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The Deep-Pocket Effect of Internal Capital Markets

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Summary

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Keywords: Business Groups, Cash Holdings, Internal Capital Markets, Deep-Pockets, Market Entry

JEL Classification: G32, G38, L41

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The Deep-Pocket Effect of Internal Capital Markets*

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Abstract

We provide evidence suggesting that incumbents' 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 presents three major findings. First, the amount of cash holdings owned by incumbent-affiliated groups is negatively related to entry in a market. Second, the impact on entry of group deep pockets is more important in markets where access to external funding is likely to be more difficult. Third, the “entry deterring effect” of group deep pockets is more pronounced when groups have more active internal capital markets. Our findings suggest that internal capital markets operate within corporate groups and that they have a potential anti-competitive effect.

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1 Introduction

A large body of literature has emphasized the role of firms' financial strength in affecting industry entry and exit patterns. However, it is only recently that economists have started investigating within formal models whether access to corporate groups' deep pockets, as opposed to own financial resources, represents a source of market power for incumbent firms.

In contrast with such a late consideration, the informal idea that affiliation with a corporate group may enhance a firm's market power has been circulating long since, the received wisdom being that groups have the ability to leverage upon their dominant position in one market to achieve market power in other sectors. An appealing argument behind this claim is that anti-competitive spillovers may originate from financial phenomena: indeed, groups can channel resources from cash-rich subsidiaries enjoying a dominant position in one market towards units facing more intense competition, thereby supporting the latter's aggressive product market strategies.¹ In this paper we present empirical evidence suggesting that these concerns are well-grounded.

To the best of our knowledge, this is the first paper that tries to assess the impact of group financial strength – as opposed to individual firm deep pockets – on product market competition. Our analysis relies on quite unique information on firms' balance sheets and the ownership structure of business groups provided by the INSEE (Institut National de la Statistique et des Etudes Economiques). We thus focus on the French economy, an intriguing case study for our purposes: recent statistics 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 dominant positions in their markets.² One possible explanation for this is that access to corporate groups' deep pockets helps incumbent firms to deter 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 – the liquid wealth owned by affiliated subsidiaries operating in other markets is negatively related to entry in the incumbents' market. Of course, this result is not enough to establish the existence of a causal link between group deep pockets and entry. Unobserved factors (e.g. group efficiency) may be driving simultaneously entry in a market and group

¹In Europe, the debate about group market power has been revived 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 largely relied on long-purse arguments, maintaining that a merger with GE would allow Honeywell to rely on GE's deep pockets to fund predatory practices in its own markets. Additionally, in the 2008 Guidelines on the enforcement of Article 82, the EC has expressed concerns about dominant firms subsidizing their non-dominant affiliates' exclusionary practices. A major critique to the Commission's approach is that its statements about financially driven multi-market spillovers are not supported by a sound theoretical and empirical underpinning.

²See Skalitz (2002). This evidence is in line with recent empirical work highlighting the role played by diversified business groups in various countries, including continental Europe. See the ECGN (1997), La Porta, Lopez-de-Silanes and Shleifer (1999), Claessens, Djankov and L. Klapper (2000) and Khanna and Yafeh (2007) for evidence on the ubiquity of business groups around the world.

cash holdings in other markets. To tackle this concern, in the absence of a quasi-natural experiment providing exogenous variation in group liquid wealth, we adopt a theory-driven empirical approach and test a battery of predictions from Cestone and Fumagalli (2005), who study the conditions under which access to a group’s internal capital market allows incumbent firms to be credibly perceived as stronger competitors by potential entrants. We deliver two results that are in line with their theory and, at the same time, incompatible with competing explanations based on real phenomena.

The first prediction we test is that the entry deterrence effect of group deep pockets should be stronger when group-affiliated incumbents have a more difficult access to external finance. This is because credit rationed group units are more likely to receive liquidity injections within an efficient internal capital market. We find that in industries where firms hold less collateralizable assets entry is more sensitive to *group* liquidity and at the same time less sensitive to *incumbent* liquidity. It is difficult to explain this twofold result if not relying on internal capital market phenomena.

The second prediction we draw from Cestone and Fumagalli (2005) is that the entry-deterrence effect of group deep pockets should be boosted by the intensity of internal resource reallocation taking place within the group. We test this prediction by interacting our measure of group liquidity with the intensity of internal capital market activity, which we measure with the amount of intra-group loans. We find evidence that group deep pockets have a significantly larger effect on entry in markets where incumbent-affiliated groups display more intra-group lending. We complement this finding by using two alternative proxies of internal capital market activity, i.e. group diversification and presence of financial intermediaries, and find qualitatively similar results. We view these findings as compelling evidence that an internal capital market channel generates a causal connection between group deep pockets and product market entry. Indeed, we maintain that competing theories – based on real as opposed to financial phenomena – would fail to rationalize the findings in this paper.

Our paper contributes to the deep pocket literature dating back to Telser (1966), arguing that when firms have limited access to external funds, financial muscle is a source of competitive advantage.³ An extensive body of evidence has in fact confirmed that industry outcomes are affected by the financial status of market participants.⁴ Building on this idea, a few recent theoretical papers have 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 investigated whether and how access to

³The basic deep pocket argument is that financially fit incumbents are in a position to engage in predatory practices in order to financially exhaust their rivals and drive them out of their markets (see Bolton and Scharfstein 1990 for a formal model). Deep-pockets represent an entry deterrence tool if financial constraints undermine an entrant’s ability to endure a price war (Benoit 1984).

⁴See, 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.

⁵See Matsusaka and Nanda (2002), Cestone and Fumagalli (2005), Faure-Grimaud and Inderst (2005) and Mathews and Robinson (2008). The major insights from this literature are discussed in the next section.

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 disentangle the impact of group financial strength from that of own financial strength on the product market behavior of incumbents and their rivals.

Our work 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 sheets data of group-affiliated firms, i.e. of independent legal entities controlled by a single individual or family.⁶ Interestingly, both strands of the empirical literature have tested predictions derived from *multidivisional firm* models, where centralized borrowing takes place before resources are allocated across divisions of a diversified firm. By contrast, we draw our theoretical predictions from Cestone and Fumagalli (2005), who analyze the functioning of internal capital markets in *business groups* with an ad-hoc model allowing individual subsidiaries to receive cash injections from group headquarters while also enjoying autonomous access to external finance. Our evidence supports their prediction that only cash-rich groups can be expected to channel resources towards subsidiaries hit by adverse shocks such as new entry. Indeed, our finding that group affiliation *per se* need not deter entry is in line with their idea that internal capital markets entail strategic costs and benefits for member firms, with the latter prevailing when pooled internal resources are large.

To conclude, our paper ultimately provides an indirect test of the perfect capital market hypothesis. In a perfect capital market model, the entrants' willingness to compete with a long-pursed group should not be affected by the intensity of internal resource reallocation within the group itself. Conversely, an imperfect capital market model implies that group deep pockets may scare perspective entrants out of a market, especially so when the group has a very active internal capital market: this implication is supported by our empirical findings. In this respect, our paper is related to the wider strand of empirical literature that has tried to establish a causal link between firm cash and real investment decisions thus concluding that external capital markets are imperfect.⁷ The most related paper to ours is Lamont (1997), who pioneered the idea that real investment in one market can react to cash flow shocks in other markets due to an internal capital market channel. In the same vein, we asked whether the product market competition faced by industry incumbents is affected by the cash holdings of subsidiaries operating in other, possibly unrelated markets.

⁶Among 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), and Scharfstein and Stein (2000). 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) and Samphantharak (2006) find that internal assets are extensively reallocated within Russian and Thai business groups. We refer to Stein (2003) for a more ample survey of the internal capital market literature.

⁷See Hubbard (1998) and Stein (2003) for detailed surveys of this literature.

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 presents a detailed discussion of the dataset and of the variables used in the analysis. Section 4 presents the empirical results and section 5 various robustness checks. Section 6 concludes.

2 Internal Capital Markets and Product Market Competition

2.1 Theoretical Framework

A set of recent theoretical papers have put forth the idea that the competitive behavior of multimarket firms and groups is bound to be shaped by the interplay between Internal Capital Markets (henceforth denoted also as ICM) and product market competition. The main message one can draw from this literature is that, in the presence of financial market frictions, the resource flexibility enjoyed by groups and multi-segment firms thanks to internal capital markets entails both strategic benefits and costs. Matsusaka and Nanda (2002) unveil a commitment cost of internal capital markets: entry in an industry may be encouraged if a group is 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”, which in turn would undermine their ability to deter entry. An objection to this argument is that access to an internal capital market may rather be a source of entry-deterrence power if business units are expected to receive a liquidity injection whenever facing new competitors. In this respect, a central question is how – within an internal capital market – resources are reallocated following a shock to one of the sectors where the group operates.

While most theoretical models of internal capital markets display *either* winner-picking *or* cross-subsidization taking place across differently profitable units,⁸ Cestone and Fumagalli (2005) have argued that within business groups, both phenomena may be observed at different levels of pooled liquidity. Indeed, cash-poor groups are more prone to engage in “winner picking”, thus exiting those markets where competition has turned more intense. Conversely, cash-rich groups find it ex-post optimal to cross-subsidize units facing tougher competition, to the extent that the latter face higher costs of outside finance when compared to units enjoying market power in their own sectors.⁹ Anticipating this, potential rivals may give up entering a market whose incumbent is “backed” by cash-rich affiliates.¹⁰ This implies that the commitment cost of internal capital markets as highlighted by Matsusaka and Nanda (2002)

⁸See e.g. Stein (1997) on the one hand, and Scharfstein and Stein (2000) on the other hand.

⁹The 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 smaller for more profitable units who can raise outside funds more easily. 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.

¹⁰This is related to an earlier idea that credit lines and loan commitments have an important strategic value for firms operating in imperfectly competitive product markets (see Maksimovic 1990).

only affects *cash-poor* groups.¹¹ To summarize, the main message delivered by this literature is that affiliation with a group (i.e., access to its internal capital market) does not *per se* represent a source of entry deterrence power: affiliation with a *cash-rich* group does.

A major empirical implication of the literature is that if access to financial resources is a source of competitive strength *and* internal capital markets operate within business groups, then 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 testable prediction that – controlling for the incumbent’s own liquidity – a market should display lower entry rates when incumbent-affiliated subsidiaries have larger cash holdings. In what follows, we delineate our empirical model. In particular, we derive two further testable implications of the theory that play an important role in our empirical strategy.

2.2 Empirical Design

Basic Entry Equation

We lay out here our baseline empirical model to uncover the link between the cash holdings of groups affiliated with market incumbents and entry rates in product market i and year t , controlling for a list of factors that includes incumbents’ own liquidity.

Formally,

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

where $Entry_{i,t}$ is the entry rate in market i at time t ,¹² 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. 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 degree 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. Finally, θ_t is a full set of year dummies that takes care of all aggregate shocks that affect all sectors equally. 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.

¹¹Faure-Grimaud and Inderst (2005) focus on multi-divisional firms rather than business groups. Their model of product market competition and financing also implies 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 a stand-alone firm.

¹²We refer the reader to section 3.2 for a detailed description of the variables.

The literature has until now focused on the role of individual *firm* deep pockets, as captured in equation (1) by the coefficient γ_2 . Differently, the focus of this paper is on *group* deep pockets: we investigate whether a causal link between group deep pockets and entry in product markets exists, due to an internal capital market channel. In a sense, this is less problematic than assessing the entry-deterrence effect of incumbents' own deep pockets. Tests of the basic deep pocket theory have to tackle the concern that market entry and incumbent cash holdings are likely to be jointly driven by underlying profitability shocks.¹³ Now, these endogeneity concerns are less compelling when it comes to estimating the role that group deep pockets play in product markets. This is because, differently from own incumbent's liquidity, the cash holdings of units operating in *other markets* are less likely to be affected by shocks to market i .¹⁴ Thus, it is important to emphasize that in equation (1) we make a distinction between an incumbent's liquidity and the cash held by the *rest of the group* this incumbent is affiliated with.

We reckon that it would be unwise to readily interpret the results from the estimation of equation (1) as evidence of a causal link between group cash and entry. The reason is that the extent to which group cash holdings in other markets can confidently be treated as exogenous depends on the correlation between shocks affecting those markets and market i . In other words, there may be variables omitted from equation (1) that determine both entry rates in market i and group cash holdings in other markets. In fact, as previous papers have emphasized, standard industrial classification codes used to identify markets may not perfectly reflect the relatedness or unrelatedness of business subsidiaries.¹⁵ For instance, entrants may be scared out of markets where cash-rich groups are present simply because the latter are (perceived as) more efficient in managing all their subsidiaries. This story is compatible with a model where external capital markets are perfect (and thus internal capital markets superfluous), suggesting that even if a link between entry and group deep pockets exists, it needs neither be causal nor be ascribed to an ICM channel. Rather, it may be generated by an unobserved group characteristic (efficiency) that affects both entry rates and group cash.¹⁶

To try and go beyond the analysis of simple correlations, we draw and put to test additional predictions from Cestone and Fumagalli (2005) that relate the importance of group deep pockets to the degree of *external* capital market imperfections and the intensity of *internal* capital market activity. This theory-driven empirical approach aims at providing additional pieces of evidence that are consistent with a model where internal capital markets have product market effects, while being hard to rationalize with competing theories.

¹³This concern is, at least partially, addressed in equation (1) by the list of controls described above, that reduces the likelihood that omitted variables drive the correlation between incumbents' cash and entry patterns. See Frésard (2008) for an instrumental variable approach to this problem.

¹⁴Lamont (1997) has been the first to propose this argument to test whether multi-segment corporations condition their real decisions (in his case, real investment) in one sector to variations in cash flows in other sectors.

¹⁵Chevalier (2000) points out that common factors specific to a conglomerate firm may drive correlations between otherwise unrelated SIC codes.

¹⁶For this reason, in section 5, we will extend the baseline specification and control for group ROA to account for group efficiency.

Group Deep Pockets and External Capital Markets

If the impact of group deep pockets on market entry is due to an internal capital market channel, then those incumbents that are most likely to receive liquidity injections from their affiliated group should benefit more from group deep pockets. As implied by Cestone and Fumagalli (2005), within an efficient ICM, business units with easier access to external capital should receive less internal capital injections.¹⁷ We thus complement our estimates by testing the following prediction: group deep pockets should matter more for entry in markets where access to external funding is *more* difficult.

We test this prediction by splitting our sectors into two sub-samples according to the ease of access to the external capital market, that we proxy through the share of tangibles over total assets (*Tangibles*). We then estimate equation (1) separately for sectors above and below the median of the (market-year) distribution of the ratio of tangibles to total assets. We expect to find that group deep pockets are more effective at deterring entry in markets where the ratio of tangibles to total assets is low.

Evidence consistent with this prediction would make us more confident that we are indeed capturing the effects of ICM activity. Still, we cannot definitely exclude alternative explanations. For instance, more efficient (hence, more cash-rich) groups may be better able to scare potential entrants out of a market when the latter find it harder to raise external finance. To tackle this last concern we test an additional prediction which is utterly specific to an internal capital market model.

Group Deep Pockets and Internal Capital Markets

If the correlation between group liquidity and entry is driven by internal capital market phenomena, then such correlation should be stronger whenever internal capital markets are more active. Conversely, in a perfect capital market model, the entrant's willingness to compete with a long-pursed group should not be affected by the *intensity* of resource reallocation taking place within the group.

Therefore, we extend our baseline specification introducing a measure of the intensity of ICM activity in incumbent-affiliated groups ($ICM_{i,t-1}$), and interacting it with the rest-of-group cash holdings ($TC_{i,t-1}^{BG} \times ICM_{i,t-1}$):

$$\begin{aligned} Entry_{i,t} = & \gamma_1 TC_{i,t-1}^{BG} + \gamma_2 TC_{i,t-1}^{INC} + \gamma_3 TC_{i,t-1}^{BG} \times ICM_{i,t-1} + Z_{i,t-1}^{INC} \lambda_1 \\ & + \lambda_2 ICM_{i,t-1} + X_{i,t-1} \beta + \alpha_i + \theta_t + \varepsilon_{i,t}, \end{aligned} \quad (2)$$

where we use three alternative measures of the intensity of ICM activity: (*i*) a direct measure, as provided by the amount of intra-group loans within a group; and two proxies, namely (*ii*) the number of financial intermediaries within the group and (*iii*) the extent of group

¹⁷Gopalan, Nanda and Seru (2007) provide evidence that this is indeed the case in Indian business groups, where firms with more tangible assets, and thus easier access to collateralized credit, are among the main providers of group loans, whereas firms with less tangibles tend to receive group loans.

diversification.¹⁸

Evidence that the entry deterrence effect of group deep pockets is stronger when groups have more active internal capital markets can only be rationalized by a model where cash-rich groups channel resources in favor of weaker units, thereby supporting the latter’s aggressive product market strategies. We are confident that this last exercise will allow us to discard competing explanations – based on real as opposed to financial phenomena – of the correlation patterns that emerge from the simple estimation of equation (1).

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 financial wealth of individual firms, but also on firm ownership status. The latter allows 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 US SIC 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 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

¹⁸See section 4.3 for a discussion of these measures.

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 a new business group a pre-existing one whose head of the group 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.¹⁹ 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. Moreover, as explained in section 3.2, the availability of information on the structure of business groups also allows to reduce the noise in the identification of entrant firms.

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.²⁰ 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.²¹ 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'Activité 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 industries, 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 outside a multiple of five of the interquartile range. These restrictions leave

¹⁹This 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.

²⁰The 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.

²¹In 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.

us with a sample of approximately 70,000 firms per year that we collapse into 2683 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 $t - 1$, with the additional condition for group-affiliated firms that no other firm of the same group was active in that market at time $t - 1$. Thus, the availability of trustworthy information on the group structure allows *per se* to obtain more meaningful measures of entry as we are able *not* to consider as entry the appearance of a firm in a market where another firm of the same group was already operating. Moreover, it also allows to (partially) handle potential misclassification of entrant firms due to the re-labeling of the firm and not to true entry, at least for firms that are affiliated with a group. In fact, we do *not* consider as entrants all group-affiliated firms that change their identifiers as long as another firm of the same group is present in the same market.²²

We compute two measures of entry. The first measure of entry in market i in year t ($Entry_{i,t}$) is the ratio of total employment of entrant firms to total employment in the market, in a given year t . Differently stated, in order to account for size effects, we weight entry rates (defined as number of entrants over total number of firms) by employment (see Aghion, Fally and Scarpetta 2007). Our second measure of entry uses different weights as it is the ratio of the aggregate turnover of entrant firms to total turnover in the market, in a given year t . The advantage of the former measure is that employment figures are measured with a high degree of precision. The latter measure, however, allows us to better measure entry by multidivisional firms since the “Enquête Annuelle des Entreprises” includes information on market dedicated sales for each segment of a firm. We report results for both measures.

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. If a group operates in a given market through several subsidiaries we aggregate them and treat them as a single unit. We then compute market shares in terms of sales of each 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

²²Unfortunately, we are not able to handle misclassification in other potentially relevant cases, as the case of stand-alone entrant firms. However, we are confident that we have removed most of the noise as group sales account on average for as much as 72% of the market, as reported in Table 1.

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.²³

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 affiliation on entry.

The remaining variables refer to all firms in the market. Profitability of market i in year t is the weighted average of the return on assets (*ROA*) of all firms present in market i in year t . 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*). We proxy access to credit in a given market/year using the weighted average of the ratio of tangible assets to total assets (*Tangibles*). Next, we measure reliance on external debt as the (weighted average of) the ratios of non-group loans to total assets (*External Debt to Assets*). 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*.

We build one direct measure of internal capital market activity and two proxies. As most of the internal reshuffling of resources within groups takes place through internal loans (Gopalan, Nanda and Seru 2007) our direct measure of ICM is the (weighted average of the) total amount of intra-group loans (*Reshuffling*).²⁴ Our first proxy for the intensity of ICM activity is *Financial Intermediaries*. It equals the (weighted average of the) number of financial intermediaries owned

²³Our weighted averages are meant to capture the idea that larger incumbents are more likely to affect market entry. Indeed, only for incumbents with large market shares the long term benefits of predatory practices outweigh their short term costs, an argument reflected in antitrust authorities' focus on firms enjoying dominant positions in their markets. Note that our 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).

²⁴To avoid double counting this is computed as sum of the absolute value of all intra-group loans/credits divided by the number of firms that borrow/lend within the group.

by a group. The second proxy is a measure of how diversified is the activity of the group across different markets. We measure (the inverse of) diversification (*Focus*) by first computing the shares of each unit's sales within the group and then summing their squared values. This index is an HHI calculated within a group, and takes a value of 1 when all the activity of the group is concentrated in a single market (See Peyer, 2002).²⁵

Further group characteristics include *BG ROA* and *Loans of Inc. From BG*. The first, *BG ROA*, is computed in two steps. For each group, we compute the weighted average of units' ROAs using as weights the units' share of total group sales. Then, for each market we take the weighted average for all group-affiliated incumbents. The second, *Loans of Inc. From BG*, 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

Tables 1, 2 and 3 provide descriptive statistics.

Entry Rates

Table 1 presents descriptive statistics of markets in terms of entrants and incumbents. The first three rows present entry in terms of absolute number of firms. On average, 46 firms enter a market in a given year. However, consistent with evidence by Dunne, Roberts and Samuelson (1988) we find that entrant firms cover, most of the time, only a small fraction of market sales. Indeed, entrants with more than 1% of market shares are much harder to find (on average only slightly more than 2), and entrants that capture more than 5% of the market in their first year of 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 of them with significant market shares.

The last two rows report entry rates into manufacturing activities weighted by sales (using employment weights does not alter the picture). We find that despite the high heterogeneity in the size of entrants, entry rates are relatively less dispersed 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 thus close to the figures reported by Aghion, Fally and Scarpetta (2007) and Dunne, Roberts and Samuelson (1988). The very last row reports the entry rate of firms affiliated with business groups. Interestingly, entry by group-affiliated firms represents a high 3/4 of total entry.

Market Characteristics

Column (1) of Table 2 presents average market characteristics. Columns (2) and (3) present average market characteristics conditional on the total cash of the business group the incumbents are affiliated with, i.e. respectively above and below the median of the market-year distribution of business group total cash.

²⁵Remember that we treat all firms of the same group that operate in the same market as a single unit.

Even though one cannot draw firm conclusions from the comparison of these market-level unconditional means, it is interesting to notice that on average entrants constitute around 16% of market sales (column 1), irrespectively of whether incumbents are affiliated with cash-rich or cash-poor groups (columns 2 and 3). The second row confirms that business groups are pervasive in French manufacturing industries. Group-affiliated incumbents represent on average 72% of market sales, the market share being significantly greater for incumbents affiliated with cash-rich groups. Markets where incumbents are affiliated with cash-rich groups also tend to be slightly larger, more concentrated, more capital intensive and with a lower share of tangibles to total assets compared to markets where incumbents are affiliated with cash-poor groups. At the same time, markets where incumbents are affiliated with cash-rich groups seem to be both equally profitable and as leveraged as markets where incumbents are affiliated with cash-poor groups.

Business Group Characteristics

Table 3 presents descriptive statistics on business group characteristics. Column (1) presents average characteristics of the business groups incumbents are affiliated with. Columns (2) and (3) present average business groups characteristics for markets respectively above and below the median of the market-year distribution of business groups total cash.

The table shows that markets where incumbents are affiliated with cash-rich groups are also markets where on average the cash holdings of the incumbents are significantly greater. Next, the table reports that business groups are on average present in 16 different markets.²⁶ This number rises to more than 21 for cash-rich business groups and decreases to less than 10 for cash-poor groups. The table also shows that cash-rich groups tend to be less focused, i.e. more diversified, compared to relatively cash-poor business groups, and to own a significantly higher number of financial intermediaries, nearly 1, the average for cash-poor groups being 0.63. However, business groups do not seem to differ in terms of aggregate profitability since cash-rich groups have on average the same operating return on assets as cash-poor groups. Finally, the amount of loans normalized by total assets that incumbents receive from the rest of the group is about 4% irrespectively of the liquid wealth of the group.

The overall picture that emerges suggests that on average cash-rich groups operate in a larger number of markets, are more diversified and hold a higher number of financial intermediaries. They are also as profitable as and grant as much loans to incumbents as cash-poor groups.

4 Results

4.1 Deep Pockets, Business Group Affiliation and Entry

Does Membership in a Business Group Deter Entry?

We first investigate whether incumbents' affiliation with a business group per se affects entry in

²⁶This suggests that business groups in developed economies tend to be significantly more diversified when compared to business groups in developing economies (Samphantharak, 2006).

a market. Theoretical predictions are ambiguous in this respect (see Section 2.1). Specifically, while affiliation with cash-rich groups is expected to discourage entry, affiliation with a cash-poor group invites entry in an incumbent’s market.

Table 4 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.²⁷ Columns (1) to (3) use employment-weighted entry rates. Columns (4) to (6) use sales-weighted entry rates. Column (1) and column (4) only include basic market characteristics, such as market size in levels and growth rates (*Size* and Δ *Size*), profitability (*ROA*), capital intensity and market concentration (*HHI*). Columns (2) and (5) add the market share held by group-affiliated incumbents (*BG Affiliation*). Finally, columns (3) and (6) add a measure of (the inverse of) group diversification (*Focus*) to control for the fact that more focused groups are potentially both more efficient in running their operations and more committed to “stay and fight” when faced with new entry.

Our estimates only partly confirm previous evidence that on average the presence of business groups deters market entry (see e.g. Lawrence, 1991). Results in columns (2) and (5) show that the coefficient of *BG Affiliation*, though always negative, is statistically significant at standard levels only when using the sales-weighted measure of entry. The same happens in columns (3) and (6) where we control for the degree of focus of incumbent-affiliated groups. This mixed result is likely due to the fact that we estimate the *average* effect of business group presence without distinguishing between cash-rich and cash-poor groups, that according to theory behave quite differently when it comes to injecting liquidity in their units. Consistently, Khanna and Tice (2001) show that diversified firms sometimes compete more aggressively and sometimes less aggressively than their stand-alone peers, suggesting that the effect of group presence on product market competition is heterogeneous and depends on group characteristics.

Therefore, we now turn to the role of group deep pockets, allowing the effects of group presence to differ according to the amount of liquidity held.

Do Group Deep Pockets Help Deter Entry?

Table 5 starts addressing the main question of the paper. Theory predicts that if capital markets are not perfect *and* internal capital markets operate within business groups, the amount of financial resources owned by incumbent-affiliated groups should have a negative effect on entry. In particular, controlling for the incumbent’s own liquidity, a market should display lower entry rates when the rest-of-group cash holdings are larger.

Again we present results both with employment- and sales-weighted entry rates, respectively in columns (1)-(3) and (4)-(6). For expositional convenience, columns (1) and (4) reproduce the results from our base regression. Columns (2) and (5) add the incumbents’ cash holdings. Results suggests that the incumbents’ deep pockets negatively affect entry of potential competitors. The effect is statistically significant and economically non-negligible. A 10 percent

²⁷In all regressions we cluster standard errors at the 3SIC sector level in order to account for potential inter-market correlation of the error term.

increase in the cash held by incumbent firms is associated with an average reduction in entry rates of 0.43 percentage points. Given that the average entry rate is 16 percent, this implies an average drop in entry rates of 2.7 percent.^{28,29}

Columns (3) and (6) of Table 5 separately control for incumbent own liquidity and (rest of the) group cash holdings.³⁰ Business group cash has in both specifications a negative and statistically significant impact on entry rates. A 10 percent increase in group cash holdings is associated with a reduction of 0.17 (0.12 in the case of sales-weighted entry rates) 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 1 percent in entry rates. Finally note that once group liquidity is controlled for, business group presence in a market is no longer significant.

Comparing columns (3) and (6) with columns (2) and (5), we observe that once we control for group cash, the product market effect of individual firm liquidity is smaller. This suggests that access to internal capital markets substantially mitigates the credit rationing problems that make firm liquidity relevant for product market behavior, and is consistent with findings by Hoshi, Kashyap and Scharfstein (1991), where membership in a conglomerate group is found to reduce the sensitivity of a firm's investment to its own liquidity.

In summary, we find evidence that an increase in group cash coming from firms operating in other markets is associated with a negative impact on the degree of competition in a market. This is consistent with an imperfect capital market framework where cash rich groups redirect liquidity towards units faced with tougher competition. Our finding suggests that internal capital markets indeed operate within French corporate groups and that access to internal capital markets of cash-rich groups provides member firms with a competitive advantage. However, as discussed in section 2.2, the results obtained so far may also be rationalized by alternative theories that do not rely on internal capital market phenomena. To try and identify a causal link between group deep pockets and entry, we now test additional specific predictions of the theory.

4.2 Group Deep Pockets and Access to External Finance

One important implication of Cestone and Fumagalli (2005) is that, within an efficient ICM, business units with easier access to external capital should receive less internal capital injections. It follows that group deep pockets should matter more for entry in markets where incumbents' access to outside financing is more problematic. A natural proxy for ease of access to external capital is given by the proportion of tangible assets with respect to total assets in the industry.

²⁸This exercise refers to employment-weighted entry rates. Results are consistent for both measures of entry rates.

²⁹In line with our results, Frésard (2008) also finds that the impact of incumbent cash on rivals' entry and expansion is non negligible. For instance, he shows that a one standard-deviation increase in cash holdings allows the average firm to increase its market share by 2.9 percent over the next two years.

³⁰As discussed above, group liquidity is built by adding up the cash holdings of all group operations except the considered incumbent. In addition, group-affiliated incumbents are reconstructed by aggregating all group units operating in the same market.

Indeed, the higher the proportion of tangibles, the easier it is for firms to collateralize loans and thus raise external funds. We therefore expect the entry deterrence effect of group cash holdings to be more important in markets with a low proportion of tangibles.

Table 6 investigates this issue by estimating our equations in the two sub-samples of markets with a proportion of tangibles below (columns 2 and 5) and above (columns 3 and 6) the median. Our results are consistent with the above prediction: the impact of group cash on entry is nearly three times higher in markets with a proportion of tangibles below the median.

Also, in markets where firms hold more tangible assets, incumbents' *own* liquidity seems to be more important for entry. This result is consistent with our ICM theory: incumbents with easier access to credit receive less resources from the rest of the group, and thus have to rely more on their own financial resources.³¹ Note that it is difficult to articulate an alternative, non-ICM based story to explain the twofold result that easier access to credit alleviates group deep pocket effects while enhancing the role of incumbent deep pockets. True, as explained in section 2.2, one may argue that new entrants in sectors where outside funds are easy to raise may be less concerned by the presence of very efficient (and thus cash-rich) business groups. However, this story fails to rationalize our result that entry in high asset-tangibility industries is *more* sensitive to incumbents' own deep pockets.

4.3 Deep Pockets and ICM Activity

The third prediction we test is that group deep pockets should matter more for entry when internal capital markets are more active. We do so by using three different measures of ICM activity, and interacting them with group and incumbent cash.

Intra-Group Loans

Our balance sheet data provide us with a direct measure of the extent of internal liquidity reshuffling, as the amount of intra-group lending taking place within incumbent-affiliated groups is explicitly recorded. Indeed, intra-group lending is often the most important tool through which resources are reallocated within business groups.³² Table 7, columns (1) and (4), suggests that the effect of group deep pockets on entry is larger when incumbent-affiliated groups display more intra-group lending. However, it is interesting to note that intra-group lending *per se* has a *positive* impact on product market entry. This result seems to suggest that the presence of incumbents affiliated with groups where internal capital markets are very active may actually invite entry as the latter are perceived as less committed to their home industries.

³¹Besides 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 liquidity matters *less* 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* effective in deterring product market entry.

³²See for instance Gopalan, Nanda and Seru (2007) on the role of intra-group loans in Indian groups' internal capital markets.

Within-Group Financial Intermediaries

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 Scharfstein (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 view the number of financial intermediaries within a group as a candidate proxy for ICM activity. Results in columns (2) and (5) of Table 7 are mixed. While for both measures of entry the interaction between the number of financial intermediaries and group cash is negative, this effect is statistically significant only in the case of sales-weighted entry rates. Interestingly, and in line with the theory, the presence of more financial intermediaries in a group alleviates the entry deterrence role of incumbents' own deep pockets.

Diversification and Focus

Theoretical models of internal capital markets imply that in groups operating in different, unrelated markets there is more room for internal resource reallocation. Cestone and Fumagalli (2005) find for instance that resource reallocation takes place whenever two subsidiaries have a different shadow value of internal funds: this is more likely to be the case in more diversified groups. Existing empirical work has confirmed that corporate groups operating in a larger number of industries have more active internal capital markets (see Samphantharak, 2006). We thus include a measure of group focus (*Focus*) in our regressions and interact it with group and incumbent liquidity.

Results are reported in Table 7, columns (3) and (6): the adverse impact of group liquidity on market entry is *less* pronounced when incumbents belong to *more focused* groups, i.e. groups which are likely to have *less active* ICMs. Note that the group deep pocket effect tends to vanish as our measure of focus gets closer to one and thus groups tend to be focused on one industry.

Let us summarize our findings so far. Estimates of our basic equation suggest that group-affiliated incumbents enjoy lower entry rates in their markets owing to group deep pockets – that is, liquid assets held by group subsidiaries operating in other markets. There seems, in other words, to be a causal relationship between group cash holdings and entry that can be attributed to an internal capital market channel. This latter claim is backed by our subsequent findings that the relationship between group deep pockets and entry is stronger when groups have more active internal capital markets and in markets with a low proportion of tangibles. The robustness checks we perform in the next section provide additional support for the theory that access to a *group's* long purse enhances a firm's competitive strength.

5 Robustness Checks

In this Section we perform some robustness checks in order to provide additional support to the validity of our results and exclude potential confounding factors that could drive differences in

entry rates and group liquidity.

Group Cash from Distant Markets

First, we estimate our entry equation using as a measure of incumbent-affiliated group liquidity *only* the liquid assets held by units operating in *distant* markets, i.e. in markets outside the incumbent’s *2SIC* market. This should make the reader more confident that variations in group cash holdings can be viewed as exogenous with respect to the market where the incumbent operates. Columns (3) and (6) in Table 8 show that cash holdings from distant markets have a negative and statistically significant impact on entry rates (measured in terms of employment *and* sales). The magnitude of our main coefficient is somehow lower than the one displayed in Table 5: a 10 percent increase in group liquidity is now associated with a reduction in entry rates of 0.08 (0.05 in the case of sales-weighted entry rates) percentage points.

Group Profitability

One additional potential confounding factor is group profitability. More profitable groups may generate and allocate larger amounts of cash. If at the same time more profitable groups are more efficient in managing their subsidiaries, thereby scaring entry, the correlation between entry and group deep pockets is not to be ascribed to an ICM channel, but rather to a real channel. As explained in Section 4.3, we believe this issue is best tackled by testing theoretical predictions which are specific to an internal capital market theory. However, as a further robustness check we include a direct measure of group profitability into our base regression. Columns (1) and (4) in Table 9 show that controlling for group profitability the coefficient of group cash is still negative and significant.

Intra-Group Loans

So far our conjecture has been that potential rivals give up entering a market whose incumbents are “backed” by cash-rich group because they *anticipate* that, in case of entry, incumbents would receive a cash injection from the rest of the group (see Section 2.1). In order to test this prediction, we have controlled for cash holdings of incumbent-affiliated groups, which is a measure of the resources available for redistribution in favor of the incumbents. Alternatively, potential rivals may give up entering a market because, when the entry decision has to be taken, they observe that incumbents *have actually received* resources from the rest of the group.³³ We proxy such cash injection with the loans received by incumbents from the rest of the group (*Inc Loans from BG*) and we introduce them as an additional control in our entry equation. Columns (2) and (5) in Table 9 show that magnitude and the precision of the coefficient of group cash is unaffected by the inclusion of intra-group loans received by incumbents. Interestingly, we find that group loans do have a negative impact on entry into product markets. This suggests that

³³From 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 deter 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.

entry may be discouraged not only by the threat of incumbents' cross-subsidization but also by actual (strategic) reallocation of financial resources within the group.

Outliers

A final robustness check relates to the accuracy in the measurement of entry rates. Indeed, in 2002 the French product market classification has been modified and as a result certain SIC classifications were merged or split. We addressed this problem by re-classifying back the different markets in order to make them homogeneous with the pre-2002 classification. However, as a double check, we run our regressions excluding the year of the SIC re-classification from our estimation. Results are presented in Table 9, columns (3) and (6). The negative impact of group deep pockets is still present, as both the magnitude and significance of the coefficients remains similar when excluding the year of the SIC re-classification.³⁴

6 Conclusion

This paper tests the hypothesis that product market entry is adversely affected when incumbent firms have ample access to liquidity due to the functioning of internal capital markets within business groups. To this end, we investigate empirically whether entry in a firm's market is affected by the pooled cash holdings of its affiliated subsidiaries operating in other markets. We rely on a unique dataset providing extensive information on the balance sheets as well as the ownership status of individual French firms.

Our main finding is that entry rates are inversely related to the amount of liquidity owned by incumbent-affiliated groups. This is in line with the theory which has shown that cash-rich groups can be expected to shift their resources towards units faced with new competition, and suggests that access to a group's deep pockets enhances the incumbents' entry deterrence capacity. Theory also suggests that the effect on entry of group cash holdings should be more acute for groups with more active internal capital markets. We find evidence that this is the case by using sensible proxies for internal capital market activity. Additionally, our results suggest that the impact of group liquidity on entry is more pronounced in markets where access to credit is more difficult (and thus internal finance more central to a firm's actual and perceived strength), while the impact of incumbent liquidity is less pronounced.

Overall, our evidence suggests the existence of a causal link between group deep pockets and entry. Thus, our findings provide support to the view that financial phenomena within business groups may allow dominant firms to extend their market power to adjacent markets. Such a concern has been often expressed in the antitrust arena but, so far, has received no empirical content. To have a grasp of the economic importance of these phenomena, consider a market dominated by an incumbent firm affiliated with a cash-rich subsidiary. According to our

³⁴As a further robustness check we also experimented excluding the top 1% and 5% of entry rates in our sample. Results (available upon request) do not change.

estimates, incorporating in the group an equally wealthy additional unit, thereby doubling the rest of the group cash holdings, decreases the entry rate in the incumbent's market by about 10 percent.

Also, our findings suggest that, in countries where business groups are pervasive, 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 one posed by the deep pockets of the entire group incumbents are affiliated with. Of course, our claim is not that group-membership is necessarily anti-competitive: the detrimental effect identified in this paper should be traded off with the efficiency gains possibly generated by group deep pockets and related to the financial slack provided to group members. To conclude, let us stress that the presence of cash-rich groups with active internal capital markets may also generate pro-competitive effects, to the extent that group-backed entrants are less vulnerable to incumbents' predatory strategies. Viewed from this perspective, group membership may favor - rather than deter - entry. Group-backed entry is a relevant issue that complements the one investigated in this paper, and represents the next step in our research agenda.

A Appendix: Variable Description

Unweighted variables:

- *Size*: Log of total sales in the 4SIC market;
- Δ *Size*: Difference between the log of 4SIC total sales in t and the log of 4SIC total sales in $t - 1$;
- *HHI*: Herfindahl index of the 4SIC 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 4SIC market;
- *Capital Intensity*: Firms' total assets divided by their total sales in the 4SIC market;
- *Tangibles*: Firms' tangible assets divided by their total assets in the 4SIC market;
- *External Debt To Assets*: Firms' total external debt divided by their total assets in the 4SIC 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 (4SIC / 2SIC)*: (Log of the weighed average of) incumbent firms' total cash. For group-affiliated incumbents, this variable has been computed by aggregating and treating as a single incumbent, alternatively: (i) all group units operating in a 4SIC market, or (ii) all group units operating in the 2SIC market;
- *BG Total Cash (4SIC / 2SIC)*: (Log of the weighed 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 (4SIC or 2SIC market) 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 4SIC market;
- *Focus*: Group focus is computed as the sum of the squared values of the sales shares of each unit (4SIC market) within the group;
- *Financial Intermediaries*: Total number of financial intermediaries owned by the group;
- *Reshuffling*: Total amount of intra-group loans;
- *BG ROA*: Weighted average of units' ROAs where weights are the units' shares of total group sales;
- *Loans of Inc. From BG*: Loans granted to incumbents by other members of the affiliated group, divided by incumbents' total assets in the 4SIC market.

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Table 1: Entry Patterns Into Product Markets

		Mean	St.Dev.	Quartiles			N
				p25	p50	p75	
# of Entrants	All	46	77	6	19	55	2683
	> 1% Sales	2.27	2.14	1	2	3	2683
	> 5% Sales	.53	.87	0	0	1	2683
# of Incumbents	All	252	446	34	98	305	2683
	> 1% Sales	15.48	6.91	10	16	21	2683
Entry Rates (Sales)	All	.16	.17	.05	.11	.19	2683
	BG Entrants	.12	.17	.02	.06	.13	2683

Notes: 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 . 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 $t - 1$, with the additional condition for group-affiliated firms that no other firm of the same group was active in that market at time $t - 1$. *Entry Rates* in market i in year t is obtained by computing the aggregate turnover of entrants over total market turnover in year t .

Table 2: Market Characteristics

Variable	Business Group Cash		
	All (1)	Above Median (2)	Below Median (3)
Entry Rates (Sales)	.16 (.17)	.16 (.18)	.16 (.16)
BG Affiliation	.72 (.24)	.78 (.19)	.65 (.27)
Size of Market (log sales)	15 (1.57)	15.40 (1.50)	14.62 (1.54)
HHI	.16 (.18)	.20 (.19)	.12 (.15)
Capital Intensity	.59 (.28)	.63 (.29)	.56 (.01)
Tangibles	.77 (.14)	.75 (.14)	.78 (.13)
ROA	.23 (.17)	.22 (.17)	.23 (.18)
Debt to Assets	1.21 (.81)	1.20 (.87)	1.22 (.73)
Number of observations	2683	1443	1240

Notes: Sectoral-level data between 1995 and 2004. The sample split refers to market-year observations above/below the median of the market-year distribution of *BG Total Cash (4SIC)*. *BG Total Cash (4SIC)* is the (log) of the weighted average of the total cash held by an incumbent-affiliated group. Entry is defined as in Table 1. *BG Affiliation* is the market share of group-affiliated incumbents; *Size* is the (log of) total sales; *HHI* is the Herfindahl index (firms' market shares computed in terms of sales); *Capital intensity* is the ratio of fixed assets over output; *Tangibles* is the ratio of tangibles to total assets; *ROA* is the ratio of operating profits to total assets in a given market; *Debt To Assets* is the ratio of total debt of the incumbent divided by its assets. All market characteristics are computed as weighted averages: see appendix A for a detailed description of the weighting scheme. Standard deviations in parentheses.

Table 3: Business Group Characteristics

Variable	Business Group Cash		
	All (1)	Above Median (2)	Below Median (3)
Inc. Total Cash (4SIC)	11.48 (1.86) [2510]	12.24 (1.59) [1327]	10.62 (1.77) [1183]
BG Total Cash (4SIC)	12.93 (2.40) [2381]	14.16 (1.88) [1262]	11.54 (2.16) [1119]
Number of Markets	16.16 (14.14) [2683]	21.62 (15.13) [1443]	9.81 (9.57) [1240]
Focus (Sales)	.57 (.18) [2683]	.50 (.16) [1443]	.65 (.17) [1240]
Financial Intermediaries	.82 (2.55) [2683]	.98 (2.54) [1443]	.63 (2.55) [1240]
BG ROA	.23 (.15) [2683]	.23 (.15) [1443]	.23 (.16) [1240]
Incumbent Loans From BG	.04 (.06) [2683]	.04 (.06) [1443]	.04 (.06) [1240]

Notes: Sectoral-level data between 1995 and 2004. The sample split refers to market-year observations above/below the median of the market-year distribution of *BG Total Cash (4SIC)*. *BG Total Cash (4SIC)* is the (log) of the weighted average of the total cash held by an incumbent-affiliated group. *Inc. Total Cash (4SIC)* is the (log) of the weighted average of the own total cash of incumbent firms. *Number of Markets* is the sum of all the 4SIC markets within the group; *Focus* is sum of the squared values of the sales shares of each 4SIC market within the group; *Financial Intermediaries* is the number of financial intermediaries within the group; *BG ROA* is the weighted average of each unit's operating return on assets within the group; *Incumbent Loans From BG* is the ratio of intra-group loans received by the incumbent divided by its assets. All variables in the table are computed as weighted averages using as weights the market shares of group-affiliated incumbents. See appendix A for a detailed description of the variables. Standard deviations in parentheses and number of observations in square brackets.

Table 4: Business Group Affiliation And Entry Deterrence

	Entry Rates (Employment)			Entry Rate (Sales)		
	(1)	(2)	(3)	(4)	(5)	(6)
Size	-0.045** (0.02)	-0.041** (0.02)	-0.041** (0.02)	-0.047** (0.02)	-0.044** (0.02)	-0.044** (0.02)
Δ Size	-0.021 (0.03)	-0.023 (0.03)	-0.024 (0.03)	-0.031 (0.03)	-0.032 (0.03)	-0.032 (0.03)
ROA	-0.043 (0.05)	-0.042 (0.05)	-0.042 (0.05)	-0.026 (0.05)	-0.025 (0.04)	-0.025 (0.04)
Capital Intensity	-0.134*** (0.04)	-0.128*** (0.04)	-0.127*** (0.04)	-0.125*** (0.04)	-0.120*** (0.04)	-0.120*** (0.04)
HHI	0.122* (0.07)	0.129* (0.07)	0.133* (0.07)	0.185*** (0.07)	0.192** (0.07)	0.192** (0.07)
BG Affiliation		-0.098 (0.06)	-0.087 (0.06)		-0.088** (0.04)	-0.086* (0.05)
Focus		0.035 (0.06)			0.005 (0.06)	0.005 (0.06)
Market & Year FE	YES	YES	YES	YES	YES	YES
R-squared	0.241	0.243	0.243	0.254	0.255	0.255
N	2683	2683	2683	2683	2683	2683

Notes: Sectoral-level data between 1995 and 2004. Entry in sector i year t is the ratio of employment (cols 1-3) or sales (cols 4-6) of entrant firms over total employment/sales in sector i year t . $Size$ is the (log of) total sales; $\Delta Size$ 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 Herfindahl index (firms' market shares computed in terms of sales); $BG\ Affiliation$ is the market share of group-affiliated incumbents; $Focus$ is the sum of the squared values of the sales shares of each 4SIC market within the group. All market characteristics are computed as weighted averages: see appendix A for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses.

Table 5: Business Group Affiliation, Financial Strength and Entry Deterrence

	Entry Rates (Employment)		Entry Rate (Sales)			
	(1)	(2)	(3)	(4)	(5)	(6)
Size	-0.041** (0.02)	-0.020 (0.02)	-0.018 (0.02)	-0.044** (0.02)	-0.023 (0.02)	-0.017 (0.02)
Δ Size	-0.023 (0.03)	-0.025 (0.03)	-0.010 (0.03)	-0.032 (0.03)	-0.044* (0.02)	-0.036 (0.02)
ROA	-0.042 (0.05)	-0.044 (0.05)	-0.004 (0.05)	-0.025 (0.04)	-0.028 (0.05)	-0.004 (0.04)
Capital Intensity	-0.128*** (0.04)	-0.096*** (0.03)	-0.064 (0.04)	-0.120*** (0.04)	-0.107*** (0.03)	-0.082** (0.04)
HHI	0.129* (0.07)	0.265*** (0.08)	0.279*** (0.09)	0.192** (0.07)	0.328*** (0.08)	0.377*** (0.10)
BG Affiliation	-0.098 (0.06)	-0.058 (0.06)	0.006 (0.07)	-0.088** (0.04)	-0.063* (0.03)	-0.027 (0.04)
Inc. Total Cash (4SIC)		-0.043*** (0.01)	-0.038*** (0.01)		-0.039*** (0.01)	-0.035*** (0.01)
BG Total Cash (4SIC)			-0.017*** (0.00)			-0.012*** (0.00)
Market & Year FE	YES	YES	YES	YES	YES	YES
R-squared	0.243	0.284	0.288	0.255	0.303	0.299
N	2683	2510	2381	2683	2510	2381

Notes: Sectoral-level data between 1995 and 2004. Entry in sector i year t is the ratio of employment (cols 1-3) or sales (cols 4-6) of entrant firms over total employment/sales in sector i year t . $Size$ is the (log of) total sales; $\Delta Size$ 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 Herfindahl index (firms' market shares computed in terms of sales); $BG\ Affiliation$ is the market share of group-affiliated incumbents; $Inc. Total\ Cash (4SIC)$ is the (log) incumbent firms' total cash. For group affiliated incumbents, this variable has been computed by aggregating and treating as a single incumbent all group units operating in the same 4SIC market; $BG\ Total\ Cash (4SIC)$ is the (log) 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 (4SIC market) incumbent. All market characteristics are computed as weighted averages: see appendix A for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses.

Table 6: Cash Holdings And Access To External Finance: Sample Split by Tangibles

	Entry Rates (Employment)			Entry Rate (Sales)		
	(1) All	(2) < M	(3) > M	(4) All	(5) < M	(6) > M
Size	-0.017 (0.02)	-0.002 (0.02)	-0.039 (0.04)	-0.015 (0.02)	0.003 (0.02)	-0.056** (0.03)
Δ Size	-0.008 (0.03)	-0.017 (0.04)	0.004 (0.05)	-0.030 (0.02)	-0.060** (0.02)	0.044 (0.05)
ROA	-0.006 (0.05)	-0.007 (0.05)	-0.001 (0.06)	-0.007 (0.03)	0.017 (0.05)	-0.032 (0.04)
Capital Intensity	-0.057 (0.04)	-0.048 (0.06)	-0.065 (0.06)	-0.065 (0.04)	-0.058 (0.05)	-0.061 (0.07)
HHI	0.283*** (0.09)	0.265** (0.11)	0.281** (0.14)	0.387*** (0.10)	0.297** (0.12)	0.517*** (0.14)
BG Affiliation	0.005 (0.07)	0.037 (0.08)	0.001 (0.10)	-0.028 (0.04)	-0.032 (0.07)	-0.006 (0.06)
Tangibles	0.042 (0.07)	-0.000 (0.08)	0.106 (0.15)	0.109 (0.07)	0.060 (0.09)	0.109 (0.13)
Inc. Total Cash (4SIC)	-0.037*** (0.01)	-0.030*** (0.01)	-0.043*** (0.01)	-0.034*** (0.01)	-0.032*** (0.01)	-0.034*** (0.01)
BG Total Cash (4SIC)	-0.017*** (0.00)	-0.025*** (0.01)	-0.010** (0.00)	-0.012*** (0.00)	-0.019*** (0.01)	-0.006 (0.00)
Market & Year FE	YES	YES	YES	YES	YES	YES
R-squared	0.288	0.325	0.259	0.301	0.331	0.281
N	2381	1147	1234	2381	1147	1234

Notes: Columns 1 and 4 present estimates on the full sample. Columns 2-3 and 5-6 show results from split regressions for markets above and below the median of the distribution of tangibles. *Tangibles* is the proportion of tangible assets with respect to total assets. As in the case of other market characteristics, the average tangible holding in a 4SIC market is then computed by using as weights the firms' market shares. See appendix A for a detailed description all variables. Robust standard errors clustered at the 3SIC sector level in parentheses.

Table 7: Group Deep Pockets and Proxies for ICM Activity

	Entry Rates (Employment)			Entry Rate (Sales)		
	(1)	(2)	(3)	(4)	(5)	(6)
Size	-0.028 (0.02)	-0.018 (0.02)	-0.011 (0.02)	-0.024 (0.02)	-0.018 (0.02)	-0.009 (0.02)
Δ Size	-0.011 (0.03)	-0.011 (0.03)	-0.009 (0.03)	-0.033 (0.03)	-0.037 (0.02)	-0.036 (0.02)
ROA	0.015 (0.05)	-0.005 (0.05)	-0.007 (0.05)	0.021 (0.03)	-0.002 (0.03)	-0.009 (0.04)
Capital Intensity	-0.071 (0.04)	-0.064 (0.04)	-0.062 (0.04)	-0.079* (0.04)	-0.082** (0.04)	-0.079** (0.04)
HHI	0.347*** (0.09)	0.283*** (0.09)	0.255*** (0.08)	0.433*** (0.11)	0.387*** (0.10)	0.344*** (0.10)
BG Affiliation	-0.002 (0.07)	0.006 (0.07)	-0.014 (0.07)	-0.020 (0.04)	-0.029 (0.04)	-0.045 (0.04)
Inc. Total Cash (4SIC)	-0.042*** (0.01)	-0.038*** (0.01)	-0.028* (0.02)	-0.038*** (0.01)	-0.037*** (0.01)	-0.037*** (0.01)
BG Total Cash (4SIC)	-0.016*** (0.00)	-0.017*** (0.00)	-0.043*** (0.01)	-0.011*** (0.00)	-0.010*** (0.00)	-0.041*** (0.01)
Reshuffling	0.686** (0.345)			0.633** (0.287)		
Financial Intermediaries		0.003 (0.01)			0.012* (0.01)	
Focus			-0.437 (0.27)			-0.751*** (0.23)
Inc. Cash (4SIC) \times ICM Proxy	0.009 (0.01)	-0.0001 (0.001)	-0.011 (0.03)	-0.007 (0.008)	0.002*** (0.00)	0.011 (0.02)
BG Cash (4SIC) \times ICM Proxy	-0.06*** (0.02)	-0.0001 (0.001)	0.039** (0.02)	-0.046** (0.018)	-0.003*** (0.00)	0.044*** (0.02)
Market & Year FE	YES	YES	YES	YES	YES	YES
R-squared	0.296	0.288	0.292	0.306	0.303	0.308
N	2193	2381	2381	2193	2381	2381

Notes: *Reshuffling* is the sum of the absolute value of intra-group loans/credits divided by the number of firms that borrow/lend within the group (in million of Francs); *Financial Intermediaries* is the number of financial intermediaries within the group; *Focus* is an *inverse* measure of ICM activity and is given by the sum of the squared values of the sales shares of each 4SIC market within the group. All market characteristics are computed as weighted averages; see appendix A for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses.

Table 8: Robustness Checks - Group Deep Pockets from Distant Markets

	Entry Rates (Employment)			Entry Rate (Sales)		
	(1)	(2)	(3)	(4)	(5)	(6)
Size	-0.041** (0.02)	-0.014 (0.02)	-0.026 (0.02)	-0.044** (0.02)	-0.017 (0.02)	-0.024 (0.02)
Δ Size	-0.023 (0.03)	-0.044 (0.03)	-0.023 (0.03)	-0.032 (0.03)	-0.051** (0.02)	-0.030 (0.02)
ROA	-0.042 (0.05)	-0.058 (0.05)	-0.013 (0.05)	-0.025 (0.04)	-0.038 (0.04)	-0.011 (0.03)
Capital Intensity	-0.128*** (0.04)	-0.106*** (0.04)	-0.059 (0.04)	-0.120*** (0.04)	-0.107*** (0.04)	-0.073 (0.04)
HHI	0.129* (0.07)	0.239*** (0.08)	0.205*** (0.07)	0.192** (0.07)	0.294*** (0.09)	0.295*** (0.10)
BG Affiliation	-0.098 (0.06)	-0.061 (0.06)	0.027 (0.07)	-0.088** (0.04)	-0.067 (0.04)	-0.035 (0.05)
Inc. Total Cash (2SIC)		-0.039*** (0.01)	-0.032*** (0.01)		-0.034*** (0.01)	-0.029*** (0.01)
BG Total Cash (2SIC)			-0.008** (0.00)			-0.005* (0.00)
Market & Year FE	YES	YES	YES	YES	YES	YES
R-squared	0.243	0.286	0.251	0.255	0.298	0.273
N	2683	2521	2271	2683	2521	2271

Notes: *BG Total Cash (2SIC)* is the (log) 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 units operating in the same 2SIC markets as the incumbent. All market characteristics are computed as weighted averages: see appendix A for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses.

Table 9: Robustness Checks - Group Profitability, Intra-Group Loans and no 2002

	Entry Rates (Employment)			Entry Rate (Sales)		
	(1)	(2)	(3)	(4)	(5)	(6)
	No 2002			No 2002		
Size	-0.018 (0.02)	-0.017 (0.02)	-0.020 (0.02)	-0.017 (0.02)	-0.017 (0.02)	-0.027 (0.02)
Δ Size	-0.010 (0.03)	-0.010 (0.03)	0.026 (0.03)	-0.036 (0.02)	-0.037 (0.02)	0.001 (0.02)
ROA	-0.011 (0.06)	-0.003 (0.05)	0.014 (0.05)	0.000 (0.05)	-0.003 (0.04)	-0.016 (0.04)
Capital Intensity	-0.064 (0.04)	-0.062 (0.04)	-0.026 (0.04)	-0.082** (0.04)	-0.081** (0.04)	-0.062 (0.04)
HHI	0.279*** (0.09)	0.278*** (0.08)	0.258*** (0.08)	0.377*** (0.10)	0.376*** (0.10)	0.326*** (0.09)
BG Sales	0.006 (0.07)	0.013 (0.07)	0.079 (0.06)	-0.027 (0.04)	-0.020 (0.04)	0.062* (0.03)
Inc. Total Cash (4SIC)	-0.038*** (0.01)	-0.038*** (0.01)	-0.023*** (0.01)	-0.035*** (0.01)	-0.035*** (0.01)	-0.016** (0.01)
BG Total Cash (4SIC)	-0.017*** (0.00)	-0.017*** (0.00)	-0.012*** (0.00)	-0.012*** (0.00)	-0.012*** (0.00)	-0.008*** (0.00)
BG ROA	0.010 (0.07)	0.010 (0.07)	0.010 (0.07)	-0.006 (0.06)	-0.006 (0.06)	0.010 (0.06)
Inc. Loans From BG		-0.106** (0.05)			-0.100* (0.06)	
Market & Year FE	YES	YES	YES	YES	YES	YES
R-squared	0.288	0.289	0.089	0.299	0.300	0.089
N	2381	2381	2113	2381	2381	2113

Notes: *BG ROA* is the weighted average of units' operating return on assets; *Incumbent Loans From BG* is the ratio of intra-group loans received by the incumbent divided by its assets. Columns (3) and (6) show results from regressions excluding market-year observations in year 2002. All market characteristics are computed as weighted averages: see appendix A for a detailed description of the variables. Robust standard errors clustered at the 3SIC sector level in parentheses.

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