, Market Entry.
JEL Classification: G32, G38, L41.

1   Introduction

A vast theoretical and empirical literature has emphasized that the availability of internally generated liquidity enhances firms' investment capacity in environments where access to external funds is limited.[1] Research on internal capital markets has then shown that, within multi-segment firms and business groups, investment capacity in one sector can as well be enhanced by cash generated in other sectors.[2] This suggests that firms that enjoy access to internal capital markets can take actions that are not available to their stand-alone rivals due to financial constraints, which would explain why group firms and conglomerates engage more in corporate innovation (Belenzon and Berkovitz, 2010, Belenzon, Berkovitz and Bolton, 2011) and plant acquisitions (Maksimovic and Phillips, 2008).

In this paper, we explore the idea that internal capital markets, by alleviating financial constraints, enhance a firm's actual and perceived competitive strength. We do so by investigating whether entry in manufacturing industries is negatively affected when incumbents are affiliated with business groups hoarding large cash reserves in other sectors.

Although conglomerates and business groups are ubiquitous both in advanced and emerging economies,[3] the economic literature on the product market effects of groups is fairly limited. In particular, it is not obvious how internal capital markets operating within groups affect the competitive behavior of affiliated firms. Our analysis then sheds light on one of the channels through which groups shape the economic environment.

To the best of our knowledge, this is the first paper that tries to assess the impact of group cash holdings – as opposed to individual firm liquidity – on product market competition. This gap in the literature is also due to the lack of detailed information on business group structures, which typically take the form of pyramids and are quite hard to reconstruct. Our analysis relies on unique information on the ownership structure of business groups and firms' balance sheets provided by the INSEE (Institut National de la Statistique et des Etudes Economiques). We thus focus on the French economy, an interesting case study for our purposes: recent statistics (Skalitz, 2002) estimate that 30 percent of French manufacturing firms are affiliated with a group and generate 72 percent of the sales in their sectors; in fact, 89 percent of the largest incumbents in manufacturing industries belong to corporate groups, suggesting that group-affiliated firms in France enjoy strong positions in their markets. One possible explanation for this is that incumbents that are able to draw on group deep pockets are better able to fund R&D, advertising and other capital expenditures that are central to the competitive game, which in turn may discourage entry of new rivals. Our paper empirically investigates this idea.

Our first finding is that – controlling for a host of factors including incumbents' own cash holdings and efficiency – the liquid wealth owned by affiliated subsidiaries operating in *other* markets is negatively related to entry in the incumbents' market. This is per se a novel contri-

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[1]See Hubbard (1998) and Stein (2003) for detailed surveys of this literature.

[2]See among others Hoshi, Kashyap and Scharfstein (1991), Lamont (1997), and Shin and Stulz (1998).

[3]Recent work by ECGN (1997), La Porta, Lopez-de-Silanes and Shleifer (1999), Claessens, Djankov and Klapper (2000) and Khanna and Yafeh (2007) highlights the role played by diversified business groups in various countries, including continental Europe.

bution, to the extent that – while a few papers have investigated the link between competition and business group *presence* in product markets – there is no evidence relating product market dynamics to business group *characteristics*.

The robust negative relation between entry and group cash holdings that we identify calls for further investigation, as it could be ascribed to both a financial constraint explanation and an efficiency explanation. As suggested earlier on, it may be the case that internal capital markets operated by cash rich groups relax financial constraints faced by affiliated units, hence providing the latter with a competitive edge over potential entrants, who may instead have a harder time raising capital. However, it may well be that potential entrants are scared out of markets dominated by cash-rich groups because the latter are perceived as very efficient. Our results suggest that the relaxation of financial constraints plays a non-negligible role in explaining why entry is inversely related to group cash: indeed, the negative correlation survives after controlling for several measures of efficiency.

To further explore the financial constraint explanation, we draw and take to the data two theoretical predictions that relate the impact of group cash holdings on entry in a given industry to the severity of financial constraints and the need for external capital that characterize that industry. Theory suggests that the impact of internal finance – hence of group cash holdings – on firms' competitive strength should be more pronounced in environments where firms face larger costs in raising capital, i.e. are more financially constrained. In line with this prediction, we find that entry is more sensitive to incumbent groups' liquidity in industries where intangible assets, that sustain little external financing, make up for a large part of firm value; by contrast, the group deep pocket effect is absent in high tangibility industries. Group liquidity is also more relevant to entry in industries experiencing a downturn (an event that tends to exacerbate financial constraints) with respect to booming industries. Finally, we find that in growing and innovative industries, that are typically associated with larger information asymmetries vis-à-vis external financiers, the group deep pocket effect is more pronounced than in mature and less innovative sectors.

The second prediction we test is that the effect of group cash holdings on entry should be more pronounced in manufacturing sectors characterized by larger technological needs for external finance, along the lines of Rajan and Zingales (1998). This rests on the argument that financially dependent incumbents who can draw upon additional sources of funding – such as group liquidity generated in *other sectors* – will be perceived as stronger competitors by equally financially dependent, stand-alone firms. Our results support this hypothesis: entry in financially dependent industries negatively responds to increases in group cash; by contrast, group cash has no role in explaining entry in non-dependent industries.

The idea that group deep pockets mitigate incumbents' financial constraints thus enhancing their competitive strength is also corroborated by additional findings. First, we find that the group deep pocket effect is larger when incumbent firms are affiliated with a larger number of financial intermediaries. This may be due to the fact that financial intermediaries facilitate internal capital market activity, hence making group affiliation more valuable to manufacturing

firms. We also estimate the effect on entry of non-negligible year-on-year changes in group liquidity, and find that negative shocks to group cash significantly increase entry rates in manufacturing industries.

Our paper adds to the extensive body of evidence confirming that in the presence of capital market frictions industry outcomes are affected by the financial status of market participants.[4] Building a bridge between this literature and work on internal capital markets, a few theoretical papers have recently investigated whether internal capital markets established within business groups and multi-segment firms, by providing a source of financial slack to member units, may turn them into stronger competitors.[5] However, due to the lack of reliable data on corporate group structures, little work has empirically explored whether and how access to internal capital markets affects a firm's competitive conduct. Lawrence (1991) shows that imports and entry tend to be lower in Japanese markets where keiretsu-affiliated firms have larger market shares. Weinstein and Yafeh (1995) find that, upon entry in a market, group-affiliated firms compete more aggressively than stand-alone entities. Khanna and Tice (2000, 2001) find that multi-segment incumbents responded very differently from stand-alone incumbents to Wal Mart's entry in the discount department store business between 1975 and 1996. However, none of the above papers has tried to assess the impact of group financial strength on the product market behavior of incumbents and their rivals.

Our paper also contributes to the literature on internal capital markets. While most empirical work on the topic has made use of multi-segment firm data, a growing number of recent papers rely, like ours, on more accurate balance sheet data of group-affiliated firms, i.e. of independent legal entities controlled by a single individual or family.[6] The results we present provide indirect evidence that French business groups operate active internal capital markets. Our findings suggest that wealthy groups tend to inject liquidity towards more financially constrained as well as more financially dependent affiliates, that as a consequence rely on a cheaper source of capital than comparable stand-alone firms. This confirms a longstanding claim that in the presence of pronounced financial frictions conglomerates may represent a valuable organizational form (See for instance Khanna and Palepu, 1997 and Rajan, 2010).

The rest of the paper is organized as follows. Section 2 presents the underlying theoretical framework to be tested and discusses our empirical strategy. Section 3 describes the data set and the variables used in the analysis, and provides descriptives statistics. Section 4 presents the empirical results. Section 5 concludes.

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[4]See, among others, Chevalier (1995a and 1995b), Zingales (1998), Kovenock and Phillips (1995 and 1997), Maksimovic and Phillips (2002), Campello (2003), Mac Kay and Phillips (2005), Bertrand, Schoar and Thésmar (2007) and Frésard (2009).

[5]See Matsusaka and Nanda (2002), Cestone and Fumagalli (2005), Faure-Grimaud and Inderst (2005) and Mathews and Robinson (2008).

[6]Among the papers investigating the functioning of internal capital markets in multi-segment firms are Lamont (1997), Shin and Stulz (1998), Rajan, Servaes and Zingales (2000), Scharftsein and Stein (2000), and Maksimovic and Phillips (2002). Houston, James and Marcus (1997), Houston and James (1998) and more recently Campello (2002) provide evidence that ICMs also operate within multi-bank holding companies, whereas Perotti and Gelfer (2001), Samphantharak (2006), Gopalan, Nanda and Seru (2007), and Bertrand, Mehta and Mullainathan (2002) find that internal assets are extensively reallocated within Russian, Thai and Indian business groups. We refer to Stein (2003) for a more ample survey of the internal capital market literature.

2   Internal Capital Markets and Product Market Competition

A copious literature dating back to Fazzari, Hubbard and Petersen (1988) has emphasized how the availability of internally generated cash affects firms' real investment decisions by alleviating their financial constraints. This suggests that firms that can rely on internal finance can take actions and strategies that are not available to their cash-poor rivals: as recent empirical findings suggest, this advantage is likely to be pronounced in environments where access to external funds is limited.[7]

A set of recent papers builds on these theories to put forth the idea that the competitive strength of firms may be substantially affected by their access to internal capital markets. Cestone and Fumagalli (2005) show within a formal model that cash-rich groups can be expected to inject liquidity into those units facing higher costs of external finance.[8] Due to this privileged access to liquidity, firms affiliated with wealthy groups end up enjoying a competitive edge over stand-alone rivals. The alleviation of financial constraints may for instance enhance group firms' ability to make R&D and advertising investments that are central to the competitive race.[9] Of course, if efficiency considerations drive internal capital market allocations, as the evidence in Maksimovic and Phillips (2002) suggests, then more efficient group firms are the ones that benefit most from this effect.

Matsusaka and Nanda (2002) unveil in contrast a commitment cost of internal capital markets: new rivals may be encouraged to enter an industry if conglomerates are expected to drain financial resources from that sector once this is faced with more intense competition. In other words, diversified business groups and multi-segment firms may lack – when compared to focused firms – the commitment to "stay and fight" in response to new entry. However, this commitment cost is only likely to affect *cash-poor* groups, whereas affiliation with cash-rich groups mitigates financial constraints and thus enhances a firm's actual and perceived strength vis-à-vis its stand-alone rivals.[10]

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[7]Recent work confirms the prominent role of financial constraints and internal liquidity in determining firms' investment decisions. Campello, Graham and Harvey (2010) document that credit constrained firms planned to dramatically cut investments in advertising, R&D and marketing (as opposed to unconstrained firms) during the 2008 financial crisis. Moreover, a majority of corporate financial officers reported that they would turn to internal resources (whether operating income or cash reserves), where available, to fund attractive investments. Duchin, Ozbas and Sensoy (2010) find that the decline in corporate investment following the onset of the crisis was greatest for firms with low cash reserves.

[8]The main intuition behind this result is that as individual group firms have autonomous access to external capital markets, the shadow value of internal funds is larger for units with tighter financial constraints. In this respect, the internal capital market acts as a credit line that guarantees access to liquidity to those firms facing a larger cost of outside finance. This argument is supported by the empirical findings in Maksimovic and Phillips (2008) that conglomerate firms relax financial constraints faced by segments operating in industries where access to external funding is more problematic.

[9]Belenzon and Berkovitz (2010) provide empirical evidence that business group affiliates engage in more successful innovation than stand-alone firms, particularly in industries that rely more on external finance and have a higher degree of informational asymmetries.

[10]See Cestone and Fumagalli (2005) for a formal derivation of this result. Faure-Grimaud and Inderst (2005) also show within a model of product market competition and financing that access to an internal capital market can bring along both strategic benefits and commitment costs. Mathews and Robinson (2006) build on the trade off between flexibility and commitment to model competition between a multi-divisional corporation and

Theory then suggests that if access to financial resources is a source of competitive strength *and* internal capital markets operate within business groups, an increase in the liquid wealth owned by groups affiliated with market incumbents should turn the latter into stronger competitors. Drawing upon this setting, we derive the following testable prediction:

P1: A market displays lower entry rates when incumbent-affiliated subsidiaries have larger cash holdings.

In what follows, we delineate in detail our empirical model.

Basic Entry Equation

Our baseline empirical model relates, in each year, the cash holdings of groups affiliated with market incumbents with the entry rate in that market, controlling for a list of factors that includes incumbents' own liquidity. Formally,

$$Entry_{i,t} = \gamma_1 TC_{i,t-1}^{BG} + \gamma_2 TC_{i,t-1}^{INC} + Z_{i,t-1}^{INC} \lambda + X_{i,t-1} \beta + \alpha_i + \theta_t + \varepsilon_{i,t} \qquad (1)$$

where $Entry_{i,t}$ is the entry rate in market i at time t; the variable $TC_{i,t-1}^{INC}$ measures the cash holdings of incumbents in market i at time $t-1$; similarly $TC_{i,t-1}^{BG}$ measures the cash holdings of all subsidiaries that operate in other markets and are affiliated with market i's incumbents.[11]

The matrix $X_{i,t-1}$ includes sectoral controls such as the size of the market (both in levels and in growth rates), capital intensity, return on assets (ROA) and the level of market concentration as measured by the Herfindahl index. These are the usual suspects in the determination of entry rates as they account for the profitability of the market, for technological barriers to entry, and for the intensity of competition in the market. The inclusion of sector fixed effects, denoted by α_i, accounts for any time-invariant sectoral determinant of entry rates we have possibly omitted. The matrix $Z_{i,t-1}^{INC}$ controls for time-varying characteristics of incumbent firms that may affect entry rates among which, most notably, business group affiliation and efficiency. Finally, θ_t is a full set of year dummies that takes care of aggregate shocks. All variables are one-year lagged to account for the information set of potential entrants when the entry decision is made. This also makes them more likely to be pre-determined at the time entry occurs.

As we argued above, one could rationalize a negative correlation between entry in a given market and group cash holdings in other markets arguing that cash rich groups relax financial constraints faced by affiliated units, hence providing the latter with a competitive edge over potential entrants, who may instead have a harder time raising capital. However, a negative correlation may also be consistent with alternative interpretations that do not rely on financial market imperfections. For instance, entrants may be scared out of markets dominated by cash-rich groups because incumbents affiliated with deep-pocketed groups are perceived as more efficient.

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a stand-alone firm.

[11]Differently from the existing literature, which has focused on the role of *individual firm* deep pockets, in equation (1) we make a distinction between an incumbent's cash holdings and the cash held by *the rest of the group* this incumbent is affiliated with. We refer the reader to Section 3.2 for a detailed description of the variables included in equation (1).

In the paper, we try to disentangle the financial constraint explanation from the efficiency explanation in two ways. First, in equation (1) we control for the efficiency of incumbent firms in the market to make sure that group deep pockets are not just proxying for superior incumbent efficiency with respect to smaller entrant firms. Additionally, we also investigate to which extent efficiency and finance considerations interact in determining the competitive strength of group affiliated firms, asking whether the group deep pocket effect is amplified rather than weakened for more efficient affiliated incumbents. If internal capital markets in business groups respond to efficiency considerations, then the most efficient affiliated firms are the ones that see their financial constraints alleviated (Maksimovic and Phillips, 2002 and 2008). Hence, we expect the effect of group deep pockets on entry to be most apparent in markets where group-affiliated incumbents are very efficient.

Secondly, we draw and put to the test two additional theoretical predictions that can be ascribed to the financial constraint explanation. These predictions relate the product market impact of group deep pockets to the financial constraints that are faced by firms in different industries, as well as the external financial needs that characterize those industries.

Group Deep Pockets and External Finance

In environments where raising external funding is more problematic, access to internally generated cash is crucial to support corporate investment. This implies that in sectors facing more severe financial constraints a company's actual and perceived strength is more likely to be enhanced by its ability to call on group cash holdings. This argument translates into the following prediction:

P2: The effect of group deep pockets on entry is greater in industries facing more serious financial constraints.[12]

We test this prediction by splitting our market-year observations into two sub-samples constructed on the basis of different proxies for the severity of financial frictions.[13] We then estimate equation (1) separately on the two sub-samples. Asset tangibility is a first natural proxy for the ease of access to external capital: assets that are more tangible sustain more external financing by increasing the value that can be pledged to creditors in default states. As credit constraints are alleviated, internal liquidity becomes less central to a company's competitive strength.[14] We therefore expect the group deep-pocket effect to be less important in industries characterized by a high proportion of tangible assets.

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[12]A further theoretical argument behind Prediction 2 rests on the efficient functioning of internal capital markets in business groups. If parent companies aim at maximizing group value, funds should be optimally reallocated from units that face a lower cost of capital towards more financially constrained units (see Cestone and Fumagalli 2005), a prediction that is corroborated by recent empirical evidence in Gopalan, Nanda and Seru (2007). Of course, this reinforces the prediction that firms operating in financially constrained environments enjoy larger strategic benefits from access to internal capital markets.

[13]See Section 4.2.1 for details on the construction of these proxies.

[14]The corporate finance literature has exploited in different ways the idea that tangible assets can reduce the severity of financial constraints. Almeida and Campello (2007) find for instance that the sensitivity of corporate investment to cash flow increases with asset tangibility at relatively low levels of tangibility, i.e. for those firms that are most likely to be constrained. Braun and Larrain (2005) show that the response of financially dependent industries to negative shocks is less pronounced for higher tangibility industries.

Financial constraints are also likely to be exacerbated during recessions, whereas booms are usually associated with looser credit conditions.[15] One would then expect that entrants' disadvantage vis-à-vis deep-pocketed incumbent groups should shrink in boom times. In line with this intuition, for each sector we identify periods of boom and of periods of bust, and we expect the group deep pocket effect to be larger in the sub-sample of market-year observations that experience a downturn.

Financial constraints also tend to be more prevalent in the growth stage of the industry life cycle and in more innovative industries, as various factors limit the payouts that can be credibly pledged to external financiers. In growing and innovative industries, most of a firm's value derives from future, yet unexploited business opportunities rather than from predictable income streams and hard, collateralizable assets; furthermore, informational asymmetries between managers and outside investors tend to be larger with respect to more mature industries, which may exacerbate credit rationing. Indeed, Maksimovic and Phillips (2008) show that the effect of conglomerate status on plant acquisitions is stronger in growing industries, suggesting that internal capital markets play an important role in relaxing financial constraints in the early stages of the industry life cycle. In a similar spirit, we expect that the group deep-pocket effect should be stronger in markets where real sales have grown more during our sample period, 1995-2004.

To complement our results on growth industries we also identify innovative industries in our sample.[16] We classify sectors based on the number of patents awarded by the European Patent Office to French firms, and regard as innovative those sectors where the number of patents awarded over the entire sample period has grown relatively more. In line with Prediction 2, we expect group deep pockets to have a more negative effect on entry in more innovative sectors.

We then move on to relate the group deep pocket effect to firms' financial dependence. The latter has to do with *external financial needs*, namely a firm's intrinsic demand for outside funding as driven by the mismatch between its capital expenditures and its internally generated cash, as opposed to the firm's *ability to raise external finance*. A vast literature starting with Rajan and Zingales (1998) has highlighted that access to finance (whether external or internally generated) has more significant real effects in financially dependent industries. In our context, this implies that the availability of an extra source of cash has a more significant strategic value in financially dependent industries; in these industries, access to internal capital markets should provide incumbents with a more pronounced competitive advantage over entrant firms. This leads us to test the following prediction:

P3: The effect of group deep pockets on entry is greater in more financially dependent industries.

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[15]Braun and Larrain (2005) show that financially dependent industries are hit harder during recessions, thus providing an indirect test to the hypothesis that credit conditions worsens in downturns.

[16]Several papers have provided indirect evidence of severe financial constraints in innovative industries, by examining the sensitivity of R&D investment to cash flow shocks (see Hall 2009 for a comprehensive survey). More recent evidence relies instead on firms' own assessment of financial constraints: Hajivassiliou and Savignac (2008) document that in French manufacturing industries innovative firms are more likely to report difficulties in raising external capital.

In order to identify industries whose intrinsic, technologically driven (unobservable) demand for external funds is larger, we follow Rajan and Zingales (1998) and gauge it by the reliance on external finance of U.S. listed firms in the Compustat database.[17] We expect group deep pockets to discourage more new firms' entry in the sub-sample of industries that are more dependent on external funds. Additionally, the corporate finance literature has highlighted that besides facing more serious financial constraints, innovative industries are as well more financially dependent. This is because R&D investments call for large capital expenditures but take a considerable amount of time before cash flows can be harvested. Hence, our split regressions on innovative sectors also provide a test to Prediction 3.

We now turn to the description of the data.

3 Data

3.1 Data sources

Empirical investigation on the relationship between ICM activity in business groups and entry requires reliable and extensive information not only on product markets and on the financial wealth of individual firms, but also on firm ownership status. The latter is needed to recover the structure and characteristics of business groups controlling individual firms. We obtain this information from the following data-sets.

As in Bertrand, Schoar and Thésmar (2007), we use the firm- and industry-level data sets based on accounting data extracted from tax files that the French Fiscal Administration (Direction Générale des Impôts) collects. The accounting information available covers all French firms, regardless of ownership, whose annual sales exceed 100,000 Euros in the service sector and 200,000 Euros in other sectors. Above these thresholds firms are required to fill in a detailed balance sheet and profit statement. Instead, smaller firms are subject to a simplified tax regime. The tax files also include four-digit industry classification codes similar to the U.S. ISIC coding system and unique firm identifiers allowing to track firms over time. Firm-level employment figures are also provided and are especially reliable since cross-checked with information from employer labor tax reports. Since each firm can be active in several markets, we cross the fiscal data set with an extensive yearly survey by the Ministry of Industry ("Enquête Annuelle des Entreprises"). The survey is filled by French firms with more than 20 workers and contains information on the different markets in which a firm operates. The data include the vast majority of French firms and span over the period 1995-2004.

The identification of business group structures is based on a yearly survey by INSEE called "Enquête Liasons Financieres" (LIFI). It covers all economic activities but restricts its attention to firms which either employ more than 500 employees, or generate more than 60 Million Euros of revenues, or hold more than 1.2 Million Euros of traded shares. However since 1998 the

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[17]The construction of this index will be illustrated more extensively in Section 4.2.2.

survey is crossed with information from Bureau Van Dijk and thus covers almost the whole economy. The LIFI survey contains information which makes it a unique data set to study the effects of business group activity. First, besides providing information on direct financial links between firms, it also accounts for indirect stakes and cross-ownerships when identifying the head of the group. This is important as it allows to precisely reconstruct the group structure even in the presence of pyramids. Secondly, the LIFI survey allows to correctly account for the creation, merger and disappearance of business groups and avoids misclassifying as new a pre-existing business group whose group head has changed. This is done by looking at whether most of the activities of the pre-existing group (according to employment) keep existing under the new head of group.[18] These two features allow to obtain a reliable account of the structure of business groups in the French economy and, as a consequence, reliable measures of our key variable, the cash holdings of business groups.

Our data source (LIFI) defines a group as a set of firms controlled, directly or indirectly, by the same entity (the head of the group). The survey relies on a formal definition of *direct* control, requiring that a firm holds at least 50 percent of the voting rights in another firm's general assembly. This is in principle a very tight threshold, as in the presence of dispersed minority shareholders *real* control can be achieved with substantially lower equity stakes.[19] However, we do not expect this to be a major source of bias in our sample as most French firms are private and ownership concentration is strong even among listed firms.[20] Finally, let us stress again that since both indirect control and cross-ownerships are accounted for in the LIFI, a group firm need not be directly controlled with a majority stake by the head of the group.

Our product market definition coincides with the industry as defined by the four-digit classification code. This is the highest level of disaggregation allowed by the French Activity Classification (*1993 Nomenclatures d'Activitité Française*). Our geographical market definition is France. For each year and each market we identify entrants and incumbents. We focus on entry in the manufacturing industry, thereby excluding retailing and service industries, because firms active in these sectors typically compete on geographical markets which are narrower than the national one. Also, we exclude the financial sector from the sample (banking and insurance industries), as well as regulated sectors. Finally, we delete as outliers firm-year observations whose financial ratios (Debt/Assets, ROA, Net Liquid Assets/Assets, Cash Flow/Assets) fall

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[18]This is particularly important as in the LIFI dataset there are as much as 25,000 changes of the head of the group between 1995 and 2004.

[19]The literature reconstructing corporate ownership and control has used different definitions of real control, with thresholds ranging from 5 percent to 33 percent (which in most countries, included France, is the ownership stake that would spur a mandatory public offer). Indeed, as emphasized by Franks, Mayer and Rossi (2009) it is quite natural to have more than one definition of ownership, with differently defined groups having control over different actions. And once control is formally defined as ownership of a majority stake as in our dataset, it is quite reasonable to assume that resources can be reallocated from one firm to another without encountering the opposition of minority shareholders.

[20]In their overview of ownership structures and voting power in France, Bloch and Kremp (1999) show that ownership concentration is pervasive: for non-listed companies with more than 500 employees the main shareholder's ownership stake is 88%. The degree of ownership concentration is slightly lower for listed companies but still above 50 percent in most cases.

outside a multiple of five of the interquartile range. These restrictions leave us with a sample of approximately 70,000 firms per year that we collapse into 3083 market-year observations.

3.2 Definition of Variables

Entry Rates

We define as entrants in market i at time t all firms that appear at time t and were not active at time $t - 1$. We measure entry in market i and year t ($Entry_{i,t}$) as the ratio of total sales of entrant firms to total sales in the market. Differently stated, in order to account for size, we weight entry rates (defined as number of entrants over total number of firms) by sales. Notice that we are able to accurately measure entry by multidivisional firms since the "*Enquête Annuelle des Entreprises*" includes detailed information on market dedicated sales for each segment of a firm.

Market Characteristics

We first identify all firms that operate in market i at time t. Among these, we define as incumbents those firms that are not entering the market in the given year. We then compute market shares in terms of sales of each incumbent firm and use those market shares as weights in the computation of market averages of the following variables.

The first variable, *Incumbent Total Cash* (TC^{INC}), is meant to reflect "the size of incumbents' pockets". We measure each incumbent's cash holdings as the sum of its net liquid assets (defined as current assets minus current liabilities minus inventories) and its operating cash flow corrected by changes in working capital. The first is a stock measure of all the assets that can be liquidated reasonably quickly, but it ignores all recent cash flow that is immediately invested and never shows up in the end-of-period stock variable. The addition of cash flow allows to account for changes in internal funds (see also Cleary, Povel and Raith, 1999). Note that we use cash flow from operations rather than free cash flow, so as to have a measure of additional internal resources accruing to the firm which is not affected by investment decisions. The market-level variable *Incumbent Total Cash* is (the log of) the weighted average of incumbents' cash holdings.[21]

The second variable, *BG Affiliation*, also refers to incumbent firms. It represents the market share of group-affiliated incumbents in the market. In the regression analysis this variable accounts for the (average) effect of business group presence on entry.

Finally, we measure *Efficiency* of incumbent firms in market i and year t as the weighted average of incumbents' Total Factor Productivity (TFP). TFP can be estimated as the deviation between observed output and predicted output, where predicted output is obtained from the direct estimation of a production function. OLS estimates suffer from problems of simultaneity and selection, because productivity shocks affect not only output but also the firm's input choices and the decision to stay in the market. We therefore exploit a semi-parametric method

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[21]Saled-based weighted averages are meant to capture the idea that larger incumbents are more likely to affect market entry. Results are robust to alternative weighting schemes: for this, we refer the reader to the working paper version of this article (CEPR-Discussion Paper 7184).
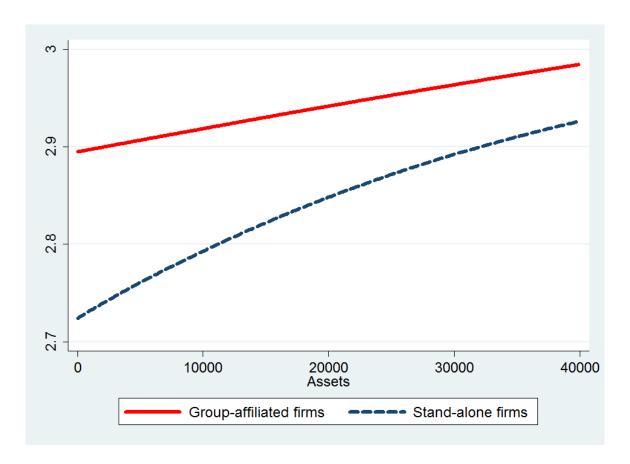
Figure 1: Olley and Pakes TFP estimates

introduced by Olley and Pakes (1996) which accounts for both problems, thereby allowing one to estimate the production function parameters consistently and to obtain reliable productivity estimates.[22] In estimating TFP we exploit the firm-level dimension of our dataset using more than 226000 firm-year observations for incumbent firms. We obtain a labour coefficient $\beta = 0.79$ (with standard error 0.0009) and a capital coefficient $\alpha = 0.18$ (with standard error 0.002).[23]

We also introduce a measure of dispersion of incumbents' efficiency in market i at year t, that we call *Relative Efficiency*. When making entry decisions, firms try to anticipate whether their efficiency level will be high enough to survive in the market. To form expectations on this, firms look not only at the average level of efficiency in the market but also at its dispersion. For a given average, the higher the dispersion of efficiency, the more likely that a low-efficiency entrant will be able to stay in the market. Figure 1 shows that, in our data, efficiency is increasing in size (measured by assets) and, conditional on size, is larger for affiliated firms. Hence, we build our measure of relative efficiency by classifying as strong rivals the affiliated firms belonging to the top quartile of the distribution of affiliated firms' size, whereas weaker firms are the stand-alone firms belonging to the bottom quartile of the distribution of their size. Our *Relative Efficiency* measure is given by the ratio between the TFP of large affiliated

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[22]We refer to Appendix A.1 for a more detailed description of the procedure to estimate TFP.

[23]These estimates are in line with recent evidence from Cingano and Schivardi (2004) on Italian firms who, using the same methodology, estimate the contribution of labour and capital to be approximately 0.7 and 0.3 in most manifacturing industries. Similar to their study, our estimates are also indicative of constant return to scale. Pavcnik (2002) also estimates TFP using the Olley and Pakes methodology on a sample of Chilean manufacturing firms, finding 0.08 for the capital coefficient.

incumbents and the TFP of small stand-alone incumbents.

The remaining variables refer to all firms in the market. We proxy technological characteristics of a given market in a given year by the weighted average of the capital intensity of all firms that operate in the market, where capital intensity is computed as the ratio of fixed assets over output (*Capital Intensity*). Profitability of market i in year t is the weighted average of the return on assets (*ROA*) of all firms present in market i and year t. We proxy access to credit in a given market/year using the weighted average of the ratio of tangible assets to total assets (*Tangibility*). The size of the market (*Size*) is measured as the (log of) total sales, and the growth rate of the market (Δ *Size*) as the change in market size from $t-1$ to t. Finally, concentration in a market is proxied by the Herfindahl index (*HHI*).

Business Group Characteristics

For each *incumbent* in market i and year t we identify the group the incumbent is affiliated with (if any). Even though we focus on entry in manufacturing industries, we reconstruct groups considering affiliated firms operating in *any* sector. Based on this, we measure business group characteristics among which group cash holdings. For each market, we average the characteristics of incumbent-affiliated groups using as weights the *incumbents'* market shares.

BG Total Cash (TC^{BG}) is defined as the (log of the weighted average of) total cash held by an incumbent-affiliated group. This is computed by adding all the group subsidiaries' cash holdings, *excluding the cash held by the incumbent*.

As a proxy for the intensity of ICM activity, we consider the (weighted average of the) number of financial intermediaries owned by a group (*Financial Intermediaries*).

Finally, further group characteristics include *Loans of Inc. From BG*. This is computed as the weighted average of loans granted to incumbents by other members of the affiliated group, divided by the incumbents' total assets.

3.3 Descriptive Statistics

Entry rates

Table 1 shows descriptive statistics on entry. The first three rows present the number of entrant firms. On average, 46.6 firms enter a market in a given year. However, consistent with evidence by Dunne, Roberts and Samuelson (1988) we find that entrant firms account, most of the time, for only a small fraction of market sales. Indeed, entrants with market shares above 1 % are rare (on average only slightly more than 2), and entrants that cover more than 5 % of the market in the first year of their existence are even more infrequent (on average only about 0.5). The number of incumbents in a given market exhibits a similar pattern: high absolute number of firms, but only a small fraction with significant market shares.

The last three rows of Table 1 report entry rates into manufacturing activities weighted by sales. We find that despite the high heterogeneity in the size of entrants, (average) entry rates display relatively low dispersion around a median of 11%, the 25th percentile being 5% and the 75th percentile 19%. The magnitude of entry rates in the manufacturing sector is close to the

figures reported by Aghion, Fally and Scarpetta (2007) and Dunne, Roberts and Samuelson (1988).

The table also shows that sectoral business cycles affect entry rates. On average, entry rates are close to 20% when sectors experience positive demand shocks, whereas they decrease to 13.3% when sectors experience downturns. Our data (not reported in the Table) also indicate that entrants tend to be larger during sectoral booms than in recessions: the (weighted) average of entrants' employment is 1373 during booms while it decreases to 437 during recessions.[24] A similar pattern emerges looking at assets. Additionally, during sectoral recessions our measure of *Relative Efficiency* appears to be lower than during booms: the mean value is 1.18 in the former case, whereas it is 1.21 in the latter.[25] This suggests that during recessions the least efficient firms are unable to survive, hence the dispersion of incumbents' efficiency tends to decrease.

To start digging into the relationship between group cash and entry, we now move to examine the characteristics of entrants and compare them to those of incumbents, distinguishing between business-group affiliated and stand-alone firms (Table 2). Table 3 presents an even finer disaggregation distinguishing also between sectors in which incumbents are affiliated to cash-rich and sectors in which incumbents are affiliated to cash-poor groups.

Entrants and Incumbents

Table 2 compares the characteristics of entrants and incumbent firms distinguishing between group affiliated and stand alone firms.

Columns (1) and (4) reveal that incumbent firms tend to own more assets and to employ more workers than entrants. Incumbents are slightly more productive in terms of value added per worker while total factor productivity is similar in the two groups.[26] In the first year of activity entrants hold little liquidity (indeed negative at the median), while incumbents' liquid wealth is positive. Finally, the last rows of columns (2) and (5) shows that incumbents tend to be affiliated to wealthier business groups than entrants.

Columns (2)-(3) and (5)-(6) reveal that the differences between stand-alone and affiliated firms are even more pronounced. Affiliated firms are significantly larger than stand-alones both in terms of assets and employment. They produce more value added per worker than stand-alone firms and their TFP is larger (at least for entrants).[27] Finally, affiliated incumbents own a larger stock of liquid assets than their stand-alone counterparts; conversely, affiliated entrants display negative liquid wealth more than stand-alone entrants do. This may suggest that group

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[24]As for all our market-level variables, these figures are based on sales-weighted averages. Unweighted figures are of course smaller (238 and 123, respectively) but exhibit the same cyclical pattern.

[25]The difference -0.03 has a standard error of 0.008 and is therefore different from zero at any conventional level of significance.

[26]As illustrated in Section 3.2 we estimate firm-level TFP using the methodology proposed by Olley and Pakes (1996). Such a methodology does not allow to estimate TFP of entrants, as it requires information on lagged values of inputs not available for the first year of a firm's activity. As a proxy for entrants' TFP we therefore consider TFP in the year posterior to entry, which is defined only for the entrants that are still active in the second year.

[27]The difference in (average) TFP between stand-alone and affiliated entrants is -0.025 with a standard error of 0.013 which implies significance at 7.7%.

affiliation favors entry into sectors where set up costs are large and investment projects take time to generate cash flows, possibly by facilitating entrants' access to finance.

Overall, business group affiliation seems to be associated with competitive strength. To explore this idea, Table 3 compares markets where incumbents are affiliated to cash-rich and cash-poor groups. More precisely, the table compares markets where the liquid wealth of the rest of the group incumbents are affiliated with is above the median (from now on denoted as high-BG cash markets) with markets where the liquid wealth of the rest of group is below the median (low-BG cash markets). The first part of Panel A shows that (unconditional) entry rates are similar across the two groups of markets at the median. However, the second part of Panel A shows that in high-BG cash markets, affiliated incumbents represent 82.3% of market sales, while in low-BG cash markets, the market share of affiliated incumbents is 62.9 %. A possible interpretation of this finding is that affiliation with cash-rich groups provides incumbents with a stronger competitive edge, thereby making the competitive environment tougher for non-affiliated firms. Consistently, the third part of Panel A shows that in high-BG cash markets a larger percentage of entrants is backed by a business group (68.8% as opposed to 49.7% in low BG cash markets). Also, Panel B of Table 3 shows that in markets where cash-rich groups are present, *affiliated* incumbents are much larger, produce more value added per worker, and are more productive than their courterparts in low-BG cash markets.[28] A similar pattern emerges for the other market participants, stand-alone incumbents and entrants.[29] One may thus argue that product market competition is more intense in high-BG cash markets, leading to the selection of more efficient entrants and incumbents.

4 Results

4.1 Deep Pockets, Business Group Affiliation and Entry

Table 4 starts addressing the main question of the paper. We first investigate whether incumbents' affiliation with a business group per se affects entry in a given market. Table 4, column (1) presents results from our base regression where we relate entry rates to market characteristics and to the market share held by group-affiliated incumbents (*BG Affiliation*), not controlling yet for firms' or groups' liquidity.[30] The coefficient of *BG Affiliation* is negative and statistically significant at standard levels, confirming previous evidence that the presence of business groups discourages market entry (see e.g., Lawrence, 1991).

Both our measures of efficiency, average and relative efficiency, instead turn out to be insignificant. We do not see this as evidence that efficiency is irrelevant for market entry. Rather,

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[28]The difference in TFP of affiliated incumbents between high and low-BG cash market is -0.245 and is different from zero at any conventional level of significance, the standard error being 0.018.

[29]The difference in TFP of stand-alone incumbents between high and low-BG cash market is -0.244 with a standard error of 0.018. The figure for entrants is a very similar -0.248 with a standard error of 0.018. Both are different from zero at any conventional level of significance.

[30]In all regressions we cluster standard errors at the 3SIC sector level in order to account for potential intra-market correlation of the error term.

entry is likely to be mostly determined by the persistent, technologically driven component of efficiency, already absorbed by the sectoral fixed effects.

We now turn to the role of deep pockets. Column (2) adds the incumbents' cash holdings: we find that the latter are negatively correlated with entry of potential competitors. The effect is statistically significant. To quantify the economic effect, a 10 percent increase in the cash held by incumbent firms is associated with an average reduction in entry rates of 0.09 percentage points. Given that the average entry rate is 16 percent, this implies an average drop in entry rates of about 0.6 percent.

Column (3) of Table 4 separately controls for incumbent own liquidity and (rest of the) group cash holdings. Business group cash is negatively correlated with entry rates and is statistically significant. A 10 percent increase in group cash holdings is associated with a reduction of 0.07 percentage points in entry rates. Thus, according to our estimates, an increase of 10 percent in group cash entails a reduction of slightly more than 0.4 percent in entry rates.

Note that business group liquidity is significant even though we control for both average and relative efficiency of incumbents firms. This result is robust to efficiency measures different from the Olley and Pakes (1996)'s TFP estimates,[31] to employment-weighted entry rates (see Table 10 in Appendix A.2),[32] and to the exclusion of all sectoral time-varying controls. This suggests that the negative correlation we find in the data cannot be completely ascribed to the higher efficiency of cash-rich incumbent groups discouraging new entry. Our results thus point to a financial constraint explanation whereby internal capital markets relax the financial constraints of group-affiliated incumbents, hence increasing their actual and perceived strength.

Efficiency seems to amplify the group deep pocket effect on entry. Column (4) adds the interaction between business group cash and the (average) efficiency of *affiliated* incumbents. The interaction is negative and significant at 10%, suggesting that more efficient units derive larger strategic benefits from business group affiliation, probably because they are more likely to receive liquidity injections through the group's internal capital market. In this sense, our result is in line with Maksimovic and Phillips' (2002, 2008) empirical findings that conglomerate firms channel resources towards their most efficient segments, that as a consequence see their financial constraints mitigated.

Finally, comparing column (3) with column (2), we observe that once we control for group cash, the product market effect of individual firm liquidity is smaller. This again suggests that access to internal capital markets mitigates the credit rationing problems that make a firm's own cash holdings central to product market behavior, and is consistent with the finding in Hoshi, Kashyap and Scharfstein (1991) that membership in a conglomerate group reduces the sensitivity of a firm's investment to its own liquidity.

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[31]In unreported regressions (available upon request), we proxy efficiency using either labor productivity or TFP from the estimate of Cobb-Douglas and Translog production functions. The coefficient of group cash remains always negative and statistically significant.

[32]In our data-set employment figures are particularly reliable as they are cross-checked with information from employer labor tax reports. However, we do not have information on market dedicated employment for multidivisional firms. For this reason, we use employment-weighted entry rates only as robustness.

4.2 Group Deep Pockets and External Capital Markets

In this Section we seek to better understand the economic mechanism underlying our finding that entry in a given market is negatively correlated with group liquidity hoarded by group units operating in other markets. For this purpose we explore whether the importance of group cash for entry varies across markets/years in ways that are consistent with additional predictions derived from the theory. If financial phenomena in business groups are the source of the previous results, we expect group deep pockets to matter more for entry in environments where access to outside financing is more limited. Also, we expect the role of group cash to be more important in markets where the need for external funds is larger.

4.2.1 Group Deep Pockets and Access to External Capital Markets

Tangibility

Table 5, columns 1 and 2, investigates whether the effect of group liquid wealth on entry is more important in industries where firms hold less tangible assets. In these industries firms should find it harder to raise external funds.

In order to classify industries based on asset tangibility, we take the average over time of market *Tangibility*, as defined in Section 3.2, and we estimate our equations in the two sub-samples of markets below and above the median of the distribution of this time-invariant measure of tangibility. Our results support Prediction 2: the coefficient of BG cash is larger in industries characterized by low asset tangibility, with the difference between the two coefficients being statistically significant almost at 5 percent (the p-value is 0.067). Results are even stronger when we split the sample considering industries belonging to the bottom quartile and to the top quartile of the distribution: while in very intangible industries the coefficient of BG cash is -0.016***, in highly tangible industries the impact of group cash is null (-0.0004). The difference is statistically significant at 1 percent (the p-value is 0.007). These results are intuitive: access to internal group liquidity is a more important source of competitive strength in the *book and periodical publishing* industry, where soft assets make up for 54 percent of asset value, than in the *iron and steel* manufacturing industry, where 96 percent of assets are tangible and can thus be pledged as collateral to raise capital externally.

As we argued in Section 2, an alternative explanation for our results is that new entrants – or their financiers – are put off by the presence of efficient groups, rather than by the groups' deep pockets. This effect might then be less pronounced in high tangibility sectors, where entrants themselves are less likely to be financially constrained. However, the fact that we control for incumbent efficiency in our split regression makes this concern less compelling.

Finally, we also find that in sectors where firms hold more tangible assets, incumbents' *own* liquidity seems to be more important for entry. This result is consistent with recent ICM theories such as Cestone and Fumagalli (2005): incumbents with easier access to credit are the ones that receive less liquidity injections from the rest of the group, hence own financial

resources rather than group cash are their main source of financial muscle.[33]

Sectoral Booms and Busts

Table 5, columns 3 and 4, investigates whether group cash has a differential effect on entry in markets experiencing an economic downturn as compared to markets undergoing an expansion period. The former should face more binding financial constraints.

We identify booms and busts from the fluctuations of real sectoral sales, where nominal sales are deflated by industry-specific price deflators, following the Braun and Larrain (2005) peak-to-trough criterion, where a trough occurs when the (log) of real sales deviates from its trend level by more than one standard deviation. We compute the trend using the Hodrick-Prescott filter with a smoothing parameter of 100. For each trough, we go back in time until we find a local peak, which is defined as the closest preceding year for which cyclical real sales (the difference between actual and trend values) are higher than during the previous and posterior year. A bust goes from the year after the local peak to the year of the trough. The same procedure is used to identify sectoral booms. A peak occurs when current real sales are more than one standard deviation above their trend. Once identified a peak, we go back in time until we find a local trough. The years falling between a local trough and a peak are labeled as a boom.

We then run our regressions in the two sub-samples of markets-year observations experiencing a bust (column 3) and a boom (column 4). Our results support Prediction 2: we find that groups cash matters more for entry in industries experiencing an economic downturn and thus subject to tighter credit conditions. The difference between the two coefficients is statistically significant at 5 percent (the p-value is 0.051).

High-Growth and Innovative Industries

Table 6, columns 1 and 2, investigates whether BG cash has a stronger effect on entry in industries that grow more in the long-run.

We divide our (4 digit SIC) manufacturing industries in two groups: industries where the growth of the real value of sales during our sample period, 1995-2004, exceeds the median growth of all manufacturing industries, and industries where the growth of real sales is below the median. The real value of sales is computed using industry price deflators. Business group cash matters more for entry in fast growing industries than in industries that grow less in the long-run. However, the difference between the two coefficients is significant at 10 percent only (the p-value is 0.1).

Results are more clear-cut when we classify industries based on innovation activity, as measured by patent growth. We have information on all the patents awarded by the European Patent Office (EPO) to French firms over the period 1995-2003, at the (4 digit) sectoral level.

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[33]Of course, besides this ICM effect, easier access to credit can be expected to have an additional, conflicting impact on the role of incumbent deep pockets, to the extent that internally generated liquidity matters *less* for entry in a setting where credit is easily available to firms. Although the overall effect is a priori undetermined, in our data the ICM effect seems to dominate, thus making incumbent own deep pockets *more* important for product market entry.

This allows us to split the sample into the industries where the growth of awarded patents is above the median and industries where patent growth lies below the median. Columns (3) and (4) show that the effect of BG cash on entry is stronger in more innovative industries, with the difference between the two coefficients being significant at 2 percent (the p-value is 0.022). In line with economic intuition, incumbents' access to group cash plays no role to shape entry and competition in the *textile* industry, which displays very little patenting activity in our sample period and very low sales growth in most of its 4-SIC codes. Conversely, group cash is an important determinant of entry in the *waste management* and the *medical imaging* industry, where patents more than doubled during our sample period: when the financing of R&D cannot be supported by hard assets or informational asymmetries with outside investors are severe, access to group liquidity relaxes financial constraints and thus represents a source of competitive strength (in line with Prediction 2). These same industries are also characterized by large external financial needs, hence these results are also in line with Prediction 3.

4.2.2 Financial Dependence and Group Deep Pockets

Table 8, columns 1 and 2, explores whether financially dependent industries display a more pronounced group deep pocket effect (Prediction 3). In some industries, the amount of internally generated cash is not in line with the desired capital expenditures. In these environments, financially dependent incumbents who can draw upon additional sources of funding – such as group liquidity generated in *other sectors* – will be perceived as stronger competitors by equally financially dependent, stand-alone firms. This in turn may negatively affect entry.

We measure the unobservable technological need for external finance relying on the index developed by Rajan and Zingales (1998) for U.S. sectors. Their indicator of a firm's reliance on external finance is the share of capital expenditures not financed with cash flow from operations. The external financial dependence of U.S. publicly listed companies over the '80s (from COMPUSTAT) is computed and then aggregate over time and across companies in a given industry (by using the industry median). The advantage of classifying industries based on the amount of external finance used by U.S. listed firms is that capital markets in the U.S. are among the most advanced in the world, and large publicly traded firms typically face the least frictions in accessing finance. Hence, the amount of external finance used by listed firms in the U.S. is likely to be a relatively pure measure of their (technologically driven) *demand* for external finance. Conversely, the actual amount of external funds used by (mostly private) French firms is likely to reflect factors that affect the *supply of external finance* such as the availability of hard, collateralizable assets. As long as the technological reasons why some industries depend more on external finance than others are persistent across countries, the Rajan and Zingales (1998) financial dependence ranking can be used to identify highly dependent industries in France.

Table 7 shows the external finance dependence index for the industries ranked by Rajan and Zingales (1998). The figures have been updated by Braun (2003) and refer to the period 1986-1995. Industries with low external financial dependence include tobacco, leather products,

beverages and petroleum refineries; financially dependent industries include electrical machinery and professional and scientific equipment. As the Table shows, to classify industries in our sample according to the Rajan and Zingales (1998) index we match the U.S. ISIC classification code with the French Activity Classification (NAF Code). This allows us to identify sectors whose external financial dependence is above/below the median of the distribution and to estimate our equations in the two sub-samples.

The results in Table 8 support Prediction 3: business group cash negatively affects entry in financially dependent industries, while it has no role in non-dependent industries. The difference between the two coefficients is significant at 10 percent. This shows that group cash disproportionately affects entry in financially dependent sectors, consistently with previous work by Klapper, Laeven and Rajan (2006) and Aghion, Fally and Scarpetta (2007) who show that financial development matters more for entry in more financially dependent industries.

4.3 Additional Evidence

Group Cash Holdings and Internal Capital Market Activity

If access to cash-rich groups' internal capital markets boosts firms' competitive strength by relaxing financial constraints, then we would expect the correlation between group liquidity and entry to be more pronounced when internal capital markets are more active. As a proxy for the intensity of Internal Capital Market activity, we use the number of within-group financial intermediaries. Indeed, financial intermediaries within a group are likely to facilitate the flow of resources across different subsidiaries, thus making a group's internal capital market more active. This view is supported by Hoshi, Kashyap, and Sharfstein (1991) and more recently by Samphantharak (2006), who finds that affiliation with financial intermediaries reduces the investment-cash flow sensitivity of group member firms. Hence, we classify our industries based on the number of financial intermediaries incumbents are affiliated with through a group structure. We expect group cash to exert a stronger effect on entry in sectors where incumbents are affiliated with a number of financial intermediaries above the median.

Table 8, columns 3 and 4, shows the results. The coefficient of BG cash is negative and significantly different from zero only in industries dominated by groups including at least one financial intermediary. However, the difference between the coefficients of BG cash in the two sub-samples is not significantly different from zero (the p-value is 0.2).

Shocks to Group Cash

While theory suggests that product market competition is affected by the overall depth of group pockets (which include both the stock of net liquid assets held at a given time and current cash flows), it might be argued that changes in net liquid assets reflect a group's liquidity policy, that in turn may incorporate strategic considerations of entry deterrence. For this reason, we also study how entry in a market reacts to changes in group cash flows which are arguably less subject to manipulation. In doing this, we allow negative and positive shocks to affect asymmetrically an incumbent's competitive strength (and thus entry in its market). Table 9

reports results from the estimation of equation (1), where group liquidity is now replaced by two dummies ($Shock_{i,t}^{-}$ and $Shock_{i,t}^{+}$) capturing non-negligible year-to-year changes in group liquidity. $Shock_{i,t}^{-}$ indicates a negative shock to group liquidity in year t (for groups affiliated to incumbents in market i), and takes a value one if there is a fall in group cash flows of more than 10% in year t relative to the previous year and zero otherwise. $Shock_{i,t}^{+}$ is analogous to $Shock_{i,t}^{-}$ and takes a value one if there is an increase in group cash flows of more than 10% in year t relative to the previous year and zero otherwise.[34]

Column 1 indicates that when incumbent-affiliated groups experience a year-to-year fall in cash flows larger than 10%, market entry increases by 2.3 percentage points. By contrast, market entry does not seem to respond to positive shocks to group liquidity (see column 2). Interestingly, this asymmetric result carries over to unreported estimates, where we use alternative measures of shocks to group cash. A potential explanation for the strong pro-entry effect of negative shocks to group cash is that groups that are hit by a substantial reduction in cash flows may switch from a regime where they provide liquidity to affiliated firms even when these are faced with more intense competition, to a regime where they exit markets challenged by new entrants. As a consequence, a "Matsusaka and Nanda effect" may invite entry in those groups' markets. This change of regime would not occur for long-pursed groups experiencing a positive shock to their cash flows, which can explain why entry reacts mildly to such shocks.

Loans actually received

In Section 4.2 we have explored the hypothesis that incumbents "backed" by cash-rich groups are perceived as stronger competitors by potential entrants as they are expected to face less stringent financial constraints. To this purpose, in our estimated equations we have controlled for the cash holdings of incumbent-affiliated groups – a measure of the resources *available for redistribution* in favor of the incumbents. Alternatively, potential rivals may give up entering a market because, at the time the entry decision is made, they observe that incumbents *have actually received* resources from the rest of the group.[35] We proxy such cash injection with the loans received by incumbents from the rest of the group (*Inc Loans from BG*) and we introduce this as an additional control in our entry equation. Column (3) in Table 9 shows that the magnitude and the precision of the coefficient of group cash is unaffected by the inclusion of intra-group loans received by incumbents: entrants are put off by incumbents' easy access to a source of internal finance (the group's cash reserves). Conversely, group loans do not have a significant impact on entry into product markets. Hence, we find no evidence that entry is being deterred by actual (strategic) liquidity injections in favor of incumbent firms.

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[34]The year-to-year change represents a rough yet immediate measure of shocks to cash flows (see Bertrand and Mullainathan 2001 and Gopalan, Nanda and Seru 2007 for similar shock measures). Results are robust to different values of the threshold (5% and 20%). In additional unreported estimates available upon request, we focus on changes in cash flows held by units operating in *distant* markets, i.e. in markets outside the incumbent's *2SIC* market. We also experiment with an alternative measure of shocks to group liquidity defined as the residual of a regression of group cash flows on sector and year effects. Results are similar in both cases.

[35]From a theoretical standpoint, both actual and expected cash injections – provided they are ex post optimal from the group perspective – have the potential to help market incumbents discourage entry. Of course, in a well-functioning internal capital market cash injections that are not ex post optimal for the group suffer from a commitment problem and are thus unlikely to have any strategic effect.

5   Conclusion

This paper finds that entry rates in a given market are inversely related to the amount of liquidity hoarded by incumbent-affiliated subsidiaries active in other markets. This is in line with the theoretical prediction that cash-rich groups can be expected to shift liquidity in favor of units facing higher costs of external finance, hence providing the latter with a competitive edge over potential entrants. Theory also suggests that entry should be more sensitive to group cash holdings in industries characterized by more severe financial constraints and by larger external financial needs. We find evidence consistent with these predictions.

To the best of our knowledge, this is the first work to investigate the link between product market dynamics and the (financial) characteristics of business groups. Our analysis is made possible by a unique dataset providing extensive information on the balance sheets as well as the ownership status of individual French firms.

A policy implication that can be drawn from our analysis is that, in environments where external finance is costly to raise, the presence in a market of incumbents affiliated with cash-rich groups should be seriously considered as a barrier to entry. In other words, an accurate assessment of competitive conditions in a given market requires to shift attention from the potential threat posed by incumbents' deep pockets to the ones posed by the deep pockets of incumbent-affiliated groups.

However, our findings do not support the view that group-membership is per se anti-competitive. In particular, we do not provide evidence that internal capital market activity facilitates predatory behavior by channeling resources from cash-rich subsidiaries enjoying a dominant position in one market towards units facing more intense competition.[36,37] In fact, our paper suggests that the financial slack provided to group members allows them to adopt product market strategies not available to (financially constrained) stand-alone rivals. This may well make the competitive environment tougher and, despite lower entry, benefit consumers (and total welfare) through lower prices, superior quality and the selection of more efficient product market players.[38] It is only in specific situations that access to group liquid wealth may facilitate predation. Whether the case at hand exhibits the factual characteristics

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[36]This is a long-standing concern in the anti-trust arena, that recently has been revived in Europe by the formation of large privatized multi-utilities and by the European Commission's recent stance that conglomerate mergers may create scope for anti-competitive spillovers. A prominent example is the EC's ban on the proposal to merge General Electric and Honeywell (Case No. COMP/M.2220): in motivating its decision, the Commission maintained that a merger with GE would allow Honeywell to rely on GE's deep pockets to fund predatory practices in its own markets. (This decision was upheld by the Court of First Instance, but the motivations for the predatory behavior have been considered insufficient.) Additionally, in the 2009 Guidance Paper on the enforcement of Article 82, the EC has expressed concerns about dominant firms subsidizing their non-dominant affiliates' exclusionary practices (Section C.62, page 20).

[37]In this respect, our paper does not provide a test to the argument that financially fit incumbents can engage in predatory practices in order to financially exhaust their rivals and drive them out of their markets (See Telser, 1966, Benoit, 1984, and Bolton and Scharfstein, 1990).

[38]Descriptive statistics in Table 3 are consistent with this argument.

that make predation a likely outcome should be assessed with care.

One may as well remark that, to the extent that group-backed entrants have the financial muscle to withstand incumbents' predatory strategies, cash rich groups may exert a pro-competitive effect by entering markets where stand-alone firms would not expect to survive. The finding (shown in Table 3) that in markets where incumbents are members of cash-rich groups, a larger percentage of entrants is also affiliated with a group confirms that group-backed entry is a relevant phenomenon that complements the one investigated in this paper. In fact, this represents the next step in our research agenda.

To conclude, in the present paper we have focused on the effect of internal capital markets on product market entry. Our results shed light on the claim that access to group liquidity, by alleviating financial constraints, may affect a firm's behavior along several dimensions, among which its employment policy, its propensity to engage in international trade and the intensity of its R&D activity. These are three issues we plan to investigate next.

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Table 1: **Entry Patterns Into Product Markets**

		Mean	St.Dev.	Quartiles			N
				p25	p50	p75	
# of Entrants	All	46.6	78.7	7	19	56	3083
	> 1% Sales	2.32	2.15	1	2	3	3083
	> 5% Sales	.53	.87	0	0	1	3083
# of Incumbents	All	249	437	35	99	301	3083
	> 1% Sales	15.6	6.91	10	16	21	3083
Entry Rate (%)		16	17	5.6	11.5	19.9	3083
Entry Rate in Booms (%)		19.6	16.5	8.9	15.1	25.8	614
Entry Rate in Busts (%)		13.3	12.3	5.24	10.7	17.3	754

Note: Sectoral-level data between 1995 and 2004. We define as *Incumbent* in market i at time t all firms that appear at time t and were active in this market at time $t - 1$. We define as *Entrant* in market i at time t all firms that appear at time t and were not active at time $t-1$. *Entry Rates* in sector i year t is the ratio of sales of entrant firms over total sales in sector i year t. *Sectoral booms* and *busts* are identified from the fluctuations of real sectoral sales (where nominal sales are deflated by industry price deflators) using a peak-to-trough criterion.

Table 2: **Entrants and Incumbents**

		Entrants			Incumbents		
		All	BG Aff.	SA	All	BG Aff.	SA
		(1)	(2)	(3)	(4)	(5)	(6)
Assets	Mean	154223	184781	6046	210078	234367	7491
	Sd	797848	895565	62731	714309	739676	30695
	p50	11642	20290	1044	42777	55811	2454
	N	2995	2777	2883	3082	3064	3035
Employment	Mean	790	974	55.5	936	1073	68.8
	Sd	3570	4027	150	2589	2696	90.2
	p50	144	227	30.5	341	434	47.5
	N	2995	2777	2883	3082	3064	3035
VA/worker	Mean	87	88.3	58.6	108	124	54.9
	Sd	863	942	545	884	1183	65.6
	p50	48.7	50.8	42.3	55.9	58.1	47.8
	N	2988	2756	2861	3082	3063	3026
TFP	Mean	3.05	3.07	3.04	3.05	3.05	3.05
	Sd	0.462	0.46	0.458	0.459	0.459	0.458
	p50	3.05	3.07	3.05	3.05	3.06	3.05
	N	2347	2101	2221	2427	2419	2402
Own Total Cash	Mean	165	-347	-290	69531	79155	4534
	Sd	99484	108465	6799	174241	183075	16079
	p50	-541	-1089	-78.2	22197	28704	1984
	N	2995	2777	2883	3082	3064	3035
BG Total Cash	Mean	-	1904221	-	-	2595051	-
	Sd	-	8822740	-	-	7211362	-
	p50	-	121979	-	-	544934	-
	N	-	2777	-	-	3064	-

Note: The table presents market-level variables. Nominal variables expressed in thousands of Euros have been deflated using sectoral prices indexes. All variables are based on sales-weighted averages. *TFP* is estimated using the methodology proposed by Olley and Pakes (1996). *Own Total Cash* measures the sum of firms' Net Liquid Assets and Operating Cash Flow. For affiliated firms, *BG Total Cash* measures the total cash held by the firm-affiliated group. This is computed by adding all the group subsidiaries' Total Cash, excluding the cash held by the firm.

Table 3: **Entrants and Incumbents in high and low BG-Cash markets**

PANEL A		High BG Cash (1)	Low BG Cash (2)
Entry Rates	Mean	17.5	14.8
	St. Dev.	19.5	13.6
	Median	11.5	11.7
	N	1547	1536
Market Shares of Affiliated Incumbents	Mean	82.3	62.9
	St. Dev.	16.4	25.3
	Median	86.8	67.5
	N	1546	1536
Percentage of Affiliated Entrants	Mean	68.8	49.7
	St. Dev.	30.7	32.9
	Median	79.7	51.5
	N	1507	1488

PANEL B		Affiliated incumbents		Stand-Alone Incumbents		Entrants	
		High BG Cash (1)	Low BG Cash (2)	High BG Cash (3)	Low BG Cash (4)	High BG Cash (5)	Low BG Cash (6)
Assets	Mean	402333	64416	10650	4342	269529	38019
	St. Dev.	1003807	155110	42318	8780	1098398	177856
	Median	114962	27775	2916	2096	25516	5165
	N	1541	1523	1515	1520	1515	1488
Employment	Mean	1661	478	76.4	61.2	1259	309
	Sd	3568	1021	114	56.1	4824	1229
	p50	686	295	50.1	45.2	230	97.8
	N	1540	1523	1515	1520	1515	1488
VA/Worker	Mean	158	90.2	61.1	48.7	121	51.4
	Sd	1640	305	87.8	29.3	1212	69.4
	p50	64.3	52.9	50.5	45.5	54.1	44.2
	N	1540	1523	1507	1519	1509	1487
TFP	Mean	3.17	2.93	3.17	2.93	3.17	2.92
	Sd	.451	.434	.449	.435	.452	.438
	p50	3.16	2.92	3.16	2.92	3.16	2.91
	N	1202	1217	1194	1208	1175	1177

Note: Nominal variables expressed in thousands of Euros have been deflated using sectoral prices indexes. All variables are based on sales-weighted averages. *High BG Cash* Markets are markets where the liquid wealth (Total Cash) of incumbents-affiliated groups is above the median value.

Table 4: **Business Group Liquidity And Entry**

	(1)	(2)	(3)	(4)
Size	-0.276***	-0.260***	-0.255***	-0.255***
	(0.025)	(0.023)	(0.024)	(0.024)
Δ Size	-0.038***	-0.053***	-0.054***	-0.052***
	(0.012)	(0.015)	(0.014)	(0.014)
ROA	0.084***	0.095***	0.087**	0.086**
	(0.031)	(0.033)	(0.036)	(0.037)
Capital Intensity	-0.008	-0.006	-0.008	-0.008
	(0.010)	(0.010)	(0.012)	(0.012)
HHI	0.121	0.149**	0.173**	0.169**
	(0.075)	(0.075)	(0.076)	(0.075)
Tangibility	0.019	0.014	0.019	0.012
	(0.060)	(0.063)	(0.065)	(0.066)
Average Efficiency	0.013	0.006	0.006	0.098
	(0.026)	(0.026)	(0.026)	(0.064)
Relative Efficiency	-0.036	-0.015	-0.012	-0.010
	(0.048)	(0.050)	(0.050)	(0.049)
BG Affiliation	-0.020**	-0.026***	-0.026***	-0.026***
	(0.008)	(0.008)	(0.008)	(0.008)
Inc. Cash		-0.009***	-0.005	-0.005
		(0.003)	(0.004)	(0.003)
BG Cash			-0.007**	0.011
			(0.003)	(0.010)
BG Cash x TFP				-0.005*
				(0.003)
Market & Year FE	YES	YES	YES	YES
R-squared	0.583	0.598	0.600	0.601
N	2239	2100	2050	2050

Note: Sectoral-level data between 1995 and 2004. Entry in sector i year t is the ratio of sales of entrant firms over total sales in sector i year t. *Size* is the (log of) total sales; *Δ Size* is the change in market size from $t-1$ to t; *ROA* is the ratio of operating profits to total assets in a given market; *Capital intensity* is the ratio of fixed assets over output; *HHI* is the Herfindhal index (firms' market shares computed in terms of sales); *Tangibility* is ratio of tangible assets to total assets; *Average Efficiency* is the (weighted) average of incumbents' TFP; *Relative Efficiency* is the ratio of TFP of large affiliated firms to TFP of small stand-alone firms; *BG Affiliation* is the market share of group-affiliated incumbents; *Inc. Total Cash* is the incumbent firms' total cash. *BG Total Cash* is the total cash held by an incumbent-affiliated group. This is computed by adding all the group subsidiaries' cash holdings, excluding the cash held by the incumbent. TFP in the interaction term indicates the average TFP of *affiliated* incumbents. All market characteristics are computed as weighted averages. See appendix A.1 for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses. One star denotes significance at the 10% level, two stars denote significance at the 5% level, and three stars denote significance at the 1% level.

Table 5: **Group Liquidity and Entry: Access to External Capital**

| | Tangibility | | Sectoral demand shocks | |
| | Low tang. | High tang. | Busts | Booms |
	(1)	(2)	(3)	(4)
Size	-0.242***	-0.264***	-0.304***	-0.467***
	(0.028)	(0.031)	(0.101)	(0.074)
Δ Size	-0.040**	-0.087***	0.138	0.090
	(0.017)	(0.019)	(0.084)	(0.061)
ROA	0.107**	0.074	-0.179***	0.212**
	(0.048)	(0.049)	(0.066)	(0.092)
Capital Intensity	-0.013	-0.007	-0.040***	-0.002
	(0.028)	(0.014)	(0.011)	(0.068)
HHI	0.143*	0.225	0.096	0.420*
	(0.076)	(0.177)	(0.133)	(0.241)
Tangibility	0.043	-0.051	-0.269	-0.381
	(0.072)	(0.144)	(0.230)	(0.218)
Average efficiency	-0.002	0.038	0.015	0.197**
	(0.024)	(0.060)	(0.053)	(0.093)
Relative efficiency	0.001	-0.037	0.065	-0.139
	(0.067)	(0.068)	(0.081)	(0.177)
BG Affiliation	-0.026**	-0.032**	-0.032	0.011
	(0.012)	(0.013)	(0.035)	(0.019)
Inc. Cash	0.000	-0.011**	0.001	0.006
	(0.006)	(0.005)	(0.010)	(0.009)
BG Cash	-0.009**	-0.002	-0.013***	0.001
	(0.004)	(0.003)	(0.005)	(0.007)
Market & Year FE	YES	YES	YES	YES
R-squared	0.659	0.517	0.349	0.367
N	1013	1037	490	469

Note: We take the average over time of market *Tangibility* and we define as *High-tangibility* markets as those markets where this time-invariant measure of tangibility is above the median value. We identify *booms* and *busts* from the fluctuations of real sectoral sales, where nominal sales are deflated by *industry* price deflators. We follow a peak-to-trough criterion, where a trough occurs when the (log) of real sales deviates from its trend level by more than one standard deviation. For each trough, we go back in time until we find a local peak, which is defined as the closest proceding year for which cyclical real sales (the difference between actual and trend values) are higher than during the previous and posterior year. A bust goes from the year after the local peak to the year of the trough. The same procedure is used to identify sectoral booms. A peak occurs when current real sales are more than one standard deviation above their trend. Once identified a peak, we go back in time until we find a local trough. The years falling between a local trough and a peak are labeled as a boom. See appendix A.1 for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses. One star denotes significance at the 10% level, two stars denote significance at the 5% level, and three stars denote significance at the 1% level. The p-values on the difference between the two coefficients of BG Cash being different from zero are 0.067 and 0.051.

Table 6: **Group Liquidity and Entry: Access to External Capital**

	Long-run growth		Patents growth	
	High growth	**Low growth**	**High growth**	**Low growth**
	(1)	(2)	(3)	(4)
Size	-0.271***	-0.300***	-0.226***	-0.302***
	(0.027)	(0.044)	(0.024)	(0.037)
Δ Size	-0.038**	-0.045*	-0.055***	-0.064**
	(0.017)	(0.026)	(0.013)	(0.028)
ROA	0.082	0.090*	0.118***	0.071
	(0.064)	(0.051)	(0.041)	(0.050)
Capital Intensity	0.008	-0.014	-0.016	0.025
	(0.030)	(0.010)	(0.013)	(0.033)
HHI	0.163*	0.150	0.147**	0.194
	(0.094)	(0.114)	(0.061)	(0.164)
Tangibility	-0.081	0.101	0.031	0.046
	(0.086)	(0.088)	(0.071)	(0.128)
Average efficiency	-0.023	0.036	0.025	-0.028
	(0.027)	(0.044)	(0.027)	(0.049)
Relative efficiency	0.011	-0.019	-0.056	0.075
	(0.071)	(0.069)	(0.063)	(0.082)
BG Affiliation	-0.016	-0.032***	-0.044***	-0.007
	(0.013)	(0.011)	(0.011)	(0.011)
Inc. Cash	-0.005	-0.002	-0.008*	-0.002
	(0.005)	(0.006)	(0.004)	(0.006)
BG Cash	-0.009***	-0.0035	-0.011***	-0.001
	(0.003)	(0.004)	(0.003)	(0.004)
Market & Year FE	YES	YES	YES	YES
R-squared	0.658	0.547	0.680	0.500
N	1026	1024	1088	962

Note: Columns (1) and (2) classify industries based on the growth of the real value of sales during our sample period, 1995-2004. The real value of sales is computed using industry price deflators. *High-growth* industries are those where the growth of real sales exceeds the median growth of all manufacturing industries. Columns (3) and (4) classify sectors based on the number of patents awarded by the European Patent Office to French firms over the period 1995-2003, at the (4 digit) sectoral level. *High growth* industries are those where the growth of awarded patents is above the median. See appendix A.1 for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses. One star denotes significance at the 10% level, two stars denote significance at the 5% level, and three stars denote significance at the 1% level. The p-values on the difference between the two coefficients of BG Cash being different from zero are 0.108 and 0.022.

Table 7: **External Financial Dependence**

ISIC Code	NAF Code	Industrial Sector	External dependence
311	15.1-15.8	Food products	0.1368
313	15.9	Beverages	0.0772
314	16	Tobacco	-0.4512
321	17	Textiles	0.4005
322	18.1/18.2	Wearing apparel, except footwear	0.0286
323	19.1/19.2/18.3	Leather products	-0.1400
324	19.3	Footwear	-0.078
331	20	Wood products, except furniture	0.2840
332	36.1	Furniture except metal	0.2357
341	21	Paper and products	0.1756
342	22	Printing and publishing	0.2038
352	24.2-24.7	Other chemicals	0.2187
353	23.2	Petroleum refineries	0.0420
354	23.1	Misc. petroleum and coal products	0.3341
355	25.1	Rubber products	0.2265
356	25.2	Plastic products	1.1401
361	26.2-26.4	Pottery, china, earthenware	-0.1459
362	26.1	Glass and products	0.5285
369	26.5-26.8	Other non-metallic products	0.0620
371	27.1-27.3/27.5	Iron and steel	0.0871
372	27.4	Non-ferrous metals	0.0055
381	28	Fabricated metal products	0.2371
382	29/30	Machinery, except electrical	0.4453
383	31/32	Machinery, electrical	0.7675
384	34/35	Transport equipment	0.3069
385	33	Prof and scient equipment	0.9610
390	36.2-36.6	Other manufactured products	0.4702
3511	24.1	Industrial chemicals	0.2050

Note: *External financial dependence* is the share of capital expenditures not financed with cash flow from operations. The external financial dependence is computed for U.S. publicly listed companies in the period 1986-1995 and then is aggregated over time and across companies in a given industry (using the industry median).

Table 8: **Group Liquidity and Entry: Needs for External Funds and ICM activity**

	External Dependence		Number of Fin. Interm.	
	High ED	**Low ED**	**High FI**	**Low FI**
	(1)	(2)	(3)	(4)
Size	-0.213***	-0.330***	-0.266***	-0.215***
	(0.027)	(0.023)	(0.026)	(0.037)
Δ Size	-0.055**	-0.034*	-0.052***	-0.59**
	(0.021)	(0.019)	(0.013)	(0.024)
ROA	0.113**	0.029	0.161**	0.053
	(0.051)	(0.060)	(0.072)	(0.042)
Capital Intensity	-0.048*	-0.026**	-0.018	0.009
	(0.025)	(0.011)	(0.012)	(0.036)
HHI	0.044	0.254**	0.079	0.211
	(0.101)	(0.119)	(0.080)	(0.154)
Tangibility	0.098	0.017	0.013	0.038
	(0.095)	(0.075)	(0.079)	(0.104)
Financial Intermediaries			0.001	0.001
			(0.001)	(0.002)
Average efficiency	0.005	0.018	0.011	0.028
	(0.026)	(0.056)	(0.029)	(0.046)
Relative efficiency	-0.050	0.004	-0.091	0.034
	(0.073)	(0.064)	(0.092)	(0.055)
BG Affiliation	-0.017	-0.038***	-0.040***	-0.003
	(0.012)	(0.012)	(0.013)	(0.014)
Inc. Cash	-0.004	-0.008	-0.002	-0.002
	(0.005)	(0.005)	(0.004)	(0.007)
BG Cash	-0.009**	-0.004	-0.008**	-0.004
	(0.0036)	(0.0026)	(0.003)	(0.004)
Market & Year FE	YES	YES	YES	YES
R-squared	0.578	0.652	0.751	0.346
N	1134	916	1026	1023

Note: *High-ED* industries are those where external financial dependence is above the median value. Columns (3) and (4) classify industries based on the number of financial intermediaries of incumbents-affiliated groups. *High-FI* industries are those where incumbents are affiliated with groups whose number of financial intermediaries is above the median value. See appendix A.1 for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses. One star denotes significance at the 10% level, two stars denote significance at the 5% level, and three stars denote significance at the 1% level. The p-values on the difference between the two coefficients of BG Cash being different from zero are 0.107 and 0.20.

Table 9: **Business Group Liquidity And Entry: Additional Evidence**

	(1)	(2)	(3)
Size	-0.268***	-0.270***	-0.255***
	(0.026)	(0.026)	(0.024)
Δ Size	-0.039**	-0.044***	-0.054***
	(0.015)	(0.015)	(0.014)
ROA	0.076*	0.077*	0.086**
	(0.041)	(0.041)	(0.037)
Capital Intensity	-0.010	-0.011	-0.008
	(0.010)	(0.011)	(0.012)
HHI	0.134*	0.142*	0.172**
	(0.073)	(0.074)	(0.076)
Tangibility	0.039	0.035	0.019
	(0.070)	(0.071)	(0.066)
Average Efficiency	0.007	0.009	0.006
	(0.025)	(0.025)	(0.025)
Relative Efficiency	-0.013	-0.016	-0.012
	(0.048)	(0.049)	(0.050)
BG Affiliation	-0.030***	-0.030***	-0.026***
	(0.008)	(0.008)	(0.008)
Incumbent Total Cash	-0.006	-0.007*	-0.005
	(0.004)	(0.004)	(0.003)
BG Cash $Shock_{i,t}^{-}$	0.023***		
	(0.008)		
BG Cash $Shock_{i,t}^{+}$		-0.006	
		(0.006)	
BG Total Cash			-0.007**
			(0.003)
Incumbent Loans from BG			-0.005
			(0.034)
Market & Year FE	YES	YES	YES
R-squared	0.612	0.610	0.600
N	1957	1957	2050

Note: $Shock_{i,t}^{-}$ indicates a negative shock to group liquidity in year t and takes a value one if there is a fall in group cash flows of more than 10% year t relative to the previous year, and zero otherwise. $Shock_{i,t}^{+}$ indicates a positive shock and takes a value one if there is an increase in group cash flows of more than 10% in year t relative to the previous year and zero otherwise. *Incumbent Loans from BG* measures loans granted to incumbents by other members of the affiliated group, divided by incumbents' total assets in the market. See appendix A.1 for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses. One star denotes significance at the 10% level, two stars denote significance at the 5% level, and three stars denote significance at the 1% level.

A   Appendix

A.1   Variable Description

Unweighted variables:

- *Size:* Log of total sales in the market;

- Δ *Size:* Difference between the log of total sales in t and the log of total sales in $t-1$;

- *HHI:* Herfindahl index of the market. HHI is computed as the sum of the squares of the market shares of all firms in the market;

The following variables have been computed as weighted averages of firm-level variables using all firms in the market. Weights are the individual market shares in terms of sales. The firm-level variables are defined as follows:

- *ROA:* Firms' operating cash flow divided by total assets in the market;

- *Capital Intensity:* Firms' total assets divided by their total sales in the market;

- *Tangibility:* Firms' tangible assets divided by their total assets in the market;

- *External Debt To Assets:* Firms' total external debt divided by their total assets in the market. External debt is obtained by subtracting from a firm's total debt all loans obtained from its affiliated group;

The following variables have been computed as weighted averages of *incumbent* firms variables or of variables referred to the *group* the incumbents are affiliated with, using as weights the individual incumbents' market shares in terms of sales. The incumbent- or group-level variables are defined below:

- *Inc. Total Cash:* (Log of the weighted average of) incumbent firms' total cash;

- *Average Efficiency:* Weighted average of incumbent firms' efficiency. We measure *Efficiency* of incumbent firms j in market i at year t using estimates of firm-level total factor productivity (TFP). To compute TFP we use the semi-parametric method first introduced by Olley and Pakes (1996). This methodology allows us to tackle both simultaneity and selection issues involved when trying to consistently estimate the parameters of the production function. To implement the procedure we deflate nominal variables at the two-digit SIC level using price deflators provided by INSEE.The Olley and Pakes (1996) methodology estimates the production function in three steps. As a first step we regress log value added on labor and a polynomial of third degree in investment and capital. The resulting estimate for labor is consistent and can be used to construct residuals of log value added. The second step then accounts for selection using a Heckman-type control function. We thus estimate the probability of survival by estimating a probit

model of the exit decision on a power series of order three in investment and capital. This allows us to define the estimated probability of exiting and to include it in the final step to correct for the selection bias due to attrition. In the final step we obtain the capital coefficient in the production function by approximating the unobserved productivity shock with a nonparametric function of investment, current capital stock and the probability of survival. This last step addresses the simultaneity bias assuming that the investment function can be inverted. Consistent estimation of labor and capital then allows us to construct our firm-level productivity measures.

- *Relative Efficiency:* Ratio between TFP of large affiliated incumbents and TFP of small stand-alone incumbents. Large affiliated incumbents are those belonging to the top quartile of the distribution of affiliated firms' size. Small stand-alone incumbents are those belonging to the bottom quartile of the distribution of stand-alone firms' size.

- *BG Total Cash:* (Log of the weighted average of) total cash held by an incumbent-affiliated group. This is computed by adding all the group subsidiaries' cash holdings, excluding the cash held by the incumbent;

- *Total Cash* is the sum of Net Liquid Assets and Operating Cash Flow. Net Liquid Assets is computed as current assets (cash and cash equivalents, marketable securities, accounts receivable, inventories) minus current liabilities (debt due within one year, payables) minus inventories. Operating cash flow is computed as the difference between a firms' EBIDTA and variation in working capital;

- *BG Affiliation:* Market share of BG affiliated incumbents in the market;

- *Financial Intermediaries:* Total number of financial intermediaries owned by the group;

- *Loans of Inc. From BG:* Loans granted to incumbents by other members of the affiliated group, divided by incumbents' total assets in the market.

A.2   Additional robustness

Table 10: **Business Group Liquidity And Entry: Employment-weighted Entry Rates**

	(1)	(2)	(3)	(4)
Size	-0.225***	-0.199***	-0.191***	-0.191***
	(0.026)	(0.026)	(0.026)	(0.026)
Δ Size	-0.032**	-0.048***	-0.050***	-0.049***
	(0.013)	(0.015)	(0.015)	(0.015)
ROA	0.109***	0.119***	0.112***	0.111***
	(0.039)	(0.040)	(0.035)	(0.036)
Capital Intensity	-0.016	-0.010	-0.016	-0.017
	(0.011)	(0.013)	(0.015)	(0.014)
HHI	0.168*	0.182**	0.202**	0.200**
	(0.086)	(0.082)	(0.084)	(0.083)
Tangibility	0.018	0.009	-0.007	-0.015
	(0.066)	(0.074)	(0.077)	(0.079)
Average Efficiency	-0.009	-0.015	-0.014	0.090
	(0.026)	(0.026)	(0.025)	(0.064)
Relative Efficiency	-0.054	-0.045	-0.041	-0.041
	(0.059)	(0.060)	(0.061)	(0.060)
BG Affiliation	-0.020*	-0.026**	-0.026**	-0.025**
	(0.011)	(0.012)	(0.012)	(0.012)
Inc. Cash		-0.017***	-0.014**	-0.014**
		(0.006)	(0.007)	(0.007)
BG Cash			-0.010***	0.011
			(0.003)	(0.012)
BG Cash x TFP				-0.007*
				(0.004)
Market & Year FE	YES	YES	YES	YES
R-squared	0.431	0.442	0.449	0.450
N	2239	2100	2050	2050

Note: Sectoral-level data between 1995 and 2004. Entry in sector i year t is the ratio of employment of entrant firms over total employment in sector i year t. *Size* is the (log of) total sales; Δ *Size* is the change in market size from $t-1$ to t; *ROA* is the ratio of operating profits to total assets in a given market; *Capital intensity* is the ratio of fixed assets over output; *HHI* is the Herfindhal index (firms' market shares computed in terms of sales); *Tangibility* is ratio of tangible assets to total assets; *Average Efficiency* is the (weighted) average of incumbents' TFP; *Relative Efficiency* is the ratio of TFP of large affiliated firms to TFP of small stand-alone firms; *BG Affiliation* is the market share of group-affiliated incumbents; *Inc. Total Cash* is the incumbent firms' total cash. *BG Total Cash* is the total cash held by an incumbent-affiliated group. This is computed by adding all the group subsidiaries' cash holdings, excluding the cash held by the incumbent. TFP in the interaction term indicates the average TFP of *affiliated* incumbents. All market characteristics are computed as weighted averages. See appendix A.1 for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses. One star denotes significance at the 10% level, two stars denote significance at the 5% level, and three stars denote significance at the 1% level.