Mergers and Acquisitions: Their impact on technological performance

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Abstract

This Thesis examines the impact of mergers and acquisitions (M&As) on the subsequent technological performance of the related firms. The investigated firms are selected according to their strategic choice which consists in seeing M&As as a shortcut for acquiring technological assets and capabilities and therefore the subsequent technological performance. The relatedness issue as well as the resource-based view of the firm are theoretical hints, which effectiveness on technological performance is discussed. A more managerial approach using case studies is also used in order to demonstrate a new organisational form of cooperation, derived from strategic alliances and M&As. With the help of the Renault-Nissan Alliance it is argued that this hybrid form presents many capacities for developing a successful integration process, and subsequently enhancing technological performance.

Key words: Merger - acquisition - technological performance - relatedness - resource-based view - hybrid organizational form.
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TABLE OF CONTENTS

1. INTRODUCTION .................................................................................................................. 1
   1.1. Research question ........................................................................................................ 1
   1.2. Research perspective and limitations ....................................................................... 2
       1.2.1. An essential distinction between technological performance and creative innovation in order to avoid confusion ................................................................................. 3
       1.2.2. Different literature contributions leading to the same research process ............... 4
   1.3. General outline ............................................................................................................ 5

2. METHODOLOGICAL APPROACH .................................................................................... 7
   2.1. The use of a qualitative approach ............................................................................. 7
   2.2. The reasons for choosing a grounded theory approach ............................................. 7
   2.3. The appropriated methods and the research design .................................................. 8

3. THEORETICAL FRAMEWORK ....................................................................................... 10
   3.1. An essential clarification of what technological performance is ............................... 10
   3.2. Relatedness as a factor of successful synergies ....................................................... 11
   3.3. The main contributions to the concepts of similarity and complementarity ............ 13
   3.4. A growing part of the literature that has to be taken into account: the resource-based view of the firm ................................................................. 15
   3.5. A more managerial theoretical approach that could lead to new forms of M&As ......... 16

4. EMPIRICAL DATA ............................................................................................................ 18
   4.1. A review of large-scale empirical studies and their findings .................................... 18
       4.1.1. A first step in empirical data: a study of the semi-conductor industry concerning the determinants of alliance formation .............................................................. 19
       4.1.2. Getting closer to the issue of resource redeployment by pointing out a large-scale empirical study concerning the effects of M&As on long-term performance .................. 21
       4.1.3. Focusing now on technological performance via a large-scale empirical study in the computer industry ................................................................. 24
       4.1.4. Considering the size and knowledge aspects of relatedness from a longitudinal study in the chemical industry ................................................................. 25
       4.1.5. A review of large-scale empirical studies which investigated the effects of M&As and strategic alliances on technological performance ........................................ 27
   4.2. Case studies as tools for exploring how M&As influence technological performance 30
       4.2.1. In search for failure – lessons from the Volvo-Renault case ................................ 30
       4.2.2. Review of a M&A empirical case in the automotive industry ............................. 36
       4.2.3. The Renault-Nissan case as a source of forerunning patterns for enhancing the technological performance ................................................................. 38

5. ANALYSIS ........................................................................................................................ 42
   5.1. A first overview of the observed effects of M&As on technological performance ........ 42
   5.2. Relatedness as a basic requirement for technological performance enhancement .... 43
   5.3. The connection between the automotive industry and previous research on M&As’ global effects on technological performance ........................................................... 44
   5.4. The Renault/Nissan case as an element of response ............................................... 46
   5.5. Renault-Nissan as a new organizational form proficient to enhance technological performance ................................................................. 48

6. CONCLUSION .................................................................................................................. 52
   6.1. Research conclusion ................................................................................................... 52
   6.2. Insights from the methodological approach used for this thesis ............................. 53
Table of figures

Figure 4.1: Structure of strategic alliance and cross-shareholdings of Volvo and Renault as of September, 1993, p. 31.

Figure 4.2: Structure of the proposed merger between Volvo and Renault, p.34.

Figure 4.3: Structure of Renault-Nissan in 2004, p. 40.

Graph 4.1: Relationship between alliances and technological performance according to the articles reviewed, p. 27.

Graph 5.1: Schemes of the three structural models, p.48.

Table 4.1: Classification of cases by their motivation of alliance formation, p. 20.

Table 4.2: Extent of post-acquisition divestiture, p. 21.

Table 4.3a: Extent of resource redeployment to target, p. 22.

Table 4.3b: Extent of resource redeployment to acquirer, p.23.

Table 4.4: Effect of M&As in the articles reviewed, p.29.

Table 4.5: Elements of difference and complementarity between Renault and Volvo at the time of their strategic alliance, p. 32.

Table 5.1: Summarizing the main characteristics of M&As, strategic alliances and hybrid organizational forms, p. 50.
1. **INTRODUCTION**

Through the past century many mergers and acquisitions (M&As) occurred in the course of different phases in the Western economies. The first three decades of the 20th century was a period of major waves of horizontal consolidation with most of time the creation of a dominant market position as a major intention. Following the Great Depression, the US government applied tight concentration laws that made this more difficult. In the 60s and 80s appeared two huge other merger waves. This time motives were different, financial risk reduction because of diversification and technological synergies among different industries were new reasons for merging or acquiring.

With the moderation of the US antitrust law during the 80s, the growing pace of consolidation on an unprecedented scale that occurred since the last fifteen years has significantly changed the rules of the game in the economic life.

Horizontal mergers involved firms from the same industries and the same principal markets. Many industries were then facing oligopoly situations. This amalgamation movement was complemented by beliefs standing for the benefits of size and scale economies. This contradicted the new managerial strategic advances such as production flexibility or individualized marketing (customization). Another predominant issue was that those huge M&As were now incidental to the globalization with numerous cross-border agreements, compared to the precedent waves which were mostly domestic. M&As have thereby been more the object of many attentions during the past couple of decades. Nevertheless some influential and contributing research can and must be conducted in the field.

The extensive literature concerning the subject has until now mainly focused on M&As financial and economical effects (particularly competition and merger policy) and it has therefore influenced a growing part of the economic actors, including deal-makers, consultants and external financial promoters, to favour short term objectives. In fact long term outcomes such as technological performance only became thoroughly studied and taken into account during the past decade.

In that sense M&As’ evaluations have constantly put forward the financial aspects and most of the time omitted to report the importance and the consequence on technological performance. This rising awareness for long term effects of M&As follows sensibly the fact that a merger or an acquisition is no longer the best and easiest strategic solution to companies’ successes. As it will be
effectively pointed out in the literature review and later with empirical data, many previous studies have revealed the unimpressive economic outcome of most M&As.

This Master’s Thesis aims therefore to assess what can bring different firms to technological synergies and involves therefore my research in focusing on technological performance. One can add moreover that technological performance is closely related to commercial and economic success (Franko, 1989) and stands for one of the most important – if not the most important – long-term effects of acquisitions. Another primary objective of this study is to achieve its development by proposing new research approaches that could help strategists by means of practical sources and cases to explain the reasons of those difficulties, and to propose different models of M&As that could lead to successful technological performance.

1.1. Research question

Reducing substantially costs, via economies of scale and scope, and reaching new markets without delay have been and still are the main reasons for acquiring or merging. Nevertheless many cases of M&As have shown how difficult reaching financial success appears to be. The integration process with all of its influential factors tends then to be the crucial challenge of creating synergies that would be enhanced through the development of the new entity. Mature and technologically incentive industries represent the most interesting field of business if one look at M&As’ impact on technological performance.

Furthermore some authors, including Ahuja and Katila (2001), have demonstrated that nontechnological M&As do not influence significantly technological outputs. This study will therefore focus on high-tech companies from which the relation between M&As and technological performance is obviously more evident, such as the pharmaceutical and automotive firms. The global car industry symbolizes the starting point of the research perspective. As far as I’m concerned, this study will draw more the line at this industry and its players. Nevertheless, the main criteria does not consist in a particular industry but it is linked to the strategic choice of companies which see M&As as a shortcut for acquiring technological assets and capabilities and therefore the subsequent technological performance. For that reason, the empirical part of this study will present many cases and studies which are not only linked to the automotive industry.

2
The global car industry contains in this way all the elements that could justify a study of the impact of M&As on technological performance. First, the huge process of consolidation that took place brought some global manufacturers to own no fewer than 16 or 8 different brands (GM, Daimler-Chrysler and Ford – the Big Three). On the other hand some other car companies established their strategic on organic growth (Toyota) or on a lesser process of consolidation (Renault-Nissan).

Subsequently when one takes a look at these competitors’ productions and operating margins (see the two tables in Appendix 1), one can easily see that financial difficulties are not faced by the smallest ones but by big car corporations, which apparently have not taken opportunity of potential synergies. Moreover, as it will be discussed later, they are even not leading the technological battle compared to own grown or smaller firms such as Toyota is performing, notably with its hybrid engines.

This matter has brought me to ask the question why those acquiring firms are not successful financially, but also and indeed why they are not in terms of technological performance. The underlying research question will therefore focus exclusively on M&As which primary motives have been to improve technological performance and thereby improve competitiveness. Then the objective of this thesis will consist in answering the following question:

**How firms engaged in M&As can strategize and manage their integration process in order to enhance technological performance?**

1.2. Research perspective and limitations

1.2.1. An essential distinction between technological performance and creative innovation in order to avoid confusion

During the starting process of the thesis study it has appeared necessary to make a clear distinction between those two concepts. I will therefore explain more thoroughly why the words technological performance has been chosen in this thesis title instead of innovation. Firstly I must
indicate that if the word innovation appeared to be used in this study then it would have to be considered according to the same meaning as technological performance. Nevertheless, in order to avoid misunderstandings and inconsistency innovation will be used as less as possible even if some authors don’t make such distinction. Technological performance came out of my thoughts because when I talk about innovation, I don’t want to mix technological innovation and creativeness, even though they are often linked together.

Creativity is not always linked to technology and it would be a misinterpretation to see it as innovation in the sense of technological performance. Of course most of the radical innovations that appeared in business activities have been above all due to a great sense of creativeness. Nevertheless, technological synergies do not attempt to enhance this concept of creativeness but they are above all exploited for developing technological performance. Radical innovation is hardly controllable in the sense that it is merely the consequence of a long process of R&D but rather the result of one person’s great idea.

A company which acquires or merges with another one do not expect as a synergetic outcome a great innovation that will break the competition and create a new form of market. In high tech industries things are going fast but innovations come out most of the time gradually, step by step. This is the reasons why I found important and clever to make this essential distinction in order to avoid misunderstandings and to restrict the field of research.

1.2.2. Different literature contributions leading to the same research process

Developing this study brought me in reading a wide range of the related literature. However this hasn’t been done without looking at other closed and academically linked subject such as the strategic alliance literature. If one considers that a strategic alliance is basically a lesser form of a merger, one can clearly regard this field and its studies as a useful means of enhancing the required theoretical sensitivity.

This is all the more true when some useful concepts or field of theories have been more approached in the strategic alliances literature. The resource-based theory appears then to be a perspective on which some assumptions of this study will be based. Those assumptions will be stated from previous contributions that have been mostly directed in the strategic alliances field. Later in the analysis process, some other alliances studies will be quoted as well for directing this
research about M&As and technological performance towards new approaches. Nevertheless, it has to be clearly settled that this study will not look for the effects of strategic alliances on technological performance as such.

Another important limitation concerning this research has to do with the type of factors that will be used to analyse the impact of M&As on technological performance. It appears obvious to every informed reader that these findings could lead to many different leadership and strategic areas such as human resources, culture, communication, corporate governance, and corporate finance, and also to many various concepts. Then the necessity for clarifying the research perspective becomes evident.

With the help of a clearly related literature review, the study will avoid to scatter its development into so many areas. Some of the latter such as cultural issues represent a lot of contributions, however, and even if their influences cannot be denied, technological performance will remain as the central focused point of the study. In this way, all the other areas will be approached but only by involving them in the crucial process of integration as secondary paths of the research analysis.

1.3. General outline

The first chapter was designed in order to endow with a background that could illustrate the importance of M&As and most particularly the significance of their effect on technological performance. The research question was then presented and followed by the research perspective and its limitations. The relevance of an appropriate methodological approach is then expressed in the next chapter. The reasons for choosing such an approach are there explained and argued.

The third chapter gives an overview of the theoretical background, which deliberately focus only on M&As and technological performance literature contributions. The fourth chapter concerns the empirical part of the thesis. There will be two main parts in it, first the presentation of large-scale empirical studies. And it will then get closer to managerial aspects with some case studies.
Mergers and Acquisitions:  
Their impact on technological performance  
Master’s Thesis final draft

The fifth chapter will afterwards consist in analyzing the data with the help of the theoretical framework. This part of the thesis will elaborate the answer to the research question. However, the responses that must be suggested to it will be part of the conclusion chapter. An overview of the methodology used and its efficiency will be discussed in hindsight. And finally, suggestions for further research will be proposed.
2. METHODOLOGICAL APPROACH

“Qualitative method can be used to uncover and understand what lies behind any phenomenon about which little is yet known.”

(Strauss & Corbin)

2.1. The use of a qualitative approach

Concerning the methodology used for data collection, I am mainly focusing on qualitative methods. The qualitative approach “can refer to research about persons’ lives, stories, behaviour, but also about organizational functioning, social movements, or interactional relationships” (in Strauss & Corbin, 1990, p.34). The main reason of this choice lays in the fact that this study reflects in many ways how companies cope with organizational and managerial aspects. A phenomenological approach actually brings the researcher to understand social phenomena from the actor’s own perspective (Deutscher, 1973).

The aim of this research is to find or discuss answers about the research question in order to reach the sufficient level of abstract for being then capable to propose model and concept applications in M&As that could enhance technological performance. With the intention of doing such, a qualitative approach will be mainly used, even though a quantitative approach is not excluded as a part of the research process, by taking into account data from previous quantitative studies.

2.2. The reasons for choosing a grounded theory approach

As it has been said, the empirical literature used for the Thesis research does not always refer to the automotive industry, which will be nevertheless the central point of my discussion. The analysis will then be built on a theoretical generalization (Neuman, 2003) based therefore on a grounded theory approach.
Enhancing my theoretical sensitivity corresponds to an own research process that appears essential in order to have “the ability to recognize what is important in data and give it meaning” (in Strauss & Corbin, 1990, p. 62). This is the reason why how important gaining all the relevant information in the literature review is, for acquiring the essential knowledge to use the grounded theory method.

The main objective of the grounded theory is to create a trustworthy theory that would drop some light on the research area. That’s why in my own opinion, the most important part in the grounded theory approach is the empirical one, on which I will build my own theory from. Strauss & Corbin’s perspective (1990) constantly favours the inductive discovery of theory grounded in systematically analysed data. This thesis has not the pretension and even not the ability to deduce theories from a-priori assumptions. The managerial perspective of this study engages the research process in moving from the specific to the more general (inductive perspective), with empirical observations compared to the literature knowledge. The Grounded Theory is therefore applied as a research method that enhances theory from the data: “it is discovered, developed (...) verified through (...) data collection and analyses” (in Strauss & Corbin, 1990, p.23).

**2.3. The appropriated methods and the research design**

“The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them.”

*Sir William Bragg*

By choosing the Grounded Theory, as it has been said before, this Thesis research will have to grasp many empirical data in order to rely its arguments upon a trustworthy theory. Nevertheless, few previous researches on technological performance have been built on one particular case by analyzing the all integration process of a merger or an acquisition. For implementing such an in-depth analysis, a micro-level study within the merging entities needs time and a sufficient but important capacity of taking in account all the parameters that influence all the phases of the merger or acquisition (pre-merger, integration process and post-merger phases).
However, the aim of this research combined with the circumstances and the chosen topic do not allow me in engaging in such a study, despite all the interests it could present. An adjusted approach must be then developed in order to fulfil all the expectations that I’m looking for. The importance of the integration process in creating synergies that could allow technological performance outcomes do also not allow my research in being based on only some interviews with managers who were taking part in M&As. Some authors based their studies on analyzing quantitative data of many firms involved in M&As. A recent interview study (Capron, 1999) showed interesting results based on a survey of 200 firms. Nevertheless, the reasons for choosing the methodological approach exposed in the two previous points do not support the accomplishment of such a study.

Hence, looking upon previous studies that took into account many empirical data such as the latter would support the enhancement of a reliable theoretical sensitivity. Then in order to enlighten useful theories and to formulate assumptions that could explain reasons of failures and give some path of reasoning about factors of success based on a satisfying base of data (or theoretical framework), it seems more judicious to focus on the data already available. This study will then incorporate secondary data such as technical literature based on empirical facts. In their book, Strauss and Corbin (1990) support this approach by stating that one can use the literature as secondary sources of data. And finally the empirical part of this Thesis (fourth chapter) will also base its sources on precise cases of M&As in the automotive industry, in order to focus on an analysis that could explain the different sort of failures and success that came through the huge process of consolidation.

With the aim of finding new managerial ways of strategizing in order to enhance technological performance by means of M&As, this study will develop some preliminary answers by clarifying the theories in the next chapter. Then by testing those with empirical facts such as M&As in the car industry this study aims to explain how such big car corporations are not taking advantage of potential synergies, and also mainly in order to find how they could manage their resources to gain some benefits in terms of technological performance.
3. **THEORETICAL FRAMEWORK**

3.1. **An essential clarification of what technological performance is**

As it has been said earlier, this study aims to look at how companies engage themselves in the acquisition of technology and external knowledge by means of M&As. Exploring the effects of M&As on technological performance appears relevant from many perspectives. On one hand, technological performance is closely related to financial success (Franko, 1989) and stands for one of the most important – if not the most important – long-term effects of acquisitions. This relates the subject to a more general issue regarding the economic benefits of M&As, for instance in terms of their effect on the profitability of companies (Hagedoorn & Duysters, 2000).

Moreover, technology related incentives for M&As influence long-term strategic adjustments which tend to be underestimated in much of the existing empirical research (Chakrabarti et al., 1994, Berggren, 2003), that usually concentrates on the short-term economic effects of M&As. In these long-term effects the expected synergetic characteristics of M&As can contribute to technological performance through the successful introduction of new technologies, new products and processes by the combined companies which could eventually lead to improve profitability of companies. All these reasons give the opportunity to approach the subject with an organizational learning perspective, which could lead to “understand how organizations absorb and use external knowledge” (in Ahuja & Katila, 2001, p. 197).

On the other hand, the strategy literature does not emerge as the only one that shows interests for the subject of technological performance. The latter’s role in antitrust, and more specifically in M&A geopolitical analysis, has generally been the focus of numerous academic papers. Merger policy and innovation appears to be two elements which interact and influence each other (Katz & Shelanski, 2005). Defining the degree of relatedness, as it will be explained further, between two firms may influence antitrust decision not only because the firms’ economic environment might influence the technological outcome, but also because the latter could have an impact on this environment and on the market competition.
Technological performance represents the outcome or output that gives to the combined firm its innovative capacity, essentially in terms of high tech developments. The most obvious input to this capacity is the R&D process that takes place in the company. Technological inputs and outputs in high-tech industries can be measured by standard indicators such as R&D expenditures and patents (Hagedoorn & Duysters, 2000). Nevertheless, some other authors admit that even if patents are good indicators to measure innovative output, they are rather regarded as intermediate output between acquisition and value creation (Ahuja & Katila, 2001).

Their suggestion for further research would then be an evaluation of the economic value of technological and innovative outputs. Patents counts, R&D expenditures and R&D personnel may have a significant impact on technological performance; however they do not tell how they influence this output. Cassiman et al. (2005) suggest more in-depth measures such as change in R&D portfolios and the degree of R&D reorganisation, in order to scrutinise the dynamic reorganisation processes of the firms associated with M&A. In this way, looking more closely at the integration process with the combination of R&D inputs and technological activities brings this research to its next step: the concept of synergy.

3.2. Relatedness as a factor of successful synergies

Mainly inspired by Rumelt (1974), who is often quoted in the articles and studies used for this thesis, the management literature has moved away from a general evaluation of the economic performance of M&As to an evaluation of different forms of M&As, such as horizontal, vertical and unrelated M&As (Hitt et al, 1998; Montgomery and Wilson, 1986; Singh and Montgomery, 1987).

Hagedoorn and Duysters (2000) have demonstrated in their study “that both the organisational and the strategic fit of the companies involved in these M&As are crucial for the technological success of M&As” (in Hagedoorn and Duysters, 2000, p.28). Those two concepts of strategic and organisational fit are influencing the relatedness between the companies. As an example two or more companies which are acting on the same market and therefore showing some characteristics of strategic fit, will reduce the importance of uncertainty towards the future merger or acquisition.
These authors do not only stress the importance of market relatedness, which is more a matter of partner selection, they also make an analysis of the integration of R&D intensive companies and underline the importance of organizational adaptation. Their results show evidence of achieving important strategic advantages in high-tech sectors, but only with the necessary condition of paying properly attention to these concepts of strategic and organizational fit.

Ahuja and Katila (2001) drew a longitudinal study (12 years) in the global pharmaceutical industry. They argue what has been said earlier concerning non technological M&As, i.e., without any technological inputs acquisitions - they do not study mergers in their paper - cannot be expected to have a positive impact on technological performance. They consider this contingency as a hypothesis for their analysis, and they also insert another one including three other hypotheses in their reasoning. The impact of mergers or acquisitions enhanced by the synergetic effects appears there to be dependent on the characteristics of the relationship between the knowledge of the related firms (Singh & Montgomery, 1987, Lane & Lubatkin, 1998). This second contingencies brings the authors (Ahuja & Katila, 2001) to consider the three other hypothesis that this thesis study will retrieve.

Their first assumption consists in stating that the impact on technological performance of the acquired firm is likely to vary positively with the absolute size of the acquired technological knowledge base. The second concerns the relative size of the acquired firm’s knowledge base compared to the acquirer’s. They suppose that the greater this relative size is the less the consequent innovation output of the acquiring firm is. This hypothesis justification relies in the argument of indigestibility, which will be more discussed later. Actually, if one takes a look at an acquisition in which the relative size of the acquired knowledge base represents a large volume of information, processes, technology, etc., then one can undoubtedly admit the necessity of integrating difficult stages that may slow down the integration process and the potential synergies. Therefore the negative impact of the relative size on postacquisitions technological outputs turns up to be clearly justified as a hypothesis that could be used as a research tool in this study.

Finally, their last hypothesis consists in arguing that the impact of an acquisition on technological output is curvilinearly related to the relatedness of the acquired knowledge base. In this way, technological output may increase with a certain degree of relatedness, however beyond a certain optimum the effect declines with increasing relatedness between the two firms’ knowledge base. Learning and technical communication are likely to be more developed when the firms share the same common skills, languages or cognitive structures (Lane & Lubatkin, 1998). Then the
combined firm will avoid consuming time and resources on integrating knowledge bases which consist of different routines of conducting research (Hapeslagh & Jemison, 1991). Nevertheless, when an acquired knowledge is on the other hand too similar to the acquiring knowledge base, this may limit the technological performance effects.

The absorptive capacity perspective suggests that acquired knowledge can improve the output according to two main distinctive effects (Cohen & Levinthal, 1990). First, this acquired knowledge can develop a cross-fertilization effect by addressing old problems to a new resolution perspective, by combining old and new approaches. Second, the acquired knowledge engages the new entity in looking for information from the external environment with the help of new stimuli. However, when this new knowledge appears to be too closely related to the previous one already owned, then those two reasons for enhancing the technological performance become limited. Hence, a moderate degree of relatedness is more likely to “provide the most significant positive impact on the acquiring firm’s subsequent innovation output” (in Ahuja & Katila, 2001, p.201). This similarity issue has then to be taken into account with another influent concept of relatedness: complementarity.

### 3.3. The main contributions to the concepts of similarity and complementarity

First of all, it has to be said and clarified that complementarity and similarity are two independent forms that constitute the essential factors of this concept of relatedness.

Nevertheless, this relatedness perception has not always been considered as such. Rumelt (1974) has effectively associated relatedness with similarity and overlooked complementarity. His original definition of relatedness identified three areas of potential synergies: markets, products and production, science and technology. The technology point and the concept of complementarity have been emphasized later by other authors, who have therefore reconceptualised relatedness.

This definition of the concept came out and actually since that time, many implementations and contributions have been brought to it. According to Hagedoorn and Duysters (2000), in order to achieve synergetic effects through M&As, “the strategic fit through market, product and technological complementarities or relatedness of companies has to be supplemented by an organisational fit” (in Hagedoorn & Duysters, 2000, p. 5) in which the organisational structure of the merging companies appears to match. This noteworthy quotation involves some other concepts which influence the degree of relatedness between the combined firms.
Mergers and Acquisitions: 
Their impact on technological performance 
Master’s Thesis final draft

The first one corresponds to similarities which are commonly described according to the firms’ market, products and customers. At this point of the study, the effects of similarity in M&As’ technological performance seems to be negative. Even so some authors also refer similarity to companies’ sizes and also in terms of R&D efforts. Then the effects and potential results appear to be various. So, in my analysis, I will later on keep focusing on the automotive industry and use these data for enhancing my research outcomes.

The second sub-concept is the degree of complementarity between the M&A partners. Its positive impact on technological performance appears more obvious and admitted according to the recent literature (Harrison et al., 2001; Capron and Pistre, 2002; Hitt et al., 2001; King et al., 2004). Indeed, synergetic benefits from resource combinations are more likely uniquely valuable when they are based on complementarity rather than on similarity (Harrison et al., 2001).

Recent researchers, as Chung, Singh and Lee (2000), separate and stress complementarity to similarity as a driver of alliance formation. Using data on US investment banks, they pointed up that “lead banks are likely to ally with other banks that can complement their weaknesses” (in Chung et al., 2000, p.17). This decision of building an alliance based on complementarities show how obvious the positive impact it can have on firms’ economic performance. However, by corroborating what has been said before, the aim of the thesis consists in focusing on technological performance as an effect of M&As, not like it is the case in this last study. Furthermore, this thesis study rather concentrates on the output of M&As than on the reasons why there is an alliance formation, even though this can help to analyze the outputs.

In addition, it seems essential to add for the following reasoning of this study that similarities appears obviously fixed and established before entering the process of merger or acquisition. Hence, related firms cannot influence them during the integration process because similarities’ indicators do not tell researchers how they affect technological performance. The aim of this thesis research is to answer its problematic by arguing what can be done in order to enhance technological synergies, and then to avoid a static analysis that would just limit the issue on the pre-merger or pre-acquisition firm selection. In this way the following development of the study will focus more on complementarities, which present a higher degree of influence as it will be demonstrated later on.

Therefore some authors in the literature used for this thesis reviewed those effects analyzed in previous studies (De Man & Duysters, 2005), and they separated these studies contingent on the type of measure of these effects. It is actually important to analyze the effects discovered in empirical studies according to their impact on indicators of R&D but also according to “the
conditions under which a merger or takeover improves innovative performance” (in De Man & Duysters, 2005, p. 1380).

This review of prior studies attempts to compare the different effects between M&As and alliances, but this article also states some of these effects. It notably appears obvious that the effects of M&As on technological performance are either neutral or negative. However they acknowledge that when the M&A integration process is well developed, it enables the enhancement of technological performance. Another important finding is that even though the effects might appear neutral or negative, the cost of innovation decrease considerably and takes part in the recurrent objective of achieving economies of scale. Those two findings are considered as potential research assumptions that will be put forward and analysed in the next chapters.

3.4. A growing part of the literature that has to be taken into account: the resource-based view of the firm

According to this perspective acquisitions are an important part of the business process of redeploying resources into more productive uses (Capron, Dussauge, & Mitchell, 1998). Through acquisitions, firm-specific assets held by one organization are merged with assets in another organization to improve the productivity of the combined assets (Haspeslagh and Jemison, 1991). Then, according to this viewpoint, “evaluating the postacquisition performance of firms provides evidence on the efficiency of this asset-matching and combining process” (in Ahuja & Katila, 2001, p.198).

Harrison et al. (2001) confirm this idea that synergy from M&As are enhanced by resource complementarity, however they also add that this is not only a sufficient condition for achieving greater synergy. Those resources have to be thereby well integrated and managed between the different firms. Explaining this, the authors gave a significant example which matches well with my study. The Daimler Benz acquisition of Chrysler shows really how two firms can have complementarities in terms of resources (different types of automobiles that served different markets) and on the other hand how they can face difficulties in integrating effectively those resources in order to achieve economies of scope and enhance the technological performance.
In order to explain alliance activities, Yasuda (2005) argues that the resource-based theory prevails over the transaction-cost one. His empirical study in the semi-conductor industry reveals that the primary motivation for creating alliances is the access to resources owned by partners. Here those affirmations have to be put in perspective because it does not concern M&As. The second motivation is the reduction of time required for development and marketing which can be rephrased as an issue of resources. This point tallies with what I observed in the case of Renault and Nissan, as it will be showed and discussed in the empirical and analysis parts of this study.

3.5. A more managerial theoretical approach that could lead to new forms of M&As

Rather than looking for reasons and factors of M&As’ success, some authors tried to understand why M&As were still a recurrent and common strategy, given the evidence that most of them produce disappointing results. One of these authors, Berggren (2003), analysed this issue by focusing on managerial facts and behaviours. He emphasizes the integration problems that often occur and hence, he stresses the importance of this integration process for M&As’ success.

An important statement carried out by his study is that managers tend to underestimate the “difficulties of integrating idiosyncratic1 technologies in unified product platforms” (in Berggren, 2003, p.189). Harmonisation issues are there said to take too much time to engineers and designers, who then focus less on new product development as they should in order to enhance technological synergies. Another related argument is that companies involved in M&As face a difficult trade off between revenue enhancement and asset divestiture (cost cutting objectives). Basing his statement on Capron’s study (1999), Berggren utters that because of the promises made to the stock market, acquiring firms focus more on cost cutting activities than on revenue enhancement, and this more often than not to the detriment of the acquired firm’s assets. The observed results of this empirical study (for more details see next chapter) show that “cost cutting activities often interfere with and damage long term capabilities” (in Berggren, 2003, p. 178) and moreover it creates management problems when it comes to product technologies and product platforms.

1 The word idiosyncratic has there to be understood as something particular, singular, which has its own characteristics. One of the definitions for the noun idiosyncrasy appears then to be the following: a structural or behavioural characteristic peculiar to an individual or group.
Technical integration problems and competing design philosophies are examples of these problematic differences between firms. All the more, these issues are barely taken into account in the calculations of cost savings when M&As are announced. The related effect is that it tends to take more time and therefore more resources than previously planned to integrate successfully the different entities. Economies of scale which are accurately presented as main objectives push the project managers and engineers in prioritising their activity on standardisation and formalisation. As it will be presented later in an interview, engineers and innovators from the acquired firm often come against this increase of managerial reporting requirements, which shorten their former productive activity. Aware of these difficulties, Berggren advances the argument that this procedural need for more formal control in the integration process causes an erosion of the capacity for technological performance.

In the next chapter, empirical cases and studies will be presented. A review of their important and interesting points will then allow me to make a thorough analysis based on the concepts and theories approached in this third chapter.
4. EMPIRICAL DATA

As it has been said earlier in its methodological part, this thesis establishes its empirical reasoning on secondary sources. Already available, data therefore come from different types of sources such as technical literature based on case analysis, industry analysis or interviews. The presentation of those sources will not focus on separating industries, but on grouping them according to their similarities in terms of empirical findings. Actually, this thesis do not focus necessarily only on the car industry. On the contrary it aims to find clues that could answer the research question, and hence, all the useful data that it could grasp to do such are imperatively used whatever industries or companies they talk about, from the moment that they fit in the frame of the study.

4.1. A review of large-scale empirical studies and their findings

This part will not present case studies but large-scale empirical ones. Some of them have already been quoted earlier in the theoretical framework for the theories they suggested. Here their empirical results are put forward according to an article that reviewed in the same way those types of studies with a similar approach. De Man and Duysters (2005) actually reviewed the effects of M&As and alliances on innovation. For doing such they applied a drastic selection of papers from which “a clearly defined measure of success has to be present in the papers” (in De Man & Duysters, 2005, p. 1380). They also added that innovation is defined closely in term of R&D, in order to avoid considering non-technological aspects of the innovation process. The pertinence of these criteria of selection give a clear opportunity of taking into account the results shown by those two authors, according to the methodological approach taken by this thesis based on the effects on technological performance.

Moreover, those two authors justified the choice of large-scale empirical studies by arguing that there were few case studies from which they could not draw general conclusions in aggregate, and this despite their interesting insights. As it has been mentioned earlier, in depth case studies through all the phases of a merger or acquisition represent a huge research effort, but meanwhile it could reveal to the researchers many contributing information. Those cases will not be presented in
this part, in order to not mix up the different types of results that could come out from those two different types of studies.

4.1.1. *A first step in empirical data: a study of the semi-conductor industry concerning the determinants of alliance formation*

In his paper, Yasuda (2005) makes a comparative study of the transaction-cost theory and the resource-based theory, which he acknowledges as the two most influential explanations for viewing the process of alliance formation. He however admits that there are other economic theories such as agency theory, political economy theory and relational contracting theory. But the point consists there in putting forward his empirical data from his semi-conductor industry study. He proceeded by looking at the ten biggest players on the global market (using the sales ranking published by IC Insights 2002) and then focused on their respective strategic alliance cases. He then obtained many different ones with the form of either joint R&D, technology licence, sourcing agreement or joint venture. His last selection was finally to pick up 10 cases from each of those different types of strategic alliances resulting in a collection of 40 cases, which contained those information: characteristics of partners, feature of alliances, implication by analyst, and the most important, messages provided by firms’ executives. The latter gives to the author the ability to identify the primary motivations for alliance formation.

Through his study Yasuda (2005) extracted three major reasons for alliance strategizing. Those motivations are the following:

- Access to partner’s resources
- Shortening of the time to market or production
- Reduction of the cost

He then organized his results by classifying in those three categories (resources, time and cost) each case from each of the four forms of strategic alliances. The table 4.1 (next page) summarizes this and in each cell appears the number of cases corresponding to each category.

The results of the data collection shows interesting hints even though they have to be put in balance by the fact that they only concern strategic alliances and not M&As. Nevertheless, an
interesting point and issue is the difference of incentives between joint-ventures and the other forms for alliance formation. The predominance of the resource-based view appears obvious and it will be discussed in the next chapter. However, this study on alliance formation – and not M&As – shows an interesting research path when one look at this difference of primary motivations depending on whether it’s a joint-venture or another form of strategic alliance.

<table>
<thead>
<tr>
<th>Classification of cases by their motivation for alliance formation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Resources</td>
</tr>
<tr>
<td>Time</td>
</tr>
<tr>
<td>Cost</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>


This statement comes from the fact that a joint-venture by creating a new formed entity engages the partners to commit more themselves in the project and it creates less flexibility than the three other forms of alliance. Then the idea would be to affirm that the joint-venture being a lesser form of a merger, but still closer in what it engages in terms of commitment than other types of alliance, one can suppose that M&As would look more for cost reduction issues than technology licences, joint R&D and sourcing agreement do. And subsequently one can advance the assumption that the more an alliance, merger or acquisition involves the partners in terms of resources, time and commitment the lesser they are looking for revenue enhancement (creating synergies) to the benefit of asset divestiture and cost cutting objectives. This point will be more discussed further in the analysis with the help of more data presented in the following paragraphs.
4.1.2. Getting closer to the issue of resource redeployment by pointing out a large-scale empirical study considering the effects of M&As on long-term performance

As it has been said earlier in the last part of the theoretical framework, because of the promises made to the stock market, Berggren argued that acquiring firms focus more on cost cutting activities than they do on revenue enhancement. His assertion was based on Capron’s study (1999) whose empirical findings will be now illustrated. The study is founded on a detailed survey of acquiring firms’ managers and it covers 253 M&As in European and US manufacturing firms between 1988 and 1992. The aim of this research was to point out the effect of revenue enhancement (resource redeployment) and cost cutting objectives (asset divestiture) on the long-term performance of those concerned firms. Capron did not only focus on technological aspects but as a matter of fact and as she admitted it herself, manufacturing companies’ long-term performance is closely related to technological performance.

Her dataset represents a wide range of industries, countries, firms and scope of acquisitions (see Appendix 3 for the sample description). Capron obtained different interesting findings from this data collection. It firstly concerns the extent to which acquisitions generate asset divestiture. The following Table 4.2 summarizes this within the five main functions of business: administrative services, distribution, R&D, sales network and manufacturing. The author labelled two thresholds, one corresponding to more than 10% of the assets of staff affected by the asset divestiture and another one to more than 30% of the assets or the staff.

<table>
<thead>
<tr>
<th>Target asset divestiture</th>
<th>Acquirer asset divestiture</th>
<th>Target/Acquirer divestiture</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of case in which more than 10% of assets have been disposed</td>
<td>% of case in which more than 10% of assets have been disposed</td>
<td>% of case in which more than 10% of assets have been disposed</td>
</tr>
<tr>
<td>Asset disposal</td>
<td>19.6%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Staff cutback</td>
<td>16.7%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>33.8%</td>
<td>17.4%</td>
</tr>
<tr>
<td>Staff cutback</td>
<td>43.5%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Distribution</td>
<td>23.5%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Asset disposal</td>
<td>21.1%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Staff cutback</td>
<td>34.7%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Sales networks</td>
<td>17.0%</td>
<td>11.5%</td>
</tr>
<tr>
<td>Asset disposal</td>
<td>36.0%</td>
<td>21.5%</td>
</tr>
<tr>
<td>Staff cutback</td>
<td>36.9%</td>
<td>21.2%</td>
</tr>
</tbody>
</table>

The results present a clear difference of scale of the post-acquisition divestiture according to the different functions. It appears obvious that the manufacturing, administrative services and logistic functions are more affected by the cost-cutting activities. Looking at their impact compared to R&D and sales network, the risk of divesting asset in those functions do not damage technological capabilities or commercial presence and image, and then those results appear more obvious and natural. Another important point is that the target firm is undoubtedly more affected by the post-acquisition asset divestiture than the acquirer. These results are consistent with the literature which claims that the target is often more affected by cost cutting objectives than the acquirer. Finally, one can see that companies consider with importance the R&D function by divesting less than elsewhere.

If one takes a look on the resource redeployment results, Capron’s study gives there also interesting figures. The tables 4.3a and 4.3b consider again these five business functions by reporting to which extent of redeployment in each of these resource categories. The first one concerns the extent of resource redeployment to the target firm. As usually expected this table shows that acquirers often redeploy their resources in the targets. Resource redeployment from acquirers to targets “to a large extent” or greater occurred in 44% of the cases in R&D, 51% in manufacturing know-how, 48% in marketing expertise, 48% in supplier relationship and 33% in the distribution. On the other hand, the Table 4.3b shows that the extent of resource redeployment from the target to the acquirer is much less large than on the other way. For a “very large extent” or greater, the redeployment hardly exceeds half of the figures mentioned above.

<table>
<thead>
<tr>
<th>Table 4.3a: Extent of resource redeployment to target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource redeployment</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Production innovation</td>
</tr>
<tr>
<td>Manufacturing know-how</td>
</tr>
<tr>
<td>Marketing expertise</td>
</tr>
<tr>
<td>Supplier relationship</td>
</tr>
<tr>
<td>Distribution expertise</td>
</tr>
</tbody>
</table>

**Mergers and Acquisitions:**

*Their impact on technological performance*

*Master’s Thesis final draft*

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### Table 4.3b: Extent of resource redeployment to acquirer

<table>
<thead>
<tr>
<th>Resource redeployment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>(4+5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>To a very large extent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production innovation</td>
<td>33.6%</td>
<td>12.6%</td>
<td>29.4%</td>
<td>15.1%</td>
<td>9.2%</td>
<td>24.8%</td>
</tr>
<tr>
<td>Manufacturing know-how</td>
<td>22.6%</td>
<td>20.3%</td>
<td>24.1%</td>
<td>16.2%</td>
<td>7.5%</td>
<td>23.7%</td>
</tr>
<tr>
<td>Marketing expertise</td>
<td>32.0%</td>
<td>21.6%</td>
<td>26.6%</td>
<td>10.8%</td>
<td>9.1%</td>
<td>19.9%</td>
</tr>
<tr>
<td>Supplier relationship</td>
<td>35.1%</td>
<td>26.4%</td>
<td>18.2%</td>
<td>13.5%</td>
<td>6.5%</td>
<td>20.2%</td>
</tr>
<tr>
<td>Distribution expertise</td>
<td>41.8%</td>
<td>27.0%</td>
<td>17.3%</td>
<td>7.2%</td>
<td>6.8%</td>
<td>14.0%</td>
</tr>
</tbody>
</table>

*Source: in Capron, 1999, p. 1002.*

The author then realized a measurement model and a structural model from which my intellectual strength cannot draw any valuable interpretations. Those two models gave her the opportunity to obtain first one measurement table and second from that a figure based on a structural model. They are founded on correlations between variables that were previously pointed up in a correlation matrix. The indicators and correlations result in giving interesting findings from which I will follow Capron’s major interpretations based on the significant relationships between the different variables.

The first preliminary lesson drawn from the results is that both cost-based and revenue-based synergies are contributing to acquisition performance. Nevertheless, when getting a closer look, the results show that, even though it rarely happens, when managers of the acquiring firm decide to impose divestiture to their own firm, then it enhances cost savings and it has no effects on capabilities. On the other hand, when this action is directed toward the target’s asset, which appears to be more common, then it has negative effects on both capability enhancement and cost savings.

Concerning resource redeployment the results show that, both to and from targets, it commonly takes place as a post-acquisition effect. As it will be analyzed later, it stands for the resource-based interpretation which argues that M&As are opportunities for redeploying strategic resources. The impact is obviously huge on revenue-enhancing capabilities such as technological performance and market coverage. The author also found moreover that it can even have a positive impact on cost efficiency, however this effect have only occurred in redeployment to targets. Finally she noted that the interplay between asset divestiture and revenue redeployment allows companies to redeploy resources while rationalizing at the same time the assets of the one receiving the new resources.
4.1.3. *Focusing now on technological performance via a large-scale empirical study in the computer industry*

Hagedoorn and Duysters (2000) made an empirical study about the effects of M&As on the technological performance of companies in a high-tech environment. For doing such, they analyzed the global computer industry by focusing on 35 *M&A-active* companies which aggregate market shares accounted for 70% of the international computer market. The period of the study went from 1986 to 1992 and the authors investigated 201 M&As during that time.

Those two Dutch authors approached their study by looking at the relatedness between merging firms and its effects on technological performance. As written above in the theoretical part, they contributed in pointed up the importance of similarity and complementarity in successful M&As in terms of technological performance. Their longitudinal study also revealed the importance of a good integration in order to make valuably use of these two concepts.

In order to measure the effects of the analyzed M&As, they choose the number of patents produced by the companies as an indicator of the *dependent variable technological performance*. Many authors from the related literature agree with the fact that patents are the more appropriate indicators of technological performance in high-tech sectors, albeit, as mentioned earlier, this is not the only indicator that can be used.

The results obtained by their study are also based on different correlations between variables and a regression model. Unfortunately they did not describe them as thoroughly as Capron did in the previous one. Nevertheless, the results are achieved according to four starting hypothesis they stated from their literature review. First, their analysis picked out a significant and positive relationship between the degree to which companies use related M&As and their technological performance. Secondly, concerning the technological relatedness aspect, they found a positive but statistically insignificant effect of these technologically related M&As on the technological performance of firms. Secondly, concerning the technological relatedness aspect, they found a positive but statistically insignificant effect of these technologically related M&As on the technological performance of firms.

The respond to their third hypothesis showed that acquiring or merging with a company that owns R&D intensity above average significantly improve the technological performance of the acquiring firm. Finally, they demonstrated that the greater the degree of similarity in terms of size is the lower the effect it has on technological performance. They also pointed out three interesting results from this statistical analysis. They found that an increase in R&D intensity (or expenditures) does not imply a growth in technological performance. Another empirical fact showed that
international M&As are inclined in improving the technological performance of companies. And at last, as it will be discussed further, Hagedoorn and Duysters found that M&As experience for companies does not have a significant influence on technological performance.

4.1.4. Considering the size and knowledge aspects of relatedness from a longitudinal study in the chemical industry

As it has been explained concerning the concept of relatedness previously, Ahuja and Katila (2001) contributed well in analyzing its effect on acquisitions’ technological performance. They based their statements on a longitudinal study of 12 years (from 1980 to 1991) in the global chemicals industry. The largest and leading firms of the industry were studied and this brought the authors to take into account a sample of 72 global companies. They have been able to identify no fewer than 1287 acquisitions announcements through the period of the study; however they only kept 534 of those because the others were not presenting the necessary amount of information. The technological motivation or the technological transfer and the patenting activity were taken as criteria for defining technological M&As. 283 acquisitions then appeared as technological ones because of meeting one of those two criteria, the remaining 251 were classified as non-technological.

Their statistical variables were firstly based on patents (number of-) as a dependent variable. This indicator of technological performance appeared very relevant in a high-technological and competitive industry. The independent variables which were considered by the two authors were more numerous. The first one, the number of technological acquisitions, which were defined according to at least one of the two criteria mentioned above, concerns the previous experience of the acquiring firms in acquisitions before the related take-over. The same variable but for non-technological acquisitions by a firm was defined according to the same way of measuring.

The absolute size of the acquired knowledge base corresponds to the amount of patents acquired by an acquiring firm minus the ones that were already owned before the acquisition. Then the relative size of the acquired knowledge base is obtained by dividing the absolute size of the acquired knowledge base by the size of the acquiring firm’s knowledge base (calculated with the same procedure as the acquired one). Rare were the cases when the acquired knowledge base was larger than the acquiring one, and for statistical reasons the authors considered them as not meaningful. Finally, the authors defined the relatedness of the acquired knowledge base by the following procedure. First, they listed the number of
patents that were present in both knowledge bases. Then they divided it by the absolute size of the acquired knowledge base. Ahuja and Katila also added four control variables in their models: R&D expenditures, number of employees, firm diversification (measured by an entropy formula) and national cultural distance between the acquired and acquiring firms.

The first hypothesis they discussed was the effect of non-technological acquisitions on technological performance. As a result, the correlation between the number of non-technological acquisitions and the innovation output appeared non-significant and signified that there was no valuable impact on the technological performance during the four following years of an acquisition. The coefficients found out concerning the absolute size of the acquired knowledge were positive and significant. By this way, they supported the hypothesis that the technological performance was likely to vary positively with the absolute size of the acquired firm’s knowledge.

Another hypothesis consisted in arguing that this technological performance was this time likely to vary negatively with the relative size of the acquired knowledge base. This negative relationship was also confirmed by the results showing that acquiring firms that are large compared to the acquirer leads to deterioration in post-acquisition technological performance. The fourth hypothesis was also supported by the correlation between relatedness of the acquired knowledge base and technological performance. The authors’ assumption was that it had a curvilinear impact by stating that it may increase with a certain degree of relatedness, however beyond a certain optimum the effect declines with increasing relatedness between the two firms’ knowledge base.

Actually the relatedness of the acquired knowledge base coefficient was positive and significant whereas the relatedness of the acquired knowledge base\(^2\) one (square term) was negative and therefore defining this curvilinear curve (inverse U-curve) on the technological performance of the acquiring firm. They also found that foreign acquisitions had a non-significant impact on the technological performance of the acquiring firm. They however stated that further research must in lead on this issue in order to gain more complete understandings out of it. It is also demonstrated that diversification has a negative relationship with patenting frequency by spreading in too multiple directions the research efforts, as they proposed.

Those three large-scale empirical studies, used as secondary data, have given to this empirical part the opportunity to look more closely to the effects of M&As on technological performance in different industries. Nevertheless, there are the only ones that have been conducted in the field and

\(^2\) As a reminder and in a simple way of explaining, it can be defined as following: Acquiring firm = Acquirer + Acquired firm.
two authors (De Man & Duysters, 2005) proposed a review of studies, including those ones, that approached the effects of M&As and alliances on firms’ technological performance.

4.1.5. A review of large-scale empirical studies which investigated the effects of M&As and strategic alliances on technological performance.

One of the main interesting issue of this article from De Man & Duysters (2005) resides in the fact that it allows a comparison between the measured effects on technological performance whether it is from M&As or from strategic alliances. As it has been said in the beginning of this empirical part of the thesis, these authors employed criteria for selecting their papers which correspond to the ones applied in selecting the three previous studies. In total, they reviewed 30 studies on alliances and 15 on M&As (see Appendix 4).

Concerning the strategic alliances and their effects on technological performance, the two authors in almost three quarters of the papers they found out a positive relationship (see graph 4.1 below).

Graph 4.1: Relationship between alliances and technological performance according to the articles reviewed.

Source: in De Man & Duysters, 2005, p. 1380.
This preliminary finding, which appeared quite uniform in its results, took into account the different hypothesis from the different forms of alliances considered by the studied authors, in the sense that some of them found per example a positive impact for joint-ventures but a neutral effect for licensing (Anand & Khanna, 2000). Two main reasons for this positive relationship are highlighted by De Man & Duysters (2005). First, the alliance experience of the firms involved plays an important role in outperforming those who haven’t got any well-developed capability in managing alliance for enhancing technological performance. Second, a similar knowledge base between the partners appears as a prerequisite for a successful relation between the strategic alliance and its impact on technological performance. The two authors also noted down more intense collaborations in alliances increase the possibilities of developing more technological outputs out of it.

Concerning the seven instances that claimed a neutral relationship, the first conclusion is that looser forms of alliance, such as licensing, have a neutral impact (Anand & Khanna, 2000, Hagedoorn and Schakenraad, 1994), compared to more intensive forms of collaboration. One of the explanations given is that the knowledge exchange required for increasing technological performance involves a close collaboration between the partners in order to improve the knowledge transfer among the human resources. Another conclusion emanating from the studies showing a neutral impact is that the networks of alliances influence significantly the impact that strategic alliances might have on technological performance. For instance, De Man & Duysters argued that having numerous alliances in combination with all the partners connecting with each other does not have any impact on technological performance. An optimal alliance network, still according to their findings, appears then to be dependent from the specific context of the organization. Finally, they showed that the sectoral background have also its importance in influencing the technological performance of partners. They found for instance that some authors demonstrated that in turbulent sectors like high-tech or media, alliances outperform M&As (Ernst & Halevy, 2000). Some authors provide some more insight by stating that flexible forms of alliances are successful in the semiconductor industry, whereas stable forms are more efficient in the steel industry. This contradicts what has been said earlier, i.e. more intense relationships stimulate technological performance. The analysis part will therefore try to develop this issue of technology access perspective.
As mentioned above, their study on M&As papers brought them to review 15 from which eight of those investigated the direct effect of M&As on technological performance, whereas the others focused on effectiveness of M&As under different conditions such as financial performance (see Appendix 4). When one takes a look at these eight studies, the first main characteristic that one can deduce is that none of them presents a positive impact of M&As on technological performance (see table 4.4 below).

De Man & Duysters also differentiated those eight studies according to the type of success measure that was applied. They found it relevant to make this comparison for M&As because of the possibilities for cost-saving which are said to be much higher than for alliances. They argued that input-measure declines suddenly giving then the feeling that technological performance also decrease. Nevertheless, technological performance appears to stay at the same level but at lower cost. M&As output measure is therefore seen as more accurate for evaluating the impact on technological performance. The result for the later studies is then quite outstanding showing that companies engaging in M&As face a deterioration in technological performance; the studies that used an input-measure coming up with a neutral effect.

<table>
<thead>
<tr>
<th>Type of success measure</th>
<th>Positive</th>
<th>Neutral</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input-measure</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Output-measure</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>


The analysis the two authors made on the remaining seven studies also show interesting results. They first found that successful effects on technological performance are more common when the companies involved in M&As have an overlap in their knowledge base. In that sense, diversifying M&As often present a decline in technological performance. A second finding is then related to the integration process and its crucial importance in enhancing the technological performance. A well managed merger or acquisition will then outperform others which don’t have processes of integration that run efficiently.
After having presented large-scale empirical studies, the next part of this chapter will concentrate on looking more closely at empirical case studies. In order to approach more the managerial issue that lies behind this research, those secondary sources will help this thesis study is finding how companies can manage M&As integration processes to enhance their technological performance.

4.2. Case studies as tools for exploring how M&As influence technological performance

4.2.1. In search for failure – lessons from the Volvo-Renault case

This part of the empirical chapter will present a merger case of failure between the two automotive companies: Renault and Volvo. The sources put forward below are mainly based on two articles, one written by Bruner and Spekman (1998) and another one by Bruner himself (1999). What should have come one of the biggest European merger of the 90s, appeared to be one of the most prominent flop thirteen years ago from now. Despite the objectives and good motives shown by both company concerning their commitment in the alliance and in the proposed merger, three years after its start, the partners removed and put into light many interrogations which are still topical nowadays.

Bruner & Spekman (1998) identified six major reasons for weakening the Volvo-Renault alliance and potential merger. They will be presented separately from each other by means of clearly stated empirical examples. Nevertheless, a short historical presentation of the facts seems essential before imparting those failure factors.

The two companies had quite a long history of relation. It started in 1971 with a components swap agreement and went deeper when Renault purchased some equity interest – a minority – in Volvo’s capital in 1980. Those shares were sold in 1985 because of a close bankruptcy for the French car maker. Yet, in 1989, the two concerned CEOs – Raymond Lévy and Pehr Gyllenhammar
– started to discuss about a potential merger between the two firms in the last days of the year. The next January 1990 was the moment they chose for declaring publicly their intention of creating a joint-venture. The details of this association did not appear before the next September when it became clear that it was more a strategic alliance in its objectives than a simple cooperation.

The alliance agreement, founded in 1990, was quite complex between the two firms (see figure 4.1 below) even though Raymond Lévy simplified it in one symbolic word – a marriage.

**Figure 4.1: Structure of strategic alliance and cross-shareholdings of Volvo and Renault as of September, 1993.**

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCC</td>
<td>Volvo’s restructured car operations</td>
</tr>
<tr>
<td>VTB</td>
<td>Volvo’s restructured truck and bus operations</td>
</tr>
<tr>
<td>Renault SA</td>
<td>Parent company of the Renault Group, following conversion to a capital stock company</td>
</tr>
<tr>
<td>RVI</td>
<td>Renault Véhicules Industriels SA</td>
</tr>
</tbody>
</table>

*Renault had acquired 8.24% of Volvo’s shares and 10% of the votes.*

This alliance was encouraged by two primary concerns, first creating sizable potential synergies (economies of scale and scope), notably in R&D, and second, combining these two complementary firms “in order to create a firm of sufficient size, breadth and depth as to be able to compete effectively in the global industry” (in Bruner & Spekman, 1998, p. 137). These authors
identified those elements of difference and complementarity between the two firms and classified them in the table 4.5 below.

<table>
<thead>
<tr>
<th>Home country/region</th>
<th>Volvo</th>
<th>Renault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>Swedish; Scandinavian, Anglo-Saxon</td>
<td>French; Latin; Continental European</td>
</tr>
<tr>
<td></td>
<td>Swedish; (English dominant second language)</td>
<td>French</td>
</tr>
<tr>
<td>Ownership</td>
<td>Investor-owned</td>
<td>State-owned</td>
</tr>
<tr>
<td>Size/position</td>
<td>Small niche-player in cars, Dominant in heavy trucks</td>
<td>Large, broad product line player. Weak in heavy trucks</td>
</tr>
<tr>
<td>Core values and competencies</td>
<td>Safety</td>
<td>Styling</td>
</tr>
<tr>
<td></td>
<td>Engineering</td>
<td>Cost management</td>
</tr>
<tr>
<td>Management structure</td>
<td>Decentralized; easy flow of information</td>
<td>Centralized; formal flow of information</td>
</tr>
<tr>
<td>Market orientation</td>
<td>Scandinavia, North America, Asia</td>
<td>Continental Europe</td>
</tr>
</tbody>
</table>

As one can see, the two firms had complementarities in terms of market positions, geographic regions and core competencies. Nevertheless this table also shows how difficult the challenge appeared to be concerning the way how the two firms would have bridged their cultural differences. The interviews conducted by the authors between 1991 and 1993 revealed an important difference of success perception between the Swedes and the French. Actually, on one hand, senior executives of both Volvo and Renault indicated that the strategic alliance was successful. Bruner and Spekman quoted from Gyllenhammar in 1993 that “when the alliance was made, we had many observers who taught it was complicated, difficult, heavy, and how could it work with a committee structure between major manufacturers? We can safely say today the alliance has been a success. It developed much better than sceptics thought and better than we had hoped” (in Bruner and Spekman, 1998, p.140).

On the other hand, operational executives at Volvo expressed dissatisfaction. One reason might have come with the language difference as the authors depicted, even though the French made improvements in mastering English. They reported in fact that some newspapers stated at that time that Renault engineers slipped back to speak French in times of conflict and therefore the Swedes perceived it as a way of rejecting them. Another meaningful example is the P4 Project which consisted in creating a new common platform that would have supported the development of a
high-end executive car. Between 200 and 300 engineers were occupied by it and they faced a lot of difficulties in achieving their objectives. The French were proud of their styling and the Swedes were proud of the engineering and the safety they developed in their Volvo cars. The first strike concerned the type of engine that would be used. French engineers wanted a front-wheel drive car and the Swedes strongly defended the use of a rear-wheel drive, similar to the top end German cars. They finally bought a V6 engine from Mitsubishi with whom Volvo had a joint-venture. This decision was still unpopular with the French. Moreover, the engineers also had divergences concerning their safety-consciousness differences. On one hand the Swedes wanted to strengthen the platform (i.e. increasing its weight) which appeared too light according to the crash test. On the other hand French engineers were more concerned by matters of cost and development time.

Contradicting those problems by their confidence and trust in the alliance future, Gyllenhammar and Jean-Louis Schweitzer, who became Renault's CEO in 1992, were still looking forward for more integration and were fully satisfied with the current results of the strategic alliance. Therefore those two top executives saw the merger issue as an obvious way of continuing their relation. For this they claimed that this issue had always been the aim of the strategic alliance. This opportunity appeared reinforce by the fact that Renault, as a state-owned company, could have taken advantage from the arrival of a new French government more inclined to privatize its shares in the following couple of years. Then merger talks really started in April 1993 and the executives were more obsessed about time and moving fast than in communicating and legitimising the merger across through all the concerned stakeholders.

According to Schweitzer’s words, “to achieve economies you need speed and determination. This is easier to achieve through single management than through partners who are in complete agreement” (in Bruner & Spekman, 1998, p. 142). However the two CEOs have besides forgot to acknowledge the operational symptoms that were running on in their alliance. They proposed in September 1993 the terms of the merger according to the following structure detailed in the following figure 4.2.

The following November 6, Gyllenhammar invited for a special meeting all the Volvo shareholders in order to present them the merger and its objectives. He and Schweitzer pointed out three main reasons for the merger. First, it represented a competitive advantage in terms of market share – the entity would have become the second biggest player in the truck market and the sixth in the car industry. The second argument was related to cost cutting objectives in terms of procurement, R&D and production. However those objectives were already there for the alliance formation and one can easily guess that they could also have been achievable with the alliance.
Finally the two CEOs’ last reason was related to the aim of achieving a substantial financial strength. Blinded by their vision of the future, they underestimated the resistance that was coming up from many key shareholders (mainly Swedes).

The support for the merger in Sweden was clearly insufficient for expecting a truly commitment in the CEOs’ objectives from Volvo stakeholders. The proposal “touched a nationalistic nerve” (in Bruner & Spekman, 1998, p.143) in the Nordic country, as the Volvo brand was considered as a national symbol. As a consequence of this decline of support, the share price of Volvo started to decline dramatically. Even Swedish workers announced that they would vote their shares against the proposal. So did the Volvo top executives after a meeting in their CEO’s house in November, by signing (25 of them did) a letter urging the board to drop the merger proposal. Finally, the board, affected by all this pressure, withdrew the proposal on December 2, 1993. Then on February 17, 1994, after Volvo having changed its board of directors and redirected its strategy on selling all non-core assets by 1996, Renault and Volvo declared the dissolution of the strategic alliance.
Mergers and Acquisitions: Their impact on technological performance
Master’s Thesis final draft

The interviewees from Bruner and Spekman’s study insisted on referring to process errors. The relevant attitude for top managers should be then how to respond to those errors. The authors pointed out six important points that has to be taken in account in order to resolve or avoid the problems that arose. Nevertheless this being part of their analysis, those arguments will simply be described briefly without explaining them deeply. They will be more discussed in the next chapter of this thesis. First, alliances or M&As demand alignment of senior and operating managers. The second reason which caused failure was the path dependency which may create irrational behaviours that could be potentially-dangerous. Another argument is that alliance recontracting may be highly risky due to the fact that alliances are based on cooperation and collaboration, and once those two basics are put in peril with changing conditions, then the alliance must respond and adapt adequately. The leadership style and the cultural differences are also very important if one takes a look back on the problems encountered during this alliance. Finally the time factor appeared very influential in this case, as interviewed executives mainly viewed it as an enemy and mentioned the importance of moving quickly to the merger.

Later in this empirical part of the thesis, the case of Renault-Nissan, which presents many successful results, will be described thoroughly. Between those two extreme cases, which surprisingly refers at each time to the French car company – it will then be interesting to see if it understood its past errors and how it over passed those lessons – the next empirical part will present comparisons of different M&As in the car industry. By this way, the case of Renault-Nissan being also there shortly approached, the empirical cases will move to M&As failures to successful integrations that enhance technological performance.
Mergers and Acquisitions:  
*Their impact on technological performance*  
*Master’s Thesis final draft*

4.2.2. **Review of a M&A empirical case in the automotive industry**

The case which is highlighted there concerns the Daimler-Chrysler merger. Announced in May 1998, many superlatives surrounded it such as *merger of equals or marriage in automotive heaven* (Berggren, 2005). It was the “biggest upheaval that the car industry had seen” (in The Economist, March 30, 2006) with a premium of USD 38bn paid to Chrysler shareholders by Daimler-Benz. It is moreover said that it has been executed within less than 200 working days which gave the Daimler-Benz CEO Juergen E. Schrempp the opportunity to become the manager of the year.

Some rivals such as the head of BMW acclaimed his audacity and admired the strategy. Ford Motor's boss never forgave Schrempp for not having merged with his company instead (The Economist, March 30, 2006). Strategically it allowed Daimler-Benz to become a global player in the worldwide car industry and to broaden its product portfolio. The two companies had the opportunity to match their resource complementarities, with different types of automobiles that served different markets. On the other hand the main objectives for Chrysler were different, in the sense that the American car maker needed investments and access to new technology for gaining subsequent economies of scale in R&D, purchasing and manufacturing, and therefore recovering its financial difficulties.

All these objectives and expectations were not verified in practice, even though every element that should have contributed to its success seemed to be there. The combined group share price dropped from $108 in January 1999 to $38 by November 2000. It was worth hardly the value of the German Daimler-Benz before the merger. Nowadays, the share value still remains merely half of the level attained in the post-deal euphoria. Looking at the managerial aspects, it is said that from the beginning, the new car corporation was broken up by divisions at all the different levels. The Economist even added that “neither side could agree on whether this was a genuine merger of equals or a quiet takeover of an American company by a financially stronger German one” (in The Economist, March 30, 2005).

One of the possible reasons of failure that will be discussed in the next chapter when one takes a look at Daimler-Chrysler could be linked with the time conception concerning the integration process. Those 200 days and their immediacy led the key actors, such as operational managers, to spend up to 40% of their time to the integration of the two car makers (Monin & Rouzies, 2005).
Despite their efforts in bridging their different ways of working – less formality for the Germans and more discipline for Americans’ decision-making, the two firms did not find the path of a successful integration. Furthermore, the Germans made the mistake of keeping distant from Detroit with their head office in Stuttgart unavailable to feel promptly Chrysler loosing efficiency. This lack of reaction generated a huge shrink in Chrysler’s financial results from a profit of $2.5 bn. in the first half of the year to a loss of $2 bn. in the second one. The first couple of years has been the theatre of a struggle for knowing was in control and how the merger should be managed. As a consequence, and related to Chrysler financial losses, Daimler took over the Detroit company by giving a 28% premium over the market price to the shareholders.

An interesting point is the apparent cultural clashes that occurred within the merger because of Chrysler running as a separate division without any real synergies. Components and platforms were not shared enough because Mercedes-Benz executives thought that their buyers would have felt cheated if they had shared parts with Chrysler’s inferior technology.

Mr. Zetsche, Schrempp’s successor at the head of the group after five years in leading the Detroit firm, found problems in every department when he arrived in Chrysler’s headquarters with 25 other executives from Germany. He first had to support productivity progress, with a car made at that time in 40 hours, compared to the 20 hours needed by Japanese competitors in their American factories. His aim of reaching 30 hours per car in 2007 seems to be achievable considering their average time productivity was of 33.6 hours last time. Quality control was also another problem that had been taken in account. The time for launching a new model has also been considerably reduced from two years to 17 months. Car sales were also declining for the American firm which had then to face in total the closing of six factories and the suppression of 45,000 jobs in its country.

Cost cutting was not the only advantage that Chrysler benefited from its German partner. The American firm also began to use the Mercedes’s technology, notably their rear-wheel-drive technology which engine was part of the Chrysler 300 model, which appeared to be commercially successful. The effect was that the American finally caught up to move its image to upmarket, with this car feeling like a Mercedes to drive. Today, Chrysler is the healthier of the Big Three in Detroit with profits back.

The German firm on its side was then facing domestic challenges with cost cutting objectives to remain profitable on a top end market where BMW is now leading the pace and VW eating some shares with its trendy upmarket Audi models. A cost saving plan was engaged with retirement packages or voluntary redundancy opportunities for reducing the number of employees.
Daimler also shared its manufacturing robots with Chrysler and increased their number in order to reduce manpower expenses from both sides of the Atlantic. In terms of technological performance, it is hardly visible to mention a potential increase due to the merger and the following acquisition. Reasons for this may come in the analysis part, but beforehand, the next and last case will present the Renault-Nissan merger which includes many valuable hints for this research.

4.2.3. **The Renault-Nissan case as a source of forerunning patterns for enhancing the technological performance**

In the late 90's began the alliance between Renault and Nissan. The Japanese firm had at that time difficulties for producing attractive products. Those problems were said to be mainly due to weaknesses in product design, brand management and overall product planning (Heller & Fujimoto, 2004). Nevertheless, its productive performance was still strong in many different aspects such as in assembly plant productivity, engine and key components technologies and product development lead times. According to George Douin, who was in charge of the international operations in Renault, most of Nissan’s engineers came from the University of Tokyo, which is the Japanese equivalent to Oxford or Harvard and the Japanese company was “the most international of all the Japanese manufacturers” (in Douin, 2002, p. 2). Nissan however realized strategic mistakes by creating a too broaden scope of different models and having a huge distribution channel in Japan to equal Toyota, and this despite a running down sales volume. Before the first agreement that took place in March 1999, Nissan was then facing a poor profitability and a constant decline of its market shares on the global market.

On the other hand, Renault was going through great financial and product performance with a series of successful and innovating cars in terms of concept. Renault’s recovery after having restructured its organization during the mid-80s and the mid-90s was due to intense efforts that took place in every level of the firm. Financial restructuring but also benchmarking the best ways of producing, initiating cost-cuttings in parts procurement developing successful and innovative products, those were the main actions conducted by the French firm to avoid suffering from a high cost / low profit structure with too many platforms and a rather unappealing line-up of products (Heller & Fujimoto, 2004).
In this way the two partners were presenting many resource complementarities, mainly summarized by the following words: strategic and administrative capabilities at Renault and operational capabilities at Nissan. Renault had moreover free cash that could reduce Nissan heavy debt at that time. Concerning their operating markets, there was no overlapping, in the sense that Renault was limited to Europe and to some parts of Latin America, compared to Nissan who was more active on an international level, however without being a major player in Europe and Latin America. The first agreement appeared then as an opportunity to match these complementary resources and capabilities. It first became a corporate alliance when Renault acquired a 37% equity-stake in Nissan. After two more years the French firm would have increased its stake up to 44% and Nissan acquired a 15% non-voting stake in Renault, entering by this way the alliance in its second phase.

The integration process that took place between the two firms was well conducted with priors to use of those complementarities that both partner needed. Nissan has been realizing its revival as Renault did previously from its own experience with the help of its given cash and strategic capabilities. On its side the French car company established a Renault Production System, based on the benchmarking of Nissan plants. Carlos Ghosn, a central person in Renault’s revival and a first class strategic leader, was sent to Nissan with a team of upper and mid-level managers. They engaged numerous cross-company projects, eleven in total, with joint product development projects and third country collaboration (Heller & Fujimoto, 2004), which were capable of identifying the underlying synergies. French leaders in Nissan also enhanced corporate image and brand building efforts and the development of more rapid management systems oriented towards a global strategy.

The second phase, underpinned by a stronger cross shareholding, aimed to strengthen their relationship with the creation of a community of interests in order to improve both companies’ performance. This community found its manifestation in the Renault-Nissan BV, which is equally owned by Renault and Nissan (see Figure 4.3 below) and operates under the Dutch law. Renault-Nissan BV supervises all mutual strategic decisions of the alliance, from the strategic planning over financial aspects to the management of common subsidiaries. Nevertheless, an interesting point is that the two companies still preserve their management autonomy, their brand identities, their employees and the outcomes of their own performances. Even though this second phase should have strengthened the equal alliance, Renault still remains the senior partner, in the sense that there are only two Nissan directors on the French board of directors out of 17. Compared with the three out of seven directors of Renault on the Nissan board, including Carlos Ghosn, the balance of
Mergers and Acquisitions:  
Their impact on technological performance  
Master’s Thesis final draft

governance power does not look so equal; however the success of the integration management does not put in reconsideration the independence of the Japanese car maker.

As a result, the Nissan Revival Plan, which induced no fewer than 21 000 lay-offs and the closing of six Japanese factories, met its objectives one year before the expected date in 2001. Nonetheless, cost cuttings were not the only reasons that put Nissan back on track. The massive launch of new attractive and successful models, thanks to the common platform strategy and their new trendy design, gave reason to the primary objectives of the alliance. Concerning Renault, except the fact that it gained substantial synergies from Nissan’s operational capabilities, it benefited from Nissan’s return to profit to make expend its income and base its strategy on a sustainable growth.

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This point will be discussed further with examples directly linked to the analysis.
This presentation of the Renault-Nissan case is not ended as it will be more discussed in the analysis part. Therefore some information have been deliberately kept for the next argumentations. However this empirical past chapter have shown many insights from different types of secondary sources. This research will now enter the process of analyzing those data with the support of the theoretical framework, with still as its natural aim, the ambition to respond and give some influential findings to the research question.
5. **ANALYSIS**

5.1. *A first overview of the observed effects of M&As on technological performance*

As it has to be related with the results found in previous studies on general performance of M&As, their effect on technological performance is most of the time neutral and sometimes even negative. Nevertheless, it has been clearly showed that they lead to some scale of economies and thereby lower the cost of technological performance. Another important finding that will be followed by further analysis is that it appears evident that a poorly managed merger or acquisition will be outperformed by another one which has a well managed integration process. The large-scale empirical studies presented earlier also confirm the idea that a merger or acquisition among two related firms has more possibilities of successful synergies and therefore technological performance than diversifying M&As.

Those findings appear quite obvious if one takes a look on the current economic situation in different industries. The huge process of consolidation that took place with global companies during the twenty past years has still never justified itself in terms of technological performance enhancement. Considering economies of scale and scope it is quite clear that those objectives were attained in many cases. However, the reasons for acquiring or merging in high tech firms are not always due to cost cutting objectives. The emergence of a resource-based view of the firm in the literature but also in empirical cases tallies with this idea. In an environment for which the maxim *innovate or die* has never been so closed to the reality, high tech companies are constantly looking for technological assets that could keep them ahead of their competitors.

Those technological assets necessary to firms’ survival are sometimes held by competitors, which evidently creates a need for merging and acquiring in order to obtain those complementary capabilities. If it appears noticeable that similar firms compared to diversified ones may be able to create more potential technological synergies in M&As, the influence that similarity has on technological performance has still not been proved whereas complementarity does not present any problem about its positive impact. Those relatedness matters will be discussed more in detail in the next part considering the empirical findings mentioned in the previous chapter.
As it has been said earlier similarities between firms, in terms of market, product, customers but also company sizes and R&D efforts, are helpful indicators on which the M&As formation decisions can be based. However, once the process of merging and acquiring is engaged firms cannot influence those indicators to perform better or not the integration process. On the other hand, complementarities are made of resources that take a crucial importance in mutual shares in order to gain potential synergies. The differentiation between similarity and complementarity is important because the latter makes available the identification of the integration potential between two firms. Then the resource picking-aspect of knowledge creation should be more emphasized since it affects the level of technological capability building.

The previous theoretical assumption that M&As take a more important part of the business process of redeploying resources into more productive uses (Capron, Dussauge, & Mitchell, 1998) is indeed justified. In their large-scale empirical study of the chemistry industry, Ahuja & Katila (2001) went deeper in the analysis of relatedness and its impact on technological performance. They first argued that the absolute size of the acquired knowledge base had a positive effect on technological performance. This corroborates the complementarity issue by demonstrating that acquiring new technological assets and capabilities represents a great factor of successful technological performance. Their second main result was that the relative size of the acquired knowledge base had a negative impact on technological performance. Here again it tallies with prior conclusions by stating that similar technological assets and/or capabilities may decrease the overall technological performance, even though it still remains as a means of reducing R&D costs. Another explanation they mentioned was the argument of indigestibility. If one takes a look at the Daimler-Chrysler case, the 200 days of integration were far from being fully satisfying, and it actually took a lot more than that to integrate all the necessary capabilities and information for engaging real synergetic projects. Acquiring or merging with a firm that disposes from a great knowledge base may therefore retard the integration process by devoting more times on formal aspects than on operational matters. For instance, it has been said in this case that Detroit engineers spent up to 40% of their time to the integration of the two car makers.
The time conception may cause more problems than just for the integration process itself. For instance, Monin and Rouzies (2005) explained that Renault internal discourses converge by explaining why the Avantime model came out so lately because of the attention given to Nissan, Dacia and Samsung (the two other brands of the group) at that time. This delay of almost 18 months caused the quasi-simultaneous launch of the Avantime and the Velsatis, another top-class model. The direct consequences were that it created confusion and target cannibalism between those two cars. This delay would have then contributed to the commercial failures of both series; the Avantime production being completely stopped, with the lockout of the factory, after less than two years and 8,545 cars produced.

As one can see if synergies are definitely enhanced by resource complementarities those have to be well integrated. The Daimler-Chrysler case is in this way full of interesting hints. It has been exposed how these two companies and their stakeholders must have been full of expectations with all the resource complementarities they had before the integration. However the way it has been conducted with notably cultural and identity clashes could not have lead the group to technological performance enhanced by fruitful synergies.

On the other hand, the Renault-Nissan case showed better results in these concerns. The following part of the analysis will discuss how they have been obtained and try to demonstrate how a new organizational form of merger can enhance better technological performance. Nevertheless it appears to be necessary to mention pre-eminently two reasons why the automotive car makers in general face so many difficulties in improving their technological performance after M&As.

5.3. The connection between the automotive industry and previous research on M&As’ global effects on technological performance

It has been said in the literature that the effects of M&As on technological performance are either neutral or negative (De Man & Duysters, 2005). Two particular reasons have been put forward in the literature for explaining it.

First, it concerns financial reasons. The arguments mainly rest on the hypothesis that the financial situation consequent to M&As may negatively influence R&D expenditures insofar M&A bring about a higher leverage, a lower level of investments and a divestiture policy, if not a deeper
c sees or failure (Sirower, 1997). This statement meets the idea of a decrease in R&D expenditures and the achievement of economies of scope (De man & Duysters, 2005).

If one takes a look at the car industry during its process of consolidation, the high level of competition and the weak margins on slow growth markets - China and the other new booming markets were not so attractive at that time - brought car companies to merge or acquire in order to achieve economies of scale and of scope. Setting up brands internationally with less investment in time and in capital was also one of the aims of big car companies.

Now it appears obvious that these clear objectives have been mostly achieved by the big car corporations. Nevertheless, Toyota has shown to everyone that cost cutting objectives were not the most important factors for gaining a substantial competitive advantage. By focusing on costs big corporations might have also wanted to decrease R&D investments, as some authors suggest in the literature, however this hast cost them a delay in the technological progress of the industry.

The second set of arguments for justifying the neutral or negative impact of M&As on technological performance refers to organizational changes – such as the control system adopted – and to reasons that concern human resources. It has been shown that M&As are often followed by the implementation of a short-term oriented financial control system and by the departure of key inventors in the organization (Ernst and Vitt, 2000; Hitt et al., 1991; Hitt et al., 1996). This organizational and managerial problem brings the analysis of to its next step: the critical importance of the integration process. For instance, when Zetsche, appointed as Chrysler CEO, and 25 top executives came from Daimler to Detroit, more and more American managers left the company so that after two years already two thirds of the management at Chrysler was fired or had resigned.

While one can read that integration of the acquired firm into the acquiring firm is critical to success (Hampel & Jemison, 1991), there is little research on the integration process (Harrison et al., 2001). Then the question that occurs is what actions can be conducted in order to achieve synergies from resource complementarities.
5.4. The Renault/Nissan case as an element of response

In their review of the effects of M&As and alliances on innovation, De Man and Duysters (2005) use the argument of indigestibility for comparing technological outputs of M&As and alliances. The argument rests on the fact that “a company may acquire more knowledge than it can use in a meaningful way” (in De Man & Duysters, 2005, p. 1379). The form of precision targeting (cherry picking), considering the required knowledge, which appears more achievable in alliances makes these ones generally more effective and successful than M&As in creating new products and processes.

It appears relevant to mention that acquisitions of brands (or companies) with similar resources may produce more short-term value because economies of scale are easier to achieve than economies of scope or other forms of synergy (Yasuda, 2005; see the large-scale study made on the semi-conductor industry above). Whereas acquiring firms with different but complementary resources provides the opportunity for creating significant synergies.

In the car industry one can see that there are two types of M&As in terms of process of integration. First there are many failures such as the Daimler Chrysler case which shows how difficult it is for two companies to integrate their resources with efficiency. Achieving economies of scope in different activities of the value-chain, particularly in R&D, appears then to be unattainable. The argument of indigestibility with Chrysler as a financial and commercial burden is moreover corroborating that idea.

However on the other hand, the case of Renault and Nissan shows how successful an integration of resource complementarities can be. The so-called alliance between the two companies (Renault holds as the major shareholder 44,43 % of Nissan and Nissan 15% of Renault) is improving its global market share and becoming the fourth global car manufacturer (see Appendix 2 compared with Appendix 1 for the growth evolution).

The fact that the two companies consider their relationship more like an alliance than like an acquisition influences their behaviour and indirectly also their success. Having myself read many annual reports and articles about car companies, it appears impressive how much they talk about their alliance and what is going on with it, compared to other big car corporations such as the Big Three. If we consider the indigestibility concept to the case of Renault and Nissan, one can see that as a strategic alliance they first focus on sharing key resource complementarities. And secondly the
Mergers and Acquisitions:  
Their impact on technological performance  
Master’s Thesis final draft

fact that this group remains small (four brands) compared to others facilitates also the relation based on the achievement of synergies.

By sharing the same goals, the two companies managed to keep their own company culture and brand identities, which has not always been the case in the car industry. In that sense it has certainly been easier for both management teams to enhance the process of legitimating the strategic alliance between the two firms. Therefore the process of integration of resources appears to be more approved and supported by all the employees.

In the opposite way of this reasoning, acquisitions that have taken place in the Big Three corporations are more unlikely to occur as legitimated by employees of the acquired firms. This feeling often goes with some pessimism from human resources given that these acquisitions are often followed by production reengineering and so by job cuts.

In order to make up for this problem of legitimating the alliance, merger or acquisition, which is most of the time due to a lack of communication between the top management and the employees, Renault and Nissan have not only kept their operating independence, but they have also included factors of synergy in the alliance. Common organization, transversal teams, sharing of components and of production platforms, all this has contributed in sharing the required knowledge for creating synergies from complementarities and therefore creating economies of scale.

A tremendous example of their complementary success is the launching of the last Renault Clio model. This third model has been developed in 28 months, whereas the previous one was launched after no fewer than 49 months. This huge improvement for Renault has been achieved by benchmarking the development method of Nissan, which substitutes digital simulation to physical prototypes. This time-saving has made the French car company saving 953 millions of euros (Renault, Annual Report, 2005), including 630 millions for industrial investment.

If this example doesn’t express directly an improvement of technological performance in terms of products, the time-saving and the process improvement will transcribe themselves in technological product improvement in a long term perspective, by simply creating and innovating faster.
5.5. Renault-Nissan as a new organizational form proficient to enhance technological performance

As it been said earlier concerning the Renault-Nissan case, everyone (managers or researchers) who is referring to it is calling it the Renault-Nissan alliance. However, the figures showing the stakes own by each of the two firms on the other lead us to think more about the fact that it is more financially a merger than an alliance. But the way they conducted it corresponds somehow more to a strategic alliance. The following graph 5.1 presents a new form of organizational structure which can be situated in half-way between M&As and alliances.

The first vignette represents the organizational structure of M&As, the second Strategic alliances and the third the one corresponding to Renault-Nissan; the left part corresponding to the pre-formation phase and the other to the post-formation. If one takes a look back on the figure 4.3, p. 39, representing the Renault-Nissan financial share structure, one can see without doubt the similarity with this one: the two firms stepping on each side, with Renault-Nissan BV in the middle and project teams corresponding with each entity below.

This new organizational form called hybrid presents many different structural features from an alliance, a merger or an acquisition. First the original organizations subsist according to their own
prior structures. It also has a strategic management committee (SMC) - Renault-Nissan BV in our case - with many relations between it and the firms. There are also transversal teams with workers from both companies. In Renault-Nissan, there 15 Cross Company Teams, 6 Functional Task Teams and 3 Task Teams since August 2004 (Monin & Rouzies, 2005; see figure 4.3). After a while, the more advanced transversal teams have their own juridical identity, as it is the case for RNPO (Renault-Nissan Purchasing Operation) and RNIS (Renault-Nissan Information Services). Therefore a tripolar organization (SMC, operational firms and transversal project teams) takes the place instead of a simple organization (M&As) or bipolar ones (alliances).

The strategic vision of the hybrid form also differs from M&As and alliances. The concept of integration which is complete in most of the M&As have different levels in the hybrid organization. On the opposite, the integration is only partly done on a limited area in strategic alliances. The RNPO and RNIS subsidiaries are for instance fully integrated, and concerning the brand, their identities remain untouchable by forbidding for example a Renault designer to work for Nissan models. Concerning the two firms, they applied a partly integration by sharing their existing complementarities, as it has been mentioned above. In brief, the integration has different level of intensity which is not applicable or at least not clearly stated in M&As.

Concerning the synergies, the cooperation spirit is mainly present, in the sense that they collaborate to create together new cars or components. Those exploring synergies led the group to share the development of a new four-by-four vehicle. On the other hand defensive synergies are more common in typical M&As such as it was the case in Daimler-Chrysler or Renault-Volvo when only one of the firms was taking benefits on the other’s engine to include it in one of their model. These exploiting synergies often have for main objection the realization of economies of scale instead of enhancing technological performance from exploring synergies.

These strategic perceptions of the relationship between the two firms make their relation more flexible and allow them to react more rapidly to environmental changes, notably in terms of technological performance.

The cultural issue also appears to be differently managed. In M&As integration impediment are often due to cultural and identity clashes. Injustice feelings as it has been the case in the Daimler-Chrysler case can make managers leaving the merging firm. It has been said that many of them left or others were not motivated by the reason that the merger was falsely presented as equal (this can also be related to the Renault-Volvo case). With clearly stated roles and with the time, Renault and Nissan employees do not feel affected anymore by the integration (Monin & Rouzies, 2005). There are M&A cases where only one dominant identity is kept or tried to be such. The Daimler-Chrysler
case appears again relevant there with German top managers going to Detroit and trying to apply their own methods and this without the reverse way of doing. An interview of Carlos Ghosn in 2003, CEO of Nissan at that time, corroborates this successful management of identities in the Renault-Nissan hybrid organization. He actually said that “if the alliance creates value, it is also because no one feels threatened in its identity, neither the French, nor the Japanese. Renault got enriched by its past failure with Volvo. The project failed because it was perceived as a power struggle by the Swedes. In Nissan, we had to escape from the beginning to this logic” (in Le Monde, September 3, 2003).

Monin and Rouzies (2005) found moreover in their research an interesting point showing that Renault employees were able to cope with manifold identities. For instance, in some of their interviews, people who worked in two or more different functions of the Alliance were identifying themselves to those different ones without any problems. A manager said for example in the same conversation “we, in Renault, we are good in design”, and a few minutes later “we in RNIS…” or “we in Renault-Nissan…” In that sense they could adapt themselves more easily to the complexity of the hybrid form.

All this characteristics are summarized in the following table 5.1 (see also next page), inspired on the previous findings and based on some other hints of the study carried out by Monin and Rouzies (2005).

Taking back the fact that complementary resources were undeniably present in the Renault-Nissan case, and looking at the well managed integration through the relevance of this hybrid form, then all the reasons for enhancing technological performance are matching. As Segrestin (2005) mentioned it in its study, this case has to be considered as a real forerunner of new cooperative patterns. She argued that this hybrid organization has the full capacity for mutating continually. Therefore integration processes may adapt themselves with flexibility to synergetic needs requested by the related firms, and finally, enhance the technological performance with the anticipated success.

### Table 5.1: Summarizing the main characteristics of M&As, strategic alliances and hybrid organizational forms

<table>
<thead>
<tr>
<th></th>
<th>M&amp;As</th>
<th>Strategic Alliances</th>
<th>Hybrid form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal structure</td>
<td>Integrated</td>
<td>Ad-hoc, multiple forms</td>
<td>Multi level structure and differentiated:</td>
</tr>
</tbody>
</table>
# Mergers and Acquisitions:  
Their impact on technological performance  
Master’s Thesis final draft

<table>
<thead>
<tr>
<th>Mechanisms of decision taking</th>
<th>Simple authority</th>
<th>Double authority</th>
<th>Shared authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanisms of problem solving</td>
<td>Hierarchy</td>
<td>Psychological and formal contract</td>
<td>Act of faith, confidence</td>
</tr>
</tbody>
</table>

## Process:

<table>
<thead>
<tr>
<th>Time conception</th>
<th>Immediacy</th>
<th>Linear time</th>
<th>Relative time, dependent from each level of structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration conception</td>
<td>Complete and irremediable</td>
<td>Limited and transitional</td>
<td>Along of a continuum: from lacking to complete</td>
</tr>
<tr>
<td>Synergy conception</td>
<td>More exploiting and defensive</td>
<td>More exploring and transitional</td>
<td>Balance between the two</td>
</tr>
<tr>
<td>Relation to complexity</td>
<td>Denied (simplicity)</td>
<td>Accepted (local)</td>
<td>Assumed and formalised</td>
</tr>
</tbody>
</table>

## Culture:

<table>
<thead>
<tr>
<th>Integration impediments</th>
<th>Organisational injustice and acculturation</th>
<th>Competition and decisional paralysis</th>
<th>Diminished impediments from both M&amp;As and alliances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple identities management</td>
<td>Suppression and integration</td>
<td>Compartmentalizing</td>
<td>Manifold identity responses</td>
</tr>
</tbody>
</table>
6. CONCLUSION

6.1. Research conclusion

Despite the large number of studies about M&As, few researchers have consistently focus thoroughly on their effect on technological performance. However meanwhile M&As are still seen as a means to achieve economies of scale or geographical expansion, the past few years showed a growing interest in the significance of technological motives for M&As. It has been proven that M&As are no longer financially successful. It appeared therefore interesting to investigate if technological performance, as a long term effect of M&As, could be enhanced by integration process and resource redeployment.

Even though, the overall results were not so promising, this study found results and factors of successful technological performance enhancement. It has to be stated first that not only non technological and technological firms have to be distinguished in order to evaluate the effect of a merger or acquisition on technological performance. The knowledge base relatedness has also to be discerned between firms so that we can predict on one hand what will be the effect on technological performance, and on the other hand, how those technological assets and capabilities should be shared and managed. The emergence of a resource-based view in the literature did not come by accident.

With less financial short-term success than they expected almost all of the times, leaders are now looking for building long term competitive advantages by means of M&As. As it has be pointed in The Economist, “companies also seem more intent this time on strategic, rather than financially motivated deals—building on core strengths and buying into new geographic markets are common themes in the latest round of deals” (in The Economist, September 1, 2005). Therefore, it has beenplainly demonstrated that M&As lead to some scale of economies and thereby lower the cost of technological performance. Nonetheless, their effect on technological performance is most of the time neutral or negative.
Merger and Acquisitions:
Their impact on technological performance
Master’s Thesis final draft

The association of resource complementarities and well managed integration appears then to be the best way for developing successful technological performance. The case of Renault-Nissan and its analysis findings gave reason to this statement via the creation of a new organisational form of M&As. A multi-level structure with respect to the firm’s own identities and brand image allows a greater pace for the creation of technological synergies. The flexibility allocated by this hybrid organization gives potential to adapt the resources redeployment according to the fast changing high-tech environment.

It has to be also added that the leadership role has certainly played an important part in the success of the Renault-Nissan case. Charismatic leaders such as Schweitzer or Ghosn played a significant position in communicating and legitimizing the so-called alliance to all their employees with all its complexity due to the hybrid form. Finally, this case has entirely confirmed that it was possible for nowadays firms to merge or acquire and take benefits from acquiring technological assets and capabilities, in order to enhance their technological performance, and hence to increase their degree of competitiveness due to this gained technological advantage.

6.2. Insights from the methodological approach used for this thesis

The methodological approach employed during this study was based on secondary sources, for the reasons explained in the chapter two. On one hand, it has been very fruitful to benefit from many prior different studies. Large-scale empirical studies allowed me to gain an interesting overview of the issue. And case studies gave me the opportunity to go further in the managerial aspects that have been analyzed and that provided many interesting findings. Having the choice of my sources was also an undeniable research advantage, even though I had to skip many of those due to a lack of time and resources, but also because it would have certainly been too heavy for the readers and the argumentation.

On the other hand, here also because of a lack of resources, I would have appreciated to conduct this study through all the phases that go with a merger or an acquisition. However, it appears evident that the necessary needed time is huge but also the requested intellectual strengths, which are certainly more corresponding to a real researcher.
6.3. Implications for future research

Many implications for further research arise from the end of this study. First, having studied technological aspects, it would be relevant to combine inter-disciplinary studies such as engineering and business in order to explore a particular case of merger or acquisition and its effects on technological performance. Tallying with this point of view, longitudinal in-depth studies led by teams of researchers in particular cases by considering all the phases encountered by the merger or acquisition would be an excellent way of practising research in the field.

It has also been mentioned by some authors in the literature review that they were many different indicators of technological performance. Patents and R&D expenditures have been already used in many studies but R&D portfolios and the degree of R&D reorganisation are more inclusive, in order to investigate the dynamic reorganisation processes of the firms associated with M&A. This type of technological performance evaluation could be more easily done if it would be applied in an in-depth study such as those explained above.

Another implication for future research concerns the hybrid form. It will be actually interesting to look if this organizational structure can remain sustainable as a model or if it is destined to move to an acquisition structure with a seizure of power of one of the two firms (or with a step back to alliance reorganization). It will be also interesting to see if this new cooperative pattern will be developed among other M&As or alliances, or if it will remain a as niche of managerial innovation. One of its sources of legitimacy lies in the fact that the constant tendency for oligopoly and abuses of dominant position push the antitrust lawyers to denounce those traditional M&As. And therefore this new cooperative form constitutes a powerful stratagem which gives the opportunity to maintain a certain competition between the two original firms.

Another interesting path of research consists in investigating if that kind of organizational form could live through the departure of their founder. This leadership perspective appears very interesting in the sense that interviewed employees of Renault-Nissan have often mentioned the charisma and the individual qualities of Jean-Louis Schweitzer and Carlos Ghosn. The first has already left the head of the group and has just being replaced that year by his successor. The processes of communicating confidence and legitimizing the cooperation are fruitful way of research that could explain those tremendous and somehow innovative business success stories.
References

Books & articles:


56
Mergers and Acquisitions: Their impact on technological performance
Master’s Thesis final draft


57
Me

er

ges a

Acquisitions:
Their impact on technological performance
Master’s Thesis final draft


- The Economist: “It has taken eight years, billions of dollars and blood on the carpet, but a big merger is finally starting to work”, Mar. 30th 2006.


- The Economist: “European mergers are booming, but economic nationalism remains an obstacle”, Sep 1st 2005.

- The Economist: “Will the latest cycle of European mergers produce better results?” Sep 1st 2005.
Mergers and Acquisitions:
Their impact on technological performance
Master’s Thesis final draft


- The Economist: “Why European firms are preparing for a summer of love”, Apr 7th 2005.


- The Economist: “The pace of mergers and acquisitions worldwide has slowed in recent months. Is the deal-making bonanza over, or merely pausing?”, Jan 25th 2001.

- The Economist: “Why European companies are rushing to the altar”, Apr 27th 2000.


Websites:

- European Commission website for merger cases: <http://europa.eu.int/comm/competition/mergers/cases/>
Appendix 1:

The automotive industry as a starting point

Source: The Economist “Extinction of the predator”

Source: The Economist “Extinction of the predator”
Appendix 2:

Global vehicles sales in 2005 (provisional figures estimated in millions)

Classément des dix premières alliances automobiles mondiales en 2005

en millions de véhicules particuliers et utilitaires vendus - chiffres provisoires estimés

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Sales (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GM</td>
<td>11.2</td>
</tr>
<tr>
<td>2</td>
<td>Ford</td>
<td>8.2</td>
</tr>
<tr>
<td>3</td>
<td>Toyota</td>
<td>7.8</td>
</tr>
<tr>
<td>4</td>
<td>Renault</td>
<td>6.1</td>
</tr>
<tr>
<td>5</td>
<td>Volkswagen</td>
<td>5.2</td>
</tr>
<tr>
<td>6</td>
<td>Daimler</td>
<td>4.3</td>
</tr>
<tr>
<td>7</td>
<td>Kia</td>
<td>3.6</td>
</tr>
<tr>
<td>8</td>
<td>PSA</td>
<td>3.4</td>
</tr>
<tr>
<td>9</td>
<td>Honda</td>
<td>3.3</td>
</tr>
<tr>
<td>10</td>
<td>Fiat</td>
<td>2.0</td>
</tr>
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</table>

* GM = Daimler = Suzuki = Isuzu

Source: Renault, Annual Report of 2005
Appendix 3

Sample description of Capron’s large-scale empirical study

<table>
<thead>
<tr>
<th>Industry</th>
<th>N</th>
<th>% of sample</th>
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<tbody>
<tr>
<td>Chemicals</td>
<td>39</td>
<td>15%</td>
</tr>
<tr>
<td>Foods and spirits</td>
<td>37</td>
<td>15%</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
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<td>12%</td>
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<tr>
<td>Machines-tools</td>
<td>16</td>
<td>6%</td>
</tr>
<tr>
<td>Automotive components</td>
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<td>6%</td>
</tr>
<tr>
<td>Electronics</td>
<td>13</td>
<td>5%</td>
</tr>
<tr>
<td>Instrument-medical devices</td>
<td>10</td>
<td>4%</td>
</tr>
<tr>
<td>Plastic packaging</td>
<td>9</td>
<td>4%</td>
</tr>
<tr>
<td>Materials</td>
<td>9</td>
<td>4%</td>
</tr>
<tr>
<td>Appliances</td>
<td>9</td>
<td>4%</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>7</td>
<td>3%</td>
</tr>
<tr>
<td>Steel</td>
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<tr>
<td>Aeronautics</td>
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<td>Paper</td>
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<tr>
<td>Miscellaneons</td>
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<td>NA</td>
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<tr>
<td>Total sample</td>
<td>253</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Relative size of target to acquirer (annual sales)</th>
<th>N</th>
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<tr>
<td>&lt;25%</td>
<td>132</td>
<td>52%</td>
</tr>
<tr>
<td>25–49%</td>
<td>55</td>
<td>22%</td>
</tr>
<tr>
<td>50–74%</td>
<td>17</td>
<td>7%</td>
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<tr>
<td>75–100%</td>
<td>16</td>
<td>6%</td>
</tr>
<tr>
<td>&gt;100%</td>
<td>21</td>
<td>8%</td>
</tr>
<tr>
<td>NA</td>
<td>12</td>
<td></td>
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<tr>
<td>Total sample</td>
<td>253</td>
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<table>
<thead>
<tr>
<th>Nature of relatedness</th>
<th>N-High</th>
<th>% of sample with high relatedness</th>
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<tbody>
<tr>
<td>Similar products</td>
<td>165</td>
<td>63%</td>
</tr>
<tr>
<td>Similar technologies</td>
<td>134</td>
<td>54%</td>
</tr>
<tr>
<td>Similar geographic markets</td>
<td>71</td>
<td>29%</td>
</tr>
<tr>
<td>Similar customers</td>
<td>128</td>
<td>51%</td>
</tr>
<tr>
<td>Direct competitors</td>
<td>70</td>
<td>29%</td>
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</table>

<table>
<thead>
<tr>
<th>Home country</th>
<th>N-Acquirer</th>
<th>% of sample-Acquirer</th>
<th>N-Target</th>
<th>% of sample-Target</th>
</tr>
</thead>
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<tr>
<td>France</td>
<td>106</td>
<td>42%</td>
<td>51</td>
<td>20%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>40</td>
<td>16%</td>
<td>43</td>
<td>17%</td>
</tr>
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<td>35</td>
<td>14%</td>
<td>40</td>
<td>16%</td>
</tr>
<tr>
<td>Germany</td>
<td>25</td>
<td>10%</td>
<td>28</td>
<td>11%</td>
</tr>
<tr>
<td>Scandinavia</td>
<td>20</td>
<td>8%</td>
<td>13</td>
<td>5%</td>
</tr>
<tr>
<td>Other European countries</td>
<td>20</td>
<td>8%</td>
<td>63</td>
<td>23%</td>
</tr>
<tr>
<td>Canada</td>
<td>5</td>
<td>2%</td>
<td>5</td>
<td>2%</td>
</tr>
<tr>
<td>Other countries or unknown</td>
<td>2</td>
<td>1%</td>
<td>10</td>
<td>4%</td>
</tr>
<tr>
<td>Total sample</td>
<td>253</td>
<td></td>
<td>253</td>
<td></td>
</tr>
<tr>
<td>Acquisition geographic scope</td>
<td>N</td>
<td>% of sample</td>
<td></td>
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<tr>
<td>----------------------------------</td>
<td>------</td>
<td>-------------</td>
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</tr>
<tr>
<td>Cross-border</td>
<td>177</td>
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</tr>
<tr>
<td>Domestic</td>
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<td>NA</td>
<td>2</td>
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<tr>
<td>Total sample</td>
<td>253</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Acquirer capital structure</th>
<th>N-Acquirer</th>
<th>% of sample</th>
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<tr>
<td>Stock-listed</td>
<td>151</td>
<td>60%</td>
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<tr>
<td>Non-listed</td>
<td>102</td>
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<td>Total sample</td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Acquirer diversification</th>
<th>N</th>
<th>% of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conglomerate</td>
<td>20</td>
<td>8%</td>
</tr>
<tr>
<td>Diversified into related business</td>
<td>111</td>
<td>44%</td>
</tr>
<tr>
<td>Focused on one main business</td>
<td>107</td>
<td>42%</td>
</tr>
<tr>
<td>NA</td>
<td>15</td>
<td>6%</td>
</tr>
<tr>
<td>Total sample</td>
<td>253</td>
<td></td>
</tr>
</tbody>
</table>

Appendix 4

Papers reviewed by De Man & Duysters (2005)

<table>
<thead>
<tr>
<th>Alliances</th>
<th>Mergers and acquisitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baum et al. (2000)</td>
<td>Chakrabarti et al. (1994)</td>
</tr>
<tr>
<td>Bekkers et al. (2002)</td>
<td>Duysters and Hagedoorn (2000a)</td>
</tr>
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<td>Duysters and Hagedoorn (2000a)</td>
<td>Hall (1990)</td>
</tr>
<tr>
<td>Ernst et al. (2001)</td>
<td>Hitt et al. (1996)</td>
</tr>
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<td>Gray et al. (2001)</td>
<td>Ikeda and Doi (1983)</td>
</tr>
<tr>
<td></td>
<td>as quoted in Hall (1990)</td>
</tr>
<tr>
<td></td>
<td>Reuer (2001)</td>
</tr>
<tr>
<td>Koh and Venkatraman (1991)</td>
<td></td>
</tr>
<tr>
<td>Lane and Lubatkin (1998)</td>
<td></td>
</tr>
<tr>
<td>Link et al. (1996)</td>
<td></td>
</tr>
<tr>
<td>Mitchell and Singh (1992)</td>
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<td>Mowery et al. (2001)</td>
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<tr>
<td>Mowery et al. (1996)</td>
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<tr>
<td>Powell et al. (1996)</td>
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</tr>
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<td>Rowley et al. (2000)</td>
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<tr>
<td>Sakakibara (1997a,b)</td>
<td></td>
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<td>Schut and van Frederikshult (2000)</td>
<td></td>
</tr>
<tr>
<td>Shan et al. (1994)</td>
<td></td>
</tr>
<tr>
<td>Stuart (2000)</td>
<td></td>
</tr>
<tr>
<td>Takeishi (2001)</td>
<td></td>
</tr>
<tr>
<td>VanHaverbeke et al. (2001)</td>
<td></td>
</tr>
<tr>
<td>Zucker and Darby (2001)</td>
<td></td>
</tr>
</tbody>
</table>

References in normal type refer to studies investigating the direct effect of M&A on innovation. References in italics refer to studies, investigating the relative effectiveness of M&A under different conditions.

Source: in De Man & Duysters, 2005, p. 1385-1386