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THE ECONOMIC PERFORMANCE OF BUSINESS GROUPS IN DEVELOPING COUNTRIES

The role of absorptive capacity

ESST Master Thesis
Jan Hiroshi Lintvedt
University of Oslo
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PREFACE

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Jan Hiroshi Lintvedt

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ABSTRACT

Business groups – legally independent firms tied together in various formal and informal ways – are omnipresent in emerging economies. Research on the economic performance of business groups has so far paid only limited attention to their technological capabilities and absorptive capacity, and mostly presented studies for individual economies rather than cross-country comparative analyses. This thesis presents a cross-country empirical analysis of the economic performance of group affiliated firms, investigating in particular the importance of firm capabilities and absorptive capacity – e.g. human capital, ICT usage, access to finance, international trade, technology and innovation – for the productivity performance of firms in developing countries. The empirical analysis is based on a large dataset, the *World Bank Enterprise Survey*, and the econometric analysis focuses on a sample of around 30 000 manufacturing firms in 85 developing economies. The results reveal that group affiliation enhances economic performance, and that the superior performance of group-affiliated firms *vis-à-vis* independent enterprises is related to their greater capabilities in terms of human capital, access to finance, as well as technology and innovation.

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1. INTRODUCTION

The role of innovation and technological development has been widely recognized as an explanatory factor for economic growth and welfare in the industrialized world, and the academic interest in the field of innovation studies has grown exponentially over the last three decades (Fagerberg, Fosaas, & Sapprasert, 2012). The concept of "innovation systems", which comprises "all important economic, social, political, organizational, institutional and other factors that influence the development, diffusion and use of innovations" (Edquist, 2006) has won acclamation and is beginning to shape policy agendas at both national and international level.

Nonetheless, these concepts and research topics have only recently been applied to the studies of growth in developing economies. Since many of the existing concepts were initially developed for the study of advances countries, there are important weaknesses that hamper the implementation of them on developing economies (Ernst, 2002). This has not least been demonstrated by fact that several of the countries which have reached far in catching up with the Western world have institutional arrangements that differ a lot from Western ideals (Fagerberg & Srholec, 2007). Hence, there is a rising awareness among researchers about the specific challenges for innovation and technological development which governments and firms in emerging countries are facing. In order to understand these challenges, and at the same time appreciate the opportunities, it is required to understand distinctive industry structures and firm strategies in the various countries, as well as to acknowledge that innovation has other multiple sources (Chaminade, Lundvall, Vang-Lauridsen, & Joseph, 2010).

In the case of many emerging countries, business groups constitute a large portion of private businesses in the economy. Although the characteristics of business groups are highly diversified, they share some broad similarities, and can be defined as "a collection of legally independent firms, bound together in long term strategic alliances" (Khanna & Yafeh, 2007). These confederations of firms are omnipresent in a wide range of emerging markets, where they can control a considerable fraction of a country's productive assets and comprise some of the largest and most visible firms (Khanna & Rivkin, 2001). This permeating presence of business groups infer that they may play an important role in the technological and economic development of a country. Yet, we know little about the influence of the groups on developing economies, the strategies and capabilities of group affiliated firms (GAFs), and how they differ from stand-alone firms (SAFs).

The existence of business groups in emerging economies should thus be of great interest for those attempting to understand economic growth in the developing world. During the last couple of decades, a rising awareness of the presence and role of business groups has resulted in numerous studies of their diverse nature and influence on economic development. Fewer, though, have undertaken detailed research on the strategies and capabilities of group affiliated firms. Indeed, several studies have been published on these topics using firm level data, but they are typically focused on a single economy or cross-country analyses of only a few countries, often confined to a limited scope of sectors. Hence, there exists an important research gap in the studies of cross-country differences in the strategies and capabilities of group affiliated firms. Furthermore, while there have been performed several analyses of innovation and

absorptive capacity in developing countries at national level, only a few attempts have been made at the level of groups affiliated firms. This leaves another important gap in the research.

This thesis aims at narrowing these research gaps through a quantitative analysis utilizing a large dataset from the *World Bank Enterprise Surveys* (WBES). The WBES is a large survey based dataset covering several thousand firms in nearly all developing economies, providing information about firm characteristics and strategies, as well as their perceptions about the business climate and institutional environment in which they operate. The empirical analysis in this thesis focuses on data collected in the period 2006 to 2010, from about 30 000 manufacturing firms in 85 emerging economies. This allows for a solid analysis with universal results of high explanatory value.

The first, and most general, question to be examined in this thesis concerns the economic performance of GAFs in emerging countries. Several theories highlight the potential competitive advantages business groups can provide either through compensating for institutional voids (Castellacci, 2012; Khanna & Yafeh, 2007; Mahmood & Mitchell, 2004), by enabling project execution capacities in diversified markets (Amsden & Hikino, 1994; Guillén, 2000; Kock & Guillén, 2001), or other mechanisms. However, the empirical evidence on the economic performance of GAFs remains limited and inconclusive (Carney, Gedajlovic, Heugens, Essen, & Oosterhout, 2011; Khanna & Rivkin, 2001). Running regressions with a measure of labor productivity as dependent variable, I estimate the productivity of GAFs verses that of SAFS, exploiting a larger and more geographically dispersed dataset than prior studies.

The second question constitutes a specification of the first, asking what factors may affect the economic performance of the group affiliated firms. For the purpose of answering the second question, I will adapt a framework for absorptive capacity which is better suited for firms in emerging economies. Absorptive capacity is often used as a framework for measuring a firm's propensity for innovation, but there are also direct and indirect links between absorptive capacity and economic performance (Kostopoulos, Papalexandris, Papachroni, & Ioannou, 2011). One of the contributions of this thesis is to include new variables for the measurement of absorptive capacity, as technological advancements in emerging countries are more about technology transfer from more developed nations, and less about developing original inventions. Introducing interaction variables associated with firm capabilities and absorptive capacity, I investigate the relative importance of these dimensions for the productivity of GAFs *vis-à-vis* SAFs.

The findings of the econometric analysis suggest that groups affiliated firms have better economic performance than stand-alone firms because of better capabilities related to the evaluation, assimilation, and exploitation of external knowledge. Capabilities associated with human capital, access to finance, and technology and innovation appear to have a larger effect on the productivity of GAFs than of SAFs. These findings help explain why business groups seem to thrive in developing economies, and infer that their presence may be beneficial for emerging nations' economic and technological development.

Section 2 of this thesis presents central concepts and relevant literature that constitute the theoretical framework used for the analysis and arguments that will be put forward. This includes a brief introduction to the concept of business groups, their capabilities, as well as the

economic and innovative performance of group affiliated firms. The framework of absorptive capacity is also outlined there. In the third section I introduce the research questions and conceptual model on which the empirical analyses will be based, in addition to the hypotheses to be investigated in the estimations. Section four provides information about the *World Bank Enterprise Surveys*, and presents key figures from the dataset and the sample which form the basis of the analysis. This section also presents indicators and descriptive data related to the main hypotheses under investigation. The section ends with a description of the empirical model and the methods used in the empirical analyses. The results from the analyses are exposed in section five. Finally, in section six I discuss the results and draw conclusions and implications from the findings.

2. LITERATURE REVIEW

2.1. BUSINESS GROUPS

Although there is a rising awareness of the presence and impact of business groups on technological and economic development in emerging economies, the definition of the phenomenon of "business groups" is still vaguely and ambiguously defined in the literature. The business group is a diverse form of ownership structure that can be found in many emerging economies in regions such as Latin America, Asia and Africa. They are attributed various names in different parts of the world, like the *grupos económicos* in Latin America, the *keiretsu* of Japan, *chaebol* in Korea, *mining houses* in South Africa, and so on (Mahmood & Mitchell, 2004). In an early study, Leff describes the group as a "multicompany firm which transacts in different markets but which does so under common entrepreneurial and financial control" (Leff, 1978). In other words, a business group is an assemblage of more or less diversified firms operating under some kind of coordination. It is, however, from this definition difficult to see how a business group differs from other forms of conglomerates. In a later paper, Khanna and Yafeh defines business groups as "a collection of legally independent firms bound together in long term strategic alliances" (2007). This makes two important distinctions which separates business groups from other forms of firm organization. Firstly, the firms within the group should be legally independent. This does not exclude the existence of formal connections between the firms, but they should be registered as separate entities. Secondly, the alliances should be of a long term and strategic nature. Short term inter-firm collaborations, related to specific projects

or tactical objectives, are not rare, but in a business group the associations are of a more permanent character.

Business groups vary considerably in shape in different parts of the world. Some are extensively diversified with affiliate firms in a vast array of sectors, while others are more focused within a few, related industries. They also differ in the amount of vertical integration, meaning the integration of up-stream suppliers and down-stream distributors. In some regions, the inclusion of banks and other financial services in the group is common. The reliance of family ties is fundamental in some countries, noticeable in diverse areas like Korea and Latin American countries. Certain governments favor business groups, and the groups enjoy a close relationship with government and society, while other governments may be suspicious and feel intimidated by their presence, and the relationship is characterized by rivalry and conflict.

The alliances of a business group may have a formal nature, e.g. cross-holding of stocks or affiliation to a conglomerate with a common parent company that owns controlling shares, or consist of informal associations, bound together by family ties or other interpersonal connections. Ownership and control, though, should be combined with “personal and operational ties among all the firms” (Granovetter, 1995). In other words, acquisitions by parent companies based purely on financial considerations do not form what we call a business group.

Business groups can be organized both vertically, with one parent company directly and indirectly controlling a multitude of subsidiaries, or horizontally, with several independent firms in a more loose coalition with no legal status and without a single firm or individual in control. Vertically controlled business groups are often organized as pyramids, with one firm owning

controlling shares of several other firms, whom in turn controls yet other firms on a third layer, and so on. This way, one company or family can gain control of a large group of firms with relative small capital demands. Horizontal groups, on the other hand, are often tied together through mutual stockholdings and frequent meetings at executive level (Granovetter, 1995).

2.2. THE ECONOMIC PERFORMANCE OF GROUP AFFILIATED FIRMS

Researchers studying business groups are divided in their views regarding the implications of group affiliation on a firm's economic performance. Some theories suggest that business groups may enhance financial performance by expropriating minority shareholders, engaging in rent-seeking, and exerting market power (Khanna, 2000). More importantly, in emerging markets the groups can overcome market imperfections by internalizing finance, labor, and intermediate product market functions (Khanna, 2000; Khanna & Yafeh, 2007), consequently enhancing effectiveness. In an economy with weak legal institutions, formal contract enforcement is insecure, and otherwise beneficial transactions may fail to be effectuated because the indirect costs of the transaction outweighs the benefits (Khanna & Rivkin, 2001). This market failure is especially relevant for foreign firms which may hesitate to get involved in markets where their capital investments and intellectual property rights are not properly protected. Under such circumstances, business groups may excel in relational contracting both within the group and with external partners (Hainz, 2006). In addition, groups affiliated firms may have more incentives to avoid opportunistic behavior as they put the reputation of the whole group at stake (Mahmood & Mitchell, 2004).

There is also a risk of business groups functioning as a disruptive force to the process of creative destruction, by redistributing the profits of some group affiliated firms (GAF) to cover the loss of other, uncompetitive GAFs. The recipient GAF could for example be valued as too prestigious to let fail, or there could be close personal ties between the management of the GAF and the business group leaders, something which has been suggested as being the case for several of the Japanese *keiretsu* (Miyashita, 1995). Such a strategy does not only reduce the profitability of the competitive GAFs and of the business group as a whole, but could also stagger the innovation level at a national level.

The empirical evidence for the economic performance of GAFs is nevertheless ambiguous, with some studies supporting the view, while others provide no clear conclusions about the impact of group affiliation on the economic performance of the firm (Carney et al., 2011). In an empirical study of 14 emerging economies, Khanna and Rivkin (2001) found that GAFs are more profitable in six of the countries and less profitable in three. For the remaining five countries they found no relations between group affiliation and profitability. A meta-analysis of 141 studies in 28 countries conducted by Carney et al (2011), found a small, negative relationship between group affiliation and firm performance, but also that the performance implications of group affiliation was very heterogeneous. In short, the literature and previous research provide ambiguous clues about the relationship between business group affiliation and economic performance.

2.3. BUSINESS GROUPS AND INNOVATION IN EMERGING COUNTRIES

Innovation activities are rarely performed isolated in a firm alone. Rather, innovation is an outcome of interaction between several actors in different industries, and both in the private and public sector. It is the collective system of actors that determine innovative ability, rather than the individual organizations (OECD, 1997). The concept of innovation systems is based on this understanding of innovation and technological performance as a products of relationships between actors producing, distributing and applying knowledge. The function of an innovation system is at a general level to develop and diffuse innovations through the provision of knowledge inputs, markets, support services, and institutions to the innovation process (Chaminade & Edquist, 2005). As an assumption, public institutions, knowledge development systems, financing and other support mechanisms for innovation are generally less developed in emerging countries.

In countries with a less developed innovation systems, business groups can facilitate innovation by providing institutional infrastructure that is not publicly offered (Mahmood & Mitchell, 2004). With the absence of functional institutions, transaction costs in acquiring inputs such as technology, finance and personnel increases. When these factors are hard to attain in the open market, business groups can substitute for these deficiencies by creating their own internal markets (Gubbi, Aulakh, Ray, Sarkar, & Chittoor, 2009). Consequently, business groups may overcome the institutional voids at country level by constructing their own, internal innovation systems. Through mechanisms like intra-group training programs, transfer of skilled personnel, reallocation of funding, and intra-group knowledge sharing, business groups are able to improve

the innovation capabilities and economic performance of the GAFs. However, while the presence of business groups may be beneficial for the development in countries with weak institutional structures, evidence have also been presented that the economic (Carney et al., 2011) and innovative (Castellacci, 2012) performance of group affiliated firms is positively related to high institutional development. This implies that the presence of business groups may have a positive effect on the national level of innovation and economic growth in economies of various stages of institutional development.

However, the monopolistic nature of business groups may have negative impacts if they become too dominant in an economy. If the market share of business groups in a given sector is high, it would create solid entry barriers to that sector. Groups may erect entry barriers for in least three ways: Groups are diversified companies with access to deep pockets and the ability for preemptive price-cutting, groups meet each other in multiple markets often recognize their interdependence and moderate their competition with each other, and diversified groups may establish favorable reciprocal arrangements with firms that are both buyers and suppliers. In addition, groups are able to use multi-use favors more effectively in order to obtain preferential access to permits and licenses, as well as keep out foreign competition through lobbying to impose tariffs or non-tariff barriers. Finally, a high sectoral rate of groups in an industry may imply that entrant need to have certain types of resources that are hard to obtain for firms not affiliated to groups (Mahmood & Lee, 2004).

If entry barriers are high, the sector would be of monopolistic nature and the incentives for innovation would be weak. With lower entry barriers, the increased competition could encourage spending on innovation activities among the firms in order to obtain competitive

advantages, be it through improved products or lower costs. On the other hand, if the market structure is too fragmented, it may discourage these activities because the innovator receives an insufficient share of the payoffs from the innovation. Thus, it is expected that the relation between barriers to entry and technological innovation is inverted U-shaped, meaning that innovation efforts would be at its peak in a sector with an intermediate level of market concentration.

This relation is modified by technological opportunity. Market concentration has a more favorable impact on research investments in low technological opportunity sectors, where costs for innovation activities are high, while the outcome is uncertain. If the technological opportunities in a sector are high, meaning that the technology is immature and potential for advancement is good, both costs and uncertainty is low, and market concentration may have a negative effect (Mahmood & Lee, 2004).

From this point of view, the presence of business groups may increase the amount of innovations in an economy by providing market barriers securing the profitability of new products. However, if a market is to monopolistic, the monopolists will have less incentives to improve their products, thus reducing innovation activities. Innovation performance is at its peak when groups' market share is at an intermediate level.

2.4. Business Group affiliation and Absorptive Capacity

I have in the previous section highlighted theories of how business groups are disposed to engage in innovation activities, particularly in economies with institutional voids which the groups can subdue.

It could also be argued that business groups enhance the absorptive capabilities of the individual affiliate firms and of the group as a whole. Absorptive capability refers to an organization's ability to acquire and assimilate information, as well as to the organization's ability to exploit it (Cohen & Levinthal, 1990). Previous studies of absorptive capacity have predominantly focused on large, high technology firms in the developed world, using R&D investments as a proxy for a firm's absorptive capacity. The idea is that R&D investments not only increases the propensities of the firm to produce new ideas and products by themselves, but also that the presence of highly trained technological staff and advanced research facilities makes the firm better able to identify and utilize new technology from the external environment. This approach to analyzing absorptive capacity, however, is not necessarily suitable for firms in less developed countries. In emerging economies, firms are generally smaller, more low-tech, and invest little in pure R&D. They commonly operate far from the technological frontier, and innovation is not so much about original inventions, but rather about new production processes, improved products, and organizational evolution (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2011). On the other hand, the external technology pool is potentially vast. I will later in this section suggest other factors related to the absorptive

capacity of firms in emerging markets, which could improve the firm's abilities to identify, assimilate, and exploit external knowledge.

The above mentioned elements are also relevant to the concept of dynamic capabilities, which represents an evolution of the absorptive capacity framwork. This approach emphasizes the capability of an organization to renew competences in order to keep up with the changing business environment (Teece, Pisano, & Shuen, 1997). Similar to the absorptive capacity framework, dynamic capabilities focuses on firm-specific resources, but emphasizes organizational structures and managerial processes which support adaption, integration, and reconfiguration of internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment. The potential for developing dynamic capabilities and becoming "high flex" is arguably better for business groups than for external firms. Processes for coordination and integration of activities are not constrained to the individual firm, but may transcend the whole group. A skilled labor force and wide interface towards the external environment enhances the prospective of organizational learning. Moreover, a diversified and coordinated group may have more flexibility in the face of reconfiguring and transforming the firm's asset structure.

Researchers have argued that business groups pursue unrelated diversification because of lack of competitive proprietary technology (Hobday & Colpan, 2010). The comparative advantage of business groups is not in specific technologies, but their project execution ability that can be applied to a wide range of industries (Amsden & Hikino, 1994). Thus, they suggest a modification of the traditional resource-based view with less emphasis on the advantages of focus and specialization. This idea is supported by Guillén (2000), who suggests that the

importance of business groups will be greater in emerging economies with asymmetrical trade and investment conditions because they allow few entrepreneurs and firms to develop the capability of combining the requisite foreign and domestic resources for repeated industry entry. This capability encourages those who possess it to diversify across unrelated manufacturing and service industries because it has multiple uses, is difficult to trade, and it remains idle if a group does not prepare to enter a new industry (Guillén, 2000). This capability to repeatedly enter new industries is similar, though not identical, to the above mentioned concept of dynamic capabilities advocated by Teece.

2.5. CAPABILITIES IN GAFS

By making up for missing institutions related to innovation and entrepreneurship, business groups may be more effective in their innovation endeavors. This is further reinforced if the business group affiliation boosts the absorptive capacities of the member firms. In this paper I have chosen to focus on dimensions that provide the firms better capabilities to identify, acquire, and exploit external knowledge.

2.5.1. External interface

In order to identify and acquire new knowledge, the firm needs to have some kind of interface to the external environment in which the technological development is more advanced. Linkages with firms in more advanced economies are central for technological transfer, and for

the transition from imitation to innovation in firms in emerging countries (Chang, Chung, & Mahmood, 2006). Firms in which operations are limited to a local or national level will be at disadvantage compared to firm who interact with other, more advanced countries. This interaction could be in the form of international trade, OEM-production, joint ventures, foreign ownership, or other arrangements. The form and magnitude of these interactions will lead to varying degrees of direct or indirect technological spillover effects.

Business groups are often preferred as business partner for foreign firms because of better access to capital, research facilities and talents, which could help make business group affiliates more qualified partners. Because of the groups' high visibility and outreach, GAFs have more incentives to avoid opportunistic behavior. Weak protection of intellectual property rights and contract enforcement in many less developed countries are commonly considered obstacles for investments and cooperation by foreign firms, who fear technology leakages. GAFs would often be considered less risky to do business with as they put the reputation of the whole group at stake. Moreover, the influence of large business group on other firms and potential tight connection with government and bureaucracy may make it easier for these to protect property rights and enforce contract related to third parties than for individual firms (Mahmood & Mitchell, 2004). GAFs may also exploit the international network of other firms in the same group.

2.5.2. Human capital

In order to correctly identify and assimilate new knowledge, a certain level of skill among management and employees is a prerequisite. Skilled personnel are not only better preconditioned for valuing and decoding external knowledge. The acquired knowledge will probably also diffuse better within the organization. In emerging economies, high level human resources are often scarce, as institutions for higher education and advanced research are less developed. Business groups can substitute for this shortage by setting up internal infrastructures to nurture scientific talents, and spread the costs between the firms in the group. Hence, groups sometimes perform the functions of research institutes, engineering universities and vocational schools that are usually considered public tasks (Mahmood & Mitchell, 2004). Innovation is also facilitated by creating an internal labor market. Talents can be acquired internally without having to go to the often rigid and limited external market with varied quality. Moreover, the group management may allocate personnel in the group across the affiliated firms according to the need and strategic considerations (Khanna & Palepu, 1997). If managed wisely, this could considerably improve the business group's dynamic capabilities. Business groups are also often regarded as attractive employers. They tend to be more stable and provide more secure employment, better facilities and conditions, in addition to the possibility of group internal training and relocation. Groups may therefore be better able both to attract new talents, and to keep them within the group over time.

2.5.3. Access to finance

Furthermore, for the purpose of exploiting new knowledge for commercial gains, a certain level of financing is usually required to set up new production facilities, train workers, acquire licenses, and so on. Lack of capital is a major obstacle for business development and investments in R&D and innovation. In most developed economies, this obstacle can be overcome by accessing finance from sources like internal funds, bank loans, venture capitalist, and government funding schemes. These are less viable options in the developing world. In economies with an underdeveloped capital market, raising funds could be difficult and risky because of high transaction costs and information problems, and government funding schemes are rare.

Many business groups, however, include one or more firms within the financial services sector. An internal capital market through integrated financial services could significantly improve the affiliated firms' access to finance (Khanna & Yafeh, 2007). On the other hand, even if the business group does not include financial services, affiliation could prove supportive in raising capital. By referring to the reputation of the group as a whole, a single affiliate firm may be evaluated as more credible by external bankers, venture capital funds, and other providers of funding both domestically and on the international market (Mahmood & Mitchell, 2004). Moreover, large business groups are more likely to be deemed "too large to fail" by governments, and the probability of government intervention and support in the face of a threat of bankruptcy is larger. This could cause investors to regard investments in large business groups as less risky than in SAFs.

2.5.4. Network integration and product quality

Vertical integration in business groups may also assist in the innovation performance of business groups. Vertical intermediaries, such as suppliers and distributors, play key roles in a firm's innovative endeavors by providing access to skills, equipment, and customers (Mahmood & Mitchell, 2004). David J. Teece (1986) argues that these complementary assets are often required in order to fully capture the benefits of innovation activities. In emerging economies, firms with such complementary capabilities tend to be weaker than in developed countries. By vertically integrating intermediation in the business group, the dependence on weak external complementary firms is reduced. On the other hand, if diversified business groups become too dominant and vertically integrated, stand-alone SMEs may be suppressed, reducing upstream innovations and the variety of supplies and support services. This was the case in South Korea, where the powerful *chaebols* became dependent on Japanese suppliers of high-tech components, largely because the potential Korean supply industry previously had been blocked from market by the same *chaebols* (Hobday & Colpan, 2010).

In a study of product variety in business groups, Feenstra et al (Feenstra, Yang, & Hamilton, 1999) found evidence that support their hypotheses of positive correlations between business groups and product quality due to both horizontal diversification and vertical integration. A multi-product group will have greater incentives to develop high quality products than SAFs, as the reputation of one line of products will affect the attractiveness of the other products of the group. They also find that this idea is reinforced by vertical integration. As a group is jointly profit-maximizing, intermediate goods will be sold internally at a low cost. Thus, the marginal

cost of producing the final goods would be lower. This might make the business group more willing to invest in product quality.

2.6. SUMMARY

It seems evident that business groups, through the mechanisms mentioned above, to a large extent are able to substitute some of the deficient components of a lesser developed national innovation system. In an economy where access to capital is limited, business groups can not only be supportive to innovation processes by providing internal capital; affiliation may also be beneficial in regards to attract capital from external sources. Training of personnel and researchers, the building of research facilities and institutions, and supply of infrastructure are other central elements of a developed innovation system that a business groups can support in a country where this is not provided by public organizations. Lack of trusted legal institutions may also be substituted or compensated for by large groups which have a lot at stake, as well as dominant positions to exercise influence on both external firms and government agencies. As complementary firms are important parts of an innovation system that affect the innovation potential of an individual firm, vertical diversified business groups which have the option to create and develop such complementary assets internally, will have an advantage over other companies operating in the external market.

It is also possible that business groups have a better potential for developing absorptive and dynamic capabilities than firms operating independently in the same business environment. GAFs may have better direct interface with the external environment, particularly foreign

organizations, as a result of their attractiveness as business partners and the relative trustworthiness they are conceived with in economies where the legal framework is weak and the risk of opportunism is high. If the assumption that employees in business groups are better trained and educated and have access to better facilities is correct, the individual employee would have better abilities to understand and assimilate information encountered with these interfaces. This provides the business groups with a better prerequisite for acquiring external knowledge.

The organization's absorptive capacity also depends on to what degree and how knowledge is transferred across and within units in the organization. With the personal and operational ties, reallocation of personnel and unity within firms in a business group, information may flow more freely and with less perceived risk than it would for independent firms. If there is a common structure of communication within the group, this could be of further assistance in the diffusion of knowledge.

There is, however, no guarantee that these capabilities will develop and sustain within business group. There is also a risk of groups becoming too large, top heavy, and inflexible. Capabilities need to be pursued actively through strategic management, creation of structures and routines, and knowledge building. Changes in the political-economic conditions of a country may also alter the competitive advantages and importance of business groups in a given economy.

It could be suggested from this that business groups promote innovation activities in emerging economies with less developed institutional set-up and supportive industries. Observed from a

slightly different angle, it is also possible that underdeveloped institutions and business environments encourages the formation and development of business groups.

3. RESEARCH QUESTIONS, MODEL, AND HYPOTHESES

3.1. RESEARCH QUESTIONS

The purpose of this thesis is to investigate how business group affiliation affects the absorptive capacities and economic performance of firms in emerging economies. Previous studies have shown how business group may compensate for institutional deficiencies by internalizing the functions that are weak in their surroundings (Khanna & Palepu, 1997). From a resource-based point of view, others have argued that business groups pursue diversification strategies because they lack proprietary technology, and their core resource is their project execution abilities to repeatedly enter new industries (Amsden & Hikino, 1994). This ability is particularly rewarding in countries where the political-economic settings are asymmetrical with regards to inwards and outwards trade and investments, as it creates favorable conditions for groups which may exploit an intermediary position (Guillén, 2000).

There is nevertheless a research gap in the studies of the strategies and capabilities of business groups, and how this influences the economic performance of the GAFs. Several studies have been performed on these topics using firm level data, but they have typically focused on a single economy or a cross country analysis of only a few countries, often confined to a limited scope of sectors. In this thesis I will analyze the capabilities of GAFs using a large, firm level database covering a wide variety of sectors in all developing and late industrialized countries. This will deliver a strong, robust analysis of the capabilities of GAFs and open for results valid for all developing countries.

In order to make a contribution to the existing research gaps, the following questions will be investigated and tested empirically:

- **Is the economic performance of GAFs better than that of SAFs in developing economies?**
- **In particular, what are the factors that affect group affiliated firms' economic performance in emerging markets?**

My main argument is that the factors that affect a firm's economic performance can be related to absorptive capacity. Asymmetrical policies towards foreign trade and investments provide opportunities for external linkages to more advanced markets, while limiting the entrance of MNEs. Foreign companies that are interested in doing business in the country are often compelled to open for knowledge and technology transfer. Generic project execution capabilities epitomize the business groups' capacity to assimilate and exploit external knowledge and apply it to commercial ends. As most firms in emerging markets operate far from the technological frontier, cutting-edge, highly specific technological skills are less required for knowledge assimilation than their counterparts in more advanced economies. Business groups' ability to compensate for institutional deficiencies provides them better preconditions for building absorptive capacity than stand-alone firms.

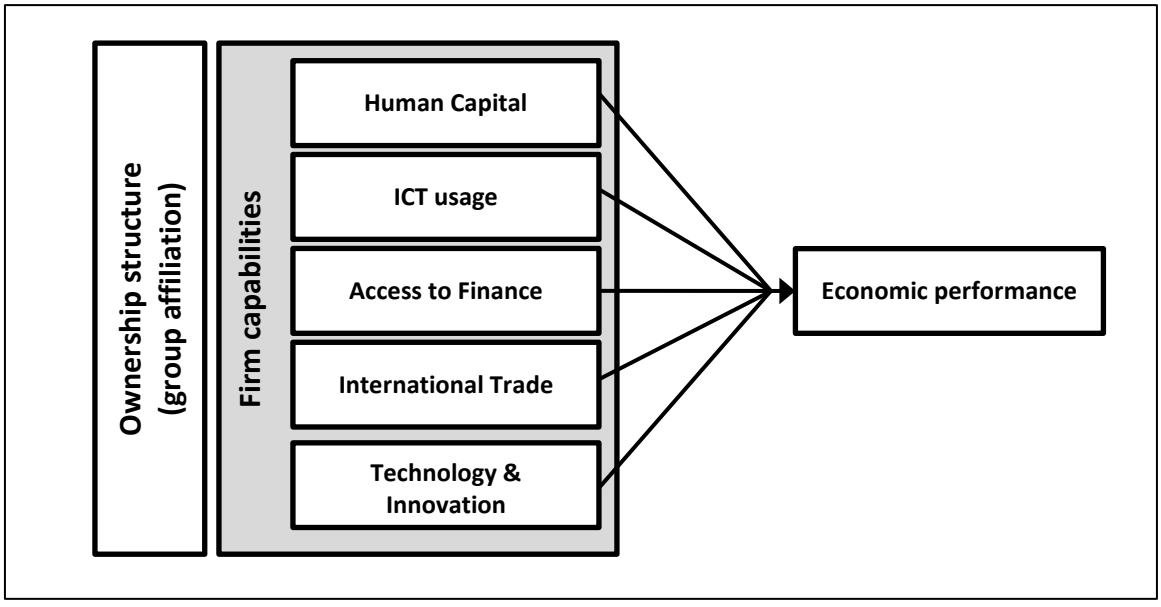
Many former studies have focused on innovation as the only output of absorptive capacity (ACAP). This stands in contrast to the initial discussions by Cohen and Levinthal (Cohen &

Levinthal, 1990) of the general commercial application of acquired knowledge (Kostopoulos et al., 2011). In other words, ACAP has other yields than innovation. Moreover, if one assumes that all firms are profit maximizing entities, the ultimate objective of innovation and other applications of ACAP would be improved economic performance.

3.2. RESEARCH MODEL

In order to perform an analysis of ACAP and economic performance, I will propose five dimensions that constitute the ACAP of firms in less developed countries. This is conceptualized in the illustration below in order to provide an overview of the general research model.

FIGURE 1: CONSEPTUAL MODEL



The Human capital dimension resembles the commonly used indicators for determining ACAP in advanced firms. The idea is that a highly skilled workforce is better capable of identifying, decoding, and assimilating external knowledge.

ICT usage augments the firm's ability to communicate and exchange codified knowledge with the external environment. In many cases, firms in emerging economies are geographically remote from advanced technological centers, and have limited possibilities for face-to-face meetings or other forms of physical interactions. Even simple computers and an internet connection may be useful in order to overcome this limitation.

As previously mentioned, access to finance is vital for investments in machinery, personnel, intermediary goods, and other factors required to adapt production to new technologies. This is a challenge in well developed economies, and even more so in emerging countries where financial institutions may be weak.

International trade provides the firm an interface with the external environment. Through contact with suppliers and customers, as well as knowledge embodied in imported goods, the firm may acquire knowledge – codified and tacit – from its network in more advanced markets.

Both product quality and innovation can be considered a measure the initial technology level of the firm. Similar to the idea that acquisition of knowledge prerequisites prior knowledge, existing technology forms a fundament for further technological development, hence forming a basis of a set of self-reinforcing mechanisms.

It is my argument that these dimensions constitute some of the main factors shaping the firm's absorptive capacity, facilitating acquisition and exploitation of relevant external knowledge. A high level of ACAP will have a positive effect on the economic performance of the firm, through product innovations and other commercial applications of the acquired knowledge.

While the links between ACAP and economic performance may hold for all firms, it is my proposal that certain firm capabilities are more important for GAFs than for SAFs. This implies that the links between these features and economic performance are stronger for GAFs. Improvements in these characteristics may lead to greater improvements in economic performance for GAFs than for SAFs, because of group level synergies and resource sharing. Thus, it is of interest to examine the links between firm-specific capabilities and economic performance, as well as ownership structure, including business group affiliation.

3.3. HYPOTHESES

3.3.1. Productivity

There is a prevalent view among scholars studying business groups that group affiliation enhances a firm's economic performance. Business groups may achieve this by expropriating minority shareholders, engaging in rent-seeking, and exerting market power (Khanna, 2000). More importantly, in emerging markets the groups can overcome market imperfections by internalizing finance, labor, and intermediate product market functions (Khanna, 2000; Khanna & Yafeh, 2007), consequently enhancing effectiveness. In an economy with weak legal

institutions, formal contract enforcement is insecure. Under such circumstances, business groups may excel in relational contracting both within the group and with external partners (Hainz, 2006). The empirical evidence for this perception is nevertheless ambiguous, with some studies supporting the view, while others conclude that groups affiliation has no, or even negative impact on the economic performance of GAFs (Carney et al., 2011). With previous evidence being inconclusive, this should be the first hypothesis to be examined. As a measure of economic performance I have chosen to utilize labor productivity as indicator. Labor productivity is a common measure of economic performance and competitiveness at the level of a firm, sector, or country. There are several ways of calculating labor productivity, but the fundamental concept is to measure the ratio of a volume measure output to a volume measure of labor input, i.e. how much the production output (e.g. sales, products) escalates if the labor input is increased by one.

H1: *The labor productivity of GAFs is higher than that of SAFs.*

This refers to the first research question and is the general hypothesis, leading to more specific hypothesis seeking to explain which underlying factors lead to a higher level of productivity for GAFs than for SAFs.

3.3.2. Human Capital

The second issue to be investigated is the effect of human capital on economic performance, and whether this effect is stronger for GAFs than for SAFs. According to Cohen and Levinthal (1990), the level of prior related knowledge in a firm strongly influences the ability to evaluate and utilize external knowledge. This prior knowledge is central not only for a dedicated R&D unit, but also in the manufacturing operations in order to recognize the value of and implement methods to reorganize or automate manufacturing processes. Thus, the outcome is not only new products, but there are also direct and indirect connections to the economic performance of the firm. This prior knowledge is a function of the level of education, experience, and training of employees. As previously mentioned, business groups not only attract high educated employees, but may also offer intra-group training programs for group personnel (Mahmood & Mitchell, 2004). Furthermore, skilled and trained personnel may be reallocated within the group according to the market situation and strategic consideration (Khanna & Palepu, 1997). If this is the case, we should expect that the level of human capital is higher for GAFs, and that these resources are utilized more effectively through intra-group reallocations, thus yielding higher productivity gains.

H2: *Human capital has a larger positive impact on the labor productivity of GAFS than of SAFs.*

3.3.3. ICT usage

Effective usage of information and communication technologies arguably improves a firm's capabilities for searching and transferring codified knowledge from the external environment. Moreover, ICT can be useful for building and maintaining effective networks. This is particularly valid if the geographical distances involved are vast, as often is the case for firms in less developed countries and their counterparts in advanced economies. I will therefore suggest ICT usage as a dimension which can increase a firm's absorptive capacity.

H3: *GAFs are more productive than SAFs partly because of their better capability to use ICT.*

3.3.4. Access to Finance

A few theories and empirical analyses have concluded that GAFs may have less difficulties getting access to finance. GAFs often have the option to acquire finances through firms in the financial service sector which are integrated in the group, or through other intra-group reallocation mechanisms (Mahmood & Mitchell, 2004). In addition, business groups may apply their influence and reputation as means to provide the GAFs with easier access to funding from external sources (Khanna & Palepu, 1997). Access to finance is essential for the innovation endeavors of a firm, requiring investments in personnel, machinery, licenses, marketing activities, and so on. There are also more direct connections from access to finance and the economic performance, related to non-innovation activities. These connections are not equally strong for all firms, and the economic outcome of financial inputs are dependent on other

resources, routines, and characteristics of the firm. For example, if the assumption that business groups are better at nurturing and allocating human capital and other resources is correct, it should be expected that the productivity outcomes relative to financial inputs is higher for GAFs than for most SAFs because of more effective utilization of finance.

H4: *GAFs have better productivity because of their better access to finance.*

3.3.5. International trade

The primary input of absorptive capacity is the inflow of external knowledge (Kostopoulos et al., 2011). For firms in emerging developing countries, linkages with firms in more advanced economies are essential for technology transfer (Chang et al., 2006). Having an interface with the external environment, particularly with advanced countries, through trade and other manners expose the firm to foreign technology. Moreover, regular contact with suppliers and customers increases the chance of transfer of both tacit and codified knowledge. Imported machinery and intermediary goods may also contain embodied knowledge that can be assimilated by the receiving firm. This leads to the introduction of hypothesis 5.

H5: *GAFs are more productive than SAFs partly because of their greater capability to undertake international trade activities.*

3.3.6. Technology and Innovation

Finally, I will examine how economic performance is related to technology and innovation. Previous studies on the topic of the innovativeness of business groups suggest that business groups are more innovative than other firms (Belenzon & Berkovitz, 2010; Castellacci, 2012; Chang et al., 2006; Mahmood & Lee, 2004). The link between the introduction of new products, services and processes, and economic performance of business groups, however, has not previously been exhaustively investigated. The commercial exploitation of innovations depends not only on technological skills, but as much on complementary expertise and assets (Teece, 1986; Teece et al., 1997). A higher level of human capital, not only in technological disciplines, but also in complementary areas such as marketing, distribution, sales, and management, is expected to lead to higher financial returns per unit of innovation. This would be augmented by common group assets such as integrated distribution networks, common brand name, and initial position in the market.

As previously mentioned, Feenstra et al (1999) found evidence that the horizontal diversification of many business groups leads to raised incentives for producing high quality products, mainly due to considerations about group wide reputation in the market. This is amplified by vertical diversification, which leads to greater control of intermediate goods and lower profit margins in the upstream chain. The quality of the final product also reflects to a certain degree the initial technology level of the production firm and its suppliers. It is therefore of interest to investigate whether group affiliation is related to greater quality of products.

H6: *GAFs have higher labor productivity than SAFs partly because of their greater technology and innovation capabilities.*

4. DATA AND METHODS

4.1. DATABASE

For the empirical analysis, I will use firm level data collected through the World Bank's Enterprise Surveys (WBES). In their mission to reduce poverty and support development, one of the World Bank's instruments is a systematic effort to construct and maintain several databases related business climate and environment in developing countries. These databases contribute to governments' and private businesses' decision about investments and involvement in poor and middle-income countries, in addition to providing a knowledge pool for research works. The Enterprise Surveys is unique in the way they cover a broad range of firm characteristics and business environment topics, collected from face-to-face interviews with top managers and business owners in nearly all developing countries. Thus, a large part of the WBES is based on actual firms' experiences and perceptions about their own performance and the business climate they operate in, rather than facts and figures from government agencies. The World Bank hires private contractors in the various countries to conduct the surveys, with emphasis on confidentiality. This allows for sensitive questions about government-business relations and corruption related topics, which would have been less feasible if government associated organizations were used (Enterprise Surveys, 2012).

In total, more than 130 000 firms in 135 in countries have been interviewed so far as part of the Enterprise Surveys project. The surveys cover a random sample of firms, stratified by firm size, business sector, and geographic region, thus ensuring high representativeness. The Enterprise Surveys data from different countries are comparable because of similar questionnaire

templates and sampling strategies, although the complete set of questions may vary between sectors, countries and regions. The questionnaire covers topics such as firm characteristics, crime, finance, gender equality, informality, infrastructure, innovation and technology, firm performance, regulations and taxes, trade, and workforce. Firms in the agricultural and extractive sectors, fully government-owned firms, and micro-firms with less than 5 employees are not covered by the Enterprise Surveys.

4.2. THE SAMPLE

Due to a change in the questionnaire template, I will use data collected between 2006 and 2010. Some of the changes in the questionnaire were inclusions of questions about firm ownership, which makes it possible to distinguish firms which are part of business groups from stand-alone firms and MNE subsidiaries. This sample contains almost 60 000 firms in 114 countries. Of these 114 countries surveyed, 38 are in Sub-Saharan Africa (AFR), 30 in Eastern Europe and Central Asia (ECA), 30 are in Latin America and the Caribbean (LAC), ten in East Asia and Pacific (EAP), five in South Asia (SAR), and one in the Middle East and North Africa region (MNA). Most of these are low and middle income countries, although there are some high income economies included in the sample, notably the Czech Republic, Poland, the Slovak Republic, and Croatia in Europe, as well as some of the more affluent Caribbean countries.

The sample size across countries differs according to the total number of firms in the countries, with a range varying from 68 surveyed firms in Micronesia to 2750 firms in Mexico. In terms of the number of surveyed firms, about 37 percent of the sample is from Latin America and the Caribbean, 25,5 percent from Sub-Saharan Africa, 22 percent from Eastern Europe and Central Asia, 8 percent is from East Asia and Pacific, 6 percent from South Asia, and less than one percent from the Middle East and North Africa.

TABLE 1: OBSERVATIONS – WHOLE SAMPLE BY REGION

Region	N (countries)	N (firms)	Percent (firms)	Manu-facturing	Services	Other
AFR	38	15276	25,5	6417	3346	5513
EAP	10	4952	8,3	2965	537	1450
ECA	30	13286	22,2	5746	4131	3409
LAC	30	22216	37,2	12457	3995	5764
MNA	1	477	0,8	244	91	142
SAR	5	3592	6,0	2244	439	909
Total	114	59799	100	30073	12539	17187

BOX 1: LEGEND – REGION CODES

AFR: Sub-Saharan Africa
EAP: East Asia and Pacific
ECA: Eastern Europe and Central Asia
LAC: Latin America and the Caribbean
MNA: Middle East and North Africa
SAR: South Asia

The purpose of this study is to cover all developing countries with available data. However, due to minor variances in the questionnaire templates, some of the variables of interest are only available for firms which were interviewed using the template for the manufacturing sector. By selecting only firms in the manufacturing sector, the sample is thus narrowed down to about 30 000 cases. This reduction of about 50 percent still leaves a considerable sample size for the analysis.

TABLE 2: OBSERVATIONS – MANUFACTURING SAMPLE BY REGION

Region	N (countries)	N (firms)	Percent (firms)
AFR	26	6417	21,3
EAP	4	2965	9,9
ECA	30	5746	19,1
LAC	20	12457	41,4
MNA	1	244	0,8
SAR	4	2244	7,5
Total	85	30073	100,0

4.3. DATA PREPARATION

The dataset was downloaded from the Enterprise Surveys web page as raw data. This meant that the dataset was untreated and could contain errors and incorrect coding. Before running statistical analyses on the dataset, certain preparations had to be made. First, outliers and extreme values were examined. Obvious errors, for example a manager having 170 years of personal experience, or the value 6 on a scale from 0 to 4, were identified and removed from

the dataset. Binary variables were coded 1 for “yes” and 2 for “no” in the dataset. In order to run regressions on these, they had to be recoded into 1 for “yes” and 0 for “no”. As answers such as “do not know” or “refuse to answer” were coded with negative values, these had to be programmed as “missing values” to be excluded from the analyses. Furthermore, dummy variables for all countries and sectors needed to be constructed, as they were coded as nominal values in the dataset. In some countries, the Enterprise Surveys has been conducted in several waves with a few year intervals. As a result, some of the firms in the sample, notably in the LAC region, were included twice in the dataset. These duplicates had to be filtered out from the sample.

TABLE 3: OBSERVATIONS BY COUNTRY – MANUFACTURING SAMPLE

Region	Country	N	Region	Country	N
AFR	Angola	356	ECA	Kosovo	98
AFR	Botswana	201	ECA	Kyrgyz Republic	92
AFR	Burkina Faso	96	ECA	Latvia	89
AFR	Burundi	102	ECA	Lithuania	97
AFR	Cameroon	116	ECA	Moldova	110
AFR	DR Congo	270	ECA	Mongolia	132
AFR	Gambia	33	ECA	Montenegro	37
AFR	Ghana	292	ECA	Poland	158
AFR	Guinea Bissau	135	ECA	Romania	193
AFR	Guinea Bissau	50	ECA	Russia	603
AFR	Ivory Coast	169	ECA	Serbia	132
AFR	Kenya	396	ECA	Slovak Republic	86
AFR	Madagascar	203	ECA	Slovenia	102
AFR	Mali	426	ECA	Tajikistan	116
AFR	Mauritania	80	ECA	Turkey	860
AFR	Mauritius	150	ECA	Ukraine	487
AFR	Mozambique	336	ECA	Uzbekistan	121
AFR	Namibia	106	LAC	Argentina	1071
AFR	Nigeria	948	LAC	Bolivia	420
AFR	Rwanda	59	LAC	Brazil	1339
AFR	Senegal	259	LAC	Chile	1100
AFR	South Africa	680	LAC	Colombia	1133
AFR	Swaziland	70	LAC	Costa Rica	232
AFR	Tanzania	273	LAC	Dominican Republic	122
AFR	Uganda	307	LAC	Ecuador	417
AFR	Zambia	304	LAC	El Salvador	557
EAP	Fiji	52	LAC	Guatemala	618
EAP	Indonesia	1176	LAC	Honduras	392
EAP	Philippines	959	LAC	Jamaica	121
EAP	Vietnam	778	LAC	Mexico	2119
ECA	Albania	110	LAC	Nicaragua	465
ECA	Armenia	113	LAC	Panama	300
ECA	Azerbaijan	120	LAC	Paraguay	431
ECA	Belarus	84	LAC	Peru	917
ECA	Bosnia and Herzegovina	124	LAC	Trinidad and Tobago	120
ECA	Bulgaria	633	LAC	Uruguay	546
ECA	Croatia	345	LAC	Venezuela	37
ECA	Czech Republic	94	MNA	Yemen	244
ECA	Estonia	90	SAR	Afghanistan	122
ECA	FYR Macedonia	115	SAR	Bangladesh	1201
ECA	Georgia	121	SAR	Nepal	137
ECA	Hungary	103	SAR	Pakistan	784
ECA	Kazakhstan	181			

4.4. INDICATORS AND DESCRIPTIVE DATA

Previous studies of absorptive capacity have tended to focus on the R&D intensity and proportion of scientific personnel in high technology firms located in advanced economies. This approach is not necessarily adaptable for studies of firms in less developed countries as innovation and economic performance is less about the commercialization of original inventions, but rather about technology transfer from the developed nations. Thus, I have proposed an alternative set of measurements for the analysis of absorptive capacity among these firms. This set is composed of five dimensions: Human capital, ICT usage, financial capital, international trade, and technology and innovation.

The dimensions are presented below, accompanied by a description of relevant indicators from the Enterprise Surveys database which will be used in the analysis. Descriptive statistics for the whole sample are presented in table 4, while table 5 describes the mean values for the various regions.

4.4.1. Economic performance

Economic performance is the dependent variable in the model. There are many possible measures of economic performance, and in this thesis I have chosen to utilize labor productivity as indicator. Labor productivity is a common measure of the economic performance and competitiveness of a firm, sector, or country. There are several ways of calculating labor

productivity, but the fundamental concept is to measure the ratio of a volume measure output to a volume measure of labor input.

LnLABPROD: Labor Productivity. The variable is constructed by dividing the values for the "establishment's total annual sales" (question D.2), by the firm's "total annual cost of labor" (question n2a). The quotient indicates how much increase in sales can be expected by adding one more unit of labor cost. The two original variables are reported in local currency units, which would make it difficult to perform cross-country comparisons. Through the division, the reliance on local currencies is eliminated, as the quotient represents a universal marginal value. Because of the wide variation of the quotient, a logarithmic transformation has been conducted. A logarithmic transformation will reduce positive skewness because it compresses the upper end of the distribution while stretching out the lower end, thus creating a more symmetric distribution of the data which is better suited for statistical analyses.

4.4.2. Ownership (group affiliation)

It has been suggested that strategic alliances is important in high technology firms for improving the firm's economic performance by increasing the absorptive capacity of the firm (George, Zahra, Wheatley, & Khan, 2001). This is relevant for business groups in emerging economies, as they can be regarded as *"a collection of legally independent firms bound together in long term strategic alliances"* (Khanna & Yafeh, 2007). Thus, the main purpose of this thesis is to analyze what factors affect the economic performance of business groups through the proposed framework of absorptive capacity. Hence, firms with group affiliation needed to be identified

and reported in the dataset. In addition, MNE affiliates were identified for the purpose of comparison.

GAF: Group-affiliated firm. This is a dummy variable (with values 0 or 1) indicating whether a firm is part of a domestic group. In order to identify GAFs among the cases, I have adopted the procedure applied by Castellacci (2012) in his study on business groups in Latin America using a selection of the same dataset. The variable is constructed by multiplying two indicators in the dataset. The indicator reporting what percentage of the firm is owned by "private domestic individuals, companies or organizations" (b2a in the questionnaire) was transformed to a dummy variable by recoding the value to 1 if 50 percent or more, and 0 if less. This purpose is to distinguish private, domestically owned firms from firms for which the majority of ownership is held by foreign entities and/or are state owned. The other indicator is a dummy variable reporting if "the establishment is part of a larger firm" (question A.7). By multiplying these dummy variables, domestic group affiliated firms (GAFs) will receive the value 1, distinguishing it from stand-alone firms. Table 2 shows that 9,7 percent of the sample are GAFs, whit the highest density being in LAC, where 11 percent of the surveyed firms report group affiliation.

While this is a good indicator of group affiliation, it is not perfect. The definitions of "business group" are ambiguous, and the characteristics of business groups differ in different regions of the world. Some business groups are based on informal connections, and the affiliated firms may not regard themselves as "part of a larger firm", thus not being identified in the sample (type I error). There is also a chance that firms which are part of multi-firm constellations that does not convey the defining characteristics of business groups are included (type II error). Nonetheless, this method of identifying GAFs is reasonably good for the purpose of this analysis.

MNE: Multinational enterprise affiliation. A constructed dummy variable reporting whether the firm is part of a larger firm (question A.7), with more than 50 percent foreign ownership (question b2b). The proportions of MNEs in the sample are marginal across all regions.

4.4.3. Human capital

This dimension is closely related to more traditional measurements of absorptive capacity. One of the fundamental assumptions in the absorptive capacity framework is that knowledge is important in providing the firms with a competitive advantage (George et al., 2001). Common measurements has been investments in R&D personnel, scientific training, and the proportion of scientists and engineers in the population (Keller, 1996; Zahra & George, 2002). The theory is that highly educated and trained personnel are better able to identify, evaluate, and assimilate both codified and tacit knowledge. This concept is valid also in developing countries, but as the technology level is lower, I will focus on the general level of human capital, rather than those involved in high-level R&D.

TRAINING: Formal training programs. Dummy variable indicating whether or not the firm had formal training programs for its employees during the last fiscal year before the survey was conducted (question L.10). 42 percent of the sample reported positively on this question. In Latin America and the Caribbean, more than half of the firms offer training programs for its employees.

EDUC: Education level. This is a categorical indicator of "the average educational attainment of a typical production worker in this establishment", with a scale ranging from 1 to 5 (question L.9). The indicator takes the value 1 if the average is 0 to 3 years of education; 2 if between 4 and 6 years; 3 if 7 to 9 years; 4 if 10 to 12 years; and 5 if the typical worker has an average education of 13 years or more. The mean value for this indicator is 2,9, implying that the average worker for the whole sample is placed somewhere in the middle of this scale. The score is higher for EAP and ECA, while the other regions are at a similar, lower level. No data is available for MNA.

4.4.4. ICT usage

I have previously argued that usage of ICT tools may improve a firm's capabilities for searching and transferring codified knowledge from the external environment, as well as for the building and maintaining effective international networks. For firms in emerging countries, which are often geographically remote from more advanced firms in the developed parts of the world, using ICT as means of communication and knowledge transfer may be of great benefit.

EMAIL: E-mail communication. Dummy variable indicating whether the firm uses e-mail in its communication with clients and suppliers (question c22a). This indicator reveals something about the ICT usage of the firm and the ability to communicate over distances. The descriptive data in table 2 show that 71 percent of the sample uses e-mail. In ECA, a dominant proportion (81 percent) reports using e-mail as mean of communication, while the proportions for firms in LAC and SAR are below average.

WEB: Website communication. Dummy variable indicating whether the firm uses its own webpage in its communication with clients and suppliers (question c22b). Similar to e-mail, this says something about the general ICT level and communication efforts. About 44 percent of the firms report using their webpage for communication. Interestingly, the score for LAC is the highest, with 86 percent of the firms using their web site for communication, while SAR also scores above the sample mean..

4.4.5. Financial capital

In most advanced economies, a good business of product idea may be supported by internal capital or get funding through channels such as bank loans, government funding schemes, or from venture capitalists. These options are less obvious in many emerging countries with less developed financial institutions. Financial capital is often required in order to realize and exploit new knowledge and ideas for commercial gains, but is omitted in previous studies of absorptive capacity. Thus, I propose to add this dimension.

FINANCE: Access to finance. This categorical variable reports whether the firm experiences access to financing, including "availability and cost (interest rates, fees and collateral requirements)" as an obstacle to the operations of the establishment (question K.30). The categories range from "no obstacle" (value 0) to "very severe obstacle" (value 4). Note that this is an inverted scale. High numbers mean that the firm perceives access to finance as an obstacle, and vice versa. It is therefore expected that firms with low numbers will have less

difficulties with financing, and consequently better economic performance. Access to finance seems to be considered a slightly worse obstacle in AFR than in the rest of the sample.

4.4.6. International trade

International trade provides a firm with external linkages to knowledge and technology which may not be present in the local or national markets. Thus, having an interface to the external environment through international trade may provide a great asset for a firm, as it often involves direct or indirect transfer of tacit and codified knowledge

IMPORT: Input material of foreign origin. This indicator reports the percentage of the material inputs and/or supplies of foreign origin (d12b). The mean proportion for the whole sample is 31,5 percent.

Export could also be relevant in this dimension, as it requires external contacts and may involve direct technology transfer, especially in the case of original equipment manufacturing (OEM). However, it is omitted in this model due to potential problems with endogeneity with the dependent variable. While export arguably may increase productivity, it is also likely that a high level of productivity leads to export. This two-way linkage may cause errors in the estimations.

4.4.7. Technology and innovation

This dimension measures the technology level of the firm. While these indicators are often considered the output of absorptive capacity, they also form the basis of a set of self-reinforcing mechanics. Similar to the idea that acquisition of knowledge prerequisites prior knowledge, existing technology forms a fundament for further technological development.

QUALITY: Quality certification. Dummy variable reporting whether the firm has "an internationally-recognized quality certification", e.g. ISO 9000, 9002 or 14000 (question B.8). Quality certification reveals something about the systems, routines, and production methods of a firm, thus reflecting the technology and managerial level of the firm. 23 percent of the firms in the sample report having obtained such a quality certification.

LICENSE: Foreign technology license. This is a dummy variable indicating if the firm "use technology licensed from a foreign-owned company" (question E.6). In the sample, 15 percent of the firms responded positively to this.

NEWPROD: New products or services. This dummy variable indicates whether the enterprise has "introduced any new or significantly improved products or services" (question e7).

NEWPROC: New processes. Dummy variable reporting whether the firm has "introduced any new or significantly improved production processes" (question e8).

These two last indicators report the innovation performance of the firm. These values are only available for countries in Sub-Saharan Africa and Latin America and the Caribbean. These

regions still encompasses about 63 percent of the surveyed firms in the sample. The regional mean value for LAC is higher than for AFR regarding both indicators, with more than 60 percent of the firms reporting having introduced new products and processes in LAC.

4.4.8. Firm characteristics

Finally, a selection of firm characteristics is introduced as control variables. These variables measure the experience, scale, and diversification of the surveyed firms.

SIZE: Firm size. Categorical variable reporting the size of the firm in terms of number of employees (question A.6). The three available options are: 1 if the firm has 5 to 19 workers ("small"); 2 if the firm employs between 20 and 99 workers ("medium"); and 3 if the firm has more than 100 employees ("large"). The mean value for this variable is 1,8, meaning that the majority of the surveyed firms are small or medium sized enterprises. The variations across regions are low.

AGE: Firm age. The age of the firm in terms of numbers of years since the firm began its operation. The age is calculated by subtracting the year of the startup (question b5) from the year the survey was conducted for the particular firm. The mean age for the whole sample is 21 years, with a minimum of 0 and a maximum age of 340 years.

SPEC: Specialization. This variable measures the product homogeneity of the firm. Firms with an evenly diversified product portfolio will have a lower score. The indicator reports the percentage of total revenue represented by the firm's main product (question d1a3).

In addition to these indicators, dummy variables for country and two-digit sector code were included as control variables.

TABLE 4: DESCRIPTIVE STATISTICS – WHOLE SAMPLE OF MANUFACTURING FIRMS

	Mean	Std. Deviation	Minimum	Maximum	N
TRAINING	0,416	0,493	0	1	29253
EDUC	2,920	0,948	1	5	16162
EMAIL	0,711	0,453	0	1	31871
WEB	0,439	0,496	0	1	31795
FINANCE	1,659	1,359	0	4	30356
DIREXPORT	10,628	25,704	0	100	31856
IMPORT	31,537	35,991	0	100	31409
QUALITYCERT	0,229	0,420	0	1	30991
LICENSE	0,150	0,357	0	1	31690
NEWPROD	0,616	0,486	0	1	8156
NEWPROC	0,576	0,494	0	1	8165
SIZE	1,834	0,787	1	3	31983
AGE	20,627	18,185	0	340	31696
SPEC	77,349	24,505	0	100	31649
GAF	0,097	0,296	0	1	30654
MNE	0,030	0,169	0	1	31925

TABLE 5: DESCRIPTIVE STATISTICS – MEANS BY REGIONS

	AFR	EAP	ECA	LAC	MNA	SAR
AGE	14,70	17,49	17,70	25,49	17,29	18,42
SIZE	1,57	1,97	1,99	1,85	1,47	1,95
QUALITY	0,15	0,23	0,35	0,22	0,10	0,17
EMAIL	0,44	0,62	0,81	0,22	0,30	0,17
WEB	0,18	0,33	0,59	0,86	0,21	0,46
SPEC	73,56	89,72	83,21	73,52	81,58	81,10
DIREXP	4,76	15,22	16,29	8,84	2,02	19,50
IMPORT	27,93	26,11	34,82	33,18	42,51	29,06
LICENSE	0,13	0,15	0,22	0,14	0,07	0,06
NEWPROD	0,57	n/a	n/a	0,63	n/a	n/a
NEWPROC	0,46	n/a	n/a	0,61	n/a	n/a
FINANCE	2,06	1,06	1,57	1,67	1,77	1,59
EDUC	2,70	3,29	3,23	2,88	n/a	2,83
TRAINING	0,29	0,30	0,40	0,52	0,21	0,11
GAF	0,11	0,07	0,07	0,11	0,26	0,07
MNE	0,04	0,03	0,02	0,03	0,00	0,00
LnLABPROD	1,82	2,07	1,89	1,79	1,58	2,05

4.5. Empirical Model and Methods

The purpose of the econometric analysis is to estimate how firm-specific characteristics affect the economic performance of the business groups, and whether any of these effects are stronger for GAFs than for SAFs. In the previous sections, I have presented preceding studies and theories on the economic and innovation performance of business group affiliated firms. From this I proposed a set of dimensions that may enhance the absorptive capacity, and hence the economic performance, of any firm in the developing world. The issue of interest is whether these characteristics are more important for GAFs than for SAFs. If the results are positive, it suggests that the relative performance of GAFs not only rely on the internalization of external functions in economies with weak infrastructures, but that the competitiveness of affiliated firms increase as a result of aspects embedded in the business groups structure. The full model specification is the following:

$$\text{LnLABPROD}_i = \alpha 1 + \beta_1 \text{GAF} + \gamma_1 \text{TRAINING} + \delta_1 \text{EDUC} + \zeta_1 \text{EMAIL} + \eta_1 \text{WEB} + \theta_1 \text{IMPORT} + \iota_1 \text{QUALITY} + \kappa_1 \text{LICENSE} + \lambda_1 \text{SIZE} + \mu_1 \text{AGE} + \nu_1 \text{SPEC} + \xi_1 \text{MNE} + \omega_1 C + \rho_1 S + \varepsilon_1$$

Where α_1 is the constant and ε is the residual, also known as white noise. C and S represent the dummies for countries and two-digit sector codes (ISIC 3.1). The dependent variable is labor productivity, while the explanatory variables are the firm specific indicators previously defined. In this model, the variables for “new products or services” and “new processes” are omitted

because they are available for only some of the regions. Therefore, a second model, which also includes these variables, will be estimated using a smaller sample size. In addition to testing for the effects of innovation, this second model with a different sample size will be useful for controlling the robustness of the estimations.

$$LnLABPROD_i = \alpha 1 + \beta_1 GAF + \gamma_1 TRAINING + \delta_1 EDUC + \zeta_1 EMAIL + \eta_1 WEB + \theta_1 IMPORT + \iota_1 QUALITY + \kappa_1 LICENSE + \lambda_1 SIZE + \mu_1 AGE + \nu_1 SPEC + \xi_1 MNE + O_1 NEWPROD + \pi_1 NEWPROC + \omega_1 C + \rho_1 S + \varepsilon_1$$

These are linear models, and in order to estimate the relationships I will perform a regression analysis on the dataset, using the ordinary least square (OLS) method. OLS is one of the most common methods in statistical analysis for estimating the unknown parameters in a linear regression model. The method minimizes the sum of squared distances from the approximated regression line (Field, 2009). This is a relatively simple method which produces solid results.

All the explanatory variables are expected to take a positive sign in the estimations. The exception is access to finance, which is measured in an inverted scale. A high value represents difficulties in obtaining financing, which is assumed to have a negative impact on performance. The firms' productivity is anticipated to be positively related to the indicators concerning the dimensions of human capital, ICT usage, international trade, technology and innovation, but, as mentioned, negatively related to (lack of) access to finance. Hypothesis 1 states that the labor

productivity of GAFs is higher than that of SAFs. This corresponds to the GAF variable in the model, which therefore is assumed to take a positive sign.

Hypothesis 1 is the general hypothesis of this study. Hypotheses 2 to 5 constitute a subset, specifying the factors that may affect the first hypothesis. In order to test these hypotheses, interaction variables were constructed and included in the regression. These interaction variables were created by multiplying (interacting) the GAF variable with the indicators related to firm capabilities. Through this method, the effects of firm capabilities for GAFs can be compared to the effect of firm capabilities for the rest of the sample.

Hypothesis 2 proposes that human capital is more important for GAFs than for SAFs. This is tested using the interaction variables for TRAINING and EDUC. Both interaction variables are expected to take positive signs.

Hypothesis 3 argues that ICT usage has a larger effect on productivity for GAFS than for SAFs. Test is performed using interaction variables for EMAIL and WEB. If the hypothesis holds true, the signs for these should be positive.

Hypothesis 4 postulates that GAFs have better productivity because of their better access to finance. This is tested using an interaction variable constructed by multiplying the GAF variable with the FINANCE indicator. This interaction variable is assumed to have a positive sign, as this will counter the assumed negative coefficient for the FINANCE variable, thus reducing the relative importance of this factor.

Hypothesis 5 suggest that international trade is a more important factor for the productivity GAFs than for that of SAFs. This test is performed by adding an interaction variable for IMPORT to the regression. The sign for this variable is expected to be positive.

Finally, hypotheses 6 put forward that technology and innovation have a larger effect on the productivity of GAFs than SAFs. The hypothesis is tested with interaction variables for QUALITY and LICENSE in the larger sample. In the smaller sample, the variables GAF*NEWPROD and GAF*NEWPROC are added to the model. All of these four interaction variables are assumed to produce positive coefficients.

5. RESULTS

In this section, I will present the results of the econometric analyses. First, I will provide a short description of the correlation table, before I move on to the regression analyses. The first part of the regression analysis focuses on the control variables, which will offer information of the relevance of the model framework. The second part comprises the main element of the section with the tests of the hypotheses. Finally, a brief summary of the main findings will be presented.

5.1. CORRELATION TABLE

The first step in the analytical process is to perform a bivariate correlation of the database. The correlation coefficients are presented in table 6. The correlation table tells us about the pairwise relationships between the variables, and provides a basis for general expectations to the final estimation results.

From the table, we can see that there is a positive correlation between group affiliation, GAF, and labor productivity, with a coefficient of 0,049. This is in line with the general hypothesis – hypothesis 1 – which proposes that GAFs have higher labor productivity than SAFs. This coefficient does not provide any information about the magnitude or causality of the relationship, but it supports the model and encourages further analyses.

All the variables related to firm capabilities – human capital, ICT, finance, international trade, technology and innovation – are positively correlated to GAF, with the expected exception of FINANCE. This supports the idea that these capabilities are generally better developed in GAFs

than SAFs. These coefficients correspond with the previous research on business groups that was presented in the literature review. In general, the GAFs in the sample have higher levels of human capital, fewer problems with finance, are more engaged in international trade, and score better on indicators on technology level and innovation. In addition, the proposal that GAFs to a larger extent utilize ICT tools is supported. Among the firm characteristic variables, SIZE and AGE are positively correlated, while SPEC has a negative coefficient. This tells us that GAFs on a general level are older, larger, and more diversified than SAFs.

Regarding the variable for labor productivity, all variables are positively correlated, again with the exemption of the FINANCE indicator. This corresponds to the assumption that the proposed dimensions are positively related to economic performance. However, the correlation coefficients tell us nothing about causality. The positive relations in this table may be the result of random covariance or spurious relationships. Thus, the table of correlation coefficients does not provide any evidence for the hypotheses, but represents a first stage in the analytical process and a fundament for the next phase of testing the hypotheses through regression analyses.

TABLE 6: CORRELATION COEFFICIENTS

	TRAINING	EDUC	EMAIL	WEB	FINANCE	IMPORT	QUALITY	LICENSE	NEWPROD	NEWPROC	AGE	SIZE	SPEC	GAF	MNE	LnLABPROD
TRAINING	1,000															
EDUC	0,127	1,000														
EMAIL	0,324	0,238	1,000													
WEB	0,331	0,186	0,532	1,000												
FINANCE	-0,053	-0,088	-0,072	-0,085	1,000											
IMPORT	0,135	0,116	0,235	0,158	-0,019	1,000										
QUALITY	0,307	0,128	0,269	0,354	-0,117	0,119	1,000									
LICENSE	0,177	0,106	0,157	0,188	-0,044	0,138	0,253	1,000								
NEWPROD	0,256	0,167	0,241	0,227	0,016	0,179	0,114	0,145	1,000							
NEWPROC	0,292	0,164	0,258	0,241	-0,022	0,144	0,149	0,156	0,570	1,000						
AGE	0,169	0,045	0,186	0,221	-0,056	0,039	0,164	0,063	0,085	0,087	1,000					
SIZE	0,359	0,168	0,420	0,415	-0,131	0,169	0,406	0,220	0,175	0,205	0,261	1,000				
SPEC	-0,127	-0,020	-0,098	-0,105	-0,044	-0,044	-0,052	-0,010	-0,088	-0,020	-0,113	-0,053	1,000			
GAF	0,104	0,031	0,090	0,122	-0,033	0,010	0,122	0,060	0,063	0,047	0,090	0,165	-0,056	1,000		
MNE	0,112	0,050	0,087	0,094	-0,062	0,098	0,170	0,166	0,034	0,038	0,043	0,165	-0,032	-0,026	1,000	
LnLABPROD	0,065	0,095	0,102	0,100	-0,081	0,060	0,124	0,080	0,063	0,086	0,143	0,024	0,013	0,049	0,062	1,000

5.2. Regression Analyses

The results from the OLS regressions are presented in table 7 and 8. Table 7 presents the results from the sample which excludes the variables for "new products and services" and "new processes". This allows for a larger sample and wider geographical distribution of cases. Table 8 shows the results from the smaller sample, which includes the two previously omitted variables. Although the sample is smaller, the regressions in this table allow for analyses of the importance of innovation. In addition, the use of two different sample sizes controls for the robustness of the results.

The dependent variable in both tables is the log of labor productivity. Columns (1) to (11) represent different model specifications, or regressions. All regressions include a set of dummy variables for countries and sectors, which are not presented the tables. The coefficient of determination, R^2, provides some information about the goodness of the model. That is, how much the model explains the variations of the dependent variable (Field, 2009). The R^2 is 0,113 for the large sample, and 0,085 for the smaller sample. This implies that that the regression models in the first table explain 11,3 percent of the variance of the dependent variable, while the models in the second table explain about 8,5 percent of the variance. There is no clear definition of what a "good" R^2 should be, but a general perception is that an explanatory value of 10% is good in analyses of with firm-level data.

5.3. RESULTS – CONTROL VARIABLES

Columns (1) and (6) present the base regressions for the larger and smaller sample, respectively. These will be the first focus of attention. The TRAINING variable turns out to be negatively and significantly related to labor productivity in both samples. This result contradicts the assumption that formal training programs increase the economic performance of firms. This finding will be discussed later in this section. The coefficient for the education level, EDUC, is on the other hand both positively and significantly related. The variables representing the ICT usage dimension, EMAIL and WEB, are with regards to both sample sizes positively and significantly related to the dependent variable, with EMAIL having a stronger estimated coefficient. The coefficient for FINANCE is negatively and significant in both samples. As previously pointed out, the FINANCE variable utilizes an inverted scale. The interpretation of the result is, at a general level, that the more a firm perceives financing as an obstacle, the less productive it is. Conversely, firms which do not consider financing an obstacle, in general have higher labor productivity. IMPORT is positively and significantly related to labor productivity, but the coefficient is very close to zero. This suggests that import has little effect on the productivity of the firm.

The dimension related to “technology and innovation” encompasses quality certifications, foreign technology license, and the introduction of “new products and services” as well as “new processes”. The QUALTY variable is positively and significantly related to the dependent variable, while the coefficient for LICENSE is positive, but not significant. The two innovation-related variables are only available for the smaller sample. Table 8 reveals no significant results

for the introduction of new products and services. However, the introduction of new or improved processes is positively and significantly related to labor productivity. Finally, moving on to the firm characteristics, firm size has a significant and positive relation to productivity, while age and product homogeneity produce no significant results.

The results described above provide information of the importance of the various variables related to the capabilities of firms in general. The findings to a large extent support the assumption that these capabilities are important for the productivity of firms.

5.4. RESULTS – HYPOTHESES TESTING

Hypothesis 1 stated that GAFs have higher labor productivity than SAFs. As discussed in previous sections, preceding research on this linkage has exhibited ambiguous results. The opportunity to perform an analysis of this relationship using a large dataset with wide geographical coverage may provide an interesting contribution to the research topic. Looking at the GAF variable, the coefficient is positive and significant in both of the models. These results support hypothesis 1. If a firm is affiliated to a business group, it is in general estimated to have higher labor productivity than SAFS. It is worth noticing that this relationship with labor productivity is expected to be even stronger if the firm is part of an MNE.

Hypotheses 2 to 5 are related to the relative importance of these dimensions for GAFs in particular. For the purpose analyzing these propensities, interaction variables were created and introduced to the equations. The interaction variables were constructed by multiplying

(interacting) the GAF dummy with the variables associated with the dimensions of firm capabilities. By interacting two variables, the relationship between each of the interacting variables and the dependent variable depends on the value of the other interacting variable. This makes it possible to estimate the relative importance of a variable of interest. In order to save space, only the interaction variables which show significant estimations are presented in the tables.

Hypothesis 2 postulates that human capital is a more important factor for the productivity of GAFs than SAFs. The EDUC variable in the base regression shows that the education level is positively related to the productivity of the firm. However, the introduction of an interaction variable GAF*EDUC did not produce significant results. The coefficient for the interaction variable GAF*TRAINING, though, turns out to be positive and significant. As mentioned above, the TRAINING variable in the base regression was negatively and significantly related to productivity with the coefficient. In regression (2) we can see that the coefficient for TRAINING is -0,069, while the coefficient for GAF*TRAINING is 0,121. The interpretation of this is that group affiliation not only reduces the negative impact formal training programs have for the productivity of SAFs, but that training programs are actually positively related to productivity for GAFs. The estimations do not reveal the reason for these disparities. It is possible that the costs and time required for training, in addition to increased wages for trained staff, outweighs the productivity benefits of training programs for SAFs. Business groups, on the other hand, may organize intra-group training programs which spread the costs and resource demand between the affiliated firms. Moreover, reallocation of trained personnel between the group firms may lead to more effective utilization of the trained workers. This is in line with previous literature

on the human capital in business groups (Khanna & Palepu, 1997; Mahmood & Mitchell, 2004). All in all, hypothesis 2 is supported by the econometric evidence.

Hypothesis 3 suggests that ICT usage has a higher effect on the productivity of GAFs than of that of SAFs. The base regression demonstrates that ICT usage is indeed important for firm productivity, and the correlation table shows that group affiliation is positively correlated to ICT usage. Still, the interaction variables produce no significant results. There is thus no support for hypothesis 3 in the data.

In hypothesis 4, it is proposed that GAFs have better productivity because of their better access to finance. This is tested with the FINANCE variable. While the coefficient for the FINANCE variable in the base regression was significant and negative, which was interpreted as a positive relation between better access to finance and productivity, the coefficient of the interaction variable GAF*FINANCE is positive and significant. This is the case in both sample sizes (regressions 3 and 10). In fact, adding the coefficients for FINANCE and GAF*FINANCE results in a positive relationship between perceiving financing as an obstacle and productivity for GAFs, although the positive coefficient small. This signifies that for GAFs, perceiving financing as an obstacle is, in general, not reflected in lower productivity. Thus, the results support the statement in hypothesis 4.

Hypothesis 5 states that GAFs are more productive than SAFs partly because of their better ability to undertake international trade activities. The estimations of IMPORT in the base regression display a positive and significant relationship to the dependent variable, but the coefficient is very low, with a value of 0,001. For the interaction variable GAF*TRAIN, the

estimation is not significant. This implies that importing has a positive, but marginal effect on productivity for firms in general and there is no support for the idea that international trade is more important for GAFs than for SAFs.

For hypothesis 6, which postulates that GAFs have higher labor productivity than SAFs partly because of their greater technology and innovation capabilities, we find some support in the sample. The estimation for the QUALITY variable presents a strong and positively significant relation to productivity. However, the variable for international technology licenses displays no significant estimations. This means that having international quality certifications is related to higher productivity for firms, but there are no such linkages for foreign technology licenses. For the statement that these factors are more important for GAFs, we find no support in the larger sample. Nonetheless, in the smaller sample, the interaction variable GAF*QUALITY provides positive and significant results (regression 11). Finally, we check for the effects of “new products and services” and “new processes”. In order to estimate these effects I utilize two variables that are only available for the smaller sample. From the base regression (6) we find no significant relations between the “introduction of new products and services” (NEWPROD) and productivity, while the estimation for the “introduction of new or significantly improved processes” (NEWPROC) provide positive and significant results. There is no evidence that these effects have different magnitudes for GAFs and SAFs: both interaction variables produce insignificant results (regressions 7 and 8). All in all, the findings provide some support for hypothesis 6.

BOX 2: LEGEND – REGRESSION TABLES

REGRESSION	INTERACTION VARIABLE	SAMPLE
(1)	Base	Larger
(2)	TRAINING	Larger
(3)	FINANCE	Larger
(4)	QUALITY	Larger
(5)	TRAINING, FINANCE, QUALITY	Larger
(6)	Base	Smaller
(7)	NEWPROD	Smaller
(8)	NEWPROC	Smaller
(9)	TRAINING	Smaller
(10)	FINANCE	Smaller
(11)	QUALITY	Smaller
(12)	NEWPROD, NEWPROC, TRAINING, FINANCE, QUALITY	Smaller

*** Statistically significant at the 1% level

** Statistically significant at the 5% level

* Statistically significant at the 10% level

TABLE 7: REGRESSION COEFFICIENTS – LARGER SAMPLE

DEPENDENT VARIABLE: LABOR PRODUCTIVITY (Ln)

	(1)	(2)	(3)	(4)	(5)
TRAINING	-0,057	-0,069	-0,057	-0,057	-0,069
	(-2,801)***	(-3,235)***	(-2,807)***	(-2,804)***	(-3,237)***
EDUC	0,043	0,043	0,043	0,043	0,043
	(3,940)***	(3,933)***	(3,958)***	(3,936)***	(3,951)***
EMAIL	0,200	0,201	0,201	0,200	0,202
	(7,991)***	(8,037)***	(8,019)***	(8,001)***	(8,069)***
WEB	0,082	0,082	0,082	0,082	0,082
	(3,566)***	(3,576)***	(3,571)***	(3,572)***	(3,583)***
FINANCE	-0,033	-0,033	-0,036	-0,033	-0,036
	(-4,854)***	(-4,854)***	(-5,170)***	(-4,857)***	(-5,195)***
IMPORT	0,001	0,001	0,001	0,001	0,001
	(3,771)***	(3,783)***	(3,802)***	(3,769)***	(3,815)***
QUALITY	0,108	0,106	0,108	0,102	0,104
	(4,155)***	(4,067)***	(4,160)***	(3,720)***	(3,775)***
LICENSE	0,007	0,006	0,007	0,007	0,007
	(0,238)	(0,236)	(0,250)	(0,239)	(0,249)
SIZE	0,081	0,081	0,080	0,081	0,081
	(5,438)***	(5,453)***	(5,391)***	(5,443)***	(5,405)***
AGE	-0,001	-0,001	-0,001	-0,001	-0,001
	(-1,172)	(-1,240)	(-1,138)	(-1,197)	(-1,211)
SPEC	0,000	0,000	0,000	0,000	0,000
	(0,989)	(1,018)	(0,989)	(0,994)	(1,019)
GAF	0,100	0,041	0,039	0,088	-0,028
	(3,159)***	(0,943)	(0,846)	(2,301)**	(-0,487)
MNE	0,158	0,162	0,157	0,160	0,161
	(2,969)***	(3,044)***	(2,948)***	(2,999)***	(3,029)***
GAF*TRAINING		0,121			0,123
		(1,966)**			(1,895)*
GAF*FINANCE			0,040		0,042
			(1,850)*		(1,943)*
GAF*QUALITY				0,039	0,011
				(0,595)	(0,156)
Country dummies	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes
R^2	0,113	0,113	0,113	0,113	0,113
Observations	13256	13256	13256	13256	13256

TABLE 8: REGRESSION COEFFICIENTS – SMALLER SAMPLE

DEPENDENT VARIABLE: LABOR PRODUCTIVITY (Ln)

	(6)	(7)	(8)	(9)	(10)	(11)	(12)
TRAINING	-0,062	-0,062	-0,062	-0,073	-0,062	-0,061	-0,070
	(-2,237)**	(-2,235)**	(-2,242)**	(-2,515)**	(-2,215)**	(-2,208)**	(-2,413)**
EDUC	0,033	0,033	0,033	0,033	0,033	0,033	0,032
	(1,982)**	(1,979)**	(1,984)**	(1,982)**	(1,968)**	(1,954)*	(1,940)*
EMAIL	0,215	0,215	0,215	0,216	0,216	0,217	0,218
	(6,366)***	(6,370)***	(6,361)***	(6,402)***	(6,393)***	(6,412)***	(6,462)***
WEB	0,082	0,082	0,082	0,082	0,082	0,083	0,082
	(2,615)**	(2,617)***	(2,608)***	(2,620)***	(2,602)***	(2,648)***	(2,616)***
FINANCE	-0,024	-0,024	-0,025	-0,024	-0,029	-0,025	-0,030
	(-2,692)**	(-2,684)***	(-2,699)***	(-2,662)***	(-3,069)***	(-2,709)***	(-3,125)***
IMPORT	0,001	0,001	0,001	0,001	0,001	0,001	0,001
	(2,096)**	(2,107)**	(2,093)**	(2,110)**	(2,153)**	(2,070)**	(2,156)**
QLTCERT	0,072	0,072	0,072	0,070	0,072	0,046	0,046
	(1,950)*	(1,950)*	(1,959)*	(1,900)*	(1,960)*	(1,170)	(1,180)
LICENSE	0,026	0,026	0,027	0,026	0,026	0,026	0,027
	(0,655)	(0,650)	(0,665)	(0,639)	(0,654)	(0,651)	(0,668)
NEWPROD	-0,005	-0,008	-0,005	-0,005	-0,005	-0,004	-0,009
	(-0,162)	(-0,250)	(-0,162)	(-0,150)	(-0,156)	(-0,138)	(-0,279)
NEWPROC	0,075	0,075	0,078	0,075	0,076	0,074	0,085
	(2,460)**	(2,456)**	(2,470)**	(2,470)**	(2,489)***	(2,425)**	(2,653)***
AGE	-0,001	-0,001	-0,001	-0,001	-0,001	-0,001	-0,001
	(-1,640)	(-1,650)*	(-1,634)	(-1,675)*	(-1,625)	(-1,725)*	(-1,732)*
SIZE	0,056	0,056	,056	0,056	0,055	0,055	0,055
	(2,701)***	(2,699)***	(2,704)***	(2,710)***	(2,674)***	(2,673)***	(2,663)***
SPEC	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	(0,066)	(0,069)	(0,064)	(0,078)	(0,068)	(0,075)	(0,081)
GAF	0,078	0,053	0,097	0,022	-0,010	0,026	-0,096
	(1,803)*	(0,682)	(1,373)	(0,373)	(-0,151)	(0,501)	(-0,921)
MNE	0,230	0,230	0,230	0,234	0,231	0,239	0,241
	(3,041)**	(3,037)***	(3,034)***	(3,087)**	(3,055)***	(3,150)***	(3,175)***
GAF*NEWPROD		0,037					0,066
		(0,403)					(0,589)
GAF*NEWPROC			-0,030				-0,111
			(-0,336)				(-1,011)
GAF*TRAINING				0,113			0,098
				(1,344)			(1,084)
GAF*FINANCE					0,052		0,057
					(1,717)*		(1,878)*
GAF*QLTCERT						0,187	0,184
						(1,981)**	(1,848)*
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0,85	0,85	0,85	0,85	0,85	0,85	0,86
Observations	6591	6591	6591	6591	6591	6591	6591

5.5. SUMMARY OF RESULTS

In the first part of the econometric analysis, I looked at the control variables in the equation. The control variables comprise a set of indicators that represent constituents of the dimensions of firm capabilities: Human capital, ICT usage, finance, international trade, and technology and innovation. A summary of the results is presented in the table below.

TABLE 9: SUMMARY OF RESULTS – FIRM CAPABILITIES

CAPABILITIES	INDICATORS	EXPECTED EFFECT	RESULTS LARGER SAMPLE	RESULTS SMALLER SAMPLE	FINDINGS
HUMAN CAPITAL	TRAINING	Positive	Negative	Negative	Partly supported
	EDUC	Positive	Positive	Positive	
ICT USAGE	EMAIL	Positive	Positive	Positive	Supported
	WEB	Positive	Positive	Positive	
FINANCE	FINANCE	Negative	Negative	Negative	Supported
INTERNATIONAL TRADE	IMPORT	Positive	Positive	Positive	Supported
TECHNOLOGY & INNOVATION	QUALITY	Positive	Positive	Positive	Partly supported
	LICENSE	Positive	Not significant	Not significant	
	NEWPROD	Positive	n/a	Not significant	
	NEWPROC	Positive	n/a	Positive	

Overall, the estimations in the regressions support the proposed analytical framework, with a few exceptions. The variables representing “foreign technology license” and “new products and services” did not produce any significant results, and the IMPORT coefficient is, although positive and significant, of a very low value. The most unexpected and inconsistent result was in

the variable for formal training programs. This was assumed to have a positive relation to the productivity of the firm, but the estimation turned out with a negative, significant value. Some possible reasons for this were discussed, but it is outside the scope of this analysis to provide any certain answers to this puzzle. Still, the other results turned out as assumed by the model, supporting the framework as a relevant for the analysis.

TABLE 10: SUMMARY OF RESULTS – HYPOTHESES TESTING

HYPOTHESIS	INDICATORS	EXPECTED RESULTS	RESULTS LARGER SAMPLE	RESULTS SMALLER SAMPLE	FINDINGS
H1 (productivity)	GAF	Positive	Positive	Positive	Supported
H2 (human capital)	TRAINING	Positive	Positive	Not significant	Partly supported
	EDUC	Positive	Not significant	Not significant	
H3 (ICT)	EMAIL	Positive	Not significant	Not significant	Not supported
	WEB	Positive	Not significant	Not significant	
H4 (finance)	FINANCE	Positive	Positive	Positive	Supported
H5 (international trade)	IMPORT	Positive	Not significant	Not significant	Not supported
H6 (technology & innovation)	QUALITY	Positive	Not significant	Positive	Partly supported
	LICENSE	Positive	Not significant	Not significant	
	NEWPROD	Positive	n/a	Not significant	
	NEWPROC	Positive	n/a	Not significant	

The main stage of the regression analysis is to test the hypotheses. The general hypothesis, H1, stated that the labor productivity of GAFs is higher than that of SAFS. This hypothesis was supported in the data sample.

The next hypotheses were specifications of the first, attempting to explain *why* GAFs are more productive than SAFs. I found evidence that perceiving finance as an obstacle has less impact on the productivity of GAFs (H4). The hypotheses about the relative importance of human capital (H2), product quality (H6), and innovation (H7) were partly supported, in that one of two variables testing each hypothesis showed significant results in the regressions. The hypotheses proposing that ICT usage (H5) and international trade (H5) are more important for productivity for GAFs than for SAFs were not supported by the evidence in the data samples.

6. DISCUSSION AND CONCLUSIONS

This thesis sought to investigate whether business group affiliated firms have a better economic performance than stand-alone firms in emerging economies. The thesis has also examined various factors which may affect the performance of the group affiliates. An empirical analysis was carried out, utilizing a large dataset collected between 2006 and 2010 through the World Bank Enterprise Surveys, with a wide coverage of firms from almost all developing countries. This allowed for a broad cross-country analysis of the economic performance of group affiliated firms, with better coverage, both in number of cases and geographical dispersion, than previous empirical studies. The empirical findings provided several conclusions to the above mentioned questions, which I will summarize here.

The first research question to be examined was whether or not the economic performance of business group affiliated firms is better than that of stand-alone firms in developing economies. This question was reflected in the first hypothesis, which stated that GAFs have higher labor productivity than SAFs. The empirical findings turned out supportive of this statement. At a general level, business group affiliated firms are more productive than the SAFs.

The second research question is a specification of the first, asking what factors affect the performance of group affiliated firms in developing countries. This question was investigated in hypotheses 2 through 7, which were based on a proposed framework for reckoning the absorptive capacity of firms in emerging markets, where economic development is less dependent on original innovations and high-tech R&D, but relies more on transfer of knowledge and technology from the external environment. Of these six hypotheses, three received full or

partly support in the empirical evidence. The main conclusion to this second research question is that GAFs have better economic performance than SAFs because of better human capital and access to finance, and greater technological and innovation capabilities.

The empirical evidence suggests that formal training programs have a larger positive impact for the productivity of GAFs than for SAFs. In fact, formal training programs is unexpectedly found to be related to lower productivity for SAFs, while for GAFs, this relationship is positive. Finding an explanation for the negative effect for SAFs, and the discrepancy between the effects on SAFs and GAFs, is outside the scope of this empirical analysis. Nevertheless, I have suggested that there is a possibility that the monetary and time costs for training programs outweigh the productivity benefits for SAFs, while group-wide cost dispersion and more effective utilization of trained personnel through reallocations within business groups contribute to the positive effect for GAFs. Other explanations might be found in literature from other research fields, such as human resource management and organizational studies. More in-depth analyses on this topic using time-series data could also prove valuable in order to shed light on this puzzle.

Another finding is that access to finance is a more important factor for the productivity of GAFs than SAFs. GAFs have better access to finance, and are better at exploiting financial capital to increase productivity. This is in line with the literature suggesting that GAFs can access finance through group-internal finance reallocations and integrated financial services (Khanna & Yafeh, 2007) or by using group-level solidity and reputation as a leverage to attract external funding (Mahmood & Mitchell, 2004). It also implies that GAFs may have complementary capabilities which enable them to utilize financing better than SAFs.

The results also display that internationally recognized quality certifications is part of the reason why GAFs are more productive than SAFs. Quality certifications do not only reveal something about product quality, but also about the technological and managerial level of the firm. Moreover it facilitates cross-national trade and investments by reducing perceived risks about low product quality, managerial deficiencies, and opportunistic behavior.

There have been proposed numerous theories about possible economic advantages of business group affiliation, be it from parasitical execution of financial control and market power (Khanna, 2000), or by compensating for the institutional voids left by poorly developed institutional frameworks (Khanna & Yafeh, 2007), but empirical research has provided diversified and ambiguous results. The empirical analysis in this thesis, performed on a larger and more geographical distributed data sample than prior studies, has however exposed that, at a general level, group affiliated firms have better economic performance than their stand-alone counterparts. The findings also infer that GAFs utilize their capabilities more efficiently than SAFs.

An implication of this is that business groups play an important role for the economic development in many emerging economies, and that the increased productivity of GAFs may lead to general growth of welfare and prosperity at a national level. However, the performance gap between GAFs and SAFs may put the majority of independent firms in a relevant disadvantage, causing this gap to grow wider. As the SAFs are pushed out of the market, and the business groups become more dominant in an economy or sector, the effects of market concentration may start to stagger growth. In order to avoid such situations, governments

should consider adopting policies in order to level the competition by providing adequate infrastructures for human capital and finance available to smaller firms as well.

Another point of interest is that GAFs seem to be able to exploit their capabilities better than SAFs. The economic performance of GAFs is not just a function of an aggregation of their individual capabilities, but there seems to be some synergy effects which create an increase in performance greater than the sums of the effects of the individual capabilities. This implies that there is a presence of complementarity among the capabilities which is in line with the theories of absorptive capacity.

The findings in this thesis suggest that research using large datasets with wide coverage may produce dissimilar results from studies focusing on a single or a small collection of countries. At the same time, this analysis has only to a limited degree focused on cross-country differences of the performance and capabilities of GAFs. There is a great diversity in the institutional arrangements of developing countries, and in order to fully understand the role of business groups it is important to investigate the relationships between institutional set-up and the importance of group related capabilities. The definition of business group covers a wide array of different structures and networks, which will influence the surrounding differently. Most importantly, little is known about how the function of business groups changes over time as countries develop and institutional infrastructures evolve. Research on these topics may have significant value for policy development in emerging economies.

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