Are small business groups an organizational strategy that promotes growth? Evidence from French SMEs.

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This paper investigates whether small business groups (SBGs) represent an organizational strategy that promotes growth. We explore empirically this issue using a unique data set on French small businesses ownership. We investigate whether SBGs represent an efficient response to market imperfections faced by small businesses. We explore two alternative hypotheses. First, SBGs may promote growth because SBG internal capital markets increase capital allocation efficiency. Second, SBGs may use their internal capital market for mutual insurance, which improves their access to external financing, and ultimately favor their dynamism. Our results show that grouping small businesses promotes small businesses development, because SBGs improve capital allocation. Finally, accounting for SBG diversification strategies does not affect the results.

Keywords: Internal capital market; Efficiency; Mutual insurance; Small business; Growth.

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1 Introduction

Under perfect market conditions, individual actors satisfy their needs through exchange. If so, why do firms exist at all (Coase, 1937)? Proposing the parallel that the firm is to individual agent as business group (BG) is to firm, Granovetter (1995) moves this issue a step further and asks why BGs exist. The extensive literature on the benefits and costs of BGs focuses on BG ability to reallocate capital within group firms, through their internal capital market (ICM). The empirical literature shows that large firm BG affiliation is beneficial in emerging economies where market imperfections are severe, but is inefficient in developed economies (see Table 1). Overall, empirical results support the hypothesis that BGs are rational institutional arrangements in which internal markets replace imperfect external markets to allocate resources (Leff 1976, 1978; Kock and Guillén, 2001).

This paper explores this hypothesis in the specific context of small business groups (SBGs). An SBG bonds together small businesses that are controlled by one of the constituent small businesses, and SBG economic weight is equivalent to that of a small and medium enterprise (SME). Recent evidence suggests that small business groupings are an emerging phenomenon. In France, the number of SMEs affiliated with an SBG has doubled over the last decade and SBG affiliation includes one-third of French SMEs (Cayssials et al., 2007). Small businesses suffer from important imperfections with respect to the market, especially from information imperfections. Informational opacity limits SME access to external finance (Berger et al., 2001; Beck et al., 2006), which undermine their growth. Thus, SMEs can adopt a specific organizational strategy to favor their development. Affiliation with a BG can be beneficial for SME development because ICMs allow for a more efficient allocation of capital. Indeed, BG controlling firms have two advantages, relative to other intermediaries, in allocating capital to affiliated firms. They possess an informational advantage and are able to effect changes in strategy with lower transaction costs. Further, by combining cash flows,

BGs can reduce the volatility of firm revenues (mutual insurance). This reduced risk favors investment and reduces the variability of financial indicators, which improves BG external financing capacity relative to standalone firms.

This paper explores whether formation of an SBG is an organizational strategy that promotes growth. To identify SBGs, we use a unique dataset that exhaustively lists ownership links between French corporations. Classically, we observe the influence of SBG affiliation on firm growth using a firm-level sample. This sample contains complete accounting information for 24 522 SMEs, which are either independent or affiliated with an SBG, over the period 1999-2007. In an original manner, we also compare the growth of SBGs to that of standalone firms. Indeed, affiliation with an SBG can favor affiliated-firm growth without leading to overall growth in the SBG. The group-level sample contains 2 799 SBGs for which we are able to compute group aggregate data and 2 799 matched standalone firms. Further, we explore through which channels SBGs promote growth. First, we test whether SBG ICMs are efficient, by observing the effect of SBG affiliation on firm performance. Second, we test whether SBGs operate mutual insurance between group firms. We explore the influence of SBG affiliation and group status on firm operating risk and capital structure. Finally, we establish a typology of SBGs according to their diversification strategies and test whether SBG characteristics affect the results.

Our results show that grouping small businesses is an organizational strategy that favors SME growth: SBGs promote affiliated-firm dynamism and SBGs invest more than their standalone counterparts. The results further show affiliation to a SBG is beneficial for firm profitability and that there is no over-investment in SBGs. Overall, the results support that SBGs ICM are more efficient in allocating capital than external markets. Finally, accounting for SBG diversification strategies does not affect the results. Nevertheless, we observe that

geographically diversified SBGs underperform relative to other SBGs, whereas we find no evidence of a diversification discount in SBGs.

The remainder of this paper proceeds as follows. Section 2 summarizes the literature and develops the hypothesis. Section 3 presents the data and the methodology. In Section 4 we discuss the results. Finally, Section 5 presents our conclusions.

2 Literature review and hypothesis development

The literature in finance and economics on the costs and benefits of BGs focuses on four aspects. A first line of research regards BGs as a setting for the study of conflicts of interest between controlling and minority shareholders (Betrand et al., 2002; Claessens et al., 2002). A second line of research regards BGs as socially counterproductive organizations. In this view, BGs serve as a mechanism through which a subset of firms obtains favorable treatment from authorities. Such a condition limits competition, which undermines the economy's allocation efficiency (Khanna, 2000). The empirical evidence on this topic is scarce and contradictory (Fisman, 2001; Manos et al., 2007). A third line of research suggests that a BG is a mechanism to increase market power. By horizontally integrating, BGs achieve the benefits of multi-market contact (Bernheim and Whinston, 1990). By vertically integrating, upstream and downstream producers avoid double marginalization and increase their joint profits (Spengler, 1950). However, empirical evidence does not support that BGs increase market power. Weinstein and Yafeh (1995) report that Keireitsu members appear to compete quite fiercely. Encoua and Jacquemin (1982) show that cartelization does not result from the formation of BGs in France.

The main stream of research focuses on the costs and benefits of internal markets. In presence of market imperfections, BGs have three main roles: BGs can be a solution to replace imperfect product and labor markets. Second, BGs can foster development by replacing defaulting public infrastructures (Fisman and Khanna, 2004). Finally, BGs pool and reallocate capital within group firms; the discussion focuses on this latter role. In a BG, the controlling firm redistributes financial resources away from some affiliates and redirects them to others through internal transfers.[1] Thus, BG controlling firm allocation decisions endogenously determine affiliated-firm wealth. Group firm performance is sensitive to BG resources (Chang and Hong, 2002; Bertrand et al., 2002). First, we review the literature on the efficiency of ICM capital budgeting policy (2.1). Second, we review the literature on the use of ICM for mutual risk insurance between group firms (2.2). Finally, we review the literature on the influence of BG characteristics on the efficiency of capital allocation (2.3).

2.1 Capital allocation efficiency in BGs

Markets imperfections can impair the efficiency of financial markets; in this context, ICMs may improve the allocation of financial resources. According to Alchian (1969) and Williamson (1975), BG controlling firms[2] improve capital allocation efficiency, compared to other types of intermediaries, because of their higher information production. BG controlling firms have access to private information on group firms, which increases their ability to assess the quality of projects, reducing adverse selection issues. Moreover, controlling firms differ from banks because they hold the residual control rights on group-firm assets. Control rights both reduce monitoring costs and give to controlling firms the authority to redeploy the assets of projects that are performing poorly under existing management (Gertner et al. 1994). Given

[1]Internal transfers occur through various operations: transfer prices, trade-credit, distribution policy, intra-group loans, cession, and acquisition of assets.

[2] We use the term controlling firm because we focus on BGs, however, the literature on conglomerates uses the term headquarters. Indeed, the literature on ICM allocative efficiency was first developed to understand the performance effect of conglomerates and applies to both types of organizations.

their specificities, controlling firms are more prone to operate on the basis of "winner picking" (Stein, 1997). Winner picking implies that resources are allocated to the best-performing group firms, which improves capital allocation. However, inefficient cross-subsidization can undermine the efficiency of capital allocation in BGs. Inefficient cross-subsidization occurs when there is over-investment in poorly performing BG firms and under-investment in highly performing ones. According to Meyer et al. (1992), failing businesses create more value loss as part of a BG than as standalone firms. Whereas a failing business cannot have a value below zero if operated on its own, it can have a negative value if it is part of a BG that provides cross-subsidies. According to the literature on large BGs, inefficient cross-subsidies result from empire building (Jensen, 1986), evaluation problems (Stein, 1997), rent seeking behavior of top management (Scharfstein and Stein, 2000), and expropriation of minority shareholders (Johnson et al., 2000).

There are two approaches to evaluate empirically the efficiency of capital allocation in conglomerates or BGs. A majority of empirical work, follows the approach of Berger and Ofek (1995), who compare the performance of an affiliated firm with a standalone counterpart. Other studies observe whether affiliated-firm investment sensitivity to BG cash flow depends on firm investment project quality, following the approach of Shin and Stulz (1998). Table 1 summarizes the mixed empirical evidence on ICM efficiency. ICMs tend to increase affiliated-firm performance in emergent countries, whereas in developed countries BG affiliation has systematically a negative influence on affiliated-firms performance. The papers using the Shin and Stulz (1998) approach generally observe that affiliated-firm performance does not explain firm investment sensitivity to BG cash flows. This observation contradicts the hypothesis of ICM capital-allocation efficiency.

Table 1: Synthesis of the empirical literature on the efficiency of ICMs

Papers	Sample	Level of comparision	Method	Measure of performance	Efficiency of ICM
Berger and Ofek (1995)	US 1986-1991	Conglomerate	Comparison	Market Value	-
Buysschaet et al. (2008)	Belgium 1997-2004	Affiliated firms	Comparison	ROA	-
Chacar and Vissa (2005)	US - India 1989-1999	Affiliated firms	Comparison	ROA persistence	-
Choi and Cowing (1999)	Korea 1985-1993	Affiliated firms	Comparison	ROE	-
Khanna and Palepu (2000)	India 1993	Affiliated firms	Comparison	ROA,TOBIN Q	-
Maksimovic and Phillips (2002)	US 1975-1992	Conglomerate	Comparison	Productivity	-
Ferris et al. (2003)	Korea 1990-1995	Affiliated firms	Comparison	Excess value, ROA	-
George and Kabir (2008)	India 1998-2000	Affiliated firms	Comparison	ROA, Tobin Q	-
Khanna and Yafeh (2005)	12 emerging countries and Japan	Affiliated firms	Comparison	ROA	Depends of the country
Khanna and Rivkin (2001)	14 emerging countries	Affiliated firms	Comparison	ROA, ROE	+ in certain countries
Claessens et al. (2006)	9 East Asian countries 1994-1996	Affiliated firms	Comparison	Market value	=
Lensink and van der Molen (2010)	India 1996-2001	Affiliated firms	Comparison	Market value, ROA	=
Chang and Choi (1988)	Korea 1975-1984	Affiliated firms	Comparison	ROA, ROE	+
Cheong et al. (2010)	Korea 1990-1996	Affiliated firms	Comparison	Factor intensity, profitability, growth	+
Estrin et al. (2009)	Russia 1993- 2002	Affiliated firms	Comparison	ROA	+
Kremp and Philippon (2008)	France 1997-2006	Affiliated firms	Comparison	Growth	+, effect is stronger for affiliation to a large BG
Hoshi et al. (1990)	Japan 1978-1985	Affiliated firms	Comparison	Cumalative investment	+
Gautier and Hamadi (2005)	Belgium 1991-1996	Affiliated firms	Effect of firm performance on its investment sensitivity to BG cash flow	ROA	=
Hoshi et al. (1991)	Japan 1965-1986	Affiliated firms	Effect of firm performance on its investment sensitivity to BG cash flow	Tobin Q	-
Lee and Lee (2002)	Korea 1997-2001	Affiliated firms	Effect of firm performance on equity investment from other BG firms	Assets, Earnings	+
Ozbas and Scharfstein (2008)	US 1979-2006	Conglomerate	Effect of firm performance on its investment sensitivity to BG cash flow	Tobin Q	-
Perrotti and Gelfer (2001)	Russia 1993- 2002	Affiliated firms	Effect of firm performance on its investment sensitivity to BG cash flow	Tobin Q	+
Shin and Stulz (1998)	US 1980-1992	Conglomerate	Effect of firm performance on its investment sensitivity to BG cash flow	Tobin Q	-
van der Molen (2005)	India 1997-2002	Affiliated firms	Effect of firm performance on its investment sensitivity to BG cash flow	Tobin Q	-
Gopalan et al. (2007)	India 1989-2001	Affiliated firms	Effect of firm performance on the decision to allocate group loans	ROA	-

Overall, the empirical evidence is consistent with the view that ICMs are a second-best option in the presence of market imperfections (Leff, 1978). Given that small businesses suffer from informational opacity, which limits their access to external financing (Berger et al., 2001), we expect group affiliation to be beneficial for small businesses. SBG ICMs might be more efficient in allocating capital to SMEs than external investors, because of their greater access to information and ability to redeploy assets.

2.2 Mutual insurance among BG firms

BGs can also promote growth if they provide mutual insurance between group firms. Mutual insurance reduces BG cash flow volatility and default risk, which ultimately increases BG-firm financing capacity.

Via the ICM, controlling firms have the ability to affect the allocation of risk. BG firms can combine their cash flows to reduce the volatility of group-firm revenue. BGs can also use cross-subsidies to redistribute cash flow to weak affiliates, which provides them with implicit insurance against bankruptcy (Riyanto and Toolsema, 2008). Indeed, within the group, the short-run profits of some firms may be sacrificed in order to allow weaker, but potentially profitable firms, to survive through economic slowdowns and external shocks. Mutual insurance among BG firms has several benefits. It limits firm under-investment, because mutual insurance stabilizes financially constrained firms' cash flow (Froot et al., 1993). Mutual insurance among BG firms can be an alternative to imperfect stock markets to achieve risk sharing. Kali (2003) theoretically demonstrates that BGs favor the development of economies by allowing entrepreneurs to choose highly productive though risky technology, when stock markets are inefficient or non-existent. Cross-subsidies to support the weaker BG firms reduce the risk of liquidation by banks (Kim, 2004). Mutual insurance between group firms reduces idiosyncratic shocks on financial indicators, which increases BG firms' external financing capacity (Shamphantharak, 2007). Moreover, the intra-group debt guarantee increases group firm debt capacity (Chang and Hong, 2000). Affiliated firms can also benefit from the BG's reputation to improve bank perceptions (Shiantarelli and Sembenelli, 2000). Finally, the Ghatak and Kali (2001) model suggests that BGs alleviate asymmetric information issues. These authors show that correlation among the costs of borrowing across group members mitigates credit rationing.

Table 2: Empirical evidence on the mutual insurance effect of BGs

Paper	Country sample	Level of comparision	Method	Effect of BG affiliation on firm risk or access to external finance
Buysschaet et al. (2008)	Belgium 1997-2004	Affiliated firms	Effect of BG affiliation on the variance of performance measure	+
Khanna and Yafeh (2005)	12 emerging countries and Japan	Affiliated firms	Effect of BG affiliation on the variance of performance measure	- except in India
Estrin et al. (2009)	Russia 1993- 2002	Affiliated firms	Effect of BG affiliation on the variance of performance measure	-
Hoshi et al., (1991)	Japan 1965-1986	Affiliated firms	Effect of BG affiliation on the variance of performance measure	-
Dewaelheyns and Van Hulle (2006)	Begium 1996-2001	Affiliated firms	Effect of BG affiliation on firms default probability	-
Gopalan et al. (2007)	India 1989-2001	Affiliated firms	Effect of BG affiliation on firms default probability	-
Dow and McGuire (2009)	Japan 1987-2001	Affiliated firms	Propping to distress affilated firms	-
Ferris et al. (2003)	Korea 1990-1995	Affiliated firms	Propping to distress affilated firms	-
Kremp and Sevestre (2000)	France 1996	Affiliated firms	Effect of group affiliation on firm capital structure	+ for large BG, = for SBG
Lensink et al. (2003)	India 1989-1997	Affiliated firms	Effect of group affiliation on firm investment cash-flow sensitivity	+
Gorodnichenko et al. (2009)	Germany 1988-2000	Affiliated firms	Effect of group affiliation on firm investment cash-flow sensitivity	+
Dewaelheyns and Van Hulle (2009)	Belgium 1996-2005	Affiliated firms	Effect of group affiliation on firm access to external debt	+
Ferris et al. (2003)	Korea 1990-1995	Affiliated firms	Effect of group affiliation on firm access to external debt	=

Table 2 summarizes the results of empirical studies that test these issues. A first set of studies observes the influence of group affiliation on the variance of firm performance. Results generally support the notion that BG firms have a lower volatility of profitability than independent firms, with the exception of Buysschaert et al. (2008) in Belgium and Khanna and Yafeh (2005) in India. Other studies test the effect of BG affiliation on firm default risk; they observe whether BG affiliation influences firm default probability. These papers observe that group affiliation reduces firms' probability of default. Alternatively, some studies investigate the issue of propping in BGs. Propping is a transfer from higher-level to lower-

level firms in the control chain, which is intended to bail out the receiving firm from bankruptcy (Friedman et al., 2003). The studies show that controlling firms transfer resources to support distressed affiliated firms, which is consistent with the propping hypothesis. Finally, papers that investigate whether BG affiliation increases firm access to external financing compare investment-cash flow sensitivities or target leverage levels between affiliated and standalone firms. The results show that group affiliation increases firm use of debt financing, particularly for the smallest firms (Gorodnichenko et al., 2009). Consistently with the empirical evidence, we expect that if SBGs realize mutual insurance among group firms, they will be less risky and have higher leverage levels than standalone firms.

2.3 The effect of group characteristics on the efficiency of the ICM

Another related body of literature focuses on how BG characteristics influence affiliated-firm performance. This literature arises from observation of a diversification discount in diversified conglomerates in the US (Berger and Ofek, 1995). Another set of empirical papers explores the influence of the characteristics of the controlling firm (banks and holding companies) on the performance effect of BG affiliation.

The literature distinguishes four types of diversification. Vertical integration involves merging a potential supplier and a customer into common ownership, thus bypassing market transactions. An important gain from vertical integration is avoiding market transaction costs. In particular, vertical integration mitigates under-investment related to the hold-up problem (Williamson, 1985) or contractual incompleteness issues (Grossman and Hart, 1986) when assets are specific. Vertical integration may also prove efficient when the market fails to provide a full set of hedging instruments (Chao et al., 2005 a,b; Aïd et al., 2009). However, vertical integration might be value decreasing, as it requires more complex coordination in technology, management, production and capital investment. Related diversification involves

merging businesses with overlapping input or output markets. This allows businesses to employ common resources such as technology, plants, brand names, distribution systems, or reputation. If such resources exhibit scale or scope economies in ways that cannot be effectively exploited though market transactions or relational contracts, it may be efficient to pool different businesses into groups to capitalize on those economies (Teece, 1980, 1982). Unrelated diversification merges businesses that operate in different industries and with no a priori synergies. Unrelated diversification can be beneficial, because product diversification reduces BG risk. However, unrelated diversification can adversely affect the efficiency of capital allocation in BGs. Given that BGs controlling firms observe investment with noise, the efficiency of capital allocation across group firms depends on the correlation between investment opportunities. Therefore, unrelated diversification reduces ICM efficiency, whereas in related industries the observation noises are correlated, which facilitates winner picking (Stein, 1997). Finally, geographic diversification consists of creating subsidiaries in different geographic areas. The literature exploring geographic diversification is scarce and generally focuses on internationalization rather than on local geographic diversification. Geographic diversification may add value because it allows exploitation of market opportunities and reduces risk across markets. However, geographic diversification might also destroy value, because it posits complex coordination problems across multiple geographic markets, which reduces the ability to derive the benefits of economies of scale and scope (Hymer, 1970; Rugman; 1977; Denis et al., 2002).

Table 3: Empirical evidence on the effect of BG characteristics on performance

Papers	Country sample	Level	Type of diversification	Performance Variable	Effect
Perrotti and Gelfer (2001)	Russia 1993- 2002	Affiliated firms	Controlling firm is a bank	Tobin Q	+
Gautier and Hamadi (2005)	Belgian 1991-1996	Affiliated firms	Controlling firm is a holding	ROA	+
Lins and Servaes (2002)	7 emerging markets 1995	Affiliated firms	Geographical	Market value, ROA, ROE	=
Kakani (2000)	India 1987-2000	BG	Geographical (International)	Tobin Q, ROA, ROE	+
Yiu et al. (2005)	China 1999	BG	Geographical (International)	ROA	+
Chang and Hong (2000)	Korean 1985-1996	Affiliated firms	Related	ROA	+
Claessens et al. (2003)	9 East Asian economies 1991-1996	Conglomerate	Related	Excess profitability	+
Ferris et al. (2003)	Korea 1990-1995	Affiliated firms	Related	Excess value, ROA	=
Kakani (2000)	India 1987-1999	BG	Unrelated	Tobin Q, ROA, ROE	-
Lensink and van der Molen (2010)	India 1996-2001	Affiliated firms	Unrelated	Market value	-
Claessens et al. (2003)	9 East Asian economies 1991-1996	Conglomerate	Unrelated	Excess profitability	-
Rajan et al. (2000)	US 1979-1993	Conglomerate	Unrelated	Investment	-
Lins and Servaes (2002)	7 emerging markets 1995	Affiliated firms	Unrelated	Market value, ROA, ROE	-
Singh et al. (2007)	India 1998-2000	Affiliated firms	Unrelated	Market value, ROA, ROE,	-
van der Molen (2005)	India 1997-2002	Affiliated firms	Unrelated	Relative value added	-
Chang and Choi (1988)	Korea 1975-1984	Affiliated firms	Unrelated	ROA, ROE	+
Buysschaet et al. (2008)	Belgium 1997-2004	Affiliated firms	Unrelated	ROA, ROE	=
Khanna and Palepu (2000)	India 1993	Affiliated firms	Unrelated	ROA, Tobin Q	non linear effect
Claessens et al. (2003)	9 East Asian economies 1991-1996	Conglomerate	Vertical integration	Excess profitability	=

The empirical evidence on the influence of diversification strategies on affiliated-firm performance generally indicates that unrelated diversification has a negative effect on affiliated-firm performance and on ICM efficiency (see Table 3). The only exception is Khanna and Palepu (2000), who observe a non-linear effect of product diversification on affiliated-firm performance in emerging countries. These authors show that low levels of diversification have a negative effect, whereas high levels of diversification have a positive effect on affiliated-firm performance. Empirical studies further suggest that related or geographic diversification is favorable for affiliated-firm performance. Claessens et al. (2003) find no effect of vertical integration on conglomerate-division performance in East Asia. Finally, Gautier and Hamadi (2005) and Perotti and Gelfer (2001) show that the performance effect of BG affiliation depends on the characteristics of the BG controlling firm. Their results

point out that the presence of a financial controlling firm enhances the performance of affiliated firms. They attribute this result to the fact that a financial controlling firm facilitates BG access to the external financing available to the group. Therefore, we expect SBG characteristics to mitigate the efficiency and mutual insurance effects of BGs. In particular, unrelated diversification should negatively affect SBG performance.

3 Data and methodology

The sample used in this study comes from two databases; we merge the information thanks to each firm's unique fiscal identifier (SIREN). We identify SBGs using a large database provided by Coface Services, which listed 1 900 000 direct and indirect ownership links between French corporations in 2005. Accounting information comes from the Diane database, supplied by Coface Services and Bureau van Dijk. This database provides detailed accounting information for French firms from 1998 to 2007. First, we define SBGs and develop the identification procedure (3.1). Second, we present the characteristics of SBGs and establish a typology of SBGs (3.2). Third, we develop the methodology used to test the hypothesis (3.3). Finally, we present the sample and descriptive statistics (3.4).

3.1 SBG definition and identification

An SBG is a BG whose economic weight is equivalent to that of an SME. The initial database on ownership links between firms does not identify groups, but only direct and indirect ownership links between firms. First, we identify BGs according to the criterion of majority control. Then, we identify SBGs according to the SME definition of the European Commission.

A BG is an ownership structure in which the controlling firm controls several firms through a control chain (Bianchi et al. 1997). A control chain is a chain of control relationships between firms.[3] A firm directly controls another firm whenever that firm has a particular minimum level of ownership in another firm. A firm indirectly controls another firm whenever that firm owns a particular minimum ownership-stake threshold in a third firm that owns an ownership-stake threshold in the controlled firm. Although the literature agrees on the fact that the ownership threshold must maximize the probability of identifying a unique controlling shareholder, it disagrees upon the threshold of ownership to adopt. Studies on large BGs often adopt a threshold of 20% of direct ownership at each level of the control chain to establish control (La Porta et al., 1999; Faccio et al., 2001; Claessens et al., 2002). However, in weakly dispersed ownership structures, several large shareholders might arise who are able to form coalitions and contest the control of the dominant shareholder (Bennedsen and Wolfenzon, 2000). As a result, the use of a 20% threshold is criticized for European firms and for private firms where ownership concentration is high (Reneboog, 2000 and Biebuyck *et al*., 2005). Moreover, a control threshold of 50% avoids counterintuitive results such as the existence of two controlling shareholders. Accordingly, we adopt the criterion of majority control[4] to identify BGs (Chapelle and Szafarz, 2005).[5] A BG corresponds to a chain of majority-control relationships: the ultimate shareholder effectively controls a firm (with direct cash flow rights larger than 50%) that in turn effectively controls another firm, and so on. Finally, we distinguish between three types of firm. **Controlling firms** are the BG's ultimate shareholder. **Controlled firms** are affiliated to a BG but are not the ultimate shareholder. In **independent firms**, no outside firm holds more than 50% ownership.

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[3] In Appendix A, we give an example of a control chain; Appendix B presents the initial database.
[4] For a detailed review of the different methodologies existing to identify BGs see Levy (2009).
[5] We detail the identification procedure in appendix C.

This study focuses on SBGs whose economic weight is equivalent to that of an SME. In order to implement this size criterion, we use the European Commission[6] SME definition. The EU definition classically includes size thresholds to define the size perimeters of SMEs. This size threshold is expressed in terms of turnover (< 50 M€), total assets (< 43 M€), and workforce (< 250 full-time employees). The EU definition also integrates the notion of economic dependence via the notion of autonomy. When a firm holds capital participations in other firms higher than 50% or when another firm holds a participation higher than 50% in that firm, then the firm is a linked enterprise. Linked firms need to aggregate their accounting data to determine if they correspond to an SME. We use the same methodology to determine BG size. The use of workforce information is difficult because is it not well described in the database and is biased by the use of external workforces. Therefore, to compute group size we aggregate BG firm turnover for 2005. We exclude identified BGs for which turnover information is lacking for one or more group firms and for which aggregate turnover is higher than 50M€. Overall, the final sample includes 15 877 SBGs.

3.2 SBG characteristics

SBGs, that we identified in the database, have on average a turnover of 9,8M€, but half of SBGs have a turnover less than 6M€ (see Table 4). Average values for the number of firms and levels indicate that the SBG control structure is generally quite simple; consisting of a controlling firm that controls directly two firms.

Given that BG characteristics influence the performance effect of BGs (see 2.3) we develop a typology of SBGs. First, we identify whether a holding company is the SBG controlling firm. The variable **holding** takes the value 1 when a holding firm controls the SBG, zero otherwise. Second, we develop several indicators of SBG diversification, departing

[6] Recommendation 2003/361/CE of the EU Commission of the 6 May 2003, applied since 1 January 2005.

from group-firm geographic and industry location. We first compute the number of "departments" [7] (NDEP) and industries (NIND) in each SBG.[8] The variable **related** takes the value 1 when there is no diversification in the SBG (both NDEP and NIND are equal to 1). Then, we classify diversified firms based on the type of diversification they embody. The variable **geo** is equal to 1 when SBG diversification is only a geographic diversification (NIND=1 and NDEP>1), and zero otherwise. Finally, **unrelated** takes the value 1 whenever the SBG is industrially diversified with no vertical relationship between group firms (NIND>1 and vertical=0).

Table 4 reports the characteristics of the 15 877 SBGs identified in the database. Panel A of Table 4 shows that, on average, SBG firms are located in 2,4 industries and 1,8 "departments", and that 10,42% of SBGs are controlled by a holding company. Some 32% of SBGs are not diversified, whereas 68% are geographically or industrially diversified. Diversified SBGs are larger, have more complex control structures (a higher number of levels), and are more often controlled by a holding firm. Panel B of Table 4 shows that the majority of diversified SBGs adopt a strategy of industrial diversification (94%), whereas only 6% of diversified SBGs adopt a strategy of pure geographic diversification. The type of diversification influences SBG size and complexity: SBGs with only geographic diversification are smaller and have fewer levels, but are more often controlled by a holding firm.

[7] Departments are French administrative districts, in Metropolitan France there is 95 departments. .
[8] When there is a holding in the BG, the variable NIND is equal to NIND-1.

Table 4: Summary statistics on SBG characteristics

Panel A : Full Sample			
	All Sample	Related	Diversified
N	15877	5094	10783
% of Total Sample	100%	32,08%	67,92%
% of groups with a holding	10,42%	3,10%	13,87%
NBFirms	3,00	2,25	3,35
Level	2,14	2,03	2,19
Nindustry	2,28	1,00	2,89
Ndep	1,82	1,00	2,20
Turnover (in K€)	9880	8034	10915

Panel B: Diversifed SBG Sample				
	Diversified		Industrial	
	Geographic	Industrial	Unrelated	Vertical
N	643	10140	9489	651
% of total sample	4,05%	63,87%	59,77%	4,10%
% of subsample	5,96%	94%	94%	6%
% of groups with a holding	17,57%	13,64%	13,72%	12,44%
Nb Firms	2,30	3,41	3,30	5,10
Level	2,08	2,19	2,13	3,15
Nindustry	1,00	3,01	2,87	4,99
Ndep	2,10	2,21	2,16	2,97
Turnover (in K€)	9223	11022	10534	18139

3.3 Methodology

Following common practice, we use regression analysis to test our hypotheses. We test the hypotheses on the firm-level sample (3.3.1), and on the group-level sample (3.3.2).

3.3.1 Firm-level tests

In order to test whether affiliation with an SBG enhances small-business growth, we estimate equation 1:

$$Growth_i = \beta_1 + \beta_2 Affiliated_i + \beta_3 Size_i + \beta_4 Age_i + Industry_i + \varepsilon_i \quad (1)$$

In equation 1, the dependent variable is the firm's average **investment rate.**[9] The equation controls for firm age, industry, location, and size. Our analysis focuses on the sign of the coefficient on firm affiliation. **Affiliated** takes the value 1 when the firm is affiliated with an SBG, and zero when it is an independent firm.[10] If affiliation with an SBG enhances small-business growth, we expect β_2 to be positive.

In order to test whether SBGs are more efficient than external investors in allocating capital to SMEs, we estimate equation 2:

$$ROA_i = \beta_1 + \beta_2 Affiliated_i + \beta_3 Size_i + \beta_4 Age_i + \beta_5 Leverage_i + Industry_i + \varepsilon_i \quad (2)$$

In equation 2, the dependent variable is firm ROA[11], which proxies for firm operating profitability. Firm industry controls for firm performance opportunities—such as the importance of economies of scale in the industry where the firm operates—as well as characteristics of the market, including its size and the intensity of competition. Equation 2 also includes control variables for firm age and size. In addition, firm leverage controls for firm financial structure. The analysis focuses on the sign of the coefficient on the affiliated status of the firm. If capital allocation by SBGs is more efficient than capital allocation by external investors, then affiliation with an SBG should increase firm performance. Overall, a positive sign on β_2 indicates that SBGs promote affiliated small businesses profitability, which is consistent with the efficiency of capital allocation in SBGs.

To test whether SBGs operate mutual risk insurance among group firms, we estimate equation 3:

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[9] All variables are defined in Appendix D.
[10] We do not include controlling firms in the subsample because we focus on the effect of affiliation with an SBG on firm growth.
[11] Firm ROA is computed as the ratio of the firm EBITDA on its total assets.

$$\sigma_{ROA_i} = \beta_1 + \beta_2 Affiliated_i + \beta_3 Size_i + \beta_4 Age_i + \beta_5 ROA_i + \beta_6 FinancialLeverage_i + Industry_i + \varepsilon_i \quad (3)$$

In equation 3, the dependent variable is the standard deviation of firm ROA (σ_{ROA_i}).[12] Drawing on the literature discussed in Section 2.2, we control for firm size, age, industry, ROA, and financial leverage. The analysis focuses on the sign of the coefficient on firm affiliation status. If SBGs use their ICMs for mutual insurance, affiliate firms should be less risky than standalone firms, because the ICM allow firms to smooth their revenue across group firms, therefore β_2 should be negative.

3.3.2 Group-level tests

Further, we estimate equations 1 to 3 for a matched sample of standalone companies and SBGs.[13] With the exception of Kakani (2000), this approach is not developed in the literature on BGs. However, we think it could provide interesting insights into SBG performance effect. First, it is difficult to derive conclusions on the global effect of SBGs on performance from estimations of the effects of SBG affiliation. Indeed, such an approach implicitly assumes that affiliated firms have similar relative importance in SBGs. Therefore, this approach could be misleading if the effect of affiliation on performance is driven by the fact that a very small affiliated firm has a high level of performance. Moreover, this approach also accounts for the fact that a BG with synergies would have an asymmetric influence on returns of all affiliate members, if the synergies do not assist all businesses in the group equally (Brush and Bromiley, 1997). Thus, we estimate equations 1 to 3 but we replace the variable **Affiliated** by the variable **Group**, which takes the value 1 when the observation is an SBG and zero when it

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[12] Hoshi et al. (1991), Khanna and Yafeh (2005), Buyssachaert et al. (2008) and Estrin et al. (2009) adopt this method to test the mutual insurance hypothesis in BG. However the use of this variable is debatable given that the standard deviation is computed with a maximum of 10 observations per firm. Other variables such as the default probability or firm rating could be better proxy to capture firm risk, unfortunately such information is not available in the database.

[13] See 3.4 for the detailed discussion on the constitution of this sample.

is a standalone firm. If grouping small businesses is an organizational strategy that enhances small businesses growth, we expect the sign of the group variable coefficient to be positive for equation 1. Moreover, interpretation of the sign of the coefficient of the group variable in equations 2 and 3 allows us to understand through which channel (ICM efficiency or mutual insurance) grouping SMEs affects growth.

Finally, to test whether group characteristics influence the effects of affiliation with an SBG and of grouping small businesses on growth, profitability, and risk, we estimate equations 1 to 3 under the additional condition of dummy variables for group types. The study of the coefficients of the group characteristics variables allows us to drive conclusions on whether all types of SBGs are beneficial to firm or group performance. Comparison of the economic significance of coefficients helps us to drive conclusions on the effect of SBG characteristics on SBG and affiliated-firm performance.

3.4 Sample construction and descriptive statistics

In order to elaborate the study sample, we merge the ownership information with the Diane database. Following common practice, we exclude observations for which we do not have the required information and with incoherent balance sheet information (such as negative total assets). Moreover, we exclude observations for which we do not have at least two consecutive years of information with which to compute growth rates. Using these criteria, we end up with a firm-level sample of 13 651 firms affiliated with SBGs and 10 869 independent firms for which we have all relevant information over the period 1999-2007.

Table 5: Firm-level sample descriptive statistics

	Global Sample		
Firm/Group characteristics	Mean	STD	Median
Turnover in K€	5811	7662	3337
Total assets in K€	5319	17021	2209
Size in k€	4875	15338	1993
Age	15,46	12,65	11,35
Performance			
Sales growth	12,80%	35,84%	7,64%
Investment Rate	9,83%	17,32%	7,30%
ROA	13,07%	14,36%	10,87%
Risk	6,24%	5,89%	4,55%
Financial Leverage	101,45%	263,32%	38,23%

	Standalone		Affiliated		Mean comparision	
Firm/Group characteristics	Mean	STD	Mean	STD		
Turnover in K€	4604	6715	6761	8416	-2158	***
Total assets in K€	4525	18721	5952	15667	-1427	***
Size in k€	4242	18226	5379	13038	-1137	***
Age	16,89	12,43	14,32	10,76	4,2079	***
Performance						
Sales growth	9,99%	42,74%	15,04%	30,35%	-5,00%	***
Investment Rate	8,30%	18,58%	11,05%	16,31%	-3,20%	***
ROA	11,57%	15,65%	14,27%	13,34%	-2,70%	***
Risk	6,55%	6,88%	6,00%	5,10%	0,56%	***
Financial Leverage	105,46%	261,95%	98,25%	264,41%	7,22%	**

Table 5 reports descriptive statistics for the firm-level sample. Firm characteristics indicate that the sample comprises small, mature businesses with an average turnover of 6 M€, and a median turnover of 3,3M€. The various ratios of performance are consistent with those obtained by the Banque de France (2009) on the French SME population. Means comparisons show that small businesses affiliated with an SBG are, on average, larger and younger than standalone firms. Moreover, we observe that affiliated firms have, on average,

higher growth and operating profitability, but lower risk and financial leverage than standalone firms.

In order to compare SBGs with standalone firms, we aggregate SBG-affiliated firm accounting data. To truly reflect SBG economic characteristics, we maintain in the sample only those SBGs for which we have all the relevant information for all group firms.[14] Then, we compute the sum of group-firm accounting variables. We use this aggregated accounting information to compute SBG financial ratios. Finally, we compute average values over the study period. In order to evaluate the results relative to an appropriate benchmark, we use a matched-sample methodology to compare SBGs with standalone SMEs[15]. We realize the matching procedure on three variables: business size, age and industry location. To match independent firms and SBGs on size, we do not use turnover, because it overestimates the economic size of SBGs given the existence of internal trade. Neither do we use total assets, as this overestimates SBG size, because it includes the equity stakes in BG firms. Therefore, we match standalone firms and SBGs on their total assets minus financial assets. We match the ages of SBG controlling firms with those of independent firms, because the aim of this aggregated sample is to test whether forming an SBG is an efficient growth strategy compared to organic growth. SBG industry is that industry with the highest turnover concentration in any particular SBG.[16] We perform the one-to-one matching procedure as follows: for each SBG, we select one out of the standalone firms from the same industry, age class and size

[14] First, we eliminate all SBGs for which we do not have accounting information for all group firms in 2005. Second, we eliminate SBGs where accounting information is lacking for one year for a group firm (for example, a firm for which we have information in 2000 and 2001 and then from 2003 and 2005). Finally, for affiliated firms for which accounting information is lacking prior to 2005, we verify whether such information is consistent with the firm creation date—if not we eliminate the SBG. Overall, this strict selection procedure ensures that SBG aggregate data reflects SBG economic characteristics.

[15] We use a matching methodology for the group-level sample to control for the potential bias resulting from the fact that SBGs tend to be bigger than standalone firms in our sample.

[16] To obtain SBG industry, we compute the firm's weight in the SBG. This weight is the ratio of firm turnover to group turnover. Then, we add weights by industry, and attribute to the SBG that industry that has the highest weight.

class.[17] The final sample contains 5 598 observations, for which we have 2 799 standalone SMEs and 2 799 SBGs.

Table 6: Group-level sample descriptive statistics

	Global Sample		
	Mean	STD	Median
Firm/Group characteristics			
Turnover in K€	13342	8297	6923
Total assets in K€	12008	7467	6230
Size in k€	8184	5115	4268
Age	25,46	13,26	19,00
Performance			
Sales growth	14,70%	65,89%	7,48%
Investment Rate	12,46%	39,88%	7,49%
ROA	10,74%	15,88%	9,98%
Risk	6,08%	6,53%	4,51%
Financial Leverage	96,19%	249,19%	40,53%
Tangibility	19,24%	17,89%	13,36%

	Standalone		SBG		Mean comparision	
	Mean	STD	Mean	STD		
Firm/Group characteristics						
Turnover in K€	13117	8200	13567	8385	-450	
Total assets in K€	11806	7340	12209	8940	-403	
Size in k€	8005	6789	8364	7894	-359	
Age	26,02	12,26	24,89	14,26	1,14	
Performance						
Sales growth	9,85%	34,33%	19,55%	84,66%	-9,70%	***
Investment Rate	9,77%	21,97%	15,15%	50,77%	-8,20%	***
ROA	10,06%	19,50%	11,41%	11,66%	-1,30%	***
Risk	5,93%	6,14%	6,23%	6,83%	-0,30%	*
Financial Leverage	102,36%	273,43%	90,02%	225,06%	12,34%	*
Tangibility	21,25%	20,86%	17,23%	16,60%	4,02%	***

[17] Age and size class are based on the decile of SBG distribution for those variables.

Observations comprise medium-sized businesses, average turnover 13,1M€, and mature firms (see Table 6). Logically, there are no differences between the two subsamples according to size and age as we match samples on this criterion. Sales growth rate is 15%, investment rate is 12% and firm operating performance is 11%. Mean comparisons indicate that SBGs invest more, are more profitable and have similar levels of operating risk and external financial leverage as standalone firms.

4 Results

This section reports results on the effect of affiliation with an SBG on small-business growth, profitability, and risk (4.1). Then, we present results on whether the formation of an SBG is an organizational strategy that enhances growth (4.2). Finally, we present results on the effect of SBG characteristics on their performance and risk (4.3).

4.1 Does affiliation to a SBG favors small businesses growth?

Table 7 reports results on the influence of firm affiliation with an SBG on firm investment rate, ROA and risk. Column 1 shows that affiliation with an SBG has a positive influence on firm investment rate. The investment rate of firms affiliated with an SBG is, on average, 2,5% higher than that of standalone firms. The results in Column 1 support the fact that affiliation with an SBG promotes small business growth. Column 2 shows that affiliation with an SBG positively influences firm operating profitability. This result supports that SBG ICMs are efficient. Finally, Column 3 indicates that affiliation with an SBG slightly increases firm operating risk. There is apparently no evidence of mutual insurance within SBGs; cross-subsidies do not seem to be used to reduce affiliated-firm risk.

Table 7: SBG-affiliation influence on firm performance[18]

Columns 1 to 3 report estimates of the coefficients when estimating equation 1 to 3, using the ordinary least square method, on the firm-level sample *Investment rate* is the firm growth of capital invested. *ROA* is the firm ratio of EBITDA on total assets. *Operating risk* is the firm standard deviation of ROA. *Affiliated* is equal to one when the firm is affiliated to a SBG, and to zero when it is a standalone firm. *Size* is the log of the firm total assets minus financial assets. *Age* is the number of years since firm creation. All financial variables are average values over the study period. The standard errors of estimates are reported in italics under the value of the estimated coefficients. *** indicates that a coefficient is significant at the 1% level according to the –test, ** at the 5% level, and * at the 1% level.

	Investment Rate		ROA		Operating Risk	
	(1)		(2)		(3)	
Affiliated	0,0250	***	0,0259	***	0,0015	*
	0,0024		*0,0019*		*0,0008*	
Size	0,0039	***	0,0024	***	-0,0103	***
	0,0009		*0,0008*		*0,0003*	
Age	-0,0002	***	-4,73E-05	**	-2,65E-06	
	2,54E-05		*2,04E-05*		*8,45E-06*	
ROA					-0,0153	***
					0,0027	
Leverage			-0,0056	***	-0,0003	*
			0,0003		*0,0001*	
Intercept	0,0583	***	0,0960	***	0,1417	***
	0,0083		*0,0073*		*0,0028*	
Industry dummies	Yes		Yes		Yes	
F	28,34	***	102,55	***	87,42	***
R2	0,0237		0,0843		0,0758	
Number of Observations	24522		24522		24522	

[18] Intriguingly results show a negative relationship between firm risk and firm profitability. Although this is quite surprising it has been observed in previous studies of the same type (see for example Buyssachet et al., 2008). This result can be explained by the fact that we do not rely on market data but on accounting data in which firm profitability is the effective firm profitability, whereas shares market values also account for the expectations of the market. This paper does not focus on this issue, however future research on the reasons to this puzzle could be very interesting.

The literature reports a negative influence of BG affiliation on firm performance in developed countries (see Table 1). Consistently with Gorodnichenko et al. (2009), who find that affiliation with a BG is beneficial for the smallest businesses, we show that affiliation with an SBG is also a mechanism that enhances capital allocation in small businesses. Overall, the results suggest that SBG affiliation promotes small business growth. SBG controlling firms do better in allocating capital to small businesses than external financiers. These results are consistent with the argument that ICMs are a second-best solution in the presence of market imperfections, in the case of this study of information imperfections.

4.2 Is grouping small businesses an organizational strategy that enhances SME growth?

Table 8 reports estimations of equations 1 to 3 on the matched samples of SBG aggregate data and standalone firms. Column 1 indicates that SBGs are significantly more dynamic than standalone firms. The economic significance of the coefficient in front of the group variable is high. The investment rate of SBGs is, on average, 6,4% higher than that of standalone firms. The results, in Column 1, clearly support that grouping small businesses, in comparison with organic growth, is an organizational strategy that enhances small business dynamism. Column 2 shows that the benefits of grouping small businesses in terms of operating profitability is rather small. However, the positive, although small, effect of SBGs on operating profitability confirms that there is no over-investment in SBGs. Column 3 shows that, on average, SBGs and standalone firms have similar levels of operating risk. This result supports that SBGs do not operate mutual insurance between group firms, but do locate risk in affiliated firms. Indeed, the risk of SBGs is smaller than that of SBG-affiliated firms, which suggests specific risk allocation patterns in SBGs.

Table 8: Group status influence on entity performance

Columns 1 to 4 report estimates of the coefficients when estimating equation 1 to 3, using ordinary least square method, on the matched sample of SBGs and standalone firms. *Investment rate* is the entity growth of capital invested. ROA is the entity ratio of EBITDA on total assets. Operating risk is the entity standard deviation of ROA. Financial Leverage is the entity ratio of financial debt on equity. Size is the log of the entity total assets minus financial assets. Age is the number of years since entity creation. All financial values are average values over the study period. The standard errors of estimates are reported in italics under the value of the estimated coefficients. *** indicates that a coefficient is significant at the 1% level according to the t-test, ** at the 5% level, and * at the 10% level.

	Investment Rate		ROA		Operating Risk	
	(1)		(2)		(3)	
Group	0,0681	***	0,0094	*	0,0014	
	0,0105		*0,0039*		*0,0018*	
Size	0,0026		0,0071	***	-0,0054	***
	0,0026		*0,0015*		*0,0007*	
Age	-0,0004	***	-0,0001	***	-4,90E-05	**
	0,0001		*1,37E-05*		*1,96E-05*	
ROA					-0,0073	
					0,0060	
Risk						
Growth			0,0048	**		
			0,0020			
Leverage			-0,0054	***	0,0001	
			0,0008		*0,0004*	
Tangibility						
Intercept	0,0642	***	0,0618	***	0,1090	***
	0,0276		*0,0148*		*0,0067*	
Industry dummies	Yes		Yes		Yes	
F	4,22	***	10,99	***	13,65	***
R2	0,0157		0,0434		0,0533	
Number of Observations	5598		5598		5598	

Overall, the results in Table 8 show that grouping small businesses is an organizational strategy that promotes growth. The results support that SBG ICMs are efficient, which increases their internal financing capacity, and ultimately their capacity to invest. Several alternative explanations can also explain why SBGs are more dynamic than standalone firms. First, structuring control in a BG permits it to raise external capital while maintaining control. If small business owners value control, creating an SBG reduces the cost of opening up firm capital to external investors. Second, the higher dynamism and performance of SBG-affiliated firms can enhance their ability to attract external capital. Finally, SBGs possess an option of partial liquidation, which reduces bankruptcy costs (Bianco and Nicodano, 2002). Unlike conglomerates, BGs are not legally obliged to bail out affiliated firms, because group firms are legally distinct. This "fractioning of liability" has several advantages. Controlling firms may choose to concentrate the bankruptcy risk in a group firm, by concentrating the external debt in this firm. However, such strategy might be costly if creditors anticipate this expropriation. Moreover, controlling shareholders can secure assets in one firm, and concentrate business risk in other group firms. Indeed, if the riskier firm goes bankrupt, the controlling shareholder still controls the assets necessary to continue production. Such strategy then reduces SBG controlling shareholder wealth exposure to business risk, which increases its incentive to invest (this issue is explored in details in Hamelin, 2011).

4.3 Effect of SBG characteristics on performance and risk

Table 9 reports estimations of the effect of SBG characteristics on growth, profitability and risk. Panel A investigates this issue at the firm level and Panel B at the group level. Columns 1 to 3 show that the type of SBG controlling firm (holding or not) does not affect the results obtained in Sections 4.1 and 4.2. However, comparison of the economic significance of the coefficients underlines some differences across SBG types. Control by a holding

company promotes more strongly the development of SBGs and reduces their risk, but limits their profitability.

Columns 4 to 6 explore the effect of diversification on affiliated firms and SBG performance. The results indicate that firms affiliated with an SBG are more dynamic and more profitable, with the exception of firms affiliated with geographically diversified SBGs. The results also show that diversification strategies do not limit affiliated firm risk in comparison with standalone firms. However, comparison of the coefficients underscores that firms affiliated with a diversified SBG are less risky than firms affiliated with an SBG with related diversification. Therefore, the results provide some support to the fact that diversification reduces affiliated firm risk. Comparison of the results at the SBG level shows that related and unrelated diversification enhances SBG growth. However, geographical diversification and vertical integration do not affect significantly SBG growth. Furthermore, Column 5 indicates that only SBGs with unrelated diversification outperform standalone firms. There is no evidence of a diversification discount in SBGs. Finally, Column 6 indicates that diversified SBGs support as much risk as standalone firms.

Table 9: Influence of SBG characteristics on affiliated firms and SBGs performances.

Columns 1 to 6 report estimates of the coefficients when estimating equation 1 to 3, using the ordinary least square method. Panel A reports estimation for the firm-level sample, and panel B for the group-level sample. The table only reports the coefficient estimation for the variables of SBG characteristics, but estimation includes all equation variables. *Investment rate* is the entity growth of capital invested. *ROA* is the entity ratio of EBITDA on total assets. *Operating risk* is the entity standard deviation of ROA. *Holding* is equal to one when the SBG controlling firm is a holding company. *Related* is equal to one when the SBG is not diversified. *Geographical* is equal to one when the SBG is geographically diversified. *Unrelated* is equal to one when the SBG is composed of firms in unrelated industries. All financial variables are average values over the study period. The standard errors of estimates are reported in italics under the value of the estimated coefficients. *** indicates that a coefficient is significant at the 1% level according to the t-test, ** at the 5% level, and * at the 1% level.

	Investment Rate		ROA		Operating Risk		Investment Rate		ROA		Operating Risk	
	(1)		(2)		(3)		(4)		(5)		(6)	
Panel A: Firm-level sample												
Holding	0,0127	***	0,0299	***	-0,0020							
	0,0005		*0,0042*		*0,0018*							
Related							0,0334	***	0,0215	***	0,0011	***
							0,0047		*0,0038*		*0,0002*	
Geographical							0,0496	**	-0,0009		-0,0007	
							0,0254		*0,0205*		*0,0086*	
Unrelated							0,0219	***	0,0280	***	0,0002	
							0,0025		*0,0021*		*0,0009*	
F	27,10	***	94,68	***	60,11	***	25,12	***	87,82	***	55,54	***
R	0,0259		0,0849		0,0556		0,0260		0,0853		0,0557	
NB	24522		24522		24522		24522		24522		24522	
Panel B: Group-level sample												
Holding	0,1532	***	-0,0063		-0,0077							
	0,0224		*0,0084*		*0,0038*							
Related							0,0441	***	0,0052		0,0019	
							0,0121		*0,0045*		*0,0020*	
Geographical							0,0092		0,0120		-0,0046	
							0,0377		*0,0141*		*0,0063*	
Unrelated							0,1056	***	0,0156	***	0,0014	
							0,0138		*0,0052*		*0,0023*	
F	4,61	***	10,72	***	13,41	***	4,31	***	9,86	***	12,15	***
R	0,0195		0,0441		0,0546		0,0197		0,044		0,0537	
NB	5598		5598		5598		5598		5598		5598	

Overall, the results in Table 9 confirm that SBG affiliation and grouping small businesses promote growth and that there is no mutual insurance within SBGs. Further, the results do not support the diversification discount hypothesis in SBGs; the less efficient strategy is geographic diversification. Finally, the results indicate that the type of controlling firm does influence SBG performance effect. The presence of a holding company in the SBG enhances affiliated firms and SBGs growth; this might be explained by the fact that holding companies benefit from higher levels of leverage given that they are generally created by leveraged

buyout. The results in Table 9 confirm that the characteristics of SBGs influence their growth, profitability and risk. However, the effect of group characteristics does not undermine the performance effect of SBGs.

5 Conclusion

This study explores whether formation of an SBG acts as an organizational strategy that promotes SME growth. This paper presents original results on the effect of firm affiliation on a SBG and of the formation of SBGs on a large sample of French SMEs over the period 1998-2007. The results show that grouping small businesses is a growth strategy: SBGs promote affiliated firm dynamism and invest more than their standalone counterparts. Our results indicate that grouping SMEs enhances growth because SBG ICMs facilitate a more efficient allocation of financial resources to group firms. Therefore, SBGs have higher profitability, which increases their internal financing capacity for investing. Finally, the results show that all types of SBG over-perform standalone firms with the exception of geographically diversified SBGs. Overall, the results support that grouping small businesses allows them to reduce their growth constraints.

This paper contributes to the literature in several ways. It presents a study of SBGs, which, to our knowledge, is an unexplored topic in the economics and finance literature. On one hand, this exploration contributes to the small businesses literature by focusing on an alternative growth strategy. On the other, it contributes to the literature on the benefits and costs of group affiliation. First, it tests whether affiliation with a BG is a response to capital market imperfection, in the specific context of small businesses, which suffer from important information imperfections. Results point out that affiliation to a SBG alleviates small

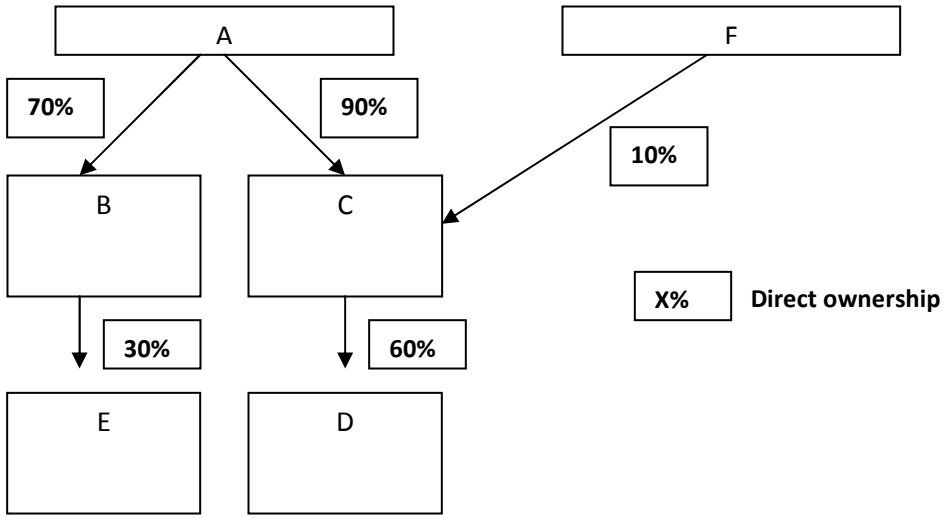
businesses growth constraints and favors their dynamism. Second, we work on SBG aggregate data, which is a novel approach in the study of BGs. Thanks to this approach, we are able to show that grouping small businesses is an organizational strategy that promotes small businesses growth.

This paper leaves several questions unanswered, which could lead to interesting future research. This study does not explore the potential endogeneity of SBG. Indeed, decisions of affiliation or integration into a SBG can result from the firm dynamism and profitability. Unfortunately our data is limited to a cross section observation of SBGs, only access to data that retraces the formation of SBGs would allow to explore this issue. Further, this study does not explore the dynamics of SBGs: are they formed through creation of new businesses or by acquisition of existing firms? Although comparison of ages between controlling and controlled firms indicates that SBGs are more likely to be created through creation rather than acquisition, we do not present formal evidence on this issue. Moreover, we do not assess differences in the effect of small business affiliation on SBGs and on large BGs. Finally, this study does not explore alternative motivations to structure into a SBG. For example the existence of size thresholds for legal and social obligations can be an important factor explaining the choice of this peculiar growth mode.

Appendices

Appendix A: Example of a BG identified in the initial database

Figure 1: Example of ownership links between firms



In the ownership structure represented in Figure 1, firm A has an ownership stake of 90%*60%=48% in firm D. However, A majority controls[19] firm C, which in turn majority controls firm D; thus A controls D. Firm A also controls firm B, given that it direct stake is higher than 50%. Firms F and E are independent firms because they neither are directly controlled at a majority by another firm or directly control at a majority another firm. Overall, the business group is formed by firms A, B, C and D.

[19] The term majority control is used to describe the situation in which a firm controls another firm through holding a majority (>50%) of the controlled firm's shares.

Appendix B: Database on ownership links from Coface Services

In the database, the firm official fiscal identity number (SIREN) uniquely identifies each firm. For each ownership link, the database provides two SIREN: one for the *controlling firm* and the other for the *controlled firm*.

Level (l): indicates the length of the control chain between the two firms. This variable is equal to 1 if the controlling firm directly owns the controlled firm. Values greater than 1 correspond to indirect ownership through a vertical chain of holdings of length *l*.

Ownership (o): the real holding of the controlling firm in the controlled firm at level *l*. For level=1, the ownership variable defines the direct ownership matrix (D), which lists direct ownership across firms. For level>1, the ownership variable defines the indirect ownership matrix (I) at level *l*. Indirect holdings are the product of direct ownership along the control chain.

Number of links (n): the number of firms that have an ownership stake in the firm.

We fill in the ownership structure illustrated in Figure 1 in Table 10:

Table 10: Initial database structure

Controlled firm	Controlling firm	Level	Number of links	Ownership
B	A	1	1	70%
C	A	1	2	90%
D	A	2	3	48%
E	A	2	2	21%
E	B	1	2	30%
D	C	1	3	60%
C	F	1	2	10%
D	F	2	3	6%

Appendix C: Procedure for identifying BGs according to criteria of effective majority control

The group identification procedure uses the criterion of majority control; a BG corresponds to a chain of majority control relationships. The majoritization rule (see, for example, Chapelle and Szafarz, 2005) implies a dichotomization of ownership to find majority control. Whenever the shareholder's ownership stake is greater than 50%, we assume that control is total. In turn, we assume that other shareholders have no effective control. This criterion seems optimal for this study. Indeed, the sample concerns privately held firms where ownership is often highly concentrated, yet this threshold avoids the counterintuitive findings for situations involving two controlling firms.

First, in order to identify the control chains and establish whether control is effective at each chain's link, we identify the ultimate holding level for each controlled firm. We create a variable *N* that indicates the higher holding level for each of the controlled firms in the initial database. The highest level of holding found in the database is 17. Contrary to the level

variable that characterizes the relation of a controlled firm with a controlling firm, the *N* variable is unique for each controlled firm and indicates the higher level at which the firm is held.

Second, a binary variable indicates whether a firm is subject to direct effective control from the firm holding it directly. The majoritization rule is applied using the ownership (o) variable when level=1 to obtain the *effective control* (*ec*) variable, which takes the value 1 if direct ownership of the firm is higher than 50%, and 0 otherwise.

Third, the *effective control level (S)* is the highest level at which the firm is effectively controlled all along the chain of control. In order to identify the effective control level of firms in the database, the procedure starts from the lowest level of control and goes up along the control chain in order to observe whether there is a control rupture. The level at which this occurs returns the value of *S*.

Fourth, we identify the controlling firm (*ActS)* at level S. When *N* is greater than 2, a procedure of N steps is required. We first identify whether the firm is effectively controlled at level 1, and then whether the controlling firm at level 1 (Act1) is effectively controlled, and so on, using the effective control variable (c) that returns the direct ownership between two firms. These transformations modify the structure of the database, as the observations are the controlled firms, and not every pair of controlled/controlling firms as illustrated in Table 11. Next, the table reports that vertical control chains are the observations and the variables indicate the chain of control. One fact not captured in the example below is that the database also contains the information on direct ownership between firms at each level *DS.*

Table 11: Identification of the vertical chains of control

Firm	N	S	ActN1	ActN2	ActNi	ActN17	Ultimate controlling firms
B	1	1	A	.	.	.	A
C	1	1	A	.	.	.	A
D	2	2	C	A	.	.	A
E	2	0	.	.	.	.	.

We need a transformation to identify groups. The aim of this transformation is to make the BGs the observations instead of the vertical chains of control. We index each controlled firm by both its level of control (l) and the horizontal branches through which it belongs to (b). This allows us to obtain the following group-level variables. *Level* indicates the length of the vertical control chain in the BG. *Nbfirms* is a variable indicating the number of firms in the BG, including the controlling firm. *Branches* provides information regarding the geometry of the group by indicating the number of horizontal chains in the BG. If this variable is equal to 1, the BG is a vertical chain of control. If it is greater than 1, the BG is a mix between a horizontal and vertical control chain, which is the case of the example BG below.

Table 12: Identification of BGs

Ultimately controlled firm	Act11	Act12	Level	NBfirms	Branches	Controlling firm	Group
D	C	D	2	4	2	A	1
E				.	.	.	0

Appendix D: Description of variables

Table 13: Explanatory variables

		Variable	Formula	Definition
Explanatory variables	SBG Affiliation	***Affiliated***		Is equal to 1 if the firm belongs to a SBG and to 0 if it is an independent firm
		Group		Is equal to 1 if the observation corresponds to a SBG, and to 0 if it is an independant firm

Table 14: Group-level variables

		Variable	Formula	Definition
Group Level variables	Technological	***Size***		Aggregate of group firms size.
		Industry		Industry that represents the highest level of tunrover in the SBG.
		Age		Age of SBG controlling firm.
	Characteritistics	***NDEP***		Number of departments in the SBG.
		NIND		Number of industries in the SBG.
		Holding		Is equal to 1 if SBG controlling firm is a holding, and 0 else.
		Diversified		Is equal to 1 if either NDEP>1 or NIND>1, and 0 else.
		Geo		Is equal to 1 if NDEP>1 and NIND=1, and 0 else.
		Vertical		Is equal to 1 is bacward is equal to 1 or 0, and 0 else.

Table 15: Explained variables

This Table presents the explained variables computed at the firm level. To compute these variables at the SBG level, we simply use the aggregate accounting of SBG accounting information to compute the following ratios.

		Variable	Formula	Definition
Explained variables	Profitability	***ROA***	$ROA_i = \frac{1}{T}\sum_{t=1999}^{2007}\frac{EBITDA_{i,t}}{TotalAsset_{i,t}}$	Return on asset (ROA) computed as the ratio of earnings before tax, interest and depreciation (EBITDA) to total firm assets.
	Growth	***Investment Rate***	$InvestmentRate_i = \frac{1}{T}\sum_{t=1999}^{2007}\frac{ProductiveAssets_{i,t}}{ProductiveAssets_{i,t-1}} - 1$	Average growth rate of productive assets. Where productive assets is the sum of gross long-term assets and working capital minus financial assets.
	Risk	***ROA volatility***		Standard deviation of ROA over the period.

Table 16: Control variables

		Variable	Formula	Definition
Control variables	Technological	***Size***		Log of firm total assets minus financial assets
		Industry		Dummy variable indicating whether a firm belongs to a particular industry in the 19 industry classification scheme (similar to NACE classification)
		Age		Log of the number of years since the firm's creation
	Financial	***Tangibility***	$Tangibility_i = \frac{1}{T}\sum_{t=1999}^{2007}\frac{FixedAssets_{i,t}}{TotalAssets_{i,t}}$	Ratio of firm fixed assets to total assets. Fixed assets correspond to long-term assets excluding financial and incorporal assets.
		Sales Growth	$SalesGrowth_i = \frac{1}{T}\sum_{t=1999}^{2007}\frac{Turnover_{i,t}}{Turnover_{i,t-1}} - 1$	Average annual growth rates of sales

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