STRATEGIC CHANGE IN THE PHARMACEUTICAL INDUSTRY 1992-2002: EVOLUTION AND COEVOLUTION OF FIRMS' GRAND STRATEGIES

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ABSTRACT

From the 1980s onwards pharmaceutical manufacture evolved from a fragmented industry to a global oligopoly. In the ecology literature coevolution theory proposes that competing species (incumbent firms) interact and shape each others' development, and that this in turn potentially shapes the community (industry) structure. This suggests that when exploring how firms' strategies changed during a period of significant industry change it is important to understand processes of both strategy evolution and coevolution in order to understand the dynamics of strategic change. This led to the research question 'How did the realised strategies of a heterogeneous set of firms coevolve during the period of pharmaceutical industry consolidation from 1992-2002?' In order to answer this a categorisation of strategic actions realised by firms in the pharmaceutical industry was developed. This was used as the basis of a methodological framework which used qualitative document analysis to longitudinally analyse how the grand strategies and strategic actions of a set of six pharmaceutical firms evolved and coevolved. These firms had arrived at different strategic outcomes and were selected using purposive sampling and replication logic. For the period 1992-2002 it was found that each firm realised unique patterns of grand strategy evolution. Further, the strategic actions that formed realised strategies coevolved both with the strategic actions of other firms and with the structure of the pharmaceutical industry as it became increasingly consolidated and globalised. Contributions to theories surrounding the environmental determinism versus strategic choice debate have been made with the findings supporting theories of coevolution, incremental and emergent strategy, and temporal patterns in strategy development. New contributions to knowledge were the development of a theory of pharmaceutical industry coevolution, development of a methodological framework for understanding strategic change in the pharmaceutical industry, and the creation of techniques to aid strategic decision making.

CONTENTS Page No.

LIST OF TABLES

LIST OF FIGURES

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CHAPTER ONE

INTRODUCTION TO THE THESIS

1.1 Introduction

The aim of this thesis is to make a contribution to the existing body of knowledge about strategic change by exploring processes of strategy evolution and coevolution. The thesis explains how the realised grand strategies and strategic actions for a set of firms evolved and coevolved as the pharmaceutical industry underwent significant structural change. This thesis contributes to existing knowledge in the strategic change literature with regard to theory, method and practice. This chapter provides an overview of the thesis. The research rationale explains the reasons for focusing upon the subject of strategy processes and strategic change in the pharmaceutical industry. This is followed by details of the assumptions underpinning the thesis which leads into an outline of the research question and sub questions that are addressed. As the academic literature contains different interpretations of the key themes discussed, a section outlining the definitions has been included. The chapter closes with a summary of the relevant literature that is reviewed and details about the structure of the thesis.

1.2 Research Rationale

According to the Structure-Conduct-Performance (S-C-P) paradigm changes in industry structure influence strategy evolution in incumbent firms (Bain, 1956; Mason, 1959) and that those strategies shape industry structure (Scherer, 1980). The S-C-P paradigm suggests that firm strategies lead to industry consolidation which leads to changes in incumbent firm strategies; and so a cycle continues. As an industry consolidates, incumbent firms arrive at different strategic outcomes such as being acquired, merged or liquidated, which leads to an increased concentration of larger firms. Yet this relationship between strategic outcomes and industry structure has not been explored,

possibly because the S-C-P model emphasises industry structure (Baumol, 1982) and not the evolution of individual firm strategies.

From the 1980s onwards the pharmaceutical industry structure has undergone significant structural change as it evolved from being highly fragmented to being a global oligopoly accompanied by a high number of small new entrants (Jones and Cockerill, 1984; Kettler, 2001a). The industry has seen several 'megamergers' and the disappearance of smaller biotechnology firms as they have either been acquired or failed to survive. In 2000 the Office of Health Economics hosted a conference that focused on "Consolidation and Competition in the Pharmaceutical Industry" (Kettler, 2001a). Among the issues explored were "the role of external networks in the pharmaceutical R&D process" (Kettler, 2001b:29), "changing market dynamics and industrial structures" (Grabowski and Vernon, 2001:62) and "Investors' Views on Merger and Acquisition, Alliance and Licensing Activity in the Pharmaceutical Industry" (Walton, 2001:80). However, what this conference did not explore, and what appears not to have been explored in the existing strategic change literature, was how the realised grand strategies and strategic actions of individual firms have evolved and coevolved during the changes in industry structure. Specifically, how these evolved and coevolved for firms that arrived at different strategic outcomes.

Population ecologists and corporate demographers have focused upon types of strategic outcome in their studies of births, deaths and transformations, tracking these for a complete industry or population from the start of its life (Carroll and Hannan, 2000). A main weakness of this approach, which will be addressed in this study, is that it was rarely feasible to provide depth to the factors that had preceded ending events (Davis, 1996). There is also significant debate as to whether it is strategic choice or the environment that determines the fate of organisations (Astley and Van de Ven, 1983). Strategic outcomes can also be related to Glueck's (1976) grand master strategies. For example, he classes liquidation as a retrenchment strategy. By focusing upon a detailed breadth of grand strategies and associated strategic actions this thesis bridges a gap in coevolution studies that have had a narrower focus, for example strategic "adaptations" (mergers, acquisitions and divestitures) and "strategic partnerships and alliances" (Lewin and Volberda 1999:528). Also, there are few longitudinal studies that have tracked the coevolution of industry and individual firm strategies (Lewin and Volberda,

1999). Therefore, this thesis aims to contribute to a current gap in our knowledge and understanding relating to how firm strategies have coevolved for a group of pharmaceutical firms that have arrived at different strategic outcomes as the industry structure has become increasingly consolidated and globalised.

1.3 Assumptions Underpinning the Thesis

As will be discussed in the literature review there are a number of endogenous and exogenous factors that have the potential to shape the strategies of firms. Due to the variety and nature of these potential forces for change it is not possible to accurately forecast how they will all impact upon strategic actions. Therefore, one of the main assumptions of this thesis is that, in order to understand what strategy is, one has to look at the strategic actions that firms have actually implemented, i.e. those that were realised, in order to identify patterns that show consistent behaviour.

A second assumption is that it is possible to identify the strategies that were realised. In other words, it is possible for a researcher to reconstruct the real world of strategy implementation and extend this to identify links between how the strategic actions of each firm have coevolved with those of incumbent firms and changes in industry structure.

A third assumption is that if people are asked to recall events there is a process of justification or problems with memory recall, which affects their perceptions when recalling events that have happened. This suggests that, when examining strategy decisions, it would be best to use documentary sources to collect data on the strategic actions that were realised in order to identify the grand strategies and strategic actions that were realised.

A fourth assumption is that in periods of consolidation and globalisation firms cannot be grouped on the basis of overall strategic thrusts as argued in the strategic group literature. Rather that, as the industry is undergoing significant change the strategies of all firms in an industry undergo some process of coevolution which can be demonstrated through the chronological tracking and analysis of strategic actions.

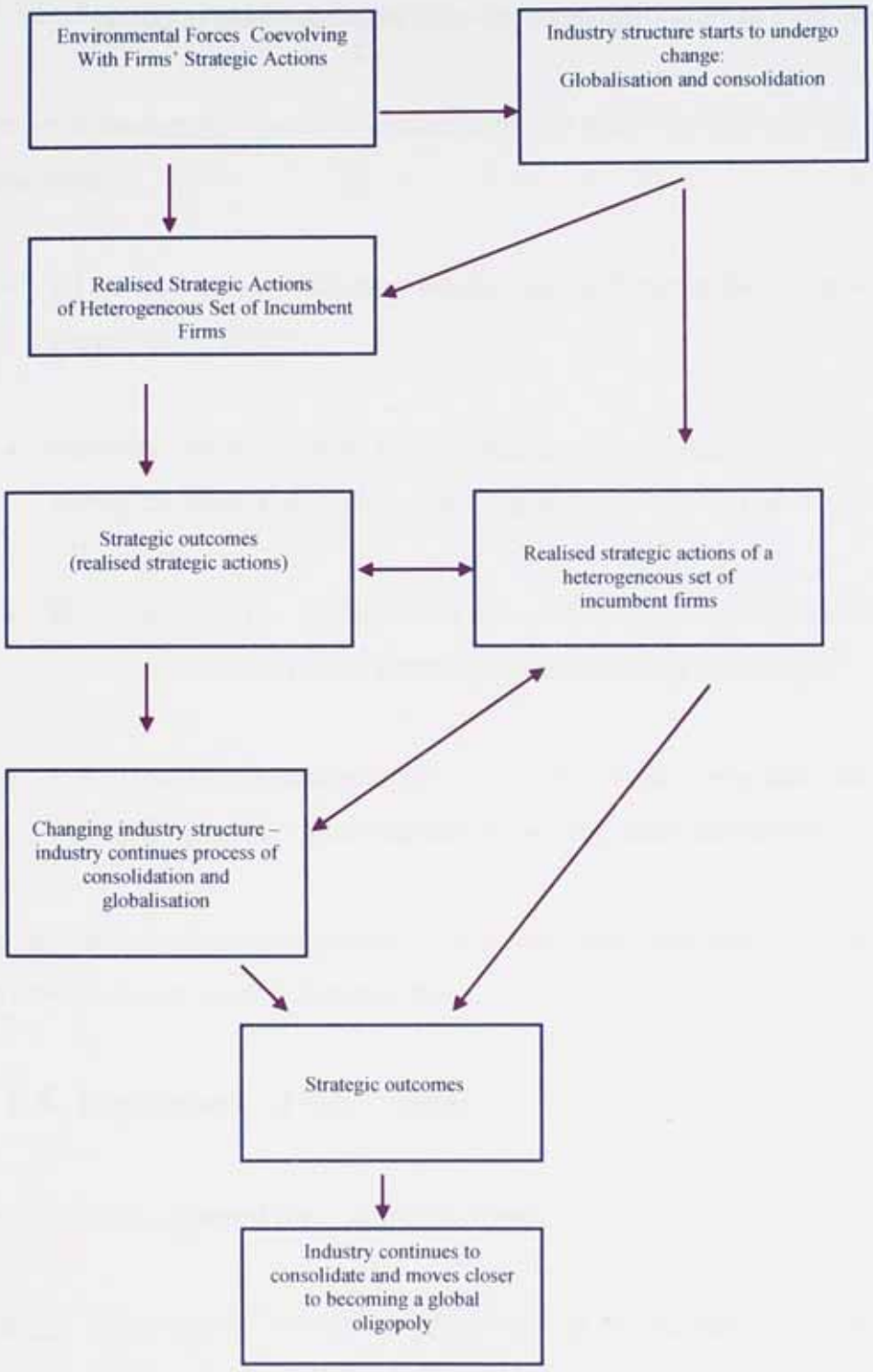
Finally, the fifth assumption is that the strategies of firms cannot be understood by focusing upon a limited number of strategic variables or at a limited number of levels. All strategic actions that have been implemented by a firm need to be identified as far as is feasible during the data collection process. Therefore quantitative techniques that lead to the forced clustering or reduction of variables are of limited value to this type of research. A qualitative approach is more informative as it involves interpretation of the findings as they emerge and leads to the identification of patterns through methods such as chronological ordering (Mintzberg and Waters, 1982), pairing and pattern matching.

1.4 Research Questions

The purpose of this thesis is to explore how the realised strategies and strategic actions of incumbent firms in an industry have evolved and coevolved during a specific period of industry change. The literature so far has not focused upon how firms' realised strategies, at the level of the strategic action, have both evolved and coevolved prior to different strategic outcomes. This research aims to contribute to the field of strategy by developing further a theory of strategic coevolution for the pharmaceutical industry.

The research is guided by the conceptual framework (Figure 1.1) which illustrates the lines of inquiry that were undertaken in order to understand this process.

Figure 1.1 Conceptual Framework of the Coevolution of the International Pharmaceutical Industry: 1992 - 2002



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This model was developed from the literature and is discussed in more detail in Chapter Four. The review of the literature and the subsequent development of the conceptual framework led to the research question:

'How did the realised strategies of a heterogeneous set of firms coevolve during the period of pharmaceutical industry consolidation from 1992-2002?'

In order to answer this question a number of sub questions also needed to be addressed. These were:

- R1: What strategic actions were realised by firms in the pharmaceutical industry during 2001-2002?"
- R2: How did the realised grand strategies of a heterogeneous set of firms evolve during the period of pharmaceutical industry consolidation from 1992-2002?
- R3: How did the realised strategic actions of a heterogeneous set of firms coevolve with each other's strategic actions during 1992-2002?
- R4: How did a heterogeneous set of firms realise internationalisation strategies during the period of pharmaceutical industry consolidation from 1992-2002?

The rationale for these sub questions, and how they were derived from the conceptual framework, is discussed in Chapter Four.

1.5 Definitions of Key Terms

The following key terms are used in this thesis.

Strategy In this study strategy is considered as "a sequence of united events which amounts to a coherent pattern of business behaviour" (Kay, 1993:9) and "a pattern....consistency in behaviour over time" (Mintzberg *et al.*, 1998:9) with the strategy being underpinned by the actions that were implemented.

Planned linear strategy is the "determination of the basic long-term goals of an enterprise, and adoption of courses of action and the allocation of resources necessary for carrying out these goals" (Chandler, 1962:13).

Emergent strategy has been defined as "patterns or consistencies realised despite, or in the absence of, intentions"(Mintzberg and Waters, 1985:257).

Realised strategy can either be emergent or intended, as in planned linear strategy, but the key point is that realised strategy is "what the organisations actually did"(Mintzberg and Waters, 1985:257). This can be understood through identifying the strategic actions that were actually implemented.

Strategic actions This thesis has adopted the definition used by Miller and Chen (1994:9) when they identified competitive actions as "implemented, public, market-oriented decisions, those significant concrete actions taken by an organisation that are observable by customers, competitors, and other industry participants." In other words, those that were publicly reported.

Evolutionary theory The emphasis of this thesis with regard to the research design incorporates the view that "evolutionary theory places dynamics, process and transformation at the centre of the analysis" (Malerba, 2004:15). Hence the research design has focused upon using a longitudinal design to collect data so that changes in the strategy process can be analysed for firms that arrived at different strategic outcomes, i.e. that transformed themselves from their original organisational form.

Coevolution theory Lewin and Volberda (1999:527) proposed that coevolution is "conditions of simultaneous evolution that persist over long time periods". Futuyma and Slatkin (1983:3) believed that "the study of coevolution is the analysis of reciprocal genetic changes that might be expected to occur in two or more ecologically interacting species and the analysis of whether the expected changes are actually realised". This is extended to focus upon how "coevolution may influence several interacting species and possibly even an entire community" (Roughgarden, 1983:57). The thesis encompasses the coevolution of species and community by identifying how the selection forces that

shape the community (industry structure) can be shaped by the incumbent species and vice versa. In other words how the species (incumbent firms) and community (industry structure) coevolve.

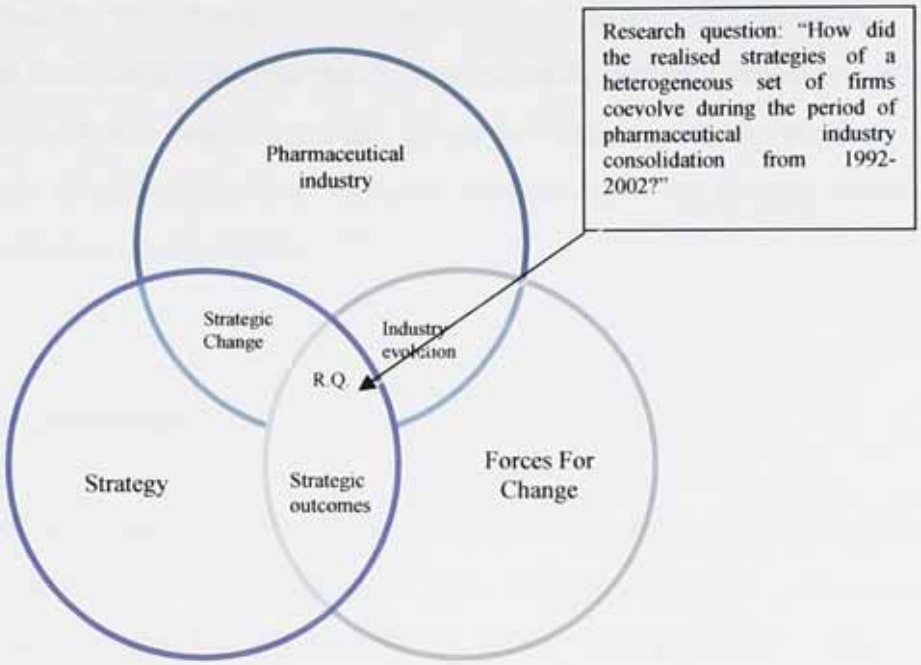
Strategic outcomes The definition of strategic outcomes for this study is adapted from the corporate demography literature relating to 'vital events' (Carroll and Hannan, 2000:45). The term 'strategic outcome' is used to define how firms evolve into a different species, for example as a result of being merged, demerged, acquired or liquidated.

The Pharmaceutical Industry "The pharmaceutical industry may be defined as being that part of the chemical industry which is concerned with the manufacture and marketing of products for the prevention, diagnosis and treatment of diseases in humans" (Bremner, 1992:17). For this study the definition has been extended in order to encompass the symbiotic relationships that traditional pharmaceutical firms have developed with biotechnology organisations (Kurdas, 1998; Rothaermel, 2000). Therefore, the term 'pharmaceutical industry' used in this thesis is the same as that referred to as 'biopharmaceutical' in some academic papers.

1.6 Structure of the Thesis

The theoretical underpinning of this thesis has been shaped by literature from the fields of strategic management, economics, organisation theory and ecology and is specifically guided by coevolution theory. The literature review can be broadly categorised under the headings: strategy, forces for change and the pharmaceutical industry, as illustrated in Figure 1.2

Figure 1.2 The Overlap of Relevant Literature



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Chapters Two and Three review the literature shown in Figure 1.2 and present conclusions as to why the pharmaceutical industry provides a suitable context for understanding processes of strategy and evolution and coevolution of strategic actions. Chapter Four presents a methodological framework for qualitatively analysing how firms' strategies and strategic actions evolve and coevolve. It explains the process for selecting six firms for the sample, each of which had arrived at a different strategic outcome. Chapter Five chronologically presents the results of the strategic actions realised by each of the firms in the sample during 1992-2002. Chapter Six discusses these results in relation to grand strategies and related internationalisation strategies. It explores the strategies that were selected by each firm and how they evolved. The chapter also presents an Empirical Typology of Grand Strategy Evolution and contextualises the strategy evolution process. Chapter Seven discusses temporal patterns in strategy development for the firms in the sample. It also explores how the realised

strategic actions coevolved and discusses issues relating to interdependence and path dependence with regard to the coevolution process. A theory of pharmaceutical industry coevolution which is presented in the form of a model is also developed. Chapter Eight presents the main conclusions of the study and discusses the contributions of the thesis with regard to theory, method and practice. Limitations of the work are acknowledged and suggestions are given for future research which could develop the findings. Chapter Eight also includes a reflection of the journey travelled during the doctoral studies for this thesis.

1.7 Chapter Summary

Chapter One has set the context for this thesis. It has provided a rationale for the study and the research question and sub questions that will be explored. Definitions underpinning the research and the structure of the thesis were presented. The next chapter reviews the literature with regard to strategy and change.

CHAPTER TWO
LITERATURE REVIEW:
STRATEGY AND CHANGE

2.1 Introduction

The main themes of the literature review were outlined in Chapter One. This chapter explores the literature with regard to strategy, forces for change, and industry evolution. It begins with a discussion of the concept of strategy and the continuum of strategy processes. A view that underpins this thesis is that strategy is not an isolated process but one that develops as a result of various evolving endogenous and exogenous factors. The literature review explores what these factors are, how they can evolve, and how they have the potential to influence the strategy process and the strategic outcomes of individual firms. This leads to a review of the environmental determinism versus strategic choice debate; concluding that coevolution theory can provide a new understanding of what determines the fate of organisations.

2.2 The Concept of Strategy

All organisations have broad goals of some form ranging from short-term survival to long-term visions (Ansoff, 1968; Suarez and Utterback, 1995). In broad terms, strategy is the overall guiding framework that enables an organisation to work towards its vision and goals and it should be designed to provide consistency in strategic actions (Hambrick and Fredickson, 2001). Although it has been suggested that strategies are the routes to decision making, such as which businesses should be in the portfolio, how the businesses should compete and how the firm should achieve growth (Ansoff, 1968; Hrebiniak *et al.*, 1989; Thomas and Pollock, 1999), it should be noted that there is no general consensus about the meaning of the term strategy (Huff *et al.*, 1994; Lynch, 1997; Markides, 2001). Despite this there is some consensus that strategy guides the

overall direction of an organisation as it seeks to maintain a strategic fit with its environment (Henderson, 1989; Barney, 1991; Porter, 1996).

It has been argued that the ultimate objective of strategy development is to achieve advantage over competitors that will lead to the long-term maximisation of profits (Porter, 1985) with organisations placing a priority on achieving a competitive advantage that can be sustained whatever the economic conditions (Bogner *et al.*, 1999). If an organisation does not achieve a fit with its environment and subsequent advantage over its competitors, its ability to earn profits will be restricted. Profits are needed for re-investment into the organisation so that it can continue to grow (Porter, 1996). Organisations that do not develop strategies to adapt to changing environments risk being selected out; in other words they fail to survive (Carroll and Hannan, 1995). So, firms should strive to implement strategies that differentiate them from their competitors whatever the environmental conditions (Henderson, 1989) in order to maximise their chances of survival; in other words, the achievement of competitive advantage. In order for competitive advantage to be achieved it has been proposed that the focus should be on strategy as a balancing unifying process in which organisations seek to find (albeit often temporarily) a unique position, vis-à-vis their competitors, i.e. the achievement of competitive advantage (Mintzberg and Lampel, 1999; Hambrick and Fredrickson, 2001; Markides, 2001).

During the past 40 years there have been various perspectives on where organisations should focus when formulating strategies in order to achieve strategic objectives. In his seminal paper Chandler (1962:383) explained that "strategy has been the plan for the allocation of resources to anticipated demand." Alfred Chandler's description of strategy in 1962 summed up the relative simplicity of the environment that organisations had been operating in during the first half of the last century. Organisations initially started-up to sell a standard product which was produced in sufficient quantities to meet demand. As Chandler's (1962) work illustrated, organisations and their products gradually became more complex. It was recognised that existing products could be sold in new markets overseas and that standard products could be produced in different formats. This has led to growth in both the size of organisations and the level of competition.

Appearing to build upon the descriptive work of Chandler (1962), Ansoff (1968) developed a prescriptive model of how strategic decisions should be made. He proposed that resources should be maximised through the development of budgets, with strategies designed to achieve the budget's objectives. The focus of corporate strategy was upon defining the current business and the potential for new businesses. Emphasis was placed upon decisions relating to product and market development. Analysis focused upon the viability of various options with emphasis given to the return on long-term investments. Subsequent selection decisions could be made in order to develop a portfolio of complementary products and markets. Emphasis was placed upon long-term planning and ensuring that the organisation was in control with regard to making strategic choices that allowed adaptation to a changing environment. Strategic decisions were based upon an analysis of the extent of risks posed by threats in the external environment and the capabilities and resources of the organisation in relation to opportunities (Andrews, 1991). This leads to the development of corporate level strategy which is focused upon defining the mission of the organisation, the corporate objectives, and policies that lead to it achieving its purpose (Hitt and Ireland, 1985; Andrews, 1991; Lynch, 1997). It defines the nature of its external relationships (Andrews, 1991; Kay, 1993) and the businesses, markets and activities that it is in or will engage in (Ansoff, 1968; Kay 1993). In order to achieve this mission, plans are developed to achieve corporate objectives to ensure fit with the external environment whilst utilising internal resources (Lynch, 1997). This strategic planning approach has been advocated for use by small and medium-sized enterprises (Analoui and Karami, 2003).

The overall purpose of corporate level strategy is to create synergy throughout the businesses controlled by the corporate parent in order to maximise profits. Profit maximisation has its roots in economic theory which suggests that the primary objective of organisations is to maximise profit (Penrose, 1959; Porter, 1980). Penrose (1959) argued that managers are motivated to maximise profits because they received benefits such as increased status and pay as a result of profits being reinvested back into the organisation, leading to increased growth. Although writers such as Chandler (1962) appear to assume that the objective of strategy is to ensure organisational growth there is no consensus that growth is the only objective of strategy. For example, Greer and Hoggett (1999:239) defined strategy as being concerned with "survival and/or growth."

2.3 The Continuum of Strategy Processes

Chandler (1962), Ansoff (1968) and Andrews (1991) were the main proponents of the view that strategy is a logical process based upon linear planning or design. However, there are other schools of thought concerning the extent to which the strategy process is planned or incremental. Whether strategy should be viewed as being an incremental, revolutionary, emergent or realised process is now considered.

2.3.1 Strategy as an Incremental Process

Lindblom (1959;1979) argued that policy (or strategy) decisions cannot be made in a linear, one direction, process. Rather, the process involves frequent refinement with decisions needing to be re-visited in order to redefine the problems, objectives and how the issues can be resolved. The suggestion was that long-term decisions cannot be planned but involve the organisation making changes step-by-step as it comes across new situations. Further, that strategies should be changing processes of refinement in light of new information. Although each decision is relatively small, over time, the actions will amount to major changes (Baden-Fuller *et al.*, 1994). This process has been termed incrementalism and thus enables the organisation to maintain fit with its changing environment (Lindblom, 1979; Quinn, 1991). Johnson (1988) disagreed, proposing that over time a gap develops between the strategic decisions and the changes in the environment leading to what he termed 'strategic drift' which would lead to a mismatch between the organisation's strategic decisions and its environment. As Strebel (1992) argued, this step-by-step form of change is not effective for all organisations all of the time. For example, if there is a sudden major change, what he termed a breakpoint, either in the organisation's immediate or competitive environment then incremental changes in strategy would not be sufficient for a firm to maintain strategic fit with its environment. Taking this further Ansoff and McDonnell (1990) argued that incremental change is reactive, that it focuses upon problems after they had occurred, rather than pre-empting them.

2.3.2 Strategy as a Revolutionary Process

Criticising the incremental approach, Hamel's (1996) view was that rather than being reactive to fast changing environments successful organisations are those which are proactive. Hamel and Prahalad (1993) suggested that organisations in which managers were focused upon attaining success over more powerful rivals were able to accomplish this by thinking outside of the normal mindset of what is achievable. The desire to succeed motivates them to stretch resource capabilities to their maximum in order to outpace the strategies of competing organisations (Hamel and Prahalad, 1993). Hamel (1996) considered that for organisations wanting to succeed, strategy should be groundbreaking, encompassing all members of the organisation and ignoring existing industry rules. However, Porter (1996) argued that the revolutionary approach prevented the long-term focus necessary for sustained competitive advantage as a firm seeks to develop its position within a specific industry. Hamel (1996) countered this, suggesting that by thinking outside industry rules the revolutionary approach may help a firm to be a driver of industry change.

Hamel (1996) prescribed guidelines in order for a firm to undertake this revolutionary approach. However, he does not appear to propose what an organisation should do if the revolutionary strategy actually leads the firm into a strategic drift away from its environment. In order to prevent potential strategic drift Tushman and O'Reilly (1996) argued that the key to long-term organisational success is the ability to combine both the incremental and revolutionary approaches. This could enable the firm to maintain fit with its environment whilst being sufficiently innovative to maintain competitive advantage. This is a view similar to that discussed with regard to Mintzberg's (1987) concept of emergent strategy which will now be discussed.

2.3.3 Strategy as an Emergent Process

Mintzberg (1994) suggested that although strategies could be deliberate there are problems if the focus is only upon planned strategic decisions. For example, the planned approach to strategy is based upon anticipated changes in the environment rather than focusing upon changes as they occur. Organisations may not always be effective in their judgement of the impact of changes in the environment (Kiesler and

Sproull, 1982) and the risk is that adherence to the plan is rated more highly by management than the need to change (Johnson, 1988). This would suggest that strategies cannot be planned too far in advance but instead need to emerge as management becomes aware of new information and identifies how its organisation can maximise the opportunities and minimise the threats as they arise (Sawy and Pauchant, 1988; Mintzberg, 1994).

Penrose (1959) argued that an organisation needs to be entrepreneurial in order for it to grow, that rational decision making is not sufficient if an organisation is to maximise the opportunities for growth. As part of his critique of the long-term planning focus, and appearing to build upon Penrose's (1959) view, Mintzberg (1987; 1994) proposed that formal long-term planning in isolation stifled the creative process. This prevents the organisation from adapting its strategy to maximise the opportunities resulting from new, unexpected discoveries. In other words, formal planning prevents the emergence of ideas that would lead to the development of the unique strategies required to give an organisation competitive advantage (Mintzberg, 1994). This is based upon the proposal that a synthesis of shared ideas leads to the development of unique products which provide organisations with an advantage over competing product offerings (Mintzberg, 1994). Mintzberg and Lampel (1999) argued that this could be enhanced through collaboration with other organisations as information is shared.

2.3.4 Strategy as a Realised Process

In this chapter so far, four perspectives about the process of strategy along a continuum ranging from long-term planning to step-by-step incrementalism, from adapting to changes in the environment to ignoring existing rules have been considered. Each of these approaches to strategy may be suitable at different times and to different organisations. What appears to be important is that organisations seek continual success whilst facing changing environments. Organisations evolve over time and so do their environments, suggesting that strategy should be an evolutionary process with different strategic processes required at various times.

Other authors have attempted to classify strategy. For instance, Whittington (1995) chose to categorise strategy schools based upon whether they were focused on profit maximisation or pluralism along one continuum and were deliberate or emergent on the other continuum. This provided four generic perspectives on strategy which he classed as the Classical approach (profit maximising and deliberate), the Processual approach (emergent and pluralistic), the Evolutionary perspective (profit-maximising and emergent) and the Systemic perspective (deliberate and pluralistic). Mintzberg *et al.* (1998) produced ten categories of strategy formation based upon the relevant processes, for example that strategy is a process of negotiation or a visionary process. They proposed that each of the ten 'schools' had focused on a different part of the strategy process rather than considering strategy as a unifying concept, although they did add that recent work had moved towards focusing upon a more integrated rather than segmented approach.

There is an emerging view in the current literature that the different perspectives of strategy are not as different as the various 'schools' would suggest (Mintzberg and Lampel, 1999; Hambrick and Fredrickson, 2001; Markides, 2001). Ideally the purpose of strategy is to guide organisations towards the achievement of long-term advantage over competitors (i.e. competitive advantage) and that this advantage should be sustainable (Henderson, 1989; Barney, 1991; Porter, 1996) with the ultimate objective being to achieve long-term profit maximisation (Porter, 1985) with organisations placing a priority on achieving competitive advantage that can be sustained whatever the economic conditions (Bogner *et al.*,1999).

Although scholars may agree that strategy should lead to the achievement of long-term objectives Porter (1996) argued that as firms had sought to maximise profits in increasingly fast changing environments they had moved their focus from strategy to organisational efficiency. Although efficiency is important for profit maximisation, Porter (1996) argued that by reacting to change rather than long-term strategic positioning the result had been continually low profits with a reduced ability to make long-term investments. He suggested that this shift in perspective away from strategy meant that organisations no longer had the ability to undertake strategic thinking, although this appears quite a generalisation. As defined in Chapter One realised strategy can be considered as "what the organisations actually did" (Mintzberg and

Waters, 1985:257) rather than their intentions or plans. By exploring how realised strategies evolved researchers can start to develop an understanding of what actually happened. This suggests that 'real world' research into strategy should examine how organisations have actually implemented strategies over a period of time in order to develop understanding of the strategy process rather than focusing upon plans. As the next sections will demonstrate, there are a wide variety of factors that have the potential to shape how strategies evolve, and thus lead potentially to differences between planned and realised strategies.

2.4 The Relationship Between Strategy and Competition

It has been proposed that if an organisation does not have competitors it does not need a strategy (Ohmae, 1982). Thomas and Pollock (1999) suggested that there has been a major focus in the strategy literature on how organisations should compete and who they are competing with. Organisations can face competition as a result of market forces or be protected by government actions such as public ownership (Mason, 1959). Competition limits the power of individual organisations by preventing them from charging excessive prices or limiting supply to the detriment of the public. It has also been argued that defining the scope of competitors is important for an organisation to be able to develop appropriate strategies (Campbell-Hunt, 2000). Literature regarding the nature of competition and competitors is now reviewed.

2.4.1 Perfect Competition

Perfect competition, a hypothetical concept, underpins traditional economic theory and is based upon a series of assumptions (Cohen and Cyert, 1975; Scherer, 1980). For example, many organisations operate in an industry with an homogenous product, which all firms produce to the same standard (Cohen and Cyert, 1975) and that, if above normal profits are seen to be earned, this will attract new entrants which will return the industry to equilibrium (Scherer, 1996a). According to the concept of perfect competition, no seller has monopoly power to protect, incumbent firms face no barriers to resource mobility, and potential entrants face no barriers to entry (Cohen and Cyert,

1975; Scherer, 1980). The concept of perfect competition has attracted criticism because it is not a reflection of real life situations (Baumol, 1982; Cohen and Cyert, 1975; Henderson, 1989). For this reason various models have been developed for undertaking competitive analysis, many of which are underpinned by the S-C-P paradigm, which will now be discussed.

2.4.2 The Structure-Conduct-Performance (S-C-P) Paradigm

Many of the models for competitive analysis are based upon the theory that there is a causal link between the structure of an industry, the strategies developed by organisations (organisation conduct) and the level of profits that can be earned (Bain, 1956; Mason, 1959). Scherer (1980) proposed that not only did structure have the ability to shape the conduct of firms but also that firms had the ability to shape the structure of the industry. This causal relationship was identified by Industrial Organisation Economists with the key concepts pioneered by Bain (1956) and Mason (1959) and is referred to as the Structure-Conduct-Performance (S-C-P) paradigm (Scherer, 1980; Bogner *et al.*, 1998; Thomas and Pollock, 1999). Structure refers to factors such as the number of sellers and buyers, barriers to entry, cost structures, product differentiation and vertical integration. Conduct (strategy) refers to factors such as pricing behaviour, product strategy, advertising, research and innovation, plant investment and legal tactics. Performance includes measures such as levels of efficiency, progress, full employment and equity (Scherer, 1980; Bogner *et al.*, 1998).

A criticism put forward by Baumol (1982) was that the S-C-P model places more emphasis on industry structure than it should do. His alternative perspective on the relationship between structure, conduct and performance was the theory of the 'contestable market'. He argued that a particular type of industry structure does not necessarily equal a particular type of performance. For example, new entrants alter the structure of an industry and its composition. According to the contestable markets theory it is merely the threat of new entrants that can make organisations change their conduct. The industrial organisation perspective places emphasis on the effect of conduct on industry performance and structure rather than structure having the main effect, although a large emphasis is placed upon market concentration using precise neoclassical models such as monopoly and oligopoly. However a criticism of this

approach is that its focus is very narrow which gives it a limited application to real life situations. It does however suggest that government policies focusing on industry structure in order to change conduct may be misplaced (Ferguson and Ferguson, 1994). The S-C-P model has provided a valuable basis for much of the competitive strategy literature (Jones and Cockerill, 1984; Faulkner and Johnson, 1992; Grant and Cibin, 1996) and was utilised by Porter (1980) in his pioneering work into generic competitive strategies. These strategies are discussed in Section 2.4.4.

2.4.3 Identification of Competitors

Market structure studies provide a basis for analysing how firms compete with each other. The unit of analysis is firms that have been allocated to an industry on the basis of their products being close substitutes leading to a high cross elasticity of demand. Measures of analysis can focus upon barriers to entry, level of demand and the associated price and income elasticities, concentration of buyers and sellers and product differentiation (Jones and Cockerill, 1984; Ferguson and Ferguson, 1994). However, it is important to note the difference between markets and industries. Markets are groupings based upon the buyer's perspective, what the buyer perceives as being close substitutes which equates to there being a high cross elasticity of demand. Therefore, firms that are in the same industry do not necessarily compete in the same markets. Thus, Scherer (1980) proposed that competitors are rivals that are directly competing for the same customers or resources.

It has been argued that defining the scope of competitors is important for an organisation to be able to develop appropriate strategies (Campbell-Hunt, 2000) as it seeks to differentiate itself from competitors in order to increase sales and maximise profits. A firm thus seeks to achieve advantage over rivals as it develops potential new customers, captures rivals' customers and competes for shared customers (Warren, 1991). Makowski and Ostroy (2001) conceptualised perfect competitors as those who could create intense rivalry by undertaking any actions necessary to increase profits. Through measures such as bargaining, perfect competitors would take every action possible to maximise profits in an industry until there is no surplus to be earned by other firms. In other words, any firms in an industry could be classed as a rival. However,

Porter (1996) argued that if firms undertake actions to stay ahead of all competitors they risk becoming all things to all people leading to persistently low profits.

Companies can focus too much on meeting the needs of core customers, which places them at risk for example from potential new entrants (Porter, 1980). Incumbent firms may be unprepared for new technology offerings from organisations outside the industry that they had not previously considered as competitors, who then target their core customers (Bower and Christensen, 1995). As these new organisations steal customers there is a loss of income for the incumbent organisations, which could lead to difficulties in accessing the necessary resources for survival and growth. Even if the sales orders of a company exceed those of rivals if they do not have sufficient resources to meet the orders then they cannot be converted to actual sales. Therefore, a company needs to focus on both acquiring customers and resources in order to achieve competitive advantage. Both researchers and firms have perspectives as to how they identify who the competing firms are. This review considers the perspectives of industry positioning and structural analysis, competitive strategies and the related concept of strategic group analysis (SGA).

Porter (1996) proposed that in order to achieve competitive advantage organisations should focus upon developing a unique, long-term strategic position within an industry that would allow them to achieve superior performance. The focus of competitive strategy is how each business competes in its market(s) as it seeks to achieve advantage over competitors (Day *et al.*,1987) through the development of an industry position that leads to profit maximisation (Porter, 1980; Kay, 1993).

In order to identify a niche in which a firm could develop its industry position, Porter (1985) developed a structural analysis model adapted from the S-C-P paradigm to understand the forces that can affect the level of rivalry in an industry. This was designed to provide an analytical framework for strategists to understand the impact of the bargaining power of suppliers and buyers and the threats posed by substitutes and new entrants together with the extent of industry rivalry. Porter (1985) argued that different industries had different levels of attractiveness based upon the profits that could be earned. The structural analysis model was designed to provide a framework for organisations to develop generic strategies that would enable them to identify the best

strategic position in an industry in order to achieve sustainable competitive advantage and maximise profits. In essence importance was placed upon how the firm positioned itself in an industry vis-à-vis its competitors and it was suggested that changes in this industry structure affected the conduct of managers, i.e., how they formulate strategies.

2.4.4 Generic Competitive Strategies

Porter (1980) argued that competitive advantage could be achieved through implementing one of three generic competitive strategies after industry structural analysis had been undertaken. According to Porter (1980; 1985) a firm has a choice between three forms of generic competitive strategy that it should adopt in order to achieve sustainable competitive advantage, which would lead to profit maximisation within an industry. These strategies were overall cost leadership, differentiation and focus. Analysis of each stage of the value chain would enable a business to pursue a cost leadership strategy that allows it to provide products or services at the same quality or price as competitors. The emphasis on cost leadership allows it to earn superior profits. These can then be used to increase marketing intensity, invest more than competitors in research and development or reduce prices to customers. Differentiation could be achieved through the development of distinctive competences within the organisation allowing it to be more innovative than competitors. This could allow the firm to either achieve first mover advantage and/or to achieve premium prices thus maximising profits. The focus strategy involves a firm concentrating on the needs of a small niche of customers with a specialised product. Porter (1980) warned that most firms would only be able to adopt one type of strategy in order to maximise success but he did agree that some firms could possibly combine two of the generic strategies.

Porter's (1980;1985) model of generic competitive strategies has attracted criticism both with regard to its theoretical contribution and that it is focused upon only three types of strategy. Chrisman *et al.*(1988) argued that Porter had not considered how firms should differentiate themselves within segments. Criticisms such as this led to various academics seeking to refine and/or extend the generic strategy concept (Wright, 1987; Chrisman *et al.*, 1988; Mintzberg, 1991). Yet despite the criticisms Porter's (1980;1985) concept of generic competitive strategies became, and continues to be, the focal model for competitive strategy research as researchers have sought to understand

the sources of sustainable competitive advantage (Hendry, 1990; Campbell-Hunt, 2000).

2.4.5 Strategic Groups

The term 'strategic groups' was originally coined by Hunt (1972) and reconceptualised the widely held school of thought that the structure of the industry influenced the conduct of organisations and thus their performance (the S-C-P paradigm). He found that rather than the structure of the industry influencing the way that organisations performed it was actually the thoughts and actions of those managing the companies, through their strategies, which affected not only the performance of the company but also of the industry. These actions impact on the structure of the industry by dividing it into subsets of organisations, strategic groups, which appear to share very similar characteristics in the way that they operate. This led to the development of an extensive literature using Strategic Group Analysis (SGA) (Porter, 1979; Mascarenhas, 1989; McGee and Segal- Horn, 1990; McGee *et al.*, 1995; Thomas and Pollock, 1999; Leask and Parker, 2004; Leask and Parnell, 2004).

In its simplest terms Strategic Group Analysis involves clustering groups of companies that have similar (generic) strategies based upon 'strategic dimensions', for example geographical coverage and marketing intensity (McGee and Segal-Horn, 1990). Porter (1979) focused on the issue of mobility barriers that surround and protect strategic groups. Mobility barriers are assets that a firm has acquired which are difficult for others to imitate and prevent or at least minimise the entry into the strategic group from those already in the industry. Porter's (1979) argument was that mobility barriers make it difficult for members of one strategic group to cross into another and that strategic group membership was related to levels of performance. McGee *et al.* (1995:257) defined strategic groups as follows:

> *"The strategic groups concept directs attention to those groups of organisations in an industry which may actively compete with each other by virtue of their investment in apparently similar distinctive assets, strategic resources and core competences."*

In other words groups of firms can be clustered together on the basis of how a group of homogeneous firms competes, with each strategic group having distinct differences from the others in the industry. Thomas and Pollock (1999) considered strategic groups in relation to asset configuration, how an individual firm assembles together assets, resources and competences into a package which it hopes cannot be easily copied by other organisations. It is the way that these are weaved together that can provide a firm with its competitive advantage. Thomas and Pollock's (1999) concept of Strategic Group Analysis raises the question of how similar characteristics have to be in order to cluster organisations together. Their work emphasises that parameters and/or strategic dimensions need to be identified, decided upon, explained and justified very clearly by any SGA analyst early in the study because otherwise the work could be open to criticism for being too vague. It could be argued that similarities were not sufficient for organisations to be clustered and therefore each firm has its own individual strategic group. That would tend to make the SGA concept obsolete for analytical purposes.

A major weakness of SGA has been the number of static studies that have looked at a snapshot in time rather than the changes resulting from industry dynamics, although some researchers have sought to address this weakness. For example, McGee and Segal-Horn (1990), in their study of the European food industry, researched industry dynamics by developing the concept of strategic space. This involved identifying gaps in firm strategies that were not being occupied by the operational strategies of organisations at the time of their study. This allowed them to predict potential gaps in the marketplace that companies could adapt their strategies to fill in the future by extending the period of time in which the strategic variables are examined. Bogner *et al.* (1996) used SGA to track changes in pharmaceutical industry structure as a backdrop for exploring the competitive positions and entry paths of European firms operating in the American market. Schwittay and Carr (2001) also used SGA to conduct a longitudinal study into changes within the spirits industry as it moved from being a multi-domestic to a global industry. SGA studies that focus upon changing industry dynamics have the potential to be further developed to provide answers to the following questions set by Huff *et al.* (1994:36):

- Which organisations are most likely to change strategic position?
- When is a change in strategy most likely to occur?; and

- How is the firm likely to reposition itself vis-à-vis its competitors, given a change in strategy?

The SGA concept has been the subject of much debate and the reader is directed to several comprehensive reviews of the research in this field that have been published (McGee and Thomas, 1986; Thomas and Venkatraman, 1988; McGee *et al.*,1995). What the concept illustrates for this thesis is that some strategists have agreed that groups of firms follow similar strategies and that these are different from the strategies of firms operating in the same industry but in different strategic groups. Thomas and Venkatraman (1988) suggested that rather than focusing upon strategic groups it may be more beneficial to define strategic groups by moving away from an industry perspective and instead group organisations according to 'environmental types' or 'profiles' according to the environmental conditions faced by the groups as they develop their competitive strategies. Porac *et al.* (1994) agreed that groups of organisations in an industry follow similar strategies but suggested that the notion of identifying similar organisations is more than an economic entity and that it also has a psychological and sociological basis. They suggested that managers have mental maps of who they consider to be in their "primary competitive group" (Porac *et al.*, 1994:135) and that these perceptions form the basis of how they develop competitive strategies.

The review of the literature about strategic groups, environmental types and primary competitive groups has highlighted the lack of academic agreement as to how competitors can be identified. What it has highlighted is the emphasis to 'group' firms together on the basis of similar attributes. Yet Deephouse (1999) argued that a strategic balance needed to be achieved between the extent that firms were similar in order to maintain legitimacy and the extent to which they differentiated themselves in order to increase competitiveness. Although groups of organisations may follow different strategies to those of rivals it should not be forgotten that every organisation is unique (Penrose, 1959; Hannan and Carroll, 1995; Kaplan and Johnston, 1998). The uniqueness of organisations results from various factors such as their history, the way in which they were started as well as their consequent evolution. Other factors include the services that the organisation provides, its resources, the collective experience of management working as a team, its decision making process and its culture (Penrose, 1959; Hannan and Carroll, 1995; Kaplan and Johnston, 1998). This uniqueness means

that organisations in the same industry, even when they appear to be similar, will not necessarily react in the same way to changes (Hannan and Carroll, 1995).

2.4.6 Network Level Strategies

It has been argued that partnerships can provide more value than a single firm acting autonomously, and that the source of competitive advantage lies in the network of alliances that a firm develops. These network relationships lead to the joint development of the inimitable resources necessary for sustainable competitive advantage (Dyer and Singh, 1998; Gulati, 1998; Gulati *et al.*, 2000). The increased trend in developing network relationships has been driven by firms' continued pursuit of competitive advantage in fast changing environments that have included increased global competition and "rapidly changing technology and fragmented markets"(Lei, 1993:36). These relationships include strategic alliances, joint ventures and licensing agreements (Gulati *et al.*, 2000), can be with competitors, suppliers and customers (Thomas and Pollock, 1999), and can transcend industry boundaries (Gulati, 1998; Gulati *et al.* 2000).

These strategic networks enable firms to share skills, resources, knowledge, costs and risks (Lei, 1993; Thomas and Pollock, 1999; Gulati *et al.*, 2000) for the "co-development of products, technologies or services" (Gulati, 1998:293) which allow them to gain access to new markets and technologies. Incumbent firms and potential new entrants may find it mutually beneficial to form linkages that allow the sharing of resources and competences (Jones and Cockerill, 1984; Malerba and Orsenigo, 1996). So a good partnership could be a large firm that has established a high reputation in an industry with a small firm that has leading-edge technological resources which ideally can lead to increased status and social recognition (Stuart, 2000). If a firm partners with another firm that has a strong status in the industry this reputation can be transferred to the partner and thus elevate their social status. This can enhance their ability to network with other firms. Firms may collaborate with certain 'competitors' in certain markets whilst continuing to compete in other areas (Dyer and Singh, 1998; Thomas and Pollock, 1999).

There are risks with entering into such strategic alliances. Strategic alliances are based upon trust as firms share and access different areas although this inadvertently causes

risks. This may not have been intentional but the skills and competences that have been developed in one area may inadvertently have been transferred to another market where the firms compete rather than co-operate (Lei, 1993; Thomas and Pollock, 1999). This may occur as information becomes tacit corporate knowledge, although information that does not relate to specific projects can be kept secret from the partner firm (Thomas and Pollock,1999). Sometimes firms may prematurely end alliances when they feel that they can take the information to other areas and have learnt all that they need to know. There is also the risk that as the relationship continues the level of learning decreases and firms can become dependent upon each other rather than working as partners (Lei, 1993). Firms may become locked into unproductive relationships and there is also the risk that existing partnerships may prevent a firm from collaborating with other partners (Gulati, 1998; Gulati *et al.*, 2000). Therefore a firm needs to decide the extent to which it needs to balance the risks associated with partnerships together with the degree of competitive advantage that it requires.

2.4.7 Strategic Actions

Kay (1993:9) described strategy as "a sequence of united events which amounts to a coherent pattern of business behaviour" and Mintzberg *et al.*(1998) used the term a "pattern of actions" that allows researchers to track "consistency in behaviour" (Mintzberg *et al.*, 1998:9). This would suggest that in order to understand the strategies realised by firms it is necessary to identify the 'strategic actions' that contribute to the different levels of strategy within an organisation. This underpins one of the main arguments of this thesis that if a comprehensive understanding of a firm's strategy is to be developed it is necessary to identify the strategy or strategies that were realised by tracking the strategic actions that were actually implemented to identify consistency in actions.

Strategic actions refer to singular actions undertaken by firms that will affect their overall strategic direction. For example, strategic actions that contribute to co-operative strategies include entering into and exiting from joint ventures, entering into merger talks and successful completion of mergers, licensing-out and licensing-in products. In essence, strategic actions and tactics may be the same thing. Tactics are "the short-duration, adaptive, action-interaction realignments that opposing forces use to

accomplish limited goals after their initial contact" (Quinn, 1980:9) which is why there is the need to identify whether actions contribute to a 'consistency in behaviour'. In their study of competitive inertia Miller and Chen (1994) identified a number of strategic actions for firms in the airline industry in order to track the level of competitive inertia. The tracking of strategic actions, which can also be referred to as strategic variables, has also been undertaken in SGA in order to identify similarities between different strategic groups. For example Bogner *et al.* (1996) applied SGA to strategic variables such as the use of internal development versus licensing and the establishment of 'generics' divisions to identify the strategies of European pharmaceutical firms.

As discussed in the previous section, firms are fighting to maximise advantage over other firms in order to access resources. The purpose of strategy is to guide organisations towards the achievement of long-term advantage over competitors (i.e. competitive advantage) in order to maximise profits (Porter, 1985; Henderson, 1989; Barney, 1991; Porter, 1996). It has been emphasised that corporate and competitive strategies should not be implemented in isolation from each other. Together they should lead to an overall strategy (Kay, 1993) that interrelates with the organisational structure including the key functional areas, the capabilities of the firm and the external environment (Chandler, 1962; Hitt *et al.*, 1982a, 1982b; Kay, 1993). Organisations should place a priority on achieving competitive advantage that can be sustained whatever the economic conditions (Bogner *et al.*,1999).

So far in this chapter focus has been on the development of an understanding of strategy, competition and competitive advantage. An explanation about how the external and internal environment have the potential to shape a firm's ability to realise competitive advantage will now be considered.

2.5 The External Environment and Strategic Fit

As has been discussed in the overview of the strategy process, the majority of scholars have talked about the relationship between strategy and the environment. The impact of the external environment upon strategy has been the focus of study for population and

organisational ecologists (e.g. Hannan and Carroll, 1995) economists (e.g. Bain, 1956; Porter 1980) and organisational change theorists (e.g. Pfeffer and Salancik, 1978; Pettigrew and Whipp, 1991). Environmental factors impacting upon how strategies evolve can be related to socio-political institutions, industry structure, economic issues (e.g. levels of inflation and stages in the economic lifecycle), innovation, customer demand, competitor actions and threats posed by potential new entrants (Bain, 1956; Lawrence and Lorsch, 1967; Porter, 1980; Nelson and Winter, 1982; Hrebiniak *et al.*, 1989; Carroll and Hannan, 2000).

It is becoming increasingly difficult for organisations to develop long-term strategies as environments are changing at a rapid pace, leading to an increase in competitive pressures for many organisations (Child, 1977; Smart and Vertinsky, 1984; Ansoff, 1994; Leavy, 1997; Liedtaka, 2000). The impact of environmental changes can vary and while not all of them will be relevant to all organisations (Pfeffer and Salancik, 1978) they will affect the competitive environment in which a firm operates as well as its ability to survive and grow (Smart and Vertinsky, 1984). Environmental factors create the context for competition which has the ability to limit the power of individual organisations in order that organisations do not charge excessive prices or limit supply to the detriment of the public (Mason, 1959). It has been argued that firms have the ability to shape how the competitive environment evolves. For example, they can implement strategic actions that can lead an industry from fragmentation to consolidation (Porter, 1980) or form policy networks to influence regulatory decisions (Nunan, 1999). Some of these factors are discussed in more detail in the following sections which start with a focus on industry evolution.

2.6 Industry Evolution

Industry structure and incumbent firm strategies and factors such as technology and regulation evolve over time. As various interacting factors reach different stages of the lifecycle (introduction, growth, maturity, decline) at different times it is important to realise that how these factors interact today is linked to the history of each, and the actions and processes that occurred in the past (Nelson and Winter, 1982). As each factor evolves in its own way it is difficult to identify how the paths will cross over to

impact upon the present, making analysis a complex process. This therefore suggests that a strategy based upon a long-term linear plan, as prescribed by the planning school (Ansoff, 1968; Porter, 1980), is not feasible in practice.

Further, as Porter (1980) commented, there is a risk in pursuing a strategy where the value risks being eroded by industry evolution. Scherer (1980) in his refinement of the structure-conduct-performance (S-C-P) paradigm proposed that firms have the ability to shape industry structure and both Porter (1980) and Hamel (1996) argued that it could be in the firms' interest to adopt appropriate strategies to do this. Yet as shown by the S-C-P paradigm, industry structure also has the ability to shape firm strategies (Bain, 1956; Mason, 1959; Scherer, 1980) and it has been argued that firms conform to industry recipes or culture (Spender, 1989; Pettigrew and Whipp, 1991) rather than attempting to create new rules. Three factors that have been identified as playing key roles in industry evolution are technology, regulation and globalisation. These are discussed in the following review of the literature which aims to highlight the ability of firms to implement strategies that shape these factors.

2.6.1 Industry Evolution Theory

Standard evolution theory suggests that an industry follows an S-curve pattern similar to that of the product lifecycle's introduction, growth, maturity and decline curve. The theory is that industries proceed through stages of introduction, growth, maturity and decline (Porter,1980; Kaplan and Johnston, 1998; McGahan, 2000). But there are various factors that can impact upon this process so that the industry does not follow the suggested pattern. Examples include new products that are the result of emerging technologies or an industry in the maturity stage can still undergo changing patterns in both supply and demand (Baden-Fuller *et al.*, 1994). Models have been developed to help strategists understand and predict these changing dynamics in order that they can develop appropriate strategies (McGahan, 2000). The ability of the models to forecast industry change is not the subject of this study. What such models do highlight though is that there are many factors that can impact upon an industry and shape its evolution.

2.6.2 *Industry Evolution and Strategic Choice*

The evolution of an industry affects the strategic choices available to firms, significantly altering the ways in which they seek to achieve competitive advantage. An understanding of how an industry will change together with the factors that drive changes in the industry, is important for an organisation when developing strategies as industry can shape the actions of organisations (Scherer, 1980; Hannan and Carroll 1995). The basis for this argument is that it allows an organisation to make the most appropriate strategic decisions in light of environmental changes and anticipated moves by rivals (Warren, 1991; Kaplan and Johnston, 1998; Ghobadian and Viney, 2001). For organisations that operate in competitive environments forces for change to strategy can result from structural changes to the industry such as barriers to entry, level of demand and the associated price and income elasticities, concentration of buyers and sellers and product differentiation (Jones and Cockerill, 1984; Ferguson and Ferguson, 1994) and the firms' strategies can shape these structural changes (Scherer, 1980). For example, Jones and Womack (1986) identified three major factors that shaped the evolution of the automotive industry. The first was the move towards mass manufacturing in the early part of the 20th Century. The second occurred in the 1950s as European manufacturing sought to combine mass production with product differentiation in order to achieve advantage over American competitors. The third was the entry of Japanese organisations in the 1960s that sought to achieve competitive advantage through innovative organisation of production processes. What this highlights is that industries can be shaped as the result of organisations pursuing new ways to develop competitive advantage and that this can have continuing effect on how each of the organisations develops future strategies.

2.6.3 *Technology Evolution*

An understanding of technological change can lead to an understanding of both environmental and organisational evolution (Tushman and Anderson, 1986) and thus how technology changes the shape of industries (Suarez and Utterback, 1995). Economists have recognised that changing technologies impact upon the competitive environments of firms in various industries, including the pharmaceutical industry

(Nelson and Winter, 1982). It was suggested earlier that organisations seek to develop distinctive competencies in order to achieve competitive advantage. Developing these competences can take many years. It has been argued that the key to having the right distinctive competencies to deal with a changing environment is the ability of managers to identify changes in the environment very much in advance of the organisation being able to realise the benefits of the change (Cockburn *et al.*,2000).

Yet, the extent that new technologies will impact upon industry evolution is inclear as their application is affected by the unique factors that make up the firms in an industry and how they develop and utilise new technology (Nelson and Winter, 1982). Incumbent firms may implement actions in order to try to prevent the entry of new firms. The S-C-P paradigm is based upon the assumption that as part of their strategy firms can seek to erect barriers to prevent the entry of new firms. In his seminal work, Bain (1956) argued that incumbent firms erect barriers to entry through measures such as patents and product differentiation in order to protect profits. However, incumbent firms may decide to adopt or ignore a new innovation and the impact of a new innovation may have been unanticipated if, for example, it had been developed in a seemingly unrelated industry (Rogers, 1983). Technological changes can be either competence enhancing or competence destroying for incumbent organisations (Tushman and Anderson, 1986; Malerba and Orsenigo, 1996). For example, Remington Rand, although very competent in typewriters was not able to transfer this competence to the emerging computer industry (Malerba and Orsengio, 1996).

Consequences of innovation can be both desirable and undesirable and can affect both individual firms and the industry as a whole (Rogers, 1983). It has been suggested that technology follows a pattern of incremental change punctuated with major changes that create technological discontinuities (Tushman and Anderson, 1986). The technological development can be so dramatic that it creates an acute discontinuity in the operating environment of organisations. This appears to build upon the view suggested by Schumpeter (cited in Mason, 1959) that technology leads to the creative destruction of an industry. In other words the creation of technology can lead to the destruction of an industry as it had previously existed with a subsequent negative impact upon incumbent organisations. This can lead to a fall in industry concentration as innovative new entrants steal market share from the market leaders (Geroski and Pomroy, 1990) or be

so radical that customers may be slow to adopt the products that result from new technologies (Bower and Christensen, 1995). Technological development has the potential to completely change the structure of an industry and can even lead to the creation of a new industry (Tang and Thomas, 1994; Malerba and Orsenigo, 1996; Kaplan and Johnston, 1998; Rothaermel, 2000). Incumbent organisations may be reluctant to embrace new technology. This encourages new entrants, leading to a dynamic process of change as new technologies are developed (Tang and Thomas, 1994) which is probably encouraged by incumbent organisations continuing to ignore the dangers presented by emerging technologies (Bower and Christensen, 1995). The reluctance of incumbent organisations to adopt new technology may actually make entry easier for new organisations (Tang and Thomas, 1994). The pace of innovation can be self-perpetuating with it increasing as the number of new entrants increases (Scherer, 1980; Geroski and Pomroy, 1990; Tang and Thomas, 1994; Rothaermel, 2000). The result can be that new entrants to an industry can change its shape and have the potential to make it more competitive (Malerba and Orsenigo, 1996). This explains why the threat of competition from potential entrants to an industry has the largest impact upon the development of competitive strategies (Bain, 1956; Baumol, 1982; Barney, 1991). It has also been argued that although some new entrants are able to become industry leaders many will exit quickly (Malerba and Orsenigo, 1996). Established firms may make a strategic decision to exit the industry if they feel it will be beneficial to use their competences or investments in more suitable industries (Burgelman, 1994).

2.6.4 Industry Regulation and Policy Networks

Having focused upon how technology has the potential to shape the evolution of an industry the chapter now proceeds to review the role of government policy, in particular regulation. The extent to which government policy changes have influenced firms has been debated in the academic literature. Chandler (1962:384) in his seminal work on the development of large business corporations in the United States, suggested that public policy issues had substantially less impact on major firms than "the market, the nature of their resources, and their entrepreneurial talents." In contrast Ansoff (1984), whose work covered a later period, suggested that socio-political issues had increasingly

impacted on the decisions of firms, giving managers progressively less freedom in their decision-making. It has been suggested that because governments placed emphasis in the policy making process on the short-term attainment of political goals, this had made the formulation and realisation of long-term strategies for firms more complex and difficult.

Pressure for changes in regulatory regimes have increasingly been the result of action taken at the European level (Majone, 1994). Rhodes (1999) argued that this delegation of functions away from central national governments, together with increased control of certain activities by the European Union, meant that the central core of national governments was effectively facing a reduction in control over matters relating to policy implementation.

Regulation is also being increasingly influenced at the global level due to factors such as the establishment and power of regulatory bodies such as the World Trade Organisation (WTO). There has been an increase in the number and power of multi-national corporations and 'stateless' organisations who are able to exert increased influence on policy decisions (Grant, 1993). Smith (1999) makes a cautionary note that although international factors may affect the natural policy process it is national factors which are more likely to influence policy decisions. For example, governments may undertake policies to protect the competitiveness of national industrial champions (Jones and Cockerill, 1984).

Majone (1994:81) discussing the role of regulatory agencies in Europe, suggested that regulation was more than legislation, and therefore "it requires detailed knowledge of, and intimate involvement with, the regulated activity". This, therefore, suggests that it is mutually beneficial for policy decision makers, including regulatory bodies, to interact with the various interested parties. Network relationships can be interdependent as civil servants rely on information from interest groups such as technical input and statistical information. This is an exchange process as government officials can gain information which will, for example, support arguments where departmental objectives are in conflict with those of another department (Grant, 1993). The information which has been gained from firms and trade associations helps to supplement the information that

government collects from other sources and helps officials to reduce errors made in the policy process.

The interactions of influencers upon policy decisions have been described as 'webs of influence' (Braithwaite and Drahos, 2000) or 'policy networks' (Rhodes, 1999). The main thrust of the concept of policy networks is that there are groups that interact in order to influence and direct the policy decisions made by the Core Executive on a specific area of policy. Interest groups tend to be a formalised representation of actors who seek to influence and direct how government designs and implements its policies. These can include formal coalitions such as trade associations which represent the views of an industry or specific sector and trade unions which represent certain sectors of employees. It can also include individual firms, societies and religious organisations (Greenwood and Thomas, 1998; Grant, 2000). A major strength of interest groups can be in how they develop relationships with government departments and thus have the ability to influence and steer policy decisions away from the control of the Minister and the Core Executive (Smith, 1999). It should be noted, however, that this concept has been criticised for not appearing to consider what Majone (1994) refers to as the traits of secrecy that can still surround the policy making process.

The application of network theory helps in the identification and understanding of the various interdependent relationships of the different actors who can exert power and influence over policy making and regulation. Early research into networks was criticised because it was descriptive and did not explore the dynamics of change (Dowding, 1995). However, later research highlighted how the various groups evolve over time, re-grouping and re-forming as differing needs change (Nunan, 1999). This may involve different levels of power within the network, and its membership and structure may differ dependent upon the specific policy issue (Rhodes, 1999). Rhodes (1999) also suggested that some professional networks are limited to the specialists operating within them. He cited the NHS as a classic example of this because of its self-contained nature, but the sector has changed as governments have moved towards introducing a management culture with an increased focus on cost control (Rhodes, 1999). This helps to explain why there has been a growth in policy networks as managers operating in the new public sector need to share responsibility and gain

knowledge from those who may be able to help them achieve their objectives (Atkinson and Coleman, 1992).

Interest groups can have competing interests and the efforts of one can cancel out those of another. For example, where there have been food scares, those representing members of the public concerned about safety have competed against those representing producers whose prime concern has been business objectives. Even though the public will represent a larger number the producers' representative would normally be in a position to exert greater political influence (Pilkington, 1998). However, in recent years there have been occasions when the industry position has been weakened as the media has influenced public concern by promoting the interests of consumers. Again, this is illustrated by the food safety issue when the normally close community of industry and civil servants has been forced into the open by the media so that public opinion has influenced policy decisions from a stronger position than on other, less media friendly, issues (Grant, 1993).

2.6.5 Industry Concentration

Microeconomics suggests that industry types can be classified into four kinds based upon the number of organisations in the industry (Jones and Cockerill, 1984). These are perfect competition, monopolistic competition, oligopoly and monopoly. The implication is that the greater the industry concentration the less competitive it is. There are various ways of measuring concentration but essentially it is concerned with the amount of market share held by organisations and sometimes the number of organisations operating in an industry. The difference in size of organisations in an industry can affect how they behave (Jones and Cockerill, 1984). Firm size can be measured by factors such as number of employees, capital employed and turnover. Different measures of size can be more appropriate to different industries. Firms in a fragmented industry can potentially make strategic choices that move the industry towards consolidation and thus increased concentration (Porter, 1980). But, as Lawrence (2002) suggested, industries are becoming increasingly concentrated.

One of the ways in which firms in a fragmented industry can work to increase market power is through merger and acquisition activity within an industry (Porter, 1980). This

decreases the number of firms and increases the size and power of those involved in mergers and acquisitions. Firms also have the ability to shape the globalisation of an industry. It has been argued that industry concentration and internationalisation, which have been partially driven by increasing financial concentration, lead to the globalisation of industries (Chesnais, 1993). Several other factors that have been discussed so far in this literature review have also contributed to industry globalisation. These are the globalisation of regulation, the evolution of multinational corporations, emerging technologies, cross border strategic alliances, merger and acquisition activity and new forms of global communication such as the world wide web (Chesnais, 1993; Braithwaite and Drahos, 2000; Tolentino, 2000). One important aspect of industry consolidation is that incumbent firms face different strategic outcomes as the number of firms reduces. This is discussed in Section 2.7.3.

Another important factor that needs to be considered in relation to industry evolution is the impact of environmental discontinuities. Although firms may make strategic choices in order to achieve competitive advantage, a major environmental discontinuity that alters an industry's structure can severely reduce the impact of any competitive advantage (Barney, 1991; Porter, 1996). The suggestion is that factors impacting upon an industry can be so severe that they create an environmental discontinuity (a sharp break in the operating environment). These factors can result from competitive actions such as new technology developments, price wars, major economic changes, or government actions such as deregulation and privatisation (Strebel, 1990; Smith *et al.*,1999). The resulting discontinuities can potentially erase an incumbent firm's source of competitive advantage, necessitating the identification and development of other sources in order to sustain competitive advantage in the newly defined industry (Barney, 1991).

It may be in the interests of incumbent organisations to trigger the major discontinuity, for example if they have developed a suitable product or competence enhancing technology (Strebel, 1992). But, as Strebel acknowledged, major discontinuities are increasingly out of the control of individual organisations. However, Smith *et al.* (1999) argued that environmental discontinuities such as deregulation do not suddenly present themselves to organisations without any warning. It is suggested that there are signs of potential change such as deregulation creating a time lag between the potential

discontinuity and its impact thus allowing the firm sufficient time to take pre-emptive action (Strebel, 1990; Smith *et al.*, 1999). For example with regard to public policy decisions it has been argued that organisations can be very influential in shaping policy decisions before they are implemented through involvement in policy networks (Nunan, 1999; Rhodes, 1999).

Tushman *et al.*(1986) have argued that those organisations that continued to be successful after a major environmental change or discontinuity are those that swiftly, almost simultaneously, undertake strategic reorientation in all areas in order to realign the business with the new environment. However, Dean *et al.* (1999) disagreed with this view, arguing that organisations should only undertake punctuated change programmes if incremental programmes have failed to realign the organisation with its environment. Miller and Friesen (1980) conducted a study investigating change in 26 companies including the Ford Motor Company and The Singer Company. Overall they found that although organisations undertook frequent incremental change, complete reorientations were sporadic. Whatever the arguments as to how swiftly internal change programmes should be undertaken other researchers have found that unless changes in the external environment were particularly significant, possibly leading the organisation to a crisis situation, the majority of companies would be slow in realigning their strategies with the changed environment (Chandler, 1962; Miller and Friesen, 1980; Grant and Cibin, 1996; Viney, 2001). Having reviewed factors in the external environment that have the potential to shape strategy evolution, factors in the internal environment will now be explored.

2.7 The Internal Environment

2.7.1 Internal Activities and Resources

The strategies that are realised do not fully explain the origins of competitive advantage. In order to understand the factors that underpin these strategies it has been argued that the internal sources of competitive advantage need to be understood. These can include the internal resources of the firm (Penrose, 1959; Barney, 1991), core competences (Hamel and Prahalad, 1990), dynamic capabilities (Teece and Pisano, 1994) and the

ability to learn (Bogner *et al.*, 1999). But in order to understand how these evolve into sources of competitive advantage it is necessary to understand the activities (Porter, 1985) or actions that are implemented and precede the achievement of competitive advantage. In other words it is necessary to understand how each of these factors interact in order to understand the unique process that each firm implements to realise the strategies that lead to competitive advantage.

A large body of literature has developed during the past twenty years relating to how a firm's internal resources, capabilities and activities can be the source of sustainable competitive advantage (Porter, 1985; Hamel and Prahalad, 1990; Barney, 1991; Teece and Pisano, 1994; Bogner *et al.*, 1999). Rather than focusing upon industry positioning in order to achieve competitive advantage proponents of the resource-based view argued that it is how an organisation develops its internal resources, capabilities and competences in a unique way that leads to the achievement of competitive advantage (Barney, 1991). Hoskisson *et al.* (1999) suggested that the literature about how firms can use internal resources to create competitive advantage has its foundations in the work of Penrose (1959) and has been termed as the Resource Based View (RBV) (Barney, 1991).

Bogner *et al.* (1998) proposed that the strategic group and resource based perspectives have parallels in terms of origin and concept development. For example, two of the main RBV proponents (Penrose, 1959; Barney, 1991; 2001) and the main champion of the industry positioning concept, who has also promoted the strategic group concept (Porter, 1979;1996) have similar perspectives about the importance of internal activities. They stress that it is the way in which an organisation develops resources or assets, skills, capabilities and competences into unique packages that enables it to achieve competitive advantage (Penrose, 1959; Barney, 1991; Porter, 1996). In order for competitive advantage to be sustainable, strategy must be value adding so that activities cannot be easily imitated (Barney, 1991; Porter, 1996).

One way in which advantage can be created from internal resources is through the development of core competences which have been referred to as the collective learning of the organisation (Hamel and Prahalad, 1990). It is argued that by identifying how it can develop distinctive competences or capabilities i.e. those competences that cannot

be copied by other organisations, an organisation can achieve competitive advantage (Hamel and Prahalad, 1990; Teece and Pisano, 1994; Bogner *et al.*, 1999). The key to these distinctive competences results from the unique way that an organisation bundles together its resources, together with a level of organisational learning that is sufficient to keep competences distinct in changing environments (Bogner *et al.*,1999) which Teece and Pisano (1994) classed as dynamic capabilities. Eisenhardt and Tabrizi (1995) argued that fast new product development is a strategic competence that allows organisations to adapt to rapidly changing environments. This concept of time-based strategies suggests that the faster an organisation carries out certain activities (such as bringing new products to market) the better it is able to achieve competitive advantage.

Both Porter (1996) and Stalk *et al.* (1992) argued that time-based strategies, such as rapid new product development, are only subsets of what they term as the need for organisations to develop strategic capabilities. They argued that in addition to speed, organisations need to consistently produce goods that satisfy customers, be able to clearly understand the changing competitive environment, be able to deal with the differing needs of multiple markets and to be innovative both in terms of product development and processes. Porter (1996) also emphasised the need to focus upon the interdependence of the pieces (e.g. core competences, key resources, value adding activities) and how they fit together in a way that is consistent with the overall strategy in order to create sustainable competitive advantage. Success is dependent upon the synergy created from the individual parts resulting from the system of integrating all of the activities (Porter, 1996). But, Porter also argued, this needed to be combined with an ability to adopt a strategic position in an industry that could be developed and defended over a timeframe in excess of ten years, rather that the short-term approaches advocated by proponents of time-based competition.

Mintzberg and Lampel (1999) criticised Porter (1996) for ignoring the need for strategic learning. A lack of learning can lead to the risk of management continually making the same mistakes. This suggests that unless barriers to learning are overcome firms may never be able to achieve sustainable competitive advantage. Top management can develop distinctive core competences by exploring linkages through the organisation that when combined provide a unique advantage to the business, the focus being upon the collective learning of the organisation (Hamel and Prahalad, 1990; Burgelman,

1994; Bogner *et al.*, 1999) which is similar to Mintzberg's (1994) view that the sharing of ideas can lead to the development of entrepreneurial strategies.

In addition to the views discussed so far, Lindley and Wheeler (2000:361) stressed the need for goals to be "multidimensional" i.e. referenced to external, internal and time-related factors. Bogner *et al.* (1998) proposed that learning at the management level was a key to sustaining competitive advantage. Referring back to Penrose (1959) there are some differences in her original work from those suggested above. Instead of learning she spoke about the collective experience of the managerial team, and so although the focus is on collective learning she did not necessarily consider the benefits of collective learning throughout the organisation. Penrose (1959) stressed that it is not the resources themselves which are the important factor but the output from the resources i.e. the services that they provide which make an organisation unique and provide it with competitive advantage.

2.7.2 Internal Threats to Survival and the Achievement of Competitive Advantage

It has been argued that it is the dynamic interrelationships between internal and external environments that persuades organisations to respond to change (Ghobadian *et al.*,1997). Hamel and Prahalad (1993) suggest that organisations in which managers are focused upon achieving success over more powerful rivals are able to achieve success by thinking outside the normal mindset of what is achievable. The desire to succeed motivates them to stretch resource capabilities to their maximum capacity in order to outpace the strategies of competing firms (Hamel and Prahalad, 1993). But not all firms are able to incorporate this type of thinking. For example, in a study of the oil majors Grant and Cibin (1996) found that most major organisations did not undergo strategic reorientation until 10 years after the 1974 oil crisis and that the trigger to this change was declining profitability. For this reason this section continues the review with a focus upon internal threats to survival and the achievement of competitive advantage.

Despite being an advocate of strategic choice, Porter (1996) emphasised that the greatest threat to the achievement of competitive advantage comes from within the organisation itself. The strategic choice literature has tended to assume that firms will maximise their strengths and opportunities in order to achieve competitive advantage in

order to maximise profits. For example, Porter (1980;1985;1996) and Hamel (1996) are very prescriptive about strategy formulation and implementation and their views appear to be based upon the assumption that firms want to profit maximise. Economic theory has suggested that the primary objective of organisations is to maximise profit (Penrose, 1959; Porter, 1980) although others have argued that this hypothesis is not always true (Ansoff, 1968; Scherer, 1980). Penrose (1959) argued that managers are motivated to maximise profits because they receive benefits such as increased status and promotion as a result of profits being reinvested back in to the organisation which lead to increased growth. Profit or wealth maximisation will also be the goal of the majority of stockholders (Hill and Snell, 1988).

Greer and Hoggett (1999:239) defined strategy in the following terms:

> *"an organisation is concerned with strategy whenever it pursues courses of action which are either means towards the organisation's survival and/or growth or towards the private advantage of organisational actors."*

Greer and Hoggett's (1999) definition raises the question of whose goals strategy is trying to achieve – whether it is those of the organisation or of the individual actors. To explore this in more detail it is necessary to refer to organisational behaviour and organisation theory literature which focuses upon the behaviour of people in an organisation rather than considering it as a rational economic entity. An organisation is reliant upon directors and managers which can be considered as a collective coalition to move the organisation towards its goals. It is managerial actions within the organisation rather than the market that it operates in that affect organisation profitability (Cohen and Cyert, 1975; Amel and Froeb, 1991). Organisational ecology literature suggests that managers may not always be working towards the pursuit of goals such as profit maximisation but, rather, the main focus is upon making life easier for organisational members. Hence it is suggested that each manager has his/her own goals and that they are not necessarily the same as those of the organisation (Hannan and Carroll, 1995). It has also been suggested that there is a frequent trade-off between the achievement of organisational goals and those of the individual, for example, to gain resources for a department irrespective of the cost implication for the organisation (Cohen and Cyert, 1975).

There are various other internal factors which can weaken a firm's ability to compete in its external environment. Management teams benefit from the collective experience of working together in the same situation (Penrose, 1959) and these cognitive thoughts may be framed with reference to their beliefs of what is and is not achievable (Hamel and Prahalad, 1993). Managers have perceptions or an 'image' (Penrose, 1959:42) of how the internal and external environments can impact upon the organisation. They use these perceptions in order to decide how to make changes that will lead to profit maximisation (Penrose, 1959). However, perception is not necessarily the same as reality and this can affect how managers respond to changing situations (Smart and Vertinsky, 1984). Jarzabkowski (2001) argued that it is how the organisation internally views itself that provides its strategic orientation, an intangible framework of how decisions should be made and how it should react to change. This orientation explains why some organisations are entrepreneurial, attempting to break into new areas and realise unique strategies (Mintzberg, 1987) and why others appear unable to react to major changes until a crisis situation is reached (Leavy, 1997). It may also affect the degree of management control exerted in the realisation of strategies (Kald *et al.*, 2000).

Analoui and Karami's (2002) study of Small and Medium Sized Enterprises (SMEs) found that those that were successful undertook environmental scanning as part of the strategy process. However, strategic inertia may be a barrier to an organisation's recognition of the need to develop strategies to adapt to the changing environments (Miller and Chen, 1994; Leavy, 1997). Possible causes of inertia can include the structure of the organisation being too bureaucratic and/or large for change to be easily implemented. Child (1977) argued that large organisations with bureaucratic mechanistic structures in particular may need to change their structures in order to be able to adapt more easily and quickly to environmental cues about change. The emphasis being that the structure should be conducive to the organisation being able to respond quickly to environmental cues (Child, 1977). Hannan and Freeman (1997) suggested that firms could be dominated by a culture that felt change was unnecessary because they had been successful in the past.

In addition to inertia, major changes in the environment mean that a management team cannot plan or make decisions based upon previous experience, and may be unable to

change as a result of institutionalisation because they are committed to previous plans even if they are no longer appropriate (Pfeffer, 1981; Kald *et al.*, 2000). There may also be a failure in the ability of managers to either recognise or correctly define problems as a result of their misinterpreting cues from the environment (Kiesler and Sproull, 1982) and how they perceive the environment (Smart and Vertinsky, 1984). It has also been suggested that middle management, when picking up on cues from a changing external environment may choose to act in a way that is not consistent with the corporate strategy, but that it is important for them to identify when is the correct time to realign the official strategy with the strategic actions that have been undertaken (Burgelman,1994).

2.7.3 Strategic Outcomes

As has been discussed in this chapter so far there are various factors that can affect the strategy process in a firm and its ability to achieve competitive advantage. During this process some firms will fail to survive and others will change their organisational form, for example as a result of merger and acquisition activity. The term 'strategic outcome' is used to define how firms can either exit an industry or evolve into a different species. Population ecologists focus upon a type of strategic outcome in their studies of births, deaths and transformations but there are three weaknesses in their approach. Firstly, as they were tracking these for a complete industry or population from the start of its life it was rarely feasible to provide depth to the factors that had caused these beginning and ending events (Davis, 1996). This suggests that the lack of depth meant that it was not feasible to track and identify the realised strategies that preceded each of the events. Secondly, with the exception of birth the focus appears to upon ending events, for example disbanding, acquisition, merger, exit to another industry, nationalisation and being taken over by creditors (Carroll and Hannan, 2000). What is argued in this thesis is that there is a need for a more fine grained approach to understanding the strategic outcomes of firms in an industry than those used by population ecologists if we are to understand the strategy process and how it relates to strategic outcomes. Table 2.1 lists a number of strategic outcomes that it is felt should be identified if a study of changes in industry structure and firm strategies is to be understood in more detail than previous studies have allowed. In the majority of these cases strategic outcomes could also be classified as strategic actions.

Table 2.1 Selected Strategic Outcomes

Strategic Outcome	References
Strategic exit from an industry	Burgelman (1994), Carroll and Hannan (2000)
Acquired by creditors, disbanded or liquidated	Glueck (1976), Carroll and Hannan (2000)
Acquired by another firm	Carroll and Hannan (2000)
Merged	Carroll and Hannan (2000)
Survived in the industry without being acquired or merged	Chandler (1962), Jones and Womack (1986), Grant and Cibin (1996)
Divested or demerged	Glueck (1976)
Privatised	Dean *et al.* (1999), Ghobadian and Viney (2001), Viney (2001)

Source: Compiled by the author

Strategic outcomes relate to discontinuities in the firm's activities. Firms enter and strategically exit industries, they merge or make acquisitions, are acquired, firms survive without being acquired, they can be privatised and they can also be liquidated. So, for example, if a firm is merged it has changed its form and as a process of further mergers continue there may be no links left that relate it to its original form (Carroll and Hannan, 2000).

These strategic outcomes can be related back to Glueck's (1976) grand master strategies of growth, combination, stability and retrenchment. Although Glueck (1976) classified retrenchment through, for example, liquidation of a business, as the least popular strategic choice it was still a strategic action chosen by the firm rather than externally decided by the environment. In other words, strategic outcomes such as liquidation of a business are not necessarily negative but may form part of an overall plan. However, the literature has failed to identify how the strategies that have evolved during a period of industry evolution differ dependent upon the strategic outcome of a heterogeneous set of firms. If a firm is entering into a merger or making acquisitions it can be classified under Glueck's (1976) strategic choice of growth as it will increase the size of the organisation.

2.8 Evolutionary Theory, Strategic Choice and Environmental Determinism

Evolutionary theory has its roots in the field of biology where the emphasis is upon how species evolve and how a process of natural selection occurs with the environment selecting which species will survive and which will die (Nelson and Winter, 1982; Henderson, 1989; Hodgson, 1995). The theory, which Lynch (1997) termed as survivor theory, underpins the concepts of incremental and emergent strategies (Lynch, 1997; Mintzberg *et al.*, 1998) and strategic choice (Child, 1995). The prescriptive views about strategy development (Ansoff, 1968; Hamel, 1996; Porter, 1996) strongly advocate that the firm has the ability to make strategic choices. These views focus upon learning from changes that are taking place in the environment and adapting strategies in order to maintain strategic fit. A major debate in the literature is the extent to which it is the strategic choices that are made or the environment which determines the fate of an organisation. Astley and Van de Ven (1983:247) summarised these opposing perspectives as:

- The natural selection view which was classified at the macro level (i.e. the industry), with the environment determining firm actions. This is underpinned by the literature relating to population ecology and industrial economics.

- The strategic choice perspective of strategic management which was classified as residing at the micro level with a voluntaristic orientation.

The theory of natural selection proposes that the fate of the organisation is determined by the environment, 'environmental determinism', rather than purely the strategic choices made by the organisation. (Astley and Van de Ven, 1983; Hrebiniak and Joyce, 1985). Although Child (1995:2) argued that proponents of environmental determinism supported an "essentially mechanistic paradigm" whilst strategic choice was closely related to concepts of organisational evolution. Henderson (1989:139), drew upon ecology theory relating to "Gause's Principle of Competition" and argued that firms (the species) in the same environment, in this situation an industry, need to differentiate themselves in order to survive and achieve advantage over competitors. The biological perspective of evolutionary theory proposed that species fight to seek competitive advantage in their environment in order to survive because there is only limited room

and so all of the species cannot be accommodated. Different species emerge with some replacing the former incumbents, a process of natural selection (Henderson, 1989).

Firms compete with each other, not just for sales but for resources as well. Few organisations are self sufficient with regard to resources and it is argued that the organisation is reliant upon other organisations and institutions to acquire the necessary resources (Pfeffer and Salancik, 1978). The population ecology perspective suggests that if firms are competing for scarce resources not all will be able to access sufficient resources and therefore cannot survive (Hannan and Freeman, 1977). Therefore an organisation is reliant upon successful interactions with both suppliers and buyers in order to survive, as well as the extent to which rivals are trying to access either of these. Organisations that do not develop appropriate strategies enabling them to adapt to changing environments risk being selected out, in other words they fail to survive (Carroll and Hannan, 1995). Hannan and Freeman (1997) argued that because organisations are unable to undertake the necessary changes it is the environment that selects which organisations will be successful and which will fail. The issue of dependence upon resources and processes of natural selection underpin evolutionary theory and the related resource-based theories of the firm (Nelson and Winter, 1982; Hodgson, 1995). Hannan and Freeman (1997:201) further argued that during industry evolution medium-sized companies can become 'trapped' as they seek to develop strategies to fend off large organisations. The position of these middle-sized companies is subsequently weakened, leading to them being unable to survive. They suggest that small organisations do not face the same problems because they are not being subjected to the same competitive threats from the large organisations.

The important issue appears to be that adaptation is a continual and complex process that results from a variety of internal and external forces exerting pressure on the organisation (Astley and Van de Ven, 1983). Hrebiniak and Joyce (1985) proposed that approaches to firm adaptation could not be illustrated by these two opposing views but, instead, that adaptation should be viewed as a continuum that influences the strategic options available to firms. In other words, that neither is mutually exclusive.

2.9 Coevolution as a Theoretical Lens

As has been discussed there are various interpretations of what is meant by the term strategy. In this review strategy has been explored as a process that could be planned, incremental, revolutionary or emergent. Both Porter (1996) and Hamel (1996) argued that firms have complete freedom of choice in how they implement and formulate strategies that will lead to the achievement of competitive advantage, as long as they follow certain prescribed guidelines. Porter (1996) prescribed a long-term strategic approach whilst Hamel (1996) focused upon ignoring existing industry rules. In comparison, proponents of emergent (Mintzberg,1987;1994) and incremental strategy (Lindblom, 1959; Quinn, 1991; Lindblom, 1979) have proposed that strategies need to be frequently redefined in order to take advantage of opportunities and maintain strategic fit with the external environment. Evolutionary theory underpins the concepts of incremental and emergent strategies, with the suggestion that firms can adapt their strategies in light of changes as they arise. Strategy evolutionists, such as Barnett and Burgelman (1996), proposed that strategy research should focus upon the strategies that have been realised and how they evolved, rather than being prescriptive about how strategies should be implemented.

In this chapter focus has been given to the different aspects of evolutionary theory; in particular, relating them to issues of strategic choice, environmental determinism and industry evolution. When discussing the debates in organisation theory that focused upon strategic choice and environmental determinism, Astley and Van de Ven (1983) suggested that future research could result in identifying that firms are both proactive and reactive in adapting to the environment. In other words instead of focusing upon defending different schools of strategic choice and environmental determinism, a unifying theory should be adopted in order to understand this process. As already discussed in this chapter, both the strategic choice and environmental determinism perspectives are underpinned by evolutionary theory. In particular, this literature review has explored interacting factors such as firm strategies, technology, regulation and changing industry structures (concentration and globalisation). As these reach different stages of their lifecycles at different times how these factors interact today is linked to the history of each, the actions and processes that occurred in the past (Nelson and

Winter, 1982). But, as each factor evolves in its own way, it is difficult to identify how the paths will cross over to impact upon the present, making analysis a complex process.

Evolutionary theory has been criticised by Child (1995:21) for not considering the "actors within the firm" and therefore ignores the processes that lead to firm outcomes. But Child's (1995) emphasis upon internal political issues limits his consideration of the actions of external actors in competing firms. For example, SGA has identified how firms have followed the strategies of those they consider to be competitors. As has been shown industry evolution results from changing factors such as technology, regulation, concentration and globalisation. Each of these factors can be influenced and shaped by the conduct of firms. Coevolution theory has been developed in the ecology literature which has proposed that competing species interact and shape each others' development, and that this in turn this can potentially shape the community structure (Futuyma and Slatkin,1983). Coevolution theory has underpinned an emerging number of papers in the management and strategy literature. This area of research has covered a number of topics including coevolution theory in relation to changes in organisational form (Djelic and Ainamo, 1999; Lewin and Volberda, 1999; Lampel and Shamsie, 2003), patterns of coevolution between the environment and firms' strategies (Carney and Gedajlovic, 2002), the coevolution of a specific network with its environment (Koza and Lewin, 1999) and processes of coevolution with regard to strategic renewal actions, regulatory and technological change (Flier *et al.*, 2003). It can therefore be said that the conduct of firms coevolves with changes in industry evolution. In addition, as was discussed, firms enter into network agreements with partners and it has been argued these strategic alliances also coevolve (Koza and Lewin, 1998). The literature on competitive dynamics has proposed that "actions triggered by one firm may trigger a series of actions among the competing firms" (Hoskisson *et al.*,1999:428). In other words, firm strategies may coevolve with those of competing firms and the industry structure. This thesis therefore adopts the proposal of Lewin and Volberda (1999) that coevolution provides a theoretical lens that will unify studies into understanding processes of adaptation and determinism.

2.10 Chapter Summary

It has been argued that, in order to contribute to our understanding of how strategies are realised, it is necessary to understand that various endogenous and exogenous factors can influence the strategy process. From the literature reviewed in this chapter it is concluded that firms should strive to achieve strategic fit with their environment. Yet, as the literature review has shown there are a variety of evolving factors that mean that the ability of the firm to forecast how the environment will change is limited. Examples of factors shaping the industry structure that can impact upon a firm's strategies include technology, regulation and globalisation. Like the moves on a chess board each action that is undertaken can potentially impact upon a competitor's next move.

Henderson (1989) proposed that all firms seek to differentiate themselves in order to achieve competitive advantage. But various endogenous factors, such as inertia and management perceptions can limit or prevent the ability of an organisation to profit maximise and achieve competitive advantage. All of these factors have their own evolutionary processes making it extremely difficult, if not impossible, to forecast how they will coevolve with each other, and the subsequent impact upon each individual firm.

This may explain why sustainable competitive advantage is such an elusive objective for most firms. As this chapter has shown exogenous factors can be influenced by firms. For example, they can introduce new technology that is competence destroying for other firms or they can form policy networks in order to exert influence on political decisions. Internationalisation strategies can lead to industry globalisation as more firms need to act globally. Similarly merger and acquisition activity can lead to industry consolidation and policy networks can seek to shape the policy decisions that affect other firms.

There have been few longitudinal studies that have tracked industry and individual firm strategy evolution simultaneously (Lewin and Volberda, 1999). In addition, studies into the coevolution of firm strategies have tended to focus upon a narrow area of strategic activity, such as strategic alliances (Koza and Lewin, 1998, 1999) and no papers were

identified that explored these processes for firms in the same industry that arrived at different strategic outcomes. Therefore, a contribution to the gap in the literature could be made by using the theoretical lens of coevolution in order to identify how strategies can coevolve with a particular emphasis upon strategic outcomes. In order to explore this further it is felt necessary to identify an industry which met certain criteria in order to provide a suitable context for studying this phenomena. The criteria were that:

- The industry structure needed to have undergone significant structural change so that relationships between industry evolution and firm strategies can be identified.

- The changes in structure needed to be those that could be related to specific types of strategy, such as merger and acquisition activity.

- The firms in the industry needed to have implemented a variety of different strategies so that strategic actions could be identified for each firm and then compared with those of other firms. This would allow for empirical research to identify how the strategies had coevolved.

- The firms in the industry needed to have arrived at a variety of different strategic outcomes. This meant that the empirical research could focus upon how the strategies had coevolved for a heterogeneous sample of firms rather than assuming that they were all homogeneous.

In the next chapter it is explained how the pharmaceutical industry provides an appropriate context for meeting the above criteria.

CHAPTER THREE
THE PHARMACEUTICAL INDUSTRY

3.1 Introduction

The purpose of Chapter Three is to explain the reasons why the pharmaceutical industry provides an appropriate context for exploring how strategies and strategic actions evolve and coevolve. As the following review shows, the industry has undergone significant changes as a result of technology evolution, regulatory changes and globalisation. The result has been that the industry has evolved from being a fragmented industry to a global oligopoly (Jones and Cockerill, 1984; Kettler, 2001a). This chapter provides a history that explains how the industry has evolved since its inception in the 17th Century through to the early 21st Century. This includes a review of how firms have pioneered new technologies and entered into cooperative strategies to exploit them. It also reviews realised pharmaceutical firm strategies that have lead to industry globalisation and consolidation and the resulting range of different strategic outcomes that firms have arrived at. Other strategies that have been implemented by incumbent firms are also discussed in order to illustrate the range of strategic choices that are available to firms in the pharmaceutical industry.

3.2 An Overview of the Pharmaceutical Industry

The pharmaceutical industry is technology intensive and it has been argued that product innovation is the key to competitive success for its firms (Kettler, 1998; Kurdas, 1998). Various Research & Development (R&D) strategies have been identified in the industry including a bias towards the development of minor local products (Thomas III, 1996), 'me-too' R&D strategies (Kettler, 1998) and focusing efforts upon therapeutic classes that were not being sufficiently targeted (Taggart, 1993).

The pharmaceutical R&D process incurs high costs coupled with a high risk of failure meaning that many lead drug candidates are not successfully developed or

commercialised (Kettler, 1998; Cunningham, 2001; Orsenigo *et al.*, 2001). The drug discovery process can be driven by factors such as government policy initiatives, scientific breakthroughs and the commercial exploitation of new technologies (Kettler, 1998). The innovations that are successful can range from being blockbuster drugs to those that have been classed as 'me-toos' which are incremental developments of existing products. Due to the uncertainty in the R&D process it is usually not possible to identify which of these two categories new innovations will fall into (Kettler, 1998). Even when a product has passed through the various regulatory stages relating to safety, efficacy and quality and it has been brought to market it may still have to be recalled due to unexpected problems (Taggart, 1993; Bhandari *et al.*, 1999). It has been estimated that the lead time from the discovery of a new compound to its commercialisation as an approved new drug takes an average of 15.3 years (Heracleous and Murray, 2001), although this figure is open to debate. Despite several periods of change in the technological trajectory the industry has been characterised by the longevity and success of established pharmaceutical firms in areas such as size of market share and the ability to bring new products to market. Some of these have survived more than one hundred years despite the introduction of pioneering technologies by potential new entrants (Kurdas, 1998).

The pharmaceutical industry has a history of being relatively unconcentrated with a large number of organisations involved in R&D (Jones and Cockerill, 1984; Grabowski and Vernon, 1994; Matraves, 1999). Based upon data from the 1980s the industry was described as fast-growing with the market being structured in a way that enabled oligopolies to exist in many sub markets as firms competed on the basis of drugs for treating specific illness (Jones and Cockerill, 1984; Taggart, 1993). Matraves (1999:191) identified the main pharmaceutical therapeutic markets. These are shown in Table 3.1.

Table 3.1 Therapeutic Classes Served by the Pharmaceutical Industry

Therapeutic Class	Drug Treatments and Illnesses
Cardiovascular	Anti-coagulants, haemophilia, beta-blockers, diuretics, hypertension, cholesterol reducers
Respiratory system	Anti-histamines, asthma, cough medicines, bronchitis, cystic fibrosis
Anti-infectives	Antibiotics, antimalarial, anti-virals, vaccines, AIDS
Pain control	Analgesics, anaesthetics, anti-arthritics, anti-gout, migraine, bone products (for rheumatism etc)
Internal medicine	Antacids, anti-nauseants, contraceptives, enzymes, hormones, laxatives, digestants, anti-ulcerants, immuno-suppressants, anti-obesity
Mental Health/CNS	Anti-convulsants, sedatives, Parkinson's disease, Alzheimer's , anti-depressants, multiple sclerosis
Topical	Dermatologicals, haemorrhoids, feminine hygiene preparations, ophthalmic
Cancer Therapy	Cancer therapy (oncology), anti-emesis in cancer treatment
Miscellaneous	Nutrients, vitamins, diabetes, diagnostics

Source: Matraves (1999:191)

For example, both Lilly and Aventis produce insulin to treat diabetes. At this market level neither firm would necessarily compete with the manufacturer of cardiovascular drugs. However, Scherer (1996b:270) argued that monopolies did exist as "drug companies seek and win dominant positions in new therapies". As will be discussed later, the pharmaceutical industry entered a period of consolidation at the end of the 1980s, largely as a result of increased merger and acquisition activity. This was accompanied by increasing moves toward the global harmonisation of pharmaceutical regulation and the industry has become a global oligopoly (Matraves, 1999; Kettler, 2001a).

Rogowsky (1996) commented that the competitive success of pharmaceutical firms was not just driven by the external factors such as government policy, which all firms face, but also by internal factors such as the entrepreneurial nature of those directing the firm. He argued that it was not just the creativity of the scientists that was important to the success of firms, but also the commercial focus of the organisation as it seeks to carve out a competitive niche in the global pharmaceutical industry. In recent times pharmaceutical firms have developed strengths in areas such as competences based around the R&D process, as well as in external relationships through the formation of networks (Bower, 1993; Henderson and Cockburn, 1994; Kettler, 1998). This chapter

continues by focusing on specific factors that have impacted upon the evolution of the pharmaceutical industry, and reviews the strategic choices available to incumbent firms.

3.3 Technological Trajectories Prior to the 1970s Biotechnology Revolution

The origins of the pharmaceutical industry can be traced back to the 17th Century when apothecaries were responsible for making and dispensing different medicines. The process became more refined during the 18th Century due to advances in chemistry. In the 19th Century some apothecary retailers, for example Allen & Hanburys and Merck, diversified into becoming manufacturing chemists. In the following years there were two main types of pharmaceutical product development. The traditional approach, used by apothecaries, was based upon extraction and purification techniques, which was the main approach adopted by US and British firms. The second was based upon a technique originally used by dyestuff manufacturers, known as synthetic organic chemistry, which was mainly pioneered by Swiss and German firms. This led to firms such as Hoechst and Bayer becoming new entrants to the pharmaceutical industry. The UK and US had been happy to import the drugs produced by German firms rather than develop their own, but they were forced to change this approach during the outbreak of World War I when they were cut off from the supply of German products (Owen 1999).

World War I resulted in two significant changes for the US and UK pharmaceutical industries. Firstly, governments recognised the need for the industry to develop its pharmaceutical capabilities. Secondly, at the end of the war assets that had belonged previously to German firms were sold to US firms and these helped to stimulate the domestic (US) pharmaceutical industry. The period of the First World War saw the development of sulphur drugs and penicillin. Although penicillin had been discovered by accident, the development of sulphur drugs (for example Prontosil by Bayer) demonstrated a move towards a focused and well organised drug development process (Owen, 1999). Following World War II the antibiotics revolution started, with the drug discovery process continuing to be based upon a trial and error approach (Kurdas, 1998). This was the main approach used until the biotechnology revolution of the 1970s.

3.4 1970s Onwards – the Biotechnology Revolution

A large proportion of pharmaceutical companies had traditionally been focused upon the development of 'chemical' pharmaceuticals and the industry had been defined as being part of the chemical industry (Bremner, 1992). This started to change in the mid-1970s with the start of the 'biotechnology revolution'(Pammolli and Riccaboni, 2001). The biotechnology revolution refers to what Walsh and Galimberti (1993:189) classed as "third generation" biotechnology. This resulted from the discovery of recombinant DNA in 1973 and its application to the genetic engineering of micro-organisms (Owen, 1999). This led to the application of biotechnology to the development of biological medicines. Biological medicines date back to the 17th Century and rather than being derived from chemicals are the product of living organisms such as plants (Morris, 2001). The introduction of biotechnology techniques led to the replacement of some traditional biological medicines. For example, animal insulin was replaced by the genetically modified human insulin[1] (Owen 1999, Morris 2001). The biotechnology revolution also led to the introduction of completely new products such as growth hormones (Morris, 2001). The development of biotechnology together with other technologies has also led to a more rational approach to the drug discovery process than the trial and error method previously used (Matraves, 1999; Ramani, 2002).

Dedicated Biotechnology Firms (DBFs) were the first to commercially exploit the third generation biotechnologies (Walsh and Galimberti, 1993). It had been assumed that firms pioneering the new technology would replace the incumbent chemical-based pharmaceutical firms (Owen, 1999), particularly as chemical processes were being increasingly replaced by biotechnology manufacturing techniques (Matraves, 1999). As discussed in Chapter Two (Section 2.6.3) technological changes can be either competence enhancing or competence destroying for incumbent organisations (Tushman and Anderson, 1986; Malerba and Orsenigo, 1996). It has been suggested that competence enhancing technologies are introduced by incumbent organisations whilst competence destroying technology is introduced by new organisations (Tushman and Anderson, 1986). It would appear that the introduction of biotechnology had the

[1] Although animal insulin has continued to be manufactured by pharmaceutical firms

potential to create a competence enhancing discontinuity for the pharmaceutical industry. However, it enabled incumbent firms to develop drugs that could not previously be made and to treat illnesses that were previously untreatable. Established pharmaceutical firms that had a long history of developing competences within the dominant design preceding this biotechnology revolution could have easily become locked into their established way of thinking and competences, leaving them unable to adapt to the new technology (Walsh and Galimberti, 1993). However, pharmaceutical firms have long histories surviving various changes in the past (Walsh and Galimberti, 1993). There is also debate with regard to how biotechnology and genetic engineering have been classified in the literature as either competence enhancing or competence destroying. This has led to a view that biotechnology was not the basis of a technological discontinuity. Instead it should be viewed as a technological trajectory that is only one of several technologies used by the pharmaceutical industry (McKelvey, 1996).

The introduction of biotechnology in the mid 1970s led to tentative strategies being undertaken by incumbent pharmaceutical firms in relation to the new technology. Bayer, for example, created a molecular biology group (Walsh and Galimberti, 1993). But the first main strategic thrust relating to biotechnology began in the early 1980s with incumbent pharmaceutical firms entering into alliances with the pioneers of biotechnology. This led to the development of symbiotic relationships in which biotechnology firms benefited from the strength of the pharmaceutical organisations in commercialising the new technologies. This allowed biotechnology firms to benefit from the pharmaceutical firms' existing networks, particularly their relationships with regulatory and licensing authorities (Walsh and Galimberti, 1993; Kurdas, 1998; Rothaermel, 2000). The trend of entering into network relationships extended into other areas and included R&D alliances, sharing competences to develop patents and licensing strategies. These are examples of the external network relationships that pharmaceutical firms entered into with the biotechnology pioneers (Taggart, 1993; Kettler, 2001b; Chiesa and Toletti, 2004). For example, Sandoz entered into research cooperation agreements in biotechnology, with firms such as Repligen and Amrad, and similarly in the area of genetic engineering with firms such as Genetic Therapy (Schmidt and Ruhli, 2002). There have been exceptions to biotechnology firms using network relationships as their main route to accessing the industry, with some

biotechnology firms, such as Amgen, developing themselves into fully-fledged pharmaceutical firms (Owen, 1999).

There was a change in the trend of cooperative relationships in the early 1990s as traditional pharmaceutical firms focused on developing in-house competences in biotechnology and as the industry saw the entry of a large number of small biotechnology organisations (Grabowski and Vernon, 1994; Kettler, 2001a). Until the early 1990s pharmaceuticals had been considered as a unique and fiercely protective industry. Until the arrival of biotechnology firms at the end of the 1980s there had been no new entrants to the industry for more than twenty years (Balance *et al.*, 1992). This signalled the start of a period of intense consolidation, which is discussed in the following section.

3.5 1980s Onwards – Towards Consolidation and International Harmonisation of Pharmaceutical Regulation

Jones and Cockerill (1984) described the pharmaceutical industry as highly fragmented. Taggart (1993) proposed that one of the reasons for this fragmentation was that because of the inherently volatile nature of the R&D process, few firms would contemplate taking the additional risks associated with merger and acquisition (M&A) activity. Consolidation of the larger pharmaceutical firms started in the late 1980s, with the formation of organisations such as SmithKline Beecham and Bristol Myers Squibb, and increased pace during the 1990s (Pursche, 1996; Matraves, 1999; Heracleous and Murray, 2001). This was followed by a number of 'megamergers' which resulted in the formation of firms such as GlaxoSmithKline and Novartis (Matraves, 1999; Schmidt and Ruhli, 2002) leading to "consolidation of firms at the top" (Matraves, 1999:188). In addition, as the biotechnology organisations have grown to medium size they have either been acquired by the larger organisations or ceased to survive (Kurdas 1998). This relates to the theory proposed by Hannan and Freeman (1997) that there is a limit to the growth potential of medium-sized organisations. This also appears to suggest that the pharmaceutical industry is heading towards bipolarisation, a trend Lawrence (2002), commenting upon studies by ESC Lyon, referred to as occurring in other industries such as brewing and publishing.

As has been discussed, the key to competitive success in the pharmaceutical industry is the ability to successfully innovate. Therefore access to new technologies and new successful products can improve the competitiveness of firms. Yet the ability to achieve this in-house, in an industry in which there is a high level of product failure, is limited. As a result firms may have weaknesses in their product line with gaps that need to be filled (Belcher and Nail, 2000; Henderson, 2000). Alongside the need to be innovative, pharmaceutical firms have been put under pressure as a result of healthcare reforms. These have included increasing costs of clinical trials and measures to reduce healthcare expenditure (Boscheck, 1996). This pressure on profits has been accompanied by a rise in price competition, particularly from generic manufacturers as patents expire. The industry faced a high level of patent expirations from 1992 through to the beginning of this century. Therefore incumbent firms needed to identify ways in which to reduce costs, strengthen the product pipeline and maximise revenue if they were to remain competitive. These appear to be the main factors that have driven the intense period of global industry consolidation that began in the early 1990s. Acquisition of biotechnology firms meant that the pharmaceutical firms were able to exploit the new technology in-house. There have also been increased competitive pressures at the global level and firms have sought to increase size in order to compete. Cross-border mergers and acquisitions gave firms the mass needed to compete at the global level, which was felt necessary as the industry evolved from being international to global. This in turn provided cost savings in areas such as marketing, and meant that products could be sold in countries where the patents had not yet expired. It has been proposed that the ability of a firm to be able to innovate is arguably increased by the size of the firm yet, Henderson (2000) argued that the larger pharmaceutical firms had exceeded the size where scale economies could be achieved.

3.6 Regulation of the Pharmaceutical Industry

As was suggested in the previous section, one of the factors that has potentially driven industry consolidation is the introduction of healthcare reforms to reduce government expenditure on pharmaceutical products. The pharmaceutical industry is strongly regulated, possibly more so than any other industry (Earl-Slater, 1993). Policy makers

have several roles to play with regard to the pharmaceutical industry. The purpose of this section is to provide an overall picture of regulatory changes that have potentially impacted upon the pharmaceutical markets where firms compete. Although there has been a move towards increased globalisation of regulation, national markets still tend to have some aspects of individuality. For example, unlike most other countries, the US Government had a long history of not regulating pharmaceutical prices (Green, 1997)[2]. For this reason the case of the UK has been adopted to explain some of the national aspects of regulation. The UK Government acts as a champion of the national industry in order to encourage its competitiveness (Kettler, 1998). The pharmaceutical industry can be very important to a nation's economy. For example in the UK, pharmaceuticals has consistently been one of the country's top three industries with regard to trade surplus. According to ABPI (2003) figures two UK companies, GlaxoSmithKline Beecham and AstraZeneca were in the top four global pharmaceutical companies in 2001, with a combined global share of 11.6%, although there were no other British firms in the top 20. This reflects changes that have occurred as a result of merger and acquisition activity. For example, of the top UK pharmaceutical firms in the 1990s, Fisons was acquired by Rhone-Poulenc Rorer and Boots by BASF (Matraves, 1999). But despite this, in 2001 the industry contributed a trade surplus of £2.9 billion and directly employed 65,000 people (PICTF, 2002; ABPI, 2003). Therefore, it is in the government's interest to support and protect the industry.

Governments, in their role as purchasers of healthcare products, seek to control and reduce healthcare expenditure. If they do not achieve the right balance between cost control and championing the industry, firms can threaten to withdraw from a country and relocate to another (McDonald, 2000). In addition governments are also responsible for the regulation of pharmaceutical products relating to safety, efficacy and quality (Earl-Slater, 1993; Taggart, 1993; Thomas III, 1996; Kettler, 1998).

[2] Although the Clinton administration did propose the introduction of price capping regulation (Abbott, 1995)

3.6.1 Pharmaceutical Regulation Relating to Safety, Efficacy and Quality

The pharmaceutical industry develops products which require regulatory approval at various stages of the product pipeline from the development of New Chemical Entities (NCEs), through to marketing issues such as advertising and labelling restrictions post-launch (Earl-Slater, 1993). Regulatory intervention in pharmaceutical markets can therefore be aimed at product composition, manufacturing, labelling, packaging, marketing and distribution. Issues of pharmaceutical regulation relating to safety, efficacy and quality have becoming increasingly stringent since the Thalidomide disaster of the 1960s (Earl-Slater, 1993; Matraves, 1999; Owen, 1999). Safety is an issue because governments want to ensure that new medicines, which are intended to improve people's health, do not cause unforeseen damage as in, for example, the case with Thalidomide. Governments also seek to minimise public concern about treatments such as those surrounding possible links between the MMR vaccination and autism. It has been argued that these aspects of regulation have both increased the costs related to the pharmaceutical R&D process, and have also raised barriers to entry (Green, 1997).

In addition to safety, efficacy and quality a fourth regulatory criterion has arisen in some countries. This relates to issues of cost and reimbursement, affecting how a product is supplied to the market (Kanavos and Mossialos, 1999). It would appear that this fourth stage has been driven through increasing pressure on health service expenditure. There are industry concerns in the UK that this was the aim behind the establishment of the National Institute for Clinical Excellence (NICE). For example, NICE guidance in 1998 focused upon the explicit rationing of Viagra although a court case by Pfizer overturned this decision. It was argued that doctors should not be prevented from making clinical decisions on the basis of cost-effectiveness (McDonald, 2000).

3.6.2 Patent Protection, Generic Products and Marketing Strategies

In many countries the argument to support government intervention has been based on the uniqueness of the pharmaceutical industry. This means that competition is not subjected to the same market forces as other industries, particularly because of patent

protection. The purpose of patent protection is to protect the incomes earnt by pharmaceutical companies for newly developed products. This is meant to allow firms sufficient time to both recoup the money spent on R&D, and raise finance for further development, before cheaper generic products can be sold on the market as a substitute. But although patent protection prevents competition from generic products, firms still compete with substitute branded products that have been produced to treat the same therapeutic class (Green, 1997). Although a patent is typically granted for twenty years, the development time that elapses prior to commercial launch effectively reduced this to approximately ten years in the 1990s, although legislation has been passed to extend patent length in some countries (Green, 1997; Matraves, 1999). Patents are becoming increasingly important for pharmaceutical firms. There have been moves to encourage prescribers to prescribe generic products whenever possible, or for a pharmacist to dispense a generic substitute even if a doctor has prescribed a branded product (Taggart, 1993; McDonald, 2000).

Pharmaceutical firms are increasingly facing generic competition as patents expire. This opens up the market to competition from generic products which can be up to 50% cheaper than the branded equivalent (Griliches and Cockburn, 1996). Scott Morgan (2000) suggested that two strategies were available to the original producer of the branded product, advertising and pricing. Jones & Cockerill (1984) identified price, along with product development and promotion as being the three main competitive weapons used in the industry. These can all be considered as key parts of a marketing strategy. Marketing strategies are an important source of competitive advantage for pharmaceutical firms as they seek to commercialise their products. As discussed, there are regulatory restrictions on the marketing of pharmaceutical products. In the United States, for example, prior to Food & Drug Administration Agency (FDA) approval potential purchasers of a new drug (prescribers) mainly obtain information through reviews in medical journals. Manufacturers cannot actively promote the indications of a drug until after FDA approval has been granted. However, once this approval has been obtained there appears to be a positive correlation between promotional expenditure and the number of patients treated (Howard Beales III, 1996). Marketing strategies have ranged from developing a niche national market to marketing an existing product line globally and 'co-operative' marketing (Taggart, 1993). Marketing is mainly conducted

through pharmaceutical representatives who 'detail' the product to the prescriber and to medical magazines (Matraves, 1999).

3.6.3 Globalisation of Pharmaceutical Regulation

Global regulatory issues relating to prescription pharmaceutical drugs had been led by the World Health Organisation and the United States until the early 1980s. Their leadership in this area has since been superseded by harmonisation implemented by the European Union and the International Conference on Harmonisation (ICH) (Braithwaite and Drahos, 2000). Pressure for changes in regulatory regimes were increasingly the result of action taken at the European level starting with the 1965 EC Directive on Medicinal Products. This directive focused on issues relating to safety, quality and efficacy (Braithwaite and Drahos, 2000). The European influence has also affected decisions relating to areas such as pricing and reimbursement, and has initiated a drive towards European rather than national approval of new drugs reaching safety standards (Kanavos and Mossialos, 1999).

At the European level there has also been a move towards establishing a single market in pharmaceuticals. This was started with a 1975 Directive that led to the establishment of a Committee for Proprietary Medicinal Products (CPMP) in Brussels (Taggart,1993; Braithwaite and Drahos, 2000). Amendment of the Directive in 1983 started a voluntary mutual recognition scheme. This means that if a pharmaceutical drug has been approved in one country it could be marketed in other European Union (EU) member states, with some exceptions (Earl-Slater, 1993; Braithwaite and Drahos, 2000). This scheme was not widely adopted and changes in 1987 meant that the new products had to be approved by CPMP before they could gain national regulatory approval (Braithwaite and Drahos, 2000). The year 1999 saw the establishment of the European Medicines Evaluation Agency (EMEA) whose role included the coordination of European wide technical approval of pharmaceutical products rather than them having to gain approval in each individual country, although this centralisation is only compulsory for biotechnology products (Matraves, 1999; Braithwaite and Drahos, 2000).

At the international level there has been a move towards harmonisation with the establishment of the International Conferences on Harmonisation of Technical

Requirements for the Registration of Pharmaceuticals for Human Use (ICH) which were established in 1990 (Matraves, 1999; Braithwaite and Drahos, 2000). The original concept of ICH was to build upon the move towards a single pharmaceutical market in Europe and bilateral agreements between countries such as Japan and the US, in order to move towards international harmonisation of the development and registration of new medicines. The initiative involves consultation between representatives of regulatory bodies. The overall aim was to speed-up the process from drug development to patient delivery. (Matraves, 1999; ICH, 2002). Despite the progress made in pharmaceutical regulation both in terms of improvements in safety, efficacy and quality, and the harmonisation of pharmaceutical regulation there are still regulatory issues that need to be developed. Unresolved issues in Europe relate to parallel trade, price liberalisation and standardisation (Kanavos and Mossialos, 1999). It has been argued that globalisation of pharmaceutical regulation has been hampered by the long history that the regulation has in developed national markets (Braithwaite and Drahos, 2000). Examples of recent changes include the European Court of Justice ruling in favour of a pharmaceutical firm with regard to parallel importing (ABPI, 2004) and the decision of World Trade Organisation (WTO) member governments to enable poorer countries to import cheaper generic pharmaceutical products (WTO, 2003).

3.7 1990s Onwards - The Creation of a Global Oligopoly

Along with the increasing trend towards globalisation of pharmaceutical regulation it has been argued that the pharmaceutical industry has evolved into a global industry (Rogowsky, 1996; Kettler, 2001a). As discussed, governments have sought to reduce the profits earnt by pharmaceutical firms, which has been combined with issues relating to shortening product lifecycles. In order to overcome the resulting financial pressures, pharmaceutical firms have sought to increase profit through the development of new products, and through geographical expansion (Taggart, 1993; Walsh and Galimberti, 1993; Matraves, 1999). Although each geographical market may present different regulatory hurdles[3], the research and development technology itself is not difficult to transfer (Matraves, 1999). This can be achieved through various strategies including the

[3] Although this is reducing as the result of increasing international harmonisation of pharmaceutical regulation

establishment of wholly owned marketing and distribution networks, entering into co-operative arrangements such as joint ventures and co-marketing agreements, outsourcing of activities or the establishment of overseas R&D facilities (Walsh and Galimberti, 1993; Matraves, 1999; Schmidt and Ruhli, 2002). Outsourcing activities can include the use of Contract Research Organisations with firms sometimes only maintaining a small internal R&D facility (Balance *et* al.,1992; Piachaud, 2002). Strategies such as international cooperative strategies and Foreign Direct Investment have led to increasing global flows of finance which has been reinforced by the globalisation process (Walsh and Galimberti, 1993). The result has been that the leading pharmaceutical firms operate either internationally or globally (Matraves, 1999) but this does not apply to all pharmaceutical firms. For example, Thomas III (1996:110-111) identified a significant number of pharmaceutical companies that had the discovery of "minor local products" as the main focus of their R&D activity. This indicates that although incumbent firms may be facing the same exogenous forces they are not necessarily evolving their strategies in the same way.

3.8 2000 Onwards – Decoding of the Human Genome, Genomics and Proteomics

June 2000 saw the initial decoding of the human genome (Jones, 2001). In pharmaceutical terms this is referred to as genomics. There is also another layer to be unravelled to fully understand the genetic sequences. Each gene provides instructions as to how proteins should be constructed, and when this is further understood it could lead to the next major technological revolution in pharmaceuticals (Jones, 2001). Genomics studies are focused upon gene expression and proteomics upon protein expansion. These technologies are being developed in the hope of addressing the issues of 'target identification' and 'lead candidate optimisation' (Cunningham, 2001). So, for example, genomics can potentially lead to the development of drugs tailored to meet the therapeutic needs of either a group of people or even for each individual (Bhandari *et al.*,1999; Heracleous and Murray, 2001). Current technological developments have started to focus upon identifying how the product success rate can be improved through the application of genomics and proteomics technologies (Bhandari, 1999; Cunningham, 2001). Such developments could lead to better understanding of how

pharmaceuticals react within each individual and lead to higher levels of product safety. The deciphering of the genetic code, although still at its initial stages, means that there is the potential to create medications for illnesses that were previously untreatable. This could potentially be extended to the development of bespoke drugs for each individual (Jones, 2001).

Bhandari *et al.* (1999) suggested that different operational strategies will be needed for pharmacogenomics, from the drug discovery stage through to commercial exploitation. However, all of the strategic options to exploit this new technology are not yet clear. Potentially a new industry will emerge as a result of the new technologies relating to genomics and proteomics. If, as Porter (1980) argued, there are no rules when a new industry emerges then it would suggest that industry recipes (Spender, 1989) no longer apply and firms may either be setting new industry rules (Hamel, 1996) or more likely to imitate the strategies of other firms in order to avoid strategic drift. This therefore suggests that the pharmaceutical industry will continue to provide an interesting context for exploring how firms' strategies and strategic actions coevolve in light of the technological changes that have shaped the industry.

3.9 Defining the Modern Pharmaceutical Industry

The history of change that has been discussed so far brings us to the modern pharmaceutical industry and this section outlines the key aspects of that industry. The modern pharmaceutical industry comprises of firms who, in various forms, are responsible for legally producing and/or marketing medicinal products that are consumed by humans (this therefore excludes veterinary products). This is an industry that has become increasingly globalised and one which has expanded from its original base of R&D-focused pharmaceutical firms to one that encompasses a heterogeneous composition of firms (Comanor, 1996; Henderson and Cockburn, 1996). Contemporary players in the industry are the traditional major pharmaceutical companies as well as specialised biotechnology companies, academic and public research institutions, contract sales organisations and contract research organisations (Kettler, 2001a).

There are two main types of pharmaceutical products: 'branded' which are produced by pioneering R&D based pharmaceutical manufacturers and 'generic'. Generic products are extremely similar to the branded products and are launched when the patent for the branded product has expired. The generic bioequivalent can sometimes be produced by a firm affiliated to the original manufacturer but more often it results from manufacturers focused upon the production of generic medicines (Griliches and Cockburn, 1996; Scott Morton, 2000). Tables 3.2 and 3.3 show the major players in the pharmaceutical industry for 1992 and 2001, which have been ranked on the basis of global sales. Separate tables are used as the high level of merger activity within the time period makes direct comparisons difficult.

Table 3.2 Top 10 Pharmaceutical Firms in 1992 - Ranked by Global Pharmaceutical Sales

Company	Country of Origin	1992 Share of Global Pharmaceutical Sales	Rank
Glaxo Wellcome	UK	3.8	1
Merck	USA	3.6	2
Bristol-Myers Squibb	USA	2.8	3
Hoechst Marion Roussel	GER	2.6	4
SmithKline Beecham	UK	2.2	5=
Ciba-Geigy	SWI	2.2	5=
Roche	SWI	2.1	7=
Sandoz	SWI	2.1	7=
American Home Products	USA	2.0	9=
Pfizer	USA	2.0	9=

Source: Matraves (1999:188)

Table 3.3 Top 10 Pharmaceutical Firms in 2001 - Ranked by Global Pharmaceutical Sales

Company	Country of Origin	2001 Share of Global Pharmaceutical Sales	Rank
Pfizer	USA	7.5	1
GlaxoSmithKline	UK	7.0	2
Merck	USA	5.3	3
AstraZeneca	UK	4.6	4
Johnson & Johnson	USA	4.4	5
Bristol-Myers Squibb	USA	4.3	6
Novartis	SWI	4.0	7
Aventis	FRA	3.5	8
Pharmacia Corp	USA	3.4	9
Abbott	USA	3.1	10

Source: ABPI (2003)

Two firms that were in the top 3 in 1992 still held top slots in 2001; Merck & Co., and GlaxoSmithKline (in its merged form). A sharp jump over the period was seen by Pfizer which had risen from 9th position in 1992 to number one in 2001. The following section provides an overview of the strategies that have been undertaken by the firms in the pharmaceutical industry, followed by an overview of strategic outcomes in the industry.

3.9.1 An Overview of Realised Strategic Actions by the Pharmaceutical Industry

The technological and regulatory factors that have been discussed so far have the potential to affect the realised strategies of incumbent firms. Regulation can affect both R&D and marketing strategies. As well as the exogenous forces that have been discussed the modern pharmaceutical industry has also been shaped by the strategies that have been realised by incumbent firms. As has been demonstrated the emergence of biotechnology has led to increased levels of both network strategies and M&A activity. In addition, other corporate level strategies identified within the industry have included retrenchment, divestment of a division, diversification, vertical integration and the creation of spin-off companies (Taggart, 1993; Schmidt and Ruhli, 2002). However, literature on pharmaceutical strategies has tended to focus on the business level, which may be because there are few 'pure' pharmaceutical firms, with many parent firms traditionally operating in a range of industries such as the chemical and pharmaceuticals industries.

Pharmaceutical industry researchers have tended to focus upon two types of strategy that create competitive advantage for pharmaceutical firms, those of R & D and marketing (Jones and Cockerill, 1984; Balance *et al.*, 1992). As discussed in Chapter Two, researchers in other industries have also identified internal competences and the development of network relationships as sources of competitive advantage. This still applies to the pharmaceutical industry, but the literature appears to indicate that this is only because these sources can strengthen the advantage achieved through R&D and marketing. However, it is not clear whether firms seeking to achieve competitive advantage should place emphasis upon the R&D process or marketing. For example, Drews (1997) placed emphasis upon R&D productivity as the key to pharmaceutical success. Yet, as Kettler (1998) emphasised, there has been an increase in 'me-too'

products which would suggest that firms are having to market more aggressively if they are to differentiate these products.

However, R&D and marketing are just two of the many strategies that pharmaceutical firms seek to implement as they choose from the available strategic choice set. As Balance *et al.* (1992) illustrated, pharmaceutical firms have many strategic options available to them although they argued that each firm will usually only implement a few. They proposed that strategic options relate to decisions about which products to develop for the product pipeline, markets to be served (both therapeutically and geographically), outsourcing, distribution methods, cooperative arrangements and merger and acquisition activity (Balance *et al.* 1992). Due to the long term focus needed to bring products from development to being profitable, finance and investment strategies are also important to the pharmaceutical industry. These have focused upon both raising additional funds and investment in other firm's operations (Taggart,1993; Henderson and Cockburn, 1996).

Strategic actions that have been discussed in the pharmaceutical literature can be grouped under the strategy headings of corporate, marketing, Research and Development (R&D), investment, network and global (Table 3.4). These categorisations are not mutually exclusive, for example a firm may implement a strategic action that fits the criteria for both globalisation and marketing.

Table 3.4 Mapping of Pharmaceutical Strategic Actions with Related Strategies

Strategic Actions	Related Strategy	References
Mergers, acquisitions, vertical integration, retrenchment, divestment, diversification, creation of spin-off companies	**Corporate strategy**	Balance *et al.* (1992),Taggart (1993), Pursche (1996), Matraves (1999), Heracleous and Murray (2001), Schmidt and Ruhli (2002).
Niche marketing, advertising, 'detailing' by sales representatives, marketing and distribution networks, co-marketing agreements	**Marketing strategy**	Balance *et al.* (1992), Taggart (1993), Walsh and Galimberti (1993), Matraves (1999), Schmidt and Ruhli (2002).
Licensing agreements, R&D alliances, establishment of overseas R&D facilities, outsourcing of the R&D function, focus upon 'minor local products', 'me-too' R&D strategies	**Research & Development (R&D) strategy**	Balance *et al.* (1992), Walsh and Galimberti (1993), Piachaud (2002), Schmidt and Ruhli (2002).
Raising additional funds, investing in other companies	**Investment strategy**	Taggart (1993), Henderson and Cockburn (1996).
Licensing strategies, outsourcing, strategic alliances, joint ventures, co-marketing agreements	**Network strategy**	Balance *et al.* (1992),Taggart (1993), Walsh and Galimberti (1993), Kurdas (1998), Matraves (1999), Rothaermel (2000), Schmidt and Ruhli (2002).
Establishment of overseas subsidiaries and R&D facilities, cross border mergers and acquisitions, cross border cooperative arrangements, co-marketing agreements	**Global strategy**	Walsh and Galimberti (1993), Matraves (1999), Schmidt and Ruhli (2002).

Source: Compiled by the author

3.9.2 Strategic Outcomes

So far this chapter has discussed the history of the pharmaceutical industry, the evolution of its structure and firm strategies that have been implemented. It has also illustrated how the industry has undergone significant changes in its technological trajectories. During this process biopharmaceutical firms have arrived at a number of different strategic outcomes. Referring to Tables 3.2 and 3.3, Merck, which was established prior to the 20th Century, was still in the global top 20 in 2001. Other firms in the top 20 have been the result of significant megamerger activity, in particular Aventis, Novartis and GlaxoSmithKline. Whilst Amgen evolved from being a new biotechnology firm into a pharmaceutical company other middle sized pharmaceutical firms were acquired or failed to survive (Kurdas 1998; Owen, 1999). These demonstrate examples of pharmaceutical firms that have arrived at different strategic outcomes. Further evidence that firms in the pharmaceutical industry arrived at a variety of different strategic outcomes is provided by the information contained in Table 3.5, which is based upon data from the Department of Trade and Industry (DTI). This is a summary of firms registering and de-registering in the UK from the manufacture of pharmaceuticals and medicinal chemicals. It confirms that 290 firms had de-registered during the period 1994 – 2000, and thus they arrived at different strategic outcomes from firms that had survived in the industry without being acquired or merged. This therefore suggests that a large number of firms in the pharmaceutical industry undergo periods of transformation that result in them arriving at different strategic outcomes.

Table 3.5 Number of New Pharmaceutical/Biotechnology Businesses Created Minus Existing Such Businesses Closing

	1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**Sub totals**
Stock[4] (as at 1st Jan)	425	430	420	415	405	405	380	-45
Registrations	40	30	40	25	35	35	35	+240
De-registrations	35	40	45	35	35	60	40	-290
Net change	**5**	**-10**	**-5**	**-10**	**0**	**-25**	**-5**	**-50**

Source: PICTF (2002:21) based upon data from the DTI

[4] Stock is the number of firms registered as manufacturers of pharmaceuticals and medicinal chemicals on 1st of January each year

3.10 The Research Question

The purpose of this chapter was to demonstrate that the pharmaceutical industry provides a suitable context for understanding the processes of evolution and coevolution relating to firm strategies and strategic actions. The criteria for a suitable industry were outlined in Section 2.10 and the pharmaceutical industry meets these criteria in the following ways:

- The industry structure has undergone significant structural change as it has evolved from being highly fragmented to a global oligopoly, accompanied by a high number of small new entrants.

- The changes in structure can be related to specific firm strategies. For example, merger and acquisition activity can be linked to industry consolidation and strategies such as cross-border co-operative arrangements have resulted in industry globalisation.

- The firms in the industry have implemented a wide range of strategic actions. Those reviewed in this chapter were categorised in Table 3.4 and showed that there is a wide range of strategic actions that can be tracked in order to identify the realised strategies of individual firms and to identify how these strategies and strategic actions have evolved and coevolved.

- The firms in the industry have arrived at a variety of different strategic outcomes. These have included firms merging, being acquired, failing to survive and surviving without being acquired or merged. Accompanying this, the industry consists of a heterogeneous set of firms that include branded pharmaceutical manufacturers, biotechnology firms, generics manufacturers, Contract Research Organisations and Contract Sales Organisations.

Although not exploring coevolution processes, McKelvey *et al's.* (2004:113) findings into sectoral innovation in the pharmaceutical industry proposed that "there is a

simultaneous interaction among firms; specificities, sectoral actors, national contexts and international trends". This suggests that the pharmaceutical industry provides a particularly interesting context for exploring coevolution processes. Carney and Gedajlovic (2002) suggested that path dependency is an important component for understanding the coevolution process. They argued that the outcomes of organisational strategies can shape the local environment which in turn affects the actions of other actors affected by this environment. This can be related to the issue of strategic outcomes that was discussed in Chapter Two and the changes to the structure of the pharmaceutical industry that were outlined in this chapter as it evolved into a global oligopoly. This leads to the specific research question that guides the empirical research for this thesis: 'How did the realised strategies of a heterogeneous set of pharmaceutical firms coevolve during the industry consolidation of 1992 - 2002?'

3.11 Contribution to Theory and Practice

As has been discussed there have been a variety of studies into pharmaceutical strategies (Balance *et al.*, 1992; Taggart, 1993; Walsh and Galimberti, 1993; Henderson and Cockburn, 1996; Pursche, 1996; Kurdas, 1998; Matraves, 1999; Rothaermel, 2000; Heracleous and Murray, 2001; Kettler, 2001b; Piachaud, 2002; Schmidt and Ruhli, 2002) but there appears to have been limited empirical research into how the strategies of individual pharmaceutical firms have evolved longitudinally. This has been partially addressed by Strategic Group Analysis (SGA) studies (Bogner *et al.*, 1996; Leask and Parker, 2004; Leask and Parnell, 2004) but, by its nature, this approach grouped firms rather than focusing upon individual patterns of strategic change. There has also been some recent research into strategy formation and processes in large pharmaceutical firms (Schmidt and Ruhli, 2002). However, there has been little examination of either strategy evolution or coevolution in the middle sized pharmaceutical firms, or factors that may have impacted upon their strategy processes prior to different strategic outcomes. Specifically, the thesis contributes to existing knowledge about coevolution with regard to addressing a gap about how the grand strategies coevolved for medium sized pharmaceutical firms who arrived at different strategic outcomes during significant change to the structure of the pharmaceutical industry.

This thesis encompasses Pettigrew's (2001) view that quality academic research also needs to be relevant by making the study context specific, i.e. by focusing upon a specific industry. This enables the researcher to focus on strategy in a single industry and understand how realised strategies have preceded the strategic outcomes of firms. A study of the type proposed for this thesis means that the academic work can be based upon both learning from the industry and subsequently being able to advise firms in the pharmaceutical industry on issues relating to strategic change.

3.12 Chapter Summary

The aim of this chapter was to explore whether the pharmaceutical industry provided a suitable context for exploring how firm strategies and strategic actions have evolved and coevolved. The chapter explored factors that have impacted upon the industry as it has undergone significant structural change with it appearing to move towards bipolarisation Also reviewed in this chapter are the strategies realised by firms in the industry, identifying that some of these could specifically be related to changes in industry structure, for example cross border mergers. It was also found that firms in the industry had arrived at a number of different strategic outcomes. As summarised in section 3.10 the pharmaceutical industry met the criteria set out in Chapter Two for deciding whether it provided an appropriate context for exploring how firm strategies and strategic actions had evolved and coevolved. This led to the development of the research question followed by the proposed contributions of the thesis to both theory and practice. The contributions that the thesis makes are discussed further in Chapter Eight.

In the next chapter the research design for the thesis is discussed. Lewin and Volberda (1999:528) proposed that the understanding of coevolution processes would be advanced with more studies using data to analyse "microstate adaptation data sequences" and they referred to the work of Webb and Pettigrew (1999) who focused upon "strategic adaptations such as mergers, acquisitions [and] divestitures" (Lewin and Volberda, 1999:528). As the next chapter shows a methodological framework has been

developed which adopts this proposal. This was achieved through focusing upon and developing a categorisation of strategic actions realised by firms in the pharmaceutical industry. This could be applied qualitatively to longitudinally track and analyse the evolution and coevolution of strategic actions and grand strategies for a set of heterogeneous pharmaceutical firms that arrived at different strategic outcomes.

CHAPTER FOUR

RESEARCH DESIGN

4.1 Introduction

The purpose of Chapter Four is to explain the research design that was used to guide the collection and analysis of empirical data to explore the research question. As was discussed in Chapter Three this thesis aims to contribute to the existing body of knowledge in the strategy field by exploring a gap in the current literature about how the strategic actions and strategies of pharmaceutical firms that arrived at different strategic outcomes evolved and coevolved during the period 1992-2002. The research question that was developed to address the gap is: 'How did the realised strategies of a heterogeneous set of firms coevolve during the period of pharmaceutical industry consolidation from 1992-2002?' The research for this thesis is guided by coevolution as a theoretical lens, a conceptual framework, and the philosophical perspective of realism.

The chapter starts with an introduction to the parameters of the research. An explanation is given of the context, level and unit of analysis for the empirical research. This is followed by an explanation of the sub questions and conceptual framework that will guide the research in order to address the research question. Attention is then focused more specifically on the issues that surrounded the research design for this study. As the chapter explains, a flexible (qualitative) research perspective was adopted as this met the criteria necessary for addressing the requirements of the conceptual framework and the desire for the research to have a realist underpinning that combined aspects of both positivism and interpretivism. It discusses how a methodological framework was developed for analysing strategic change in the pharmaceutical industry. Also explained is how this methodological framework was adapted in order to longitudinally collect data to address the research question through the use of text analysis. This was applied to a sample of six pharmaceutical firms selected by purposive non-probability sampling and replication logic. The chapter then provides an overview of the methods of data analysis and concludes with a reflection on issues relating to research bias and limitations of the research design.

4.2 The Research Parameters

There have been different perspectives as to whether emphasis should be placed upon the firm as the unit of analysis or the industry (Hoskisson *et al*., 1999). The economics-based Structure-Conduct-Performance (S-C-P) paradigm proposed that industry structure shapes firm strategy and that firm strategy shapes industry structure (Scherer, 1980) but has been criticised for only paying limited attention to firm strategy (Spanos and Lioukas, 2001). Porter (1980) adapted the S-C-P model but moved the focus to the firm strategies and performance levels, the firm also being the main point of interest for evolutionary economics (Child, 1995). But as Porter (1985) acknowledged, as the internal activities of a firm can provide its unique competitive advantage, firms are unlikely to provide access to researchers to all of the factors that contribute to their competitive success. Therefore researchers have tended to focus upon the strategic actions that firms have implemented in order to understand the strategies that have been realised, what have been termed as "strategies-in-action" (Campbell-Hunt, 2000:151).

Although scholars have placed different emphasis on whether to focus upon the firm or the industry it has been recognised that each has the ability to shape the other and yet the strategic management literature is lacking in studies that have emphasised how firm strategies coevolve with the strategies of other incumbent firms and how these strategies coevolve with changes in industry structure. Therefore, the research design for this thesis focuses upon the pharmaceutical industry as the level of analysis and the pharmaceutical firm as the unit of analysis.

The level of analysis is the pharmaceutical industry as this represents the community (Roughgarden, 1983). It is important to understand the level of analysis because factors that affect this level, such as consolidation and globalisation have an impact on the pharmaceutical firms, which are the unit of analysis. The unit of analysis is the incumbent pharmaceutical firm so that it is possible to compare the coevolution of different types of firm within the industry (Roughgarden, 1983). This is the level at which realised strategies and strategic actions can be analysed. Importance was placed upon comparing and contrasting the realised strategies of firms that had arrived at different strategic outcomes. From the literature review it was shown that strategy relates to the achievement of competitive advantage, coevolution theory relates to

'competing species' and in the strategy literature the S-C-P paradigm has tended to be adapted in models of competitor analysis. However, it is becoming increasingly difficult to identify who a firm's competitors are, particularly with the increasing emphasis upon developing cooperative networks, as demonstrated in Chapters Two and Three. This is particularly pertinent to the pharmaceutical industry where incumbent firms have entered into symbiotic relationships with new entrants, particularly biotechnology firms. Therefore this thesis has not focused upon firms that "compete" but those that have arrived at different strategic outcomes. By focusing upon the strategic actions and strategies of individual firms it was possible to track changes in how these evolve for each firm and also compare the strategic actions to those of other firms in the sample in relation to temporal patterns of strategy development (Webb and Pettigrew, 1999) and coevolution (Lewin and Volberda, 1999).

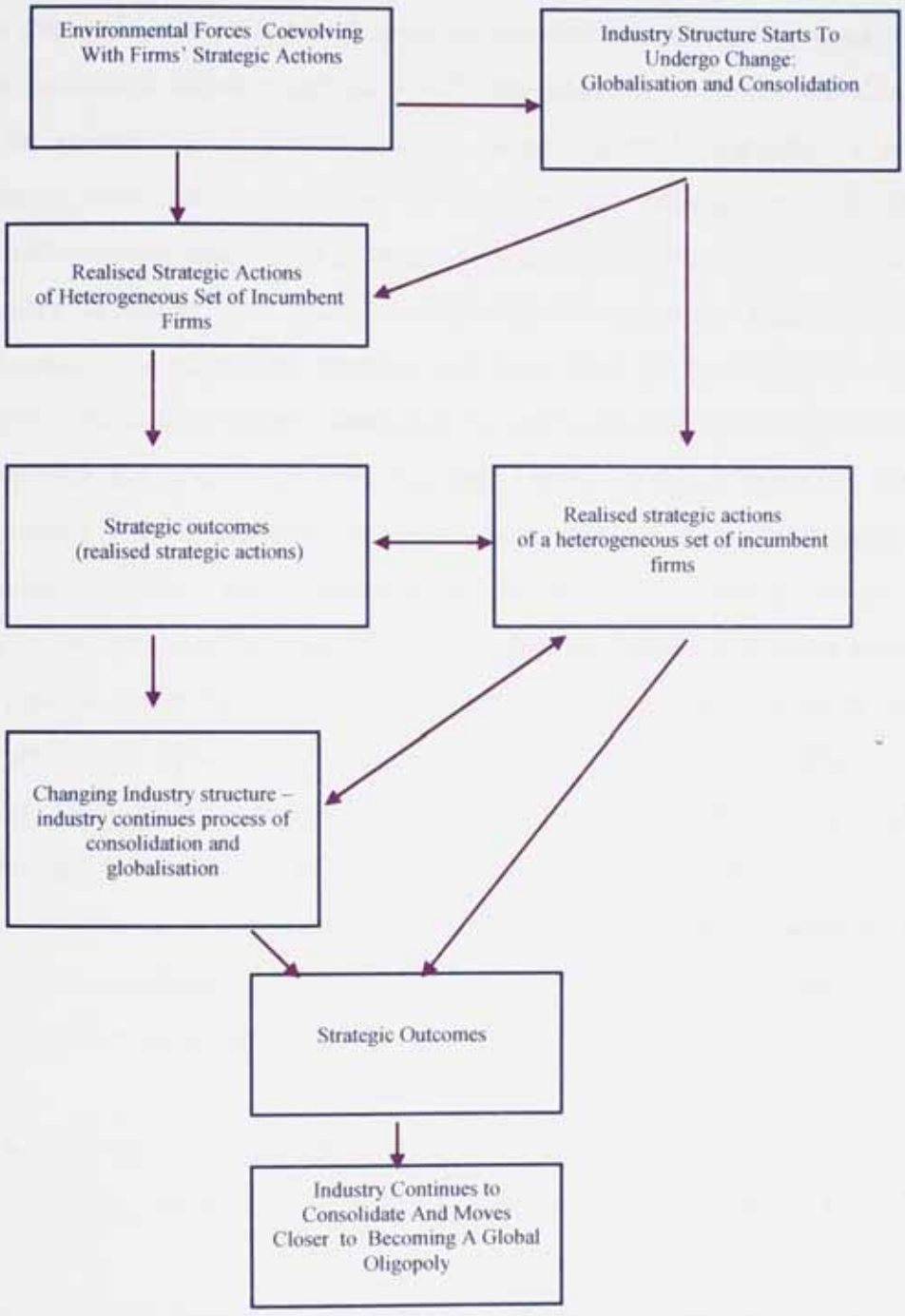
The emphasis of the research design will be upon identifying patterns in firms' realised strategies and strategic actions with regard to how they evolved and coevolved. In order to answer the research question it was felt that four sub questions also needed to be addressed. As this chapter will explain, initial exploratory research illustrated that the categorisation of strategic actions outlined in Chapter Three (Table 3.4) needed to be developed into a methodological framework in order to address the research question. It explains how this methodological framework makes a contribution in the way that it can be applied to provide new knowledge and understanding about the evolution and coevolution of strategic actions in the pharmaceutical industry whilst addressing limitations in existing analytical tools used to explore strategic change. Specifically it addresses the question:

- **R1:** What strategic actions were realised by firms in the pharmaceutical industry during 2001-2002?

From Chapters Two and Three a conceptual framework was developed to guide the research design in order to identify and analyse patterns of evolution and coevolution.

This is illustrated in Figure 4.1 and indicates the lines of inquiry that were translated into three further sub questions in order to address the research question.

Figure 4.1: Conceptual Framework of the Coevolution of the International Pharmaceutical Industry: 1992 - 2002



Source: Compiled by the author

The conceptual framework is based upon the principles of the S-C-P paradigm. It proposes that as the pharmaceutical industry structure evolved into a global oligopoly the changing structure shaped the strategies (conduct) of incumbent firms, and their strategic actions (strategies) in turn shaped the structure of the industry. These can be analysed to show how patterns have occurred in realised strategies at the grand level. The research question is based upon the proposal that a heterogeneous set of firms in the pharmaceutical industry arrived at different strategic outcomes that altered the structure of the industry as it moved towards being a global oligopoly. Coevolution theory suggests that during a period of time certain strategic actions implemented by incumbent firms shaped the strategic actions of other firms in the industry and also the industry structure. The literature reviewed also suggested that the emergence of new technology and regulatory changes may have both led to changes in industry structure, namely globalisation and consolidation, and impacted upon the realised strategies of incumbent firms. This process has then led to strategic outcomes that have in turn coevolved with the realised strategies of competing firms, and to further changes in the industry structure. For example following an initial period of merger and acquisition activity by a limited number of firms, increasing numbers of firms became involved in the process, either by being acquired or by engaging in M&A activity themselves. This in turn would have increased the concentration ratio of the industry as firms became larger, leading the industry from being fragmented to becoming a global oligopoly (Jones and Cockerill, 1984; Kettler, 2001a). In order to understand how the strategies of firms evolve as the industry structure changed the strategic actions of firms can be identified and chronologically mapped to identify the strategies that were realised. This will be achieved by addressing the question:

- **R2:** How did the realised grand strategies of a heterogeneous set of firms evolve during the period of pharmaceutical industry consolidation from 1992-2002?

The conceptual framework focuses upon the realised strategies of incumbent firms. In order to identify if there were patterns of coevolution between firms the following question will be addressed:

- **R3:** How did the realised strategic actions of a heterogeneous set of firms coevolve with each other's strategic actions during 1992-2002?

As discussed in Section 3.10 certain strategic actions, for example cross border mergers, specifically had the ability to shape the pharmaceutical industry structure as it became increasingly globalised, in other words there was a process of coevolution between the strategic actions that were realised and the evolving industry structure. The research design will therefore focus upon the collection and analysis of empirical data that can address the question:

- **R4:** How did a heterogeneous set of firms realise internationalisation strategies during the period of pharmaceutical industry consolidation from 1992-2002?

4.3 Overview Of The Research Approach

4.3.1 Overview of Research Philosophies

The key philosophical paradigms that have been discussed in the literature are those relating to positivism (Lincoln and Guba, 2000; Thietart *et al.*, 2001), interpretivism (Miles and Huberman, 1994; Thietart *et al.*, 2001), constructivism (Lincoln and Guba, 2000) and realism (Levy, 1981; Miles and Huberman, 1994; Patton, 2002; Robson, 2002).

The positivistic paradigm is based upon the application of scientific techniques in order to generate hypotheses. These lead to law-like generalisations that can be applied to the complete population. The subject being studied is assumed to be independent of the researcher. It employs a logical approach with quantitative techniques and a highly structured methodology. This objectivity is demonstrated by tests of reliability and validity (Lincoln and Guba, 2000; Thietart *et al.*, 2001). The positivistic paradigm could not fully guide the research for this thesis. Firstly because the research is exploratory and, secondly, the research cannot lead to a law-like generalisation because it is very context specific. However, positivism can be applied to this thesis in that it is argued that the process of how the data is collected can be applied to other industries in order to understand the strategies that have been realised.

In contrast to positivism, interpretivists believe that the world is too complex to be explained through law-like generalisations, particularly as each case studied could be considered as unique. Rather than one truth they believe that there are many possibilities that can be identified through research. Rather than being objective the research is subjective through, for example, studying people's motivations. Interpretivists believe that the researcher cannot be truly independent of the researched, and that part of the researcher's interpretations are the result of his/her interaction with the subject being studied (Thietart *et al.*, 2001). This thesis does involve some interpretation of the articles that appeared in the press about firms and their strategies. Although the researcher sought to be as objective as possible in recording the strategic actions that were implemented, including the writing of coding rules, some interpretation had to be applied. For example, there were two issues relating to the interpretation of merger activity. A firm may refer to the action as a merger and then refer to it as an acquisition at another point in time. It was accepted that there would be anomalies in the way that strategic actions are reported, and yet, through the development of a coding book, sought to minimise the effect. But the acceptance of potential anomalies rather than saying this is a true reflection again represents the standpoint between positivism and interpretivism.

4.3.2 Realism as a Guiding Philosophical Perspective for this Research

In Chapter Two different perspectives of strategy were discussed. Planned strategy can be real in the mind of the chief executive because it steers the organisation towards its vision and steers the organisation's plans. If s/he was to be asked what the strategy of the organisation was the planned version would probably be the one that he would discuss. But, as Mintzberg *et al.* (1998) noted, realised strategy is the action that was undertaken, and this may not be the same as the planned strategy. This concept of realised strategy is related to the paradigm guiding this study, which is one of realism. Having a 'common-sense ontology' in the way that it takes seriously the existence of things, structures and mechanisms revealed by the sciences at different levels of reality, realist research derives knowledge from experience (Outhwaithe,1998:19). As such realism is 'concerned with developing methods appropriate to the particular subject matter of the social sciences' (Blaikie, 1995:58). What were the strategies that were

realised? How did they coevolve? How does this relate to the strategic outcome of the organisation? Realism as a guiding paradigm both encompasses aspects of positivism and interpretivism whilst rejecting other aspects. This view of realism underpins this study which seeks to identify the realised strategies of firms which may be different from those that were planned. There are various perspectives of realism with terms used such as historical realism and critical realism (Robson, 2002) and transcendental realism (Miles and Huberman, 1994). Rather than being aligned within one of these subsets the researcher has adapted Robson's (2002) conceptualisation of realist research as follows:

- Action - realised strategies
- Mechanism – strategic actions
- Outcome – strategic outcome
- Context – the period of pharmaceutical industry consolidation 1992 - 2002

The research shows how realised strategies precede strategic outcomes. The research is underpinned by the assumption that the strategic outcomes of firms follow from the strategic actions that had been implemented. The mechanism for identifying the realised strategies is the identification and analysis of the strategic actions implemented by firms. The context is the period of pharmaceutical industry consolidation, 1992 – 2002. The attention to detail, in this case identifying every publicly reported strategic action, is a key aspect of realist research (Robson 2002). "At the heart of realism is the assumption that there is a reality which exists independently of our awareness of it" Robson (2002:29). Robson's (2002) comment illustrates how researchers can probe in order to reveal realities that had not been previously visible. As the philosophical positioning of this research is that of realism (Miles and Huberman, 1994; Robson, 2002), the research for this thesis seeks to identify the underlying mechanisms (e.g. strategic actions that preceded the strategic outcomes that led to industry consolidation) and is 'methodologically open' (e.g. it does not define a specific method). Hence, a qualitative methodological approach has been adopted for this research. The philosophical underpinning of this study is that a form of reality can be identified, namely the strategic actions that were implemented and reported in the press. Yet, when they were reported, they were not reported for the purposes of identifying the strategies that firms realised, but instead were reported as singular events or summaries

of a year's activities. By tracking these strategic actions it was possible to reconstruct them in order to identify the strategies that were realised. These may be different from how they would be reported by the company as it seeks to justify and explain its actions. This research provides one aspect of the reality which is under study.

In order to increase the objectivity of the research the researcher maintained a distance from those being researched – in keeping with the positivistic stance, and contrasting with the interpretivistic need to get fully involved with those being studied. But, in relation to this perspective, the researcher immersed herself in the trade publications and other relevant literature, together with initial interviews, in order to become familiar with the industry under study, and as a result this has led to an emergent research design. The underpinning realist philosophy, that there is more than one reality, means that it was tempting to make the scope of the study too wide for the time limitations that are placed on a thesis. Ideally, the research would have involved tracking all of the publicly reported strategic actions for every pharmaceutical firm during the whole period of its life. The analysis would have then focused upon analysing how the strategic actions for all of the firms had coevolved. This would have been followed through with in-depth interviews and various other case study approaches, including analysis of financial data, product pipelines and so forth, in order to paint what could be considered as nearer to a 'true' picture of the evolution and coevolution of firm strategies and strategic actions in the pharmaceutical industry. But research needs to be manageable and this would not have been feasible. However, the underpinning philosophy of realism indicates the great amount of additional research that can be undertaken after completion of the thesis in order to further develop the answer to a broader research question, by both adding depth to the analysis that was undertaken, and by adding breadth to the number of firms analysed and the length of time that is placed upon tracking the history of each firm. Until such time though, the research is guided by realism, achieving a balance between the strengths and weaknesses of positivism and interpretivism.

4.4 Methodological Choices and Research Design for an Exploratory Study

4.4.1 Research Strategies

The research strategy is guided by the philosophical underpinning of the research (realism), the research question and the conceptual framework. This research encompasses the multiple theoretical lens approach that has been proposed by researchers in strategy (Hoskisson *et al.* 1999, Thomas and Pollock 1999) and studies into adaptation and selection by using coevolutionary theory as the theoretical lens (Lewin and Volberda 1999). The research strategy guides decisions as to how information was collected and analysed in the way that was most appropriate for addressing the research question. Errors in research findings can occur as a result of giving inadequate consideration to research design. For example, by not correctly defining the research question or assessing how data collection will address that question. It has been suggested that consideration be given to analysis before the data is collected (Miles and Huberman, 1994; Yin, 1994) otherwise a mass of data can be collected that is either insufficient for addressing the research question or the researcher does not have the time to analyse the data.

Robson (2002) proposed focusing upon two overarching types of research strategy: a flexible design strategy (principally qualitative) and a fixed design strategy (primarily quantitative). He also considered a combined research strategy which is similar to that of Yin's (1994) description of case studies as a research strategy. Yin (1994) highlighted that case studies should not be confused with qualitative research strategies, but instead should be considered as a strategy in its own right that can encompass both quantitative and qualitative techniques. This section, therefore, reflects upon the adoption of both quantitative and qualitative research methods before explaining why a flexible, predominantly qualitative, research strategy was adopted (Patton, 2002; Robson, 2002).

In general terms quantitative research is closely aligned to positivism. (Robson, 2002) Quantitative designs are highly structured, and considered by their proponents to be logical and objective. The research design is tightly prespecified (Bryman, 1993;Robson, 2002) and is suited towards dealing with a large number of cases, with the aim being to generalise research findings to a complete population. This is achieved through the application of mathematical equations and statistical techniques, and is normally associated with numerical data (Miles and Huberman, 1994; Robson, 2002). Quantitative designs are theory driven, focused upon hypothesis testing. Data collection methods include experiments and questionnaires.

Qualitative research designs are more closely aligned with postpositivistic paradigms such as interpretivism and constructivism (Miles and Huberman, 1994; Robson, 2002). Data is normally provided in the form of words (Miles and Huberman, 1994; Robson, 2002). Qualitative research strategies are highly flexible meaning that research questions can be redefined as the findings emerge. Qualitative strategies focus upon a small number of cases, which leads to increased depth and richness of findings (Miles and Huberman, 1994). Qualitative data is about context specific actions (Miles and Huberman, 1994) in contrast to quantitative approaches which have been criticised for being context stripping and thus prevent analysis from being relevant (Guba and Lincoln, 1998). Qualitative approaches can include naturalistic inquiry, in-depth interviews and documentary analysis.

Both qualitative and quantitative approaches can be used to map events in a chronological order. Miles and Huberman (1994) illustrated how this could be done with qualitative data. Quantitative techniques can include time series analysis and event history analysis. Both quantitative and qualitative approaches can also be used for clustering cases on the basis of specific variables in order to identify firm heterogeneity. They can also both be used to identify causal relationships. Miles and Huberman (1994:10) also highlighted one of the strengths of qualitative research being that it provides a "real world" perspective, although it should be noted that in *Real World Research* Robson (2002) appears to indicate that this can be achieved through both quantitative and qualitative approaches. Therefore despite the extensive literature that debates quantitative versus qualitative approaches there are similarities in what they can achieve. It has been highlighted that there is a need for the researcher to identify which

approach is more suitable, in particular whether a research design needs to be highly structured (quantitative) or very flexible (qualitative) for the research that is to be undertaken (Thietart *et al.*, 2001; Robson, 2002). Of course, as highlighted by Yin (1994) a case study approach can incorporate both of these methods.

4.4.2 Review of Research Design Issues in Previous Strategic Change Research

This section focuses upon specific aspects of previous strategy content research, namely those relating to time horizons, the numbers of strategic variables that have been considered and strategic actions. The purpose of this section is to explain how a review of research methodologies in the strategy literature influenced the research design for this thesis.

Longitudinal studies are considered important in strategy research in order to understand the dynamics of industries that result from firms changing their strategies (Mascarenhas, 1989; Bogner *et al.*, 1996). Tushman and Anderson (1986) suggested that studies into changes of organisational strategy over time in competitive environments have been few. Subsequent literature searching appears to support this view, noting that longitudinal studies have also tended to focus upon large organisations (Grant and Cibin, 1996; Dean *et al.*, 1999; Ghobadian and Viney, 2001).

Many studies that claim to be longitudinal have actually employed cross-sectional analysis rather than focusing upon the process of changes in strategy (Ginsberg 1988). For example, the quantitative method of strategic group analysis (SGA) developed from snapshot studies to those of a more longitudinal nature. Bogner *et al.* (1996) and Schwittay *et al.* (2001) undertook a longitudinal approach but the data collection was actually cross sectional, with the research focused upon identifying industry breakpoints in which to group the firms on the basis of their strategic actions. SGA was evaluated as a method for analysing changes in strategies in an industry over time. However, this strategy was on the basis that it grouped firms at specific times dependent upon them following similar strategies and therefore did not allow the richness of explanation that would result from tracking the strategic actions of individual firms. This lack of depth was recognised in a study by Bogner *et al.* (1996) when tracking the entry paths of

European firms into the US pharmaceutical industry and so they supplemented their research method with historical analysis.

In order to undertake longitudinal research the issue of timescales with regard to efficiency needed to be considered. Other studies that have involved studying strategy and strategic actions have analysed text for 8 – 10 years (Miller and Chen, 1994; Viney, 2001). It was felt that as the focus of the thesis was strategic change that it was necessary to collect data that was contemporary but that also included a timescale that encompassed a major breakpoint in the structure of the pharmaceutical industry. In 1994 the *Scrip Yearbook* reported that the pharmaceutical industry had undergone its highest level of merger and acquisition activity for several years. In addition, during this period 25% of patents were facing expiry (PJB Publications, 1995). Thus in order to include a lead time to this period it was decided to collect continuous data for the two years preceding this major breakpoint through to the last day of data collection for this stage of the study i.e. January 1st 1992 to December 31st 2002.

Strategic content research, such as that discussed in the last section, has continued to focus upon a limited number of strategic variables, for example Mascarenhas (1989) focused upon seven. This was a development as it provided a wider picture than other SGA work that had only grouped companies on the basis of two variables (McGee and Segal-Horn 1990). Qualitative studies have focused upon a smaller sample of firms and tracked the strategies in more depth than that allowed for in quantitative approaches (Mintzberg and Waters, 1982; Viney, 2001). These qualitative methods do not, however, allow for a qualitative researcher to track the number of firms that quantitative analysis allows for. It does not allow for differences between a wide variety of firms to be compared, for example for measuring relative levels of strategic activity or strategic inertia between a set of firms, or to compare how different firms have shaped their strategic actions in light of changes in the industry environment. However, the advantage over quantitative analysis is that it does allow for a richness of data about each firm that allows the findings to be contextualised.

In order to understand how the realised strategies and strategic actions have evolved and coevolved it is firstly necessary to identify an appropriate way of identifying the strategies that were realised. This can be achieved through tracking strategic actions.

These categorisations can be used to track the strategic actions and industry themes/influences through a longitudinal study. Miller and Chen (1994), focusing upon strategic inertia in the airline industry, used strategic actions to compare a larger number of firms i.e. 33 in the airline industry over a longitudinal study which tracked the strategic actions of firms using a single source trade publication. Regression analysis was used to measure levels of strategic inertia. But again there were weaknesses with this study. Firstly, it appeared to assume that all of the firms in the airline industry were homogeneous, there was no evidence that they had attempted to explain differences between the organisations. This may not have been necessary, but it does mean that the method is difficult to apply to an industry where the incumbent firms may have very distinct differences. This means that analysis based upon considering firms as homogeneous is weak. Secondly, their analysis did not consider reversal of the strategic actions, so for example if a firm started a collaborative agreement no consideration was given to whether the collaborative agreement had been prematurely ended.

It was therefore considered important to design a methodological framework that could explore how strategic actions actually change, through both advancement and retrenchment, over a sustained period of time. Advancement means the implementation of a strategic action, such as entering into an R&D agreement. Retrenchment means the premature cancelling of an R&D agreement. Another example would be expansion of the workforce followed by redundancies. This is at odds with the objective of the planning school of strategy which focuses upon moving forward in a linear direction, with no consideration given to premature termination of strategic actions. In addition it is important to understand the extent to which strategic actions are undertaken that allow the organisation to achieve strategic fit with the external environment, which is the view advocated by the incremental school of thought. If this is to be explored then it is necessary to know what the external changes in the environment are and how these could relate to the strategic actions of a firm.

In summary, the review of papers into strategic content research highlighted that the majority of them had one or more of the following limitations:

- A limited number of strategic variables was usually selected;
- The research took a snapshot or cross sectional approach rather than a longitudinal approach;
- The research did not consider the potential influence of specific environmental factors on specific strategic actions;
- The research did not consider reversals in the strategic actions that had been implemented;
- The studies considered all firms to be homogenous.

In order to outline a more detailed picture of strategic change for firms in an industry it is argued that it is first necessary to develop a research design that allows for these limitations to be overcome and that allows for the study to include the following:

- A wide range of strategic content variables to be considered that apply to the industry, in other words the strategic choices available to firms;
- That these strategic choices can be tracked during a longitudinal study;
- That it is possible to identify how potential influences and themes in the industry environment can be related to strategic actions.

As outlined in this thesis such limitations can be overcome once a categorisation of strategic actions and industry influences/themes has been identified and developed. In their paper reviewing research into how companies compete and why, Thomas and Pollock (1999) suggest that whilst a study of competition at different levels such as at the strategic group and firm levels should be adopted, that it may also be beneficial to look at the overlap of networks in order to provide some form of triangulation in order to focus on the issue of competence.

These gaps therefore suggest that a valuable contribution could be made to the existing academic literature by the development of an appropriate research method. The research design outlined and developed in this chapter shows how the limitations of previous research can be overcome through the development of a classification of strategic actions that details the externally oriented strategic choice set of an heterogeneous group

of companies, in this case the international pharmaceutical industry. The collection of a large number of variables makes data collection and analysis more complicated than by focusing on a few selected variables but the inclusion of all relevant strategy variables provides a richness of data that enables a more accurate understanding of strategy (Ginsberg 1988). Although Ginsberg (1988) did warn, however, that a risk of using too many variables is that changes in strategic direction may be overlooked. This limitation has been overcome in the research design for this study because it has also recorded the termination or retrenchment of strategic actions that had been previously implemented.

This research design aims to overcome the following limitations of previous research into strategic change:

- By allowing a detailed range of externally reported strategic actions to be considered. It has therefore not limited the number of strategic variables considered in the analysis which is often the case in quantitative analysis;
- By allowing the analysis to include both when individual strategic actions were started and, if appropriate, when they were prematurely terminated;
- By allowing continuous longitudinal analysis to be undertaken and so prevents the risk of important events being omitted, a risk of cross sectional research;
- The analysis allowed consideration to be given to the heterogeneous nature of the firms in the study.

4.4.3 A Qualitative (Flexible) Research Strategy

It has been proposed that exploratory research is more suited to an unstructured (qualitative) approach whilst descriptive and explanatory/causal research is more suited to a fixed/structured (quantitative) research design (Thietart *et al.*, 2001; Robson, 2002). This thesis is focused upon developing an understanding of strategy processes putting emphasis on realised strategic actions, not plans or intentions. Further, the research question is focused upon 'how did firm strategies coevolve?' The realist philosophical underpinning has been demonstrated in the research design for this study through a qualitative approach that involves the development of a methodological framework

which avoids interaction with the people that form part of the study. This approach is akin to a positivistic quantitative approach and yet it is qualitative in that it has deconstructed documentary sources in order to identify the strategic actions implemented in the pharmaceutical industry. It focused upon words, the strategic actions that were reported in the trade press (*Scrip*)[1], the *Financial Times* and a database of merger and acquisition activities (*Mergerstat*). This framework is then used to collect data on the firms in the sample in order to identify patterns in how the strategic actions evolved and coevolved for each firm.

Further reasons why the research design needed to be flexible are given below.

- The research was context specific and was not aiming to produce law like generalisations but to generate theory.
- The thesis is exploratory and changes needed to be incorporated in light of the findings as they emerged. The methodological framework needed to be refined as more strategic actions were identified so that they could still be coded.
- As strategy is not necessarily a linear process the research design needed to include aspects of strategic actions being terminated as well as started.
- The results that emerge from focusing upon one firm may lead to a reinvestigation of the strategic actions implemented by another firm. If a static data collection instrument was used, such as that in quantitative analysis, this would not be possible.

[1] The pharmaceutical industry has a publication called *Scrip* which is produced twice each week with approximately 16 – 20 pages focusing upon the strategic actions of firms in the pharmaceutical industry. *Scrip* has been used by researchers who have tracked changes in the pharmaceutical industry (Matraves, 1999). The objective of *Scrip* is to report on the strategies and activities of firms in the pharmaceutical industry and has subsequently published a detailed list of articles that are relevant to this research and so can form the sampling frame. It is justifiable in content and text analysis studies to use a sampling frame that has been developed by an entity that is not the researcher (Nuendorf, 2002)

4.5 Development of a Methodological Framework for Analysing Strategic Change in the Pharmaceutical Industry

This section outlines one of the key contributions of this thesis: the development of a methodological framework to analyse strategic changes in the pharmaceutical industry and addresses the sub question R1. The analytical method developed overcomes the limitations of other techniques and can be adapted to analyse how firm strategies and strategic actions have evolved and coevolved over a period of time. The literature review relating to the pharmaceutical industry (Chapter Three) indicated that a large proportion of pharmaceutical strategy researchers have tended to focus upon specific aspects of strategy rather than the overall strategy of a firm, with the most comprehensive coverage of academic strategies found in the work of Taggart (1993). Taggart (1993) explored the development of the world pharmaceutical market with particular emphasis upon the application of multinational theory, technology and the competitive environment of the industry. This was complemented with case studies focusing upon companies in the United States, Europe and Japan. However, no publications were found that contained a detailed categorisation of strategic actions that firms in the pharmaceutical industry have implemented.

Having identified from the literature review that there was a gap with regard to identifying how firm strategies and strategic actions in the pharmaceutical industry had evolved and coevolved it was necessary to identify a suitable method for data collection and data analysis. But this was not straightforward and required the development of a data analysis instrument. This section outlines the stages involved in this process.

4.5.1 Pharmaceutical Industry Background

In order to become orientated with the industry, to understand the major changes that had affected its structure and the firms' strategies, the researcher immersed herself both in the strategy literature and the trade press for the pharmaceutical industry[2]. This was

[2] These publications included academic papers on strategies in the pharmaceutical industry, publications by the ABPI trade association, issues of *Scrip*, the *Scrip Yearbook*, the *Financial Times*, *Fortune* and reports by the *Financial Times* and *Mintel*.

an emergent process as the researcher sought to identify the strategies that had been implemented and to produce a focus for the thesis. When initially reading about the pharmaceutical industry, particularly the trade journal *Scrip*, there appeared to be a mass of information about the actions of individual firms, but little in the way of being able to compare and contrast the strategic actions of different sets of firms. As the reading continued it was not immediately clear that there were variations of what appeared initially to be the same strategic action. So, for example, 'entering into a licensing agreement' could actually be broken down into 'licensing-out' or 'licensing-in', the licensing agreements may or not involve equity investments and could relate to various different types of technologies, for example proteomics, genomics or information technology. This can be likened to Boyatzis' (1998:3) concept of the "codable moment". In other words the researcher is presented with a random mass of data, in this case news in a trade journal, which eventually the researcher realised could be coded, in this case into strategic actions. Reading of the printed sources led to the formation of ideas about changes in strategies in the pharmaceutical industry that could be potentially addressed through interviews. This led to a decision to conduct some exploratory interviews in order to develop the information that had been collected from printed sources. Two interview schedules were written. The first was designed to gain the views of the UK pharmaceutical industry's trade association, the ABPI, on changes that had affected the industry during the past twenty years. The second was designed for those actually operating within and/or advising the industry. A copy of the interview schedules is contained in Appendix A.

Five interviews were undertaken in order to explore changes in the pharmaceutical industry during the past twenty years. Two members of the trade association (ABPI) were interviewed, an interview was conducted with a consultancy specialising in regulatory issues and two were undertaken with biopharma organisations. The initial purpose of these interviews was to explore how the impact of regulation had affected the industry and the competitive strategies of incumbent firms in light of it being heavily regulated.

It emerged from these interviews that there was an overall perspective that government and the pharmaceutical industry were working closely together in the United Kingdom. This had meant that with the exception of clinical safety, regulatory issues had not

become any stricter, in other words they had not impacted upon the strategies of the firms. The main theme relating to change that emerged was that the industry was becoming increasingly bipolarised with the formation of five very large companies, a large amount of small, mainly biotechnology organisations and that other organisations as they grew to middle size were usually being bought by the large firms, if they were able to survive. This informed the literature search that was reviewed in Chapter Three.

What also emerged from the interviews was the inability of respondents to remember in detail events that had occurred during the past twenty years. Interviewees made statements such as "that was before my time" and "I can't remember". There was a rationalisation of what they felt was correct but that they could not guarantee this. The other important issue was that, unless commenting upon their own strategies, the impression was that the information they provided had been what they had read themselves in trade publications and other similar sources so the views were quite limited. Also, the range of strategies that they had reported upon in the industry was quite limited. Yet change was occurring as the industry globalised and bipolarised suggesting that a wide variety of strategic actions could have been implemented in order for this to occur.

4.5.2 Summary of the Findings of the Initial Exploratory Research

Returning to the text sources that had been initially read, together with the information gained from the interviews, the initial text analysis was started. This enabled the researcher to identify in excess of 50 strategic actions that had been realised by firms in the pharmaceutical industry. This raised two issues. Firstly, that interviewees were only able to recollect a small subset of strategic actions that had been implemented in the industry. Secondly, that scholars researching the pharmaceutical industry had been limited in the number of strategic variables that they had included in any one study (Table 3.4). It was therefore necessary to identify sources for collecting data that would identify if there was more detailed information about the strategic actions that had been realised by firms in the pharmaceutical industry.

4.5.3 Data Collection for Developing the Methodological Framework

The researcher found that when conducting the exploratory interviews how easy it was to guide the answers in certain directions as a result of the reading that the researcher had already done. For this reason the researcher wanted the process of data collection and recording to be systematic and uninfluenced by my own views, or at least to reduce this as far as possible. Therefore a data collection process was preferred where the researcher would not be able to influence the decisions that were made by the subjects of the study. In addition, analysis of qualitative published data prevents the biases and problems of memory recollection that could result from interviews (Plewis, 1985). This influenced the decision to select text analysis as the main form of data collection. It has been accepted that how the information was reported in the press was the result of the subjective judgement of both those in the organisations that provided the media with the information and the subjective interpretation of this information by the media.

This data collection needed to be able to overcome these weaknesses of previous research by accessing data that could identify a detailed number of strategic actions that had been implemented by firms in the pharmaceutical industry. It needed to be produced in a way that did not have problems with memory recall, and could enable the data to be collected longitudinally. Upon reviewing the possible data collection methods the researcher felt that in the initial exploratory research, publications had provided a good source of information that could be used for data collection. Researchers who have used documentary sources to track the strategies or strategic actions of firms in an industry have used trade journals (Miller and Chen, 1994) or a quality newspaper such as the *Financial Times* (Viney, 2001).

The main source of empirical data was the 'companies' pages of *Scrip* from January 1st 2001 to December 21st 2002. As was discussed previously *Scrip* is a major pharmaceutical industry trade journal. In order to check whether *Scrip* was a more suitable source of relevant data than the *Financial Times* a sample of 20 pharmaceutical company news stories that were reported in *Scrip* in the first quarter of 2001 were checked against the 2001/2002 editions of the *Financial Times*. Only 7 of the items

were reported in the *Financial Times*. This, therefore, supported *Scrip* as a key source of data on strategy in the pharmaceutical industry .

There were three main problems with using *Scrip* encountered during the study. Firstly, when underaking this form of documentary analysis it is best to have paper copies of the articles to refer back to. This was not initially possible as the copies were held in the British Library and were covered by copyright which prevented photocopying of all of the relevant articles. In order to overcome this limitation the researcher attempted to code the strategic actions as the researcher read the articles, making a note of the issue and page numbers, and a few brief words about the article. Initial codes have to be frequently refined and so coding without having the articles to return to means that the task cannot be carried out in a comprehensive manner. Boyatzis (1998) stressed that when identifying themes, in this case strategic actions, efficiency is a primary consideration in decisions about sampling. The reason for this is that the time that it takes to read the articles is multiplied possibly three to four times as the researcher assimilates the information and identifies codable moments. For this reason it was necessary for the researcher to be able to revisit the pages of *Scrip* that were being used to identify the strategic actions and undertake coding. This was not feasible if the copies were only available in the British Library. Photocopying was not an option because copyright laws meant that all the relevant pages of *Scrip* could not be reproduced.Several alternative ways of overcoming this problem were considered including only sampling a limited amount of journals (for example every other issue) but the researcher felt that this would reduce the likelihood that the resulting categorisation would be comprehensive. The researcher identified that the best way to overcome this problem would be to have all of the articles available in a printed format that could also be scanned in order that a computer based search and retrieval process could be used. After various negotiations with the publishers the researcher was allowed to access the relevant data.

4.5.4 Data Analysis for the Methodological Framework

Analysing the data from *Scrip* proved to be an emergent process. Repeated reading of *Scrip* identified patterns showing how different strategic actions could be de-constructed and then re-constructed in different ways. This concurs with the view that a

process of realisation leads to coding and analysis of patterns (Boyatzis, 1998). For example, licensing agreements could relate to co-operative strategies, investment raising strategies or R&D strategies for exploiting a new technology such as proteomics. This identified the need for strategic actions to be more tightly defined than the headings used in Table 3.4 if the categories were to be mutually exclusive. For example, as discussed earlier in this chapter, 'licensing' could be coded as 'licensing-in' or 'licensing- out'. In addition it also highlighted the need to refine the names of each strategy thus leading to the creation of additional categories. So, for example, 'Research and Development' divided into 'Cooperative Product Development (R&D)' and 'Organic Product Development (R&D)'. This led to a process of utilising various techniques in order to develop the categorisations. The stages for undertaking this are outlined in the following paragraphs.

In order to overcome the limitations of the first set of codes, techniques used in text analysis and content analysis were applied. Content analysis has been regarded as an important way of acquiring historical quantitative data (Ginsberg, 1988). Many of the quantitative approaches to text analysis involve interpreting messages and "counting" how many times a word or phrase appears. This study is more focused upon the breadth of strategic actions that are reported rather than the frequency of certain words or phrases and therefore takes the approach of coding certain words that appear in the text into themes (Boyatzis, 1998) which for this study were strategic actions.

Categorisations are more appropriate to analyses that focus upon identifying single or a few words rather than in the analysis of free-flowing text such as *Scrip* (Hodder, 2000). Techniques used in thematic analysis were also used in order to develop the categorisations (Boyatzis, 1998). This was accompanied by a process of text analysis and the development of a code book describing how the strategic actions could be identified. A coding dictionary was developed of words/concepts/phrases that meant the same as the strategic action variables in order to help with the coding process (Neuendorf, 2002). There are debates in the literature about whether, when conducting content analysis, coding should be done by people or by software (Neuendorf, 2002) which can also be applied to text analysis. As approximately 1500 pages of *Scrip* were to be reviewed, NUDIST5 (N5) software was used to import the data so that it could be stored in an electronically searchable format. N5 facilitated data display and systematic

searching. Content and text analysis were used with N5 used purely as a tool to aid the retrieval of data. The coding dictionary was used for searches undertaken. The data could be displayed in a report format and also on screen, allowing the researcher to view the complete *Scrip* article when necessary for understanding the context of the selected text. The relevant sections were coded, added to the categorisation and the dictionary developed as knowledge was increased during the coding process.

In order to develop the categorisation further, the previous draft versions were re-conceptualised. Conceptualisation is an important part of the categorisation process if the categorisation is to have purpose (Riedel, 2000). As the strategic actions were being identified in order to explain patterns in the strategies of firms, data was organised through a set of mind maps. Putting down onto paper the main strategy headings together with the strategic actions that had been identified helped to organise the information on the mind map. This allowed the linking of strategic actions in different categories and aided memory recollection of actions that had been read about but had not been noted down in the initial draft of the strategic actions.

These strategic actions were initially mapped with the six strategy headings identified in Table 3.4. This led to the identification of subcategories for the original strategy headings, for example, marketing subcategories included pricing, branding, sales and advertising strategies. In addition, notes were made of strategic actions that appeared in more than one category. For example, launching products in new geographical markets appeared in both the product launch category and the internationalisation/globalisation category. With these diagrams it was possible to see how each of the strategic actions formed part of a specific strategy and therefore illustrated how these parts added up to the implementation of a specific type of strategy.

Following one of the key principles of high quality qualitative research that data collection should be thorough, the next stage of development of the categorisation involved a fine grained analysis of the issues of *Scrip*. This was to identify all of the strategic actions that had been reported during the period January 1st 2001 – December 31st 2002 by electronically scanning the articles from *Scrip* and importing them into N5. The coding dictionary was further developed to include all words that were relevant to the strategic actions that had already been identified, and these were

recorded in the form of tree nodes using the N5 software. This led to a process of identifying further strategic actions and assigning them to an interpretation of the most appropriate strategic heading.

4.5.5 Categorisation of the Strategic Actions

Once the strategic actions had been empirically identified through the text analysis it was necessary to identify a framework that was suitable for classifying them so that they could be coded in order to identify the strategies that had been realised. Detailed reading of the literature suggested that the adoption and adaptation of Pearce II and Robinson's (1994) identification of 14 grand strategies was a suitable framework. This had also been used by Viney (2001) when he tracked the strategies of the major Regional Electricity Companies through content analysis. As the pharmaceutical industry had evolved into a global oligopoly it was preferable to apply an additional coding as to whether the strategic actions could be related to globalisation rather than how firms had competed. Grand strategies can be understood as the packages of strategies that firms had planned and/or realised in order to achieve long-term objectives. It was necessary to develop Pearce II and Robinson's (1994) framework so that the strategic actions that had been identified in the empirical research could be allocated to mutually exclusive categories. This is an important factor in developing a taxonomy (Child and Faulkner, 1998) and/or categorisation.

The empirical research had identified strategic actions relating to the external raising of finance and the use of information technology. This resulted in the addition of two new grand strategies. The empirical data had also highlighted that various cooperative and acquisition based strategic actions had been implemented. This led to the reassigning of some categories and the creation of new categories to reflect that certain strategies may be focused on acquisitions, co-operative arrangements or organic development. Finally, taking into consideration the main emphasis of pharmaceutical firms the market development category was redefined to focus upon therapeutic markets. This resulted in an extension of Pearce II and Robinson's (1994) original categorisation of 14 grand strategies to 23 for the pharmaceutical industry as illustrated in Table 4.1.

Table 4.1 Overview of Grand Strategies Implemented by Firms in the Pharmaceutical Industry 2001-2002

Grand Strategies	Definitions and Criteria for Inclusion/Exclusion
Cooperative concentration (market penetration)	Actions relating to an existing product in an existing therapeutic market that involves some form of cooperative arrangement. Must be focused upon an existing dominant technology (Pearce II and Robinson, 1994). This must be a pharmaceuticals product and not one involving biotechnology, genomics or proteomics.
Organic concentration	Actions relating to an existing product in an existing therapeutic market that have been implemented by the firm itself . It must be focused upon an existing dominant technology (Pearce II and Robinson, 1994). This must be a pharmaceuticals product and not one involving biotechnology, genomics or proteomics.
Cooperative market development	Strategic actions relating to entry into a new therapeutic market through a cooperative arrangement. The source must make reference to this being a new therapeutic market for the firm.
Organic market development	Strategic actions relating to entry into a new therapeutic market that have been implemented by the firm itself The source must make reference to this being a new therapeutic market for the firm.
M&A market development	Strategic actions relating to entry in a new therapeutic market as a result of Merger and Acquisition activity. The source must make reference to this being a new therapeutic market for the firm.
M&A product development	Acquisition rather than internal development of a product or process using technology that was already used by the firm. This does not include biotechnology, proteomics, genomics or gene libraries. The source must not state that the technology was new to the firm.
Cooperative product development (R&D)	The cooperative development of an existing product or process using technology that was already used by the firm. This does not include biotechnology, proteomics, genomics or gene libraries. The source must not state that the technology was new to the firm.
Organic product development (R&D)	The development of an existing product or process using technology that was already used by the firm. This does not include biotechnology, proteomics, genomics or gene libraries. The source must not state that the technology was new to the firm.
Cooperative innovation (R&D)	Development of a product or process, through a cooperative arrangement, relating to biotechnology, proteomics, genomics and gene libraries or any technology that the source states as being new to the firm. This can also include development of a new chemical entity (NCE), and development of a class of product that had not existed prior to the beginning of the study (1st January 1992) e.g. a super statin.
Organic Innovation (R&D)	Internal development of a product or process relating to a change in technology from those that were already used, relating to biotechnology, proteomics, genomics and gene libraries or any technology that the source states as being new to the firm. This can also include development of a new chemical entity (NCE), and development of a class of product that had not existed prior to the beginning of the study (1st January 1992) e.g. a super statin.
Cooperative innovation (Information Technology)	Actions that relate to information technology, ecommerce or ebusiness through a cooperative arrangement
Organic innovation (Information Technology)	Actions that relate to information technology, ecommerce or ebusiness through internal development
Horizontal integration	Merger or acquisition involving a firm that is broadly similar but that is not in the same supply chain e.g. a pharmaceutical firm acquiring a pharmaceutical firm. This is focused upon the merger or partial or full acquisition of a business
Vertical integration	Merger or acquisition involving a firm that is a customer or supplier e.g. a pharmaceutical firm acquiring a marketing organisation.
M&A concentric diversification	Merger or acquisition of a firm that "may be related to some distinctive competence or asset of the core business" (Mintzberg, 1991:79) e.g. a pharmaceuticals firm acquiring a generics business. It does not include a business that is broadly similar or part of the supply chain
Organic concentric diversification	The spin off or creation of a new business which must be solely owned by the company
Conglomerate diversification	Merger and acquisition activity involving a firm that is completely unrelated to the pharmaceutical technology or healthcare industry and that does not fit the criteria for concentric diversification.
Retrenchment	A strategy focusing upon restructuring, asset and cost reduction but does not include the sale of any parts of the firm
Organic growth	Corporate expansion activities which include an increase in assets and expenditure This does not include the acquisition or merger of businesses or increases that are product specific
Divestiture	The sale of complete businesses ie business units, subsidiaries etc as going concerns. This does not include the selling off of parts of the firm e.g. a plant or a product line.This does include a demerger.
Liquidation	The selling off of parts of a company as a result of the actions of an administrator. This includes the sale of complete businesses ie business units, subsidiaries, spin offs, or wholly owned businesses as going concerns as well as plants and product lines.
Joint venture	The creation of a third "daughter" firm by two or more partner firms.
External finance raising	Strategic actions that focus on financing arrangements through external organisations. These can include equity partnerships and/or licensing agreements. This includes any cooperative arrangement where the firm has had equity placed into it by the partner firm. This does not include the selling (liquidation or divestment) of assets

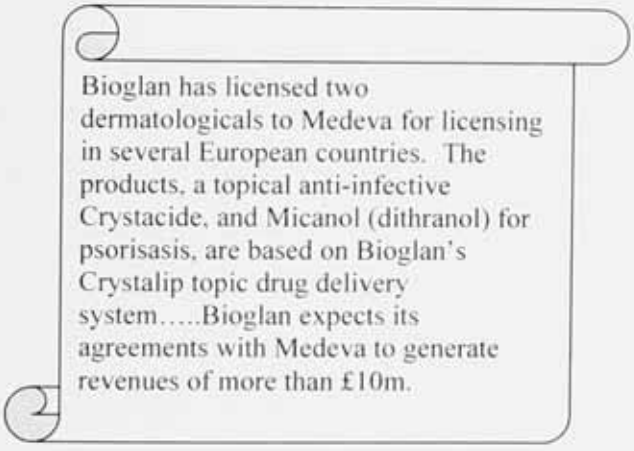
Source: Author after Pearce II and Robinson (1994)

The categorisation shown in Table 4.1 was developed so that it contributed to high quality research by adapting some of the criteria proposed by Boyatzis (1998) for good identification of themes (realised strategies) together with Miles and Huberman's (1994) recommendations for coding. The finalised categorisation therefore consisted of :

- A label (the grand strategy)
- A definition of what the theme concerns (the characteristic or issue constituting the theme)
- A description of how to know when the theme occurs (indicators on how to "flag" the theme (i.e. relevant strategic actions)
- A description of any qualifications or exclusions to the identification of the theme

Figure 4.2 shows an extract of the text that was analysed. The final categorisation is contained in Appendix B.

Figure 4.2 Example of text from *Scrip*



Source: *Scrip* April 2nd 1996:13

A detailed version of the finalised categorisation was shown to two pharmaceutical industry experts, one was a General Manager of a biopharmaceutical company and the other a representative of a pharmaceutical trade association. Both experts felt that the framework was sound and comprehensive with no amendments necessary.

4.6 Application of the Categorisation of Strategic Actions as a Methodological Framework

The next stage of the research for this thesis was applying the methodological framework so that it could be used to address the research question and sub questions R2-R4.

4.6.1 Data Collection

As Mintzberg and Waters (1982) stated, trying to track strategies over a period of time is difficult. There are limitations as to the work that can be achieved for a thesis, in particular these are with regard to financial factors and access to resources. When the categorisation was developed it was on the basis that all firms could be analysed using the same data collection instrument. However, extensive searching identified that there was a limit as to the amount of data that could be found for all of the firms in the sample going back to 1992. An email to the British Library suggested that the most comprehensive data would be on the Lexis Nexis database, but for example with regard to Bioglan the earliest annual report that Lexis Nexis professional database held was for 1998. Searches for annual reports were conducted using the databases held at the British Library and Company Annual Reports On-Line (CAROL) but again it was found that it was not possible to obtain annual reports for every firm in the sample for each of the eleven years being studied. Some detailed information was found using the LexisNexis database but again it was not possible to find the same sources for each firm for the timescale. However, some of these sources were used to provide background information about the firms.

For this reason it was decided to continue using *Scrip* as the main source for collecting data on the strategic actions and grand strategies that were realised during 1992-2002. When the data on the strategic actions for each sample firm had been collected using all issues of the 'companies section' of *Scrip* January 1st 1992 – December 31st 2002 it was triangulated with the *Financial Times* using the same process of classifying

strategic actions over the same time period and this was supplemented with data from *Mergerstat* about merger and acquisition activity that each firm in the sample had been involved with. Information was also collected from other various sources in order to contextualise the data for each of the firms. In particular, this was focused upon gaining a background to each firm's establishment and to identify any potential breakpoints in each firm's operating environment during 1992-2002.

4.6.2 Population Selection

As discussed in Chapter Three the pharmaceutical industry has evolved into a global oligopoly with consolidation at the top and the entry of a large number of small biotechnology firms (Grabowski and Vernon, 1994; Kettler, 2001a). December 27th 2000 was the first day of operating for the firm that had resulted from the last megamerger to date in the pharmaceutical industry with the creation of GlaxoSmithKline, the world's largest pharmaceutical firm (GSK, 2004). As discussed earlier in this chapter this was one of a number of major megamergers that shaped the changing structure of the pharmaceutical industry as it evolved during the 1990s moving towards being a global oligopoly. But with this thesis I have chosen to focus on the "middle ground" (Lawrence, 2002:43) firms that had arrived at different strategic outcomes rather than the largest ten firms in the pharmaceutical industry as they were listed in Table 3.3 . There were various reasons for this which are outlined below.

"Middle sized" pharmaceutical firms appear to have been rather neglected in the pharmaceutical literature. Studies into the changing structure of the pharmaceutical industry (Grabowski and Vernon, 1994; Matraves, 1999) and various aspects of competitive strategies (Bogner *et al.*, 1996; Helms, 1996) have tended to focus on the larger organisations. Although Bogner *et al.* (1996) initially selected 25 of the largest pharmaceutical organisations, after consultation with the pharmaceutical industry they increased the number to 36. This included five generic firms and also meant that they were focusing upon middle sized pharmaceutical firms as well as the very largest ones. As discussed in Chapter Three as the biotechnology companies have grown to medium size they have either been acquired by the larger organisations or ceased to survive (Kurdas, 1998). As also discussed in the literature review (Chapter Three), Hannan and Freeman's (1997) view was that there is a limit to the growth potential of medium-sized

enterprises. The reason for this is that as an industry evolves (bipolarises) middle sized companies are either acquired by large growing organisations or fail to survive as a result of competitive processes. For this reason it was decided to select the sample from medium sized pharmaceutical firms that had arrived at different strategic outcomes.

As has been discussed this research is qualitative and this approach underpins the sampling strategy used for the research. Specifically it led to the purposeful selection of a small number of cases (Patton, 2002). Purposive sampling is not statistically representative but can be used to identify key themes and aspects of uniqueness which is appropriate to a thesis that focuses upon the evolution and coevolution of strategic actions for a heterogeneous set of firms. The cases selected through the purposive sampling were those considered to be "information rich" (Patton, 2002:46) in that they represent different strategic outcomes and could therefore contribute to our understanding of how realised strategies precede these different strategic outcomes. Forms of probability sampling, traditionally used in quantitative analysis, although allowing for generalisations, would have risked omitting key cases that were needed for exploring how the realised strategies and strategic actions of a heterogeneous firms have evolved and coevolved.

Taking the end of 2000 as its starting point the sampling frame for this research focused upon the firms that were in the pharmaceutical industry top 200 by turnover at the end of 2000. This was achieved by using the *Scrip Pharmaceutical League Table* which lists the top 200 pharmaceutical firms in the world in 2000, ordered by turnover (PJB Publishing, 2001). The reason for selecting firms as they were in 2000 was so that data about the firms could be analysed in order to identify their strategic outcome at the end of the research period which was December 31st 2002. This two year period was judged to be sufficient in order for the firms sampled to have arrived at a number of different strategic outcomes during this period of pharmaceutical industry consolidation. From this a geographical cluster was identified which consisted of all European pharmaceutical firms in this sampling frame. The European firms were selected as they have to develop strategies in a different regulated trade bloc from firms in the United States and Japan, and were therefore operating in a unique environment from other pharmaceutical firms but together were affected by the same exogenous forces. In

addition the literature has shown that the strategies of Japanese pharmaceutical firms are very different from those of European firms and so this factor was isolated out of the research. This resulted in 73 firms being selected (Appendix C).

Using copies of *Scrip* from January 1st 2001 to December 31st 2002 a search was conducted to identify firms that had arrived at different strategic outcomes. As discussed in the definitions section (page 8) the term "strategic outcome" is used to define how firms evolve into a different species, for example as a result of being merged, demerged, acquired or liquidated. Therefore searches were carried out to identify firms which had arrived at any of the strategic outcomes divested, acquired, merged, demerged and liquidated. The results of the coding are shown in Appendix D. In qualitative research there is often the temptation to collect more data than is necessary to address the research question. As Miles and Huberman (1994:56) highlighted it is important to "resist overload – but not at the price of sketchiness". Each of these strategic outcomes contributed either negatively or positively to the number of firms operating in the pharmaceutical industry, which can be related to the conceptual framework (Figure 4.1) with regard to issues of strategic outcomes relating to industry consolidation.

In order to maximise the credibility of the analysis a multiple case replication approach was chosen which increased the stability of findings whilst allowing for generalisability across cases (Miles and Huberman, 1994). Yin (1994:51) argued that replication and sampling are not the same, and stated that "any use of multiple-case designs should follow a replication, not a sampling, logic and an investigator must choose each case carefully".

Yin (1994:51) also suggested that a replication approach should be

> *"in a manner similar to multiple experiments, with similar results (a literal replication) or contrasting results (a theoretical replication) predicted explicitly at the outset of the investigation."*

Therefore, in this research purposive sampling (Patton, 2002) was combined with replication logic (Yin, 1994).

In order to further explore replication logic with regard to the coevolution of firm strategies it was felt important to include in the analysis firms that had arrived at different strategic outcomes. In order to select the firms and to develop the strength of the analysis a literal replication approach was applied where each firm in the chosen sample shared at least one similar characteristic with other firms in the sample. From these a purposive sample was selected, based upon the strategic outcomes of the firms within the sampling frame and excluding the largest firms. The firms are outlined in Table 4.2.

Table 4.2 Firms in the Thesis Sample

Name	Country of Origin	Strategic Outcome	Position in the *Scrip Pharmaceutical League Tables* for 2000
Asta Medica	Germany	Disbanded and divested	65
Pierre Fabre	France	Demerged	77
Shire	England	Merged	80
LEK	Slovenia	Acquired	111
Galen	Northern Ireland	Survived without being merged or acquired	140
Bioglan	England	Liquidated	143

Asta Medica was the only firm in the sample that on January 1st 2001 was owned by a parent company and was also a parent company itself. Asta Medica's strategic outcome was that it was disbanded and divested by its parent company Degussa. Pierre Fabre merged with bioMerieux and then subsequently demerged from the company. Shire merged with the Canadian pharmaceutical firm Biochem. LEK was acquired by Novartis whilst Bioglan was chosen because it had arrived at the strategic outcome of being liquidated. Finally it was felt that in order to develop the analysis it was important to include a European firm in the sample that had stayed in the same form from January 1st 2001-December 31st 2002. When selecting this firm it was felt that it would be beneficial to ideally select a firm that had not changed its parent, been the subject of merger activity or been acquired during the period for analysing strategic actions i.e. from January 1st 1992 to December 31st 2002, although it was acceptable if the firm itself had acquired other organisations. The firm Galen met this criteria. Two particular factors made the researcher feel that it would add depth to the research findings. The first was that the *Financial Times* had described Galen as being similar to two other firms that had already been chosen for the sample, Shire and Bioglan.

> *"That leaves a space in the middle. It is a niche being exploited by a new corporate beast: speciality pharmaceutical company. Also known as emerging pharmaceuticals, the group – which includes Shire, Galen, Bioglan Pharma…… Acquisitive, pragmatic and nimble, they pride themselves on marketing niche drugs considered too small by "big pharma". Unlike flashier biotechs, they do not waste money on speculative, long-term research that may never bear fruit"*
>
> (Guerrera and Pilling, 2000:36)

The second factor that made Galen interesting to the research and with regard to replication logic was that it was in a very similar position to Bioglan in the 2001 pharmaceutical league table with regard to its ranking for leading firms by pharmaceutical sales with Bioglan ranked 143 and Galen ranked 140. A third factor was that Bioglan, Shire and Galen all originated in the United Kingdom. Therefore, it was possible to use replication logic to compare the strategies of these three similar firms with each other and with the other firms that had specific differences such as country of origin and not being labelled as 'speciality' pharmaceutical firms.

It was felt that the approach taken to selecting firms strengthened the firm analysis undertaken by enabling the analysis to identify patterns and differences across the cases in order to identify aspects of coevolution (the underpinning theory for this research). It was felt that this replication is important in research that is focusing upon how firm strategies had coevolved.

4.6.3 Choice of Qualitative Data Analysis Methods

Before undertaking the analysis to identify the strategies realised by each firm N5 was used to retrieve all of the articles relating to the firm being analysed. The stages undertaken in order to identify and record the strategic actions implemented by the firms in the sample are given below. The analysis required considerable interpretation by the researcher in order to identify whether each retrieved item actually related to a strategic action relevant to a grand strategy. In order to increase the reliability and validity of the findings the following stages were followed for coding each strategic action:

1) The relevant articles were retrieved using each of the words in the coding dictionary for the specific grand strategy being identified

2) The articles that had been retrieved were read to identify if they related to the strategic actions that had been identified for this form of grand strategy and/or the definition of the theme concerned

3) If they met this criteria each article was coded as being relevant to the grand strategy.

4) The articles that had been coded were read again to check if they matched any qualification or exclusions for the relevant grand strategy. If they included any exclusions for the theme then the coding was removed.

5) The relevant data from the coded articles were then recorded on the spread sheet as shown in Table 4.3.

Table 4.3 Example of Recorded Data: Galen's Organic Growth Strategic Actions

Year	Strategic Action Code	Strategic Action	Geographical Locations
1992	ORG1	New antibiotics plant	Northern Ireland
1994	ORG2	£7.3 million expansion programme	-
1995 – 1997	ORG3	3 year £17.4 million expansion programme	-
1997	ORG4	Establishment of a clinical trials operation	US
2000	ORG5	Expansion of UK salesforce	UK

Source: Compiled by the author

The categorisation of strategic actions was designed so that each strategic action has been allocated with a code and a description of the rules as to what does and does not constitute each type of strategic action. These codes were used in the transcription of the text data so that a record was made of each strategic action that the firm implemented, the year in which it was implemented and the number of times in each year it implemented that specific strategic action. In order to cross-check any information when this information was initially recorded it also included the journal, the date and the page number of where the strategic action was reported in order to be able to gain easy access to the information if further information is needed to explain certain aspects of the findings.

One of the problems with the data collection was a lack of historical data that this presented as it was primarily focused upon the period 1992-2002. Webb and Pettigrew (1999) also acknowledged in their study that the timescale for data collection means that the researcher can only refer to actions that occurred during the period under study. Problems that were encountered with this meant that the researcher was unable to identify the products owned by firms and the therapeutic markets served as at 1st January 1992. This therefore impacted upon the preciseness of the analysis regarding the grand strategies relating to concentration, market development and product development in the original categorisation used for the methodological framework (Table 4.1). For example, it was not possible to distinguish between internal product development, product acquisition and cooperative product arrangements. Therefore, for

the purposes of this thesis these were reduced to the one category of 'network and acquisition based product development strategy.'

The market development strategy was also removed from the classification as there is no base line data to identify the therapeutic markets served by the firm prior to 1992. However, any mention made in the *Financial Times* or *Scrip* of the firms entering into a new therapeutic market were included in the commentary about each organisation's strategic actions. Market development relating to geographical markets were referred to in the globalisation coding. Finally a new categorisation was created that related to "Product Divestment and Licensing Out". This had originally been included within the external finance raising strategy, but further reading of the pharmaceutical literature highlighted that firms may implement relevant strategic actions for reasons other than just raising finance, for example, to streamline the product pipeline. The products can either be divested or the rights to marketing the product licensed out. The adapted categorisation that was used for the final coding and resulted in the headings shown in Table 4.4 is contained in Appendix E.

Table 4.4 Grand Strategies Used in the Final Analysis

Grand Strategy
Network and acquisition based product development strategy
Cooperative innovation (Information Technology) strategy
Organic innovation (Information Technology) strategy
Merger &Acquisition strategy
Organic concentric diversification strategy
Conglomerate diversification strategy
Retrenchment strategy
Organic growth strategy
Liquidation strategy
Divestment & demerger strategy
Joint venture
External finance raising strategy
Product divestment and licensing out strategy

Source: Compiled by the author

The choice of qualitative data analysis methods is outlined in Table 4.5, which relates the sub questions R2 to R4 to the stage of qualitative analysis and analytical methods.

Table 4.5 Choice of Qualitative Data Analysis Methods

Sub Question	Stage of Qualitative Analysis	Analytical Methods
R2: How did the realised grand strategies of a heterogeneous set of firms evolve during the period of pharmaceutical industry consolidation from 1992-2002? R4: How did a heterogeneous set of firms realise internationalisation strategies during the period of pharmaceutical industry consolidation from 1992-2002?	Reconstruction and longitudinal tracking of strategic actions in order to identify the realised grand and internationalisation strategies of firms.	Chronological ordering, thematic analysis, text analysis
R3: How did the realised strategic actions of a heterogeneous set of firms coevolve with each other's strategic actions during 1992-2002?	Longitudinal tracking and matching of realised strategic actions in order to understand how they coevolved.	Pattern matching

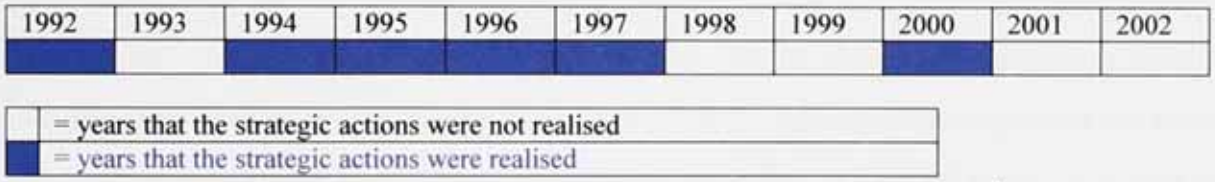
Source: Compiled by the author

Miles and Huberman (1994) advocate the use of matrices so that the data can be easily manipulated and used for different purposes. Several matrices have been developed to record the information contained in the texts in formats that can be adapted for various types of analysis and so that the information can be easily manipulated for other uses. For example, the evidence has been recorded chronologically and can be tabulated in order to calculate the frequency of different events. In order to analyse the timing of the strategic actions the data was put into chronological lists which, when suitable, were depicted in graphs, for example by pictorial representation on timescales in order to apply labels relating to patterns or sequences of events (Mintzberg and Waters, 1982). This allowed for the identification of linked sequences between strategic actions in order to identify patterns that could be classed as realised strategies. These were also used to compare the strategic actions implemented by different firms in order to identify temporal patterns in strategy development through the use of pattern matching. This is a method similar to that used by Webb and Pettigrew (1999) when they explored temporal patterns in strategy with their study of the insurance industry. Webb and Pettigrew (1999) further developed their analysis through the used of a time series based approach but for the reasons discussed previously this thesis has focused upon the use of qualitative analysis. The final stage of the analysis focused upon how the realised strategic actions of the firms in the sample had coevolved during 1992 – 2002. Using a

development of the chronological mappings discussed earlier these were compared for each type of strategy for each of the six firms using pattern matching.

Having deconstructed the text in order to categorise strategic actions, data analysis methods were identified in order to use this information to address the research question. Additional coding was applied to the article if it met the criteria for a globalisation strategy and/or a retrenchment of the strategic action. Matrices were used to record the data from the text analysis in formats that can be adapted for various types of analysis and so that the information can be easily manipulated for other uses (Miles and Huberman,1994). In order to analyse the timing of the strategic actions the data was put into chronological lists which were then depicted in bar charts in order to apply labels relating to patterns or sequences of events (Mintzberg and Waters, 1982). Figure 4.3 shows the bar charts that relates to Table 4.3.

Figure 4.3 Summary of Galen's Organic Growth Strategic Actions



This allowed for the identification of linked sequences between strategic actions in order to identify patterns that could be classed as realised strategies.

4.7 Criteria for Judging the Quality of Qualitative Research

Robson's (2002, after Cresswell, 1998) recommendations as to a 'good' flexible design were adapted as follows. Detailed methods of both data collection and analysis were undertaken. Considerable time and rigour were applied in developing a categorisation of strategic actions that was adapted to collect data to identify the strategic actions and strategies realised by the firms in the sample. The categorisation of strategic actions evolved from an initial exploratory approach through to a categorisation that was developed through a process of fine grained analysis. This multistage approach is also adopted in the analysis stage as the realised strategies of firms are identified first. This

then followed through to an analysis of how strategic actions formed strategies and the strategic actions coevolved.

As well as adopting Robson's (2002) guidelines for a 'good' qualitative research design, various criteria were applied in order to maximise the quality of the research, its data analysis, collection and writing. It is important to be guided by a philosophical paradigm, such as realism, so that it can be used to guide each stage of the research process in order to improve the quality. However, there are proponents of the view that researchers can achieve quality of research whilst accessing a plurality of paradigms (Mingers and Brocklesby, 1997). Robson (2002:18) emphasised that realism does not reject the scientific principles of positivism but incorporates a "scientific attitude". This means that research should be conducted "systematically, sceptically and ethically." As demonstrated in this chapter the research was conducted in a systematic manner, as shown by the stages involved in designing the methodological framework, the development of the sample and the stages involved in the data analysis. The nature of the research design for this thesis means that there are no ethical considerations because the documents are publicly available. Robson (2002) argues that these criteria are likely to improve the quality of research. The criteria identified in Table 4.6 were also met by the research design in order to maximise the quality of the research.

Table 4.6 Criteria for Ensuring High Quality Research

Criteria	References	Methods employed in the research design
Construct Validity	Yin (1994), Robson (1999), Patton (2002)	With regard to the categorisation of strategic actions and grand strategies for each strategic action that was identified an example was included together with the date that it appeared in the relevant documentary source. Every stage of developing the strategic action data collection instrument has been noted. With regard to the strategic actions reported for each of the firms in the sample a copy of the relevant text was recorded. Three sources of evidence were used for identifying the realised strategies and strategic actions of the firms in the sample (*Scrip*, the *Financial Times* and *Mergerstat*). Audit trails have been employed with each stage of analysis available for review that provides evidence of how the analysis was conducted through a series of building blocks.
External validity	Yin (1994)	The categorisation of strategic actions means that the data collection was replicated for each of the sample firms.
Objectivity	Patton (2002)	The design of the data collection instruments identified for the categorisation of strategic actions reflect the positivistic influence upon me. They have been developed in a format so that the information that is collected can be standardised and is objective with the researcher being independent of those that are being researched.
Biases made explicit	Patton (2002)	A section on research bias has been incorporated into the thesis.
Empirical findings emphasised in reporting	Patton (2002)	The aim was to emphasise the empirical findings, rather than personal beliefs, in the findings. For this reason all of the strategic actions that were identified were tabulated using chronological ordering.
Adequacy of theorisation	Robson (2002:62)	Coevolution theory has been employed as a theoretical lens in order to generate a theory as to how the strategies of a heterogeneous set of firms coevolve.

4.8 Research Bias and Research Limitations

One of the issues that needs to be dealt with when dealing with the analysis of qualitative data is the issues regarding the researcher's concepts (Miles and Huberman, 1994) and so this thesis has included definitions that describe the main terms that are used in the analysis. In addition the guidelines suggested by Boyatzis (1998) for developing themes has also been used. However, unlike qualitative research that involves interviewing people and asking them to recall events the use of written text for data collection to some extent means that the data is not being changed, for example because of recollection issues. Verification is undertaken in ensuring that the list of strategic actions only refers to actions that have been implemented by firms in the pharmaceutical industry and this has been done through providing specific company

examples for each strategic action. In addition the worthiness of the data was checked through various forms of triangulation.

There is also a risk of error as the coder collects information and codes it, for example the omission of a strategic action or the insertion of a wrong code (Neuendorf, 2002) but two measures were undertaken to negate the impact of such errors. Firstly the data was triangulated. Secondly, after coding all of the text on N5 the information was printed out to check and recode the data as necessary. Thirdly, each of the strategic actions that was coded was then matched up with the evidence from the relevant sources of *Scrip*, the *Financial Times* and *Mergerstat*. It would have been beneficial to have used a second coder but the high costs associated with the data collection meant that there were not sufficient resources to employ a second person to cross-check the coding.

Another limiting factor of the research is the reliance upon strategic actions that were reported in the media. This means that the data is subjective for two reasons. Firstly, it is relying upon firms to accurately, and substantially, release information about strategic actions to the media. Secondly, the information released by the firms has to have been selected by the journals' editorial staff for inclusion and is also subjected to their interpretation of events. The researcher aimed to minimise this aspect of bias by only including actions that were reported as actually having been implemented rather than those that may potentially happen, an approach used by Webb and Pettigrew (1999). So, for example, information would not have been recorded for data analysis if it was about merger talks, but would be if a merger had been agreed.

4.9 Chapter Summary

The research design has been developed in order to answer the following research question "How did the realised strategies of a heterogeneous set of pharmaceutical firms coevolve during the industry consolidation of 1992 - 2002?" The research design was underpinned by a conceptual framework and the philosophical underpinning of realism. A detailed categorisation of strategic actions realised by firms in the pharmaceutical industry was used as a methodological framework for analysing how the grand strategic actions and grand strategies of firms evolved and coevolved. This Chapter discussed how the methodological framework was applied to a sample of six pharmaceutical firms

that arrived at different strategic outcomes. The results of the strategic actions that they realised during 1992-2002 are presented in the Chapter Five.

CHAPTER FIVE

RESULTS:

REALISED STRATEGIC ACTIONS 1992-2002

5.1 Introduction

Chapter Four categorised the strategic actions that were realised for all pharmaceutical firms as they were reported in *Scrip* for the period January 1st 1992 to December 31st 2002. This chapter narrows these down to focus upon the strategic actions realised by the firms in the sample. Using the adaptation of the methodological framework discussed in Chapter Four this chapter presents the results that were obtained from the text analysis and coding of *Scrip*, the *Financial Times* and *Mergerstat* for the period 1st January 1992 to December 31st 2002. This was conducted for the six firms in the sample in order to identify the strategic actions that were realised. The strategic actions were chronologically mapped in order to provide the empirical data needed to address the sub questions R2 to R4. This will provide the basis for the discussions on strategy evolution and coevolution in Chapters Six and Seven.

Four categories have been removed from the original set as they were not reported as being implemented by any of the firms in the sample. These were cooperative innovation (IT) strategy, organic innovation (IT) strategy, conglomerate diversification strategy and liquidation. This left strategic actions relating to nine types of grand strategy that were evidenced as having been realised by the firms in the sample. The finalised categorisations are shown in Table 5.1 along with an abbreviated codename for each of the strategies.

Table 5.1 Grand Strategy Strategic Actions Realised by Firms in the Sample

Grand Strategy	Code Name
Merger and Acquisition	M&A
Network and Acquisition Based Product Development	NABPD
Organic Concentric Diversification	OCD
Organic Growth	OG
Joint Venture	JV
Divestment and Demerger	D&D
Product Divestment and Licensing Out	PD&LO
Retrenchment	TR
External Finance Raising	EFR

Source: Compiled by the author

This chapter is structured to present the strategic actions that were realised for the following firms:

- Pierre Fabre
- LEK
- Asta Medica
- Shire
- Galen
- Bioglan

5.2 Pierre Fabre

Laboratoires Pierre Fabre was a French privately owned company established by 1961 by Monsieur Pierre Fabre (Pierre Fabre, 2003). It evolved into being "France's second largest privately owned pharmaceutical firm" (*Scrip*, 1994a:13). By 2002 Pierre Fabre felt that because it was "present in all pharmaceutical sectors [that it gave it] an edge over [its] competitors in the face of regulatory changes" (Pierre Fabre, 2003:6). As Table 5.2 shows Pierre Fabre demonstrated consistency in strategic actions with regard to the implementation of Network & Acquisition Based Product Development (NABPD) strategic actions.

Table 5.2 Pierre Fabre's Network & Acquisition Based Product Development (NABPD) Strategic Actions

Year	Strategic Action	Firm	Product	Geographical Location
1992	Marketing and development agreement	Haw Par Brothers International Ltd	"Baume du Tigre" (Tiger Balm)	Europe
1992	Development, manufacture and supply agreement	R P Scherer		
1992	Licensing in agreement	Pfizer	The benign prostatic hypertrophy product, doxazosin	
1993	Co-marketing agreement	Warner-Lambert	The antiviral, Vidarabine	France
1993	R&D agreement	A & S Biovecteurs	A number of Pierre Fabre's pharmaceutical products	N/A
1994	Development and marketing agreement	Sigma-Tau	Pharmaceutical products containing propionyl L-carnitine	France and French-speaking African countries
1994	Letter of intent for exclusive licence to manufacture Pedvax HIB for sale in France	Merck & Co and Pasteur Serumset Vaccins (PMSV)	Pedvax HIB	France
1995	Distribution agreement	Gerolymatos	All of Pierre Fabre's products in Greece	Greece
1996	Licensing in/marketing agreement	Biovail	Tiazac	France
1996	Licensing in agreement: Registration, marketing and promotion	Applied Pharma Research	10% gel formulation of the antiviral, idoxuridine, for herpes simplex	Several European countries
1998	Agreement to enter a research partnership	The French scientific council CNRS	Research into pharmaceuticals derived from natural substances	
1999	Research collaboration	French Institute de Pecnerche de Developpement	Potential therapeutic substances	
1999	Licensing in of sales and development rights	Allergan	Zorac	Continental Europe
1999	Licensing in	Orphan Medical	Busulfex	21 European countries plus Argentina and South Africa
2000	Licensing in of exclusive development and marketing rights	Glaxo Wellcome	The anticancer combination eniluracil/5-fluorouracil	EU and certain French speaking African countries
2000	Joint marketing agreement	Recordati	Recordati's calcium antagonist, lercanidipine	France
2001	Five year alliance	ExonHit Therapeutics	Defining of genetic signatures for biopsies and blood samples	
2001	Cancer research contract	Celera Genomics	For the examination of tubulin gene polymorphism	
2001	License agreement	University of California San Francisco	Yellow fever virus technology	Worldwide
2001	Co-research agreement	Genfit		
2001	Co-marketing agreement	Lilly[1]	Eflucimibe (F-12511)	Worldwide
2001	Co-marketing agreement	Lilly	Raloxifene	France
2002	Development collaboration	UroGene	Novel therapeutic targets and drugs in onco-urology	

Source: Compiled by the author from various issues of *Scrip*, the *Financial Times* and *Mergerstat*, 1992-2002

Relevant NABPD strategic actions were reported as being realised in all years apart from 1997. The strategic actions related to marketing, development, research,

[1] Also see Table 5.5

manufacturing, distribution and licensing-in agreements. At least two of the cooperative arrangements were with genomics firms; Genfit and Celera Genomics. There has been detailed literature about how pharmaceutical firms increasingly interacted with biotechnology firms (Kettler, 2001a) but Pierre Fabre's relationships with Genfit and Celera suggest that future research could be conducted to ascertain if pharmaceutical firms will enter into the same symbiotic relationships with genomics firms as they did with the biotechnology firms. Pierre Fabre was involved in agreements with a variety of different types of organisation including the French scientific council CNRS, the University Of California San Francisco and university hospitals. This confirms the work of Bower (1993) with regard to the different types of organisation that can appear in a pharmaceutical firm's network and also adds weight to the view that pharmaceuticals can be viewed as a "system or network" (McKelvey *et al.*, 2004:112). Pierre Fabre also entered into five joint ventures during 1994-2001 (Table 5.3).

Table 5.3 Pierre Fabre's Joint Venture (JV) Strategic Actions

Year	Strategic action	JV Partner	JV Name	Countries
1994	Establishment of an international centre to study skin ageing	A Toulouse university hospital		France
2000	Establishment of a JV	Arriani Pharmaceuticals	Pharma Fabre SA	Greece
2000	JV production plant	Novo Nordisk	Aldapn	Tizi Ouzou region
2001	Joint research centre	CNRS, the French National Scientific Research Centre		France
2001	Joint centre for pharmacological screening	CNRS		France

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

Pierre Fabre's Joint Ventures were with pharmaceutical firms, a university hospital and the CNRS (the French National Scientific Research Centre). As was seen in Table 5.2 prior to the joint venture with CNRS Pierre Fabre had already been in involved in a research partnership with the organisation. Of the five reported JVs only two of these were with other commercial pharmaceutical organisations, i.e. Arriani Pharmaceuticals

and Novo Nordisk. As shown in Table 5.4 Pierre Fabre made a number of acquisitions that were outside its home country of France.

Table 5.4 Pierre Fabre's Merger & Acquisition (M&A) Strategic Actions

Year	Firms acquired or merged with	Notes	Geographical locations
1993	Ellem	Acquisition of a majority share	Italy
1995	Acquired the Algerian business of Biogalenique		Algeria
1998	Acquired Dolisos		France
1999	Tema Medical	Pierre Fabre acquired a 51% stake in Tema Medical	South Africa
2000	Merger with bioMerieux[2]		France
2001	Acquired Organon Teknika		Holland
2001	Transgene	Increased stake in Transgene from 52.8% to 70.3%	-

Source: Compiled by the author from various issues of *Scrip*, the *Financial Times* and *Mergerstat*, 1992-2002

With regard to its home country the reason for the acquisition of Dolisos in 1998 was so that Pierre Fabre, together with the existing Pierre Fabre Plantes & Medecine subsidiary, could develop its strength in homeopathic medicine (*Scrip*, 1998a). Pierre Fabre entered into one merger, with the French diagnostics firm bioMerieux in December 2000, creating "France's largest independent pharmaceuticals group" (Halpern 2002:15). As shown in Table 5.5 all of Pierre Fabre's PD&LO strategic actions related to licensing out agreements.

[2] This subsequently resulted in a demerger

Table 5.5 Pierre Fabre's Product Divestment & Licensing Out (PD&LO) Strategic Actions

Year	Strategic Action	Firms Involved	Products involved	Countries
1997	Licensing out of rights to Navelbine	Synthelabo	Milnacipran	European marketing rights (excluding France) plus some Latin American and Asian territories
2001	Licensing out agreement	Cypress Bioscience	Milnacipran	US and Canada
2001	Licensing out agreement	Lilly	Elfucimibe (F-12511)	Lilly gained exclusive rights to markets including Latin America and the UK
2002	Exclusive worldwide agreement which included Immuno-Designed Molecules making payments to Pierre Fabre in order to use Pierre Fabre's compounds	Immuno-Designed Molecules	Bacterial membrane-based compounds	Worldwide

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

The licensing out agreements related to products in the pipeline ranging from those at the developmental stage to others that were already being marketed. For example, the agreement with Lilly was for a product in Phase I trials whilst with Cypress Bioscience it involved the already marketed Milnacipran. As Table 5.6 illustrates Pierre Fabre's Organic Concentric Diversification (OCD) strategic actions were focused upon establishing UK subsidiaries and new businesses in France in 1997.

Table 5.6 Pierre Fabre's Organic Concentric Diversification (OCD) Strategic Actions

Year	Strategic Action	Country
1997	Establishment of a UK subsidiary Pierre Fabre Oncology	United Kingdom
1997	Establishment of UK R&D division (subsidiary): Pierre Fabre Research	United Kingdom
1997	Creation of a new business: Pierre Fabre Medicament	
1997	Creation of a new business: Pierre Fabre Dermo-Cosmetique	

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

Pierre Fabre already had various overseas subsidiaries in other parts of the Europe and the US (*Scrip*, 1997a). The establishment of the two new French companies was part of a restructuring process "to give the two businesses more freedom to develop in their specific market areas, and make it easier for them to forge alliances" (*Scrip*, 1997b:12). As shown in Table 5.7 Pierre Fabre only realised one strategic action relating to organic growth, although this was for a three year investment programme.

Table 5.7 Pierre Fabre's Organic Growth (OG) Strategic Actions

Year	Strategic Action
1995	Fr 200 million investment programme for manufacturing facilities

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

The 1999 restructuring highlighted in Table 5.8 was focused upon remaining competitive during tough trading conditions (*Scrip*, 1999c).

Table 5.8 Pierre Fabre's Retrenchment (TR) Strategic Actions

Year	Strategic Action
1994	Restructuring of Italian operations
1994	Closure of Swiss site
1999	Cutting of almost 200 jobs and other restructuring

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

As illustrated in Table 5.9 a recurring theme for Pierre Fabre was its strategic actions relating to divestment and demerger with this pattern continuing through to the demerger with bioMerieux.

Table 5.9 Pierre Fabre's Divestment & Demerger (D&D) Strategic Actions

Year	Strategic Action
1993	Divestment of Cachou Lajaunie
1996	Divestment of 50% stake in Shiseido, France
1999	Divestment of D Medica
2002	Demerger of Pierre Fabre from bioMerieux

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

The divestment of the sweets firm Cachou Lajaunie appeared to suggest that Pierre Fabre was moving to focus on its core areas of pharmaceuticals and cosmetics. In 2002 Pierre Fabre and bioMerieux demerged (Halpern, 2002), which was Pierre Fabre's strategic outcome. James (2002) proposed that mergers can present challenges that organisations had not been fully able to anticipate pre-merger. This is possibly emphasised by the case of Pierre Fabre who realised the need to remain a privately owned and controlled firm as it demerged from bioMerieux. Table 5.10 summarises the strategic actions that were reported as having been realised by Pierre Fabre.

Table 5.10 Summary of Pierre Fabre's Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
M&A		■		■			■	■	■	■	
NABPD	■	■	■	■	■		■	■	■	■	■
JV			■						■	■	
OCD						■					
OG				■							
D&D		■			■			■			■
PD&LO						■				■	■
TR			■					■			
EFR											

Source: Compiled by the author

It is noted that Pierre Fabre did not realise strategic actions relating to the External Finance Raising strategy.

5.3 LEK

LEK is a generic pharmaceuticals firm based in Slovenia. In 2004 LEK classed itself in worldwide terms as "a mid size pharmaceutical firm" (LEK, 2004). LEK's main strategic actions between 1992 and 2002 were for an Organic Growth strategy (Table 5.11).

Table 5.11 LEK's Organic Growth (OG) Strategic Actions

Year	Strategic Action	Countries
1992	Opening of a new plant	Poland
1995	Opening of a new tablet manufacturing unit	
1996	Opening of various regional offices	Russia
1998	$4million reconstruction of a production plant	
1999	Construction of a regional production centre	Macedonia
2001	Construction of a R&D centre	Ljubljana
2002	Construction of a $12m manufacturing plant	Romania

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

All of LEK's Organic Growth (OG) strategic actions, where the geographical location was reported, were based within the Central and Eastern European (CEE) market. Various Organic Growth strategic actions were reported from 1992 to 2002 in relation to the opening of new production/manufacturing and R&D facilities. Apart from the OG strategic actions LEK realised little in terms of further strategic actions until 1999 when it started to combine Organic Growth with strategic actions that were more externally focused. These were for Merger & Acquisition (M&A), Network & Acquisition Based Product Development (NAPBD) and Joint Venture (JV) strategic actions. As shown in Table 5.12 LEK was involved with two acquisitions, both of which were in 2001 and related to firms in Eastern Europe.

Table 5.12 LEK's Merger & Acquisition (M&A) Strategic Actions

Year	Firms acquired or merged with	Notes	Geographical locations
2001	Pharmatech	Acquired 90% of the capital stock	Romania
2001	Argon	Acquired an 89.45% share	Poland

Source: Compiled by the author from various issues of *Scrip*, the *Financial Times* and *Mergerstat* 1992-2002

LEK acquired majority shares in two CEE based companies in 2001, these were Pharmatech (Romania) and Argon (Poland). Following from the acquisition of Pharmatech LEK invested $30 million in developing and upgrading the Romanian firm (*Scrip*, 2002a) and was also reported as planning to invest in Argon. Although LEK's M&A activity had a narrow geographical focus its strategic actions relating to network and acquisition based product development strategic actions (Table 5.13) allowed it to develop relationships with firms in Western Europe through development and marketing agreements. 1999 was the first year that LEK entered into an Network and Acquisition Based Product Development (NABPD) agreement.

Table 5.13 LEK's Network & Acquisition Based Product Development (NABPD) Strategic Actions

Year	Strategic Action	Firm	Product	Country
1999	Collaboration agreement	Ethical Holdings	Lek's narcotic, analgesic transdermal patch	US, Western Europe and Japan
2001	Acquisition of exclusive marketing rights	Sofotec	Dry powder inhaler anti-asthma product	Eastern Europe
2001	Marketing agreement	A UK partner	Amoksiklav	UK

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

The first agreement in 1999 focused upon Ethical Holdings developing LEK's narcotic, analgesic transdermal patch with LEK paying Ethical Holdings various milestone payments. Subsequent marketing of the product was to be shared by the firms with LEK having exclusive access to some of the markets (*Scrip*, 1999a). The other two agreements were both cross border agreements. The first was a Western European partnership with the German firm Sofotec focused upon LEK marketing the partner's product in Eastern Europe (*Scrip*, 2001a). The collaboration with Sofotec allowed LEK to acquire exclusive Eastern European marketing rights to an inhaler. In comparison to

the other firms in the sample LEK realised a small number of NABPD strategic actions. The last reported marketing agreement involved LEK appointing an organisation to market the product that it had developed, Amoksiklav, in the United Kingdom (*Scrip*, 2001b). Those NABPD strategic actions that LEK did realise highlight the complexities of understanding networks in the pharmaceutical industry, with LEK both having firms to market its product and marketing other firms' products. There was no reporting of LEK developing products for other organisations although this may be in relation to LEK being a generics rather than a branded manufacturer. Table 5.14 shows that LEK's only Joint Venture was in 1999 with Sanofi-Syntelabo.

Table 5.14 LEK's Joint Venture (JV) Strategic Actions

Year	Strategic action	Who the JV was with	JV name	Geographical location
1999	JV	Sanofi-Synthelabo	Sanofi-Synthelabo-LEK	Ljubljana

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

As Table 5.15 shows LEK's only Organic Concentric Diversification (OCD) strategic action was the 1996 establishment of LEK US Inc.

Table 5.15 LEK's Organic Concentric Diversification (OCD) Strategic Actions

Year	Strategic Action	Country
1996	Establishment of LEK US Inc.	US

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

There was only one example reported of LEK being involved in a licensing out agreement (Table 5.16). This agreement was for Gideon Richter to be able sell and market the antibiotic Aktil. There were no examples of product divestments.

Table 5.16 LEK's Product Divestment & Licensing Out (PD&LO) Strategic Actions

Year	Strategic Action	Firms Involved	Products involved	Countries
1997	Licensing out agreement	Gideon Richter	Aktil	

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

The issuing of shares (Table 5.17) refers to the protracted privatisation of LEK that arose as a result of government action.

Table 5.17 LEK's External Finance Raising (EFR) Strategic Actions

Year	Strategic Action	Firms Involved	Products involved	Countries
1992 – 1994	Shares issued as part of the privatisation process	N/A	N/A	Slovenia
1996	Issuing of a second round of shares	N/A	N/A	Slovenia

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

In the initial privatisation shares were purchased by foreign partners, employees and financial institutions. Fujimoto Seiyaku was one of the international firms to buy shares in LEK in 1992 appearing to build upon a relationship that they had had for the previous ten years (*Scrip,* 1992a). There was no evidence of LEK raising finance from external sources after 1996.

In 2002, in a cross border acquisition, LEK was acquired by the Swiss firm Novartis, one of the world's largest pharmaceutical firms that focused upon both brand name and generics products (*Scrip*, 2002f). Table 5.18 summarises the strategic actions realised by LEK from 1992-2002.

Table 5.18 Summary Of Lek's Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
M&A										■	
NABPD								■		■	
JV								■			
OCD					■						
OG	■			■	■		■	■		■	■
D&D											
PD&LO						■					
TR											
EFR	■	■	■		■						

Source: Compiled by the author

LEK did not realise strategic actions relating to the strategies of Divestment & Demerger or Retrenchment.

5.4 Asta Medica

Asta Medica was a German firm established in 1919 (Hoppenstedt Firmeninformationen, 2003). The firm was the pharmaceuticals division of Degussa. In 1992 Asta Medica's core business was focused upon "branded generics, original products and OTC drugs" (*Scrip*, 1992b:9). Table 5.19 illustrates three acquisitions made by Asta Medica during 1992 to 1998, although there were none reported after this date.

Table 5.19 Asta Medica's Merger & Acquisition (M&A) Strategic Actions

Year	Firms acquired or merged with	Notes	Geographical locations
1992	Muro Pharmaceuticals	Acquisition of a minority stake	US
1996	Muro Pharmaceuticals	Completed full acquisition	US
1997	German Remedies	Asta Medica increased share by 70%	India
1998	Kampel-Martian	Acquisition of one-third share	Argentina

Source: Compiled by the author from various issues of *Scrip*, the *Financial Times* and *Mergerstat*, 1992-2002

All three of these acquisitions contributed to the firm developing its international presence by focusing upon the Americas and India. German Remedies was an Indian manufacturing and marketing firm for large German pharmaceutical companies (*Scrip*, 1997c). The initial investment in the US firm Muro in 1992 was Asta's "first acquisition in the US market" (*Scrip*, 1992c:15) although it already had licensing agreements with US firms. (*Scrip*, 1992d). The increased investment in German Remedies in 1997 was subsequently followed by Asta Medica divesting its share in the firm in 2001 (Table 5.27). There were no acquisitions reported after 1998. Table 5.20 demonstrates that Asta Medica realised network and acquisition based product development strategic actions in six out of the eleven years from 1992 to 2002.

Table 5.20 Asta Medica's Network & Acquisition Based Product Development (NABPD) Strategic Actions

Year	Strategic Action	Firm	Product	Country
1992	Co-marketing agreement	Fison's German pharmaceutical subsidiary	The anti-asthmatic, nedocromil sodium	Germany
1992	Joint development	Nippon Kayaku	Two anticancers – NK-121, an injectable platinum compound and NK-61, an oral and injectable glycoside podophyllotoxin derivative	Europe
1993	Co-marketing agreement	Farmitalia	Corinfar R Uno	Germany
1995	Development and marketing agreement	3M Pharmaceuticals	Products for use in obstructive respiratory disease	Germany
1995	Development and marketing agreement	Sugen	Potential oncology products based on Sugen's HER2 and RaF cell signal transduction programme	It is a European agreement and Sugen is American
1995	Co-promotion agreement	Probios, the Portugese subsidiary of the Spanish company Prodesfarma	Branded and generic oncology products	Portugal
1997	Licensing in agreement	Andrx	The calcium channel antagonist, dilazep, for limiting haematological toxicity associated with anticancer or anti retroviral drugs	Exclusive worldwide rights
1997	Acquisition of marketing and distribution rights	Harvard Scientific	Harvard's liposomal prostaglandin E-1 product for male erectile dysfunction	Eastern and Western Europe
1997	Development and marketing collaboration	Wyeth-Ayerst	Asta's anti-epileptic compound, retigabine	
1997	A "link-up"	Scotia	Thioctyle-gammalinolenate	
1998	Sales agreement	FH Faulding	Hospital products	The Netherlands
2001	Entering into a co-marketing agreement	Aventis	Asta Medica's Phase 1a diabetes product dexlipotam	Worldwide apart from North America and Japan

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

The agreements up until 1995 were focused upon the European market, but the 1997 licensing agreement with Andrx was for worldwide marketing rights. The strategic actions reported in Table 5.20 relate to a number of different types of cooperative agreement including marketing, development, licensing in, sales agreeements and distribution rights. The acquisition of marketing and distribution rights to Harvard's liposomal prostaglandin E-1 product illustrates an example of such an arrangement. As Table 5.21 shows Asta Medica became involved in a number of international joint ventures in Europe, Japan and the US.

Table 5.21 Asta Medica's Joint Venture (JV) Strategic Actions

Year	Strategic action	JV Partner	JV name	Countries
1992	Establishment of a JV	Prodesfarma	Pras Faring	Spain
1992	Establishment of the Tumour Biology Centre	Ciba Geigy and Schering AG	Tumour Biology Centre	Germany
1995	Establishment of a JV	Nippon Kayaku	Kayaku Asta Medica Co Ltd	Japan
1997	Establishment of a JV	Frankgen	Main Gen	Germany
1998	Establishment of a JV	Carter Wallace	Wallace Laboratories/ASTA Medica	US
1998	Collaboration for the sale and marketing of injectable pharmaceutical products	FH Faulding	Division Faulding Asta Medica	France
2000	Establishment of a JV	I E Ulagay		Turkey

Source: Compiled by the author from various issues of the *Financial Times* and *Scrip*: 1992-2002.

The joint venture with Nippon Kayaku was an extension of an existing collaboration (see Table 5.20) providing Asta with a direct entry path into the Japanese pharmaceutical market. Prior to this joint venture Asta Medica accessed this market by using licensees (*Scrip*, 1995a). Asta Medica and Ulagay had been involved in a long-term manufacturing and marketing agreement prior to the establishment of the JV (*Scrip*, 2000a). As shown in Table 5.22 in 1992 Asta Medica established two firms in the US.

Table 5.22 Asta Medica's Organic Concentric Diversification (OCD) Strategic Actions

Year	Strategic Action	Country
1992	Establishment of Asta Medica Inc and Abkit Inc	US
1994	Establishment of various new companies	Poland, the Slovak Republic, Bulgaria, Romania, Russia, the Ukraine, China, Australia, and the Philippines
1997	New sales and marketing company called Asta Medica AWD GmbH	Germany

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

In 1994 Asta Medica established a number of new companies both in the CEE market and the "rest of the world". Despite the establishment of various new companies in 1994 there was no further evidence of OCD strategic actions being realised for international expansion after 1994. The only other OCD strategic action related to Germany with the formation of the new sales and marketing company. During 1992-1997, alongside the OCD strategic actions, Asta Medica realised various strategic actions relating to organic growth although none were reported after 1997 (Table 5.23).

Table 5.23 Asta Medica's Organic Growth (OG) Strategic Actions

Year	Strategic Action	Countries
1992	Opening of experimental cancer research facility	Germany
1994	Inauguration of a new European production facility	France
1994	Establishment of three new business units – neurology, pneumology and oncology	-
1994	Opening of representative offices	Czech Republic and Hungary
1997	Establishment of a branch	Latvia

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

Again, the majority of these were situated outside of Germany (Asta Medica's home country) but were confined to Europe rather than further afield, with particular emphasis from 1994 on Eastern Europe. As Table 5.24 indicates due to it being a subsidiary (as well as a parent company) Asta Medica did not directly seek external finance for its pharmaceutical operations, instead this was channelled through Degussa.

Table 5.24 Asta Medica's External Finance Raising (EFR) Strategic Actions

Year	Strategic Action	Firms Involved	Products involved	Countries
1996	Degussa's request to shareholders for DM40m of new capital to strengthen its pharmaceutical activities	-	-	-
2001	IPO for Zentaris	Zentaris	-	North America and Japan

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

As Table 5.25 indicates there was no reporting of Asta Medica entering into licensing out agreements until 2000, although the expansion of the licensing agreement with Serono would suggest that this had originally been entered into in a previous year.

Table 5.25 Asta Medica's Product Divestment & Licensing Out (PD&LO) Strategic Actions

Year	Strategic Action	Firms Involved	Products involved	Countries
2000	Licensing out agreement	Teikoku Hormone	Sole rights to Teverelix, the LHRH antagonist peptide	-
2000	Expansion of licensing out agreement	Serono	Cetrotide (cetrorelix acetate injection)	Worldwide excluding Japan
2001	Divestment of product rights	Zydus Cadila	Five brands	63 countries
2001	Licensing out agreement	Aventis	Asta Medica Phase 1 diabetes product dexlipotam	-

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

In 2001 Asta Medica divested the product rights to five brands to Zydus Cadila and licensed out dexlipotam to Aventis. As illustrated in Tables 5.2 and 5.3 in 1992, 1994 and 1997 Asta realised strategic actions relating to internal expansion i.e. Organic Growth and Organic Concentric Diversification strategies. Yet, as shown in Table 5.26, in 1993, 1995, 1997, 1999 and 2000 it also realised strategic actions relating to restructuring and/or rationalisation.

Table 5.26 Asta Medica's Retrenchment (TR) Strategic Actions

Year	Strategic Action
1993	Merging of two subsidiaries : Temler's export business and Arzneimithelwerk Dresden (AWD)
1995	Closure of Asta Medica's Frankfurt production facility and warehouse
1997	Rationalisation of sales and marketing activities
1999	Restructuring
2000	Further restructuring and splitting up of Asta Medica into four parts: Zentaris, cancer, healthcare and branded generics, so that each part could be divested separately.

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

This supports Webb and Pettigrew's (1999) findings that firms combine expansion and withdrawal strategies. As shown in Table 5.27 there were no reports of any divestments of Asta Medica subsidiaries prior to 2000.

Table 5.27 Asta Medica's Divestment & Demerger (D&D) Strategic Actions

Year	Strategic Action
2000	Sale of US subsidiary, Abkit
2000	Sale of shareholding in the German company Temmler Pharm
2001	Asta Medica and Heller Vermagensverwaltungs, which were both part of the Degussa group, divested their stake in German Remedies of India
2001	Divestment of Transfarma Medica Indah
2001	Sale of AWD Pharma
2001	Divestment of Asta Medica Onkologie

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

From 2000 several divestments were made during the following two years, both directly by Asta Medica and by Degussa on behalf of Asta Medica. This coincided with Degussa's failed attempt to sell Asta Medica as a complete entity in 2000, and subsequent restructuring of Asta Medica into four separate units for divestment. The disbanding and divestment of Asta Medica was finalised in December 2002 with the completion of the sale of Zentaris (Degussa, 2002). The strategic actions realised by Asta Medica for 1992-2002 are summarised in Table 5.28.

Table 5.28 Summary Of Asta Medica's Strategic Actions 1992-2002

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
M&A	■				■	■	■				
NABPD	■	■		■		■	■			■	
JV	■			■		■	■		■		
OCD	■		■			■					
OG	■		■			■					
D&D									■	■	
PD&LO									■	■	
TR		■		■		■		■	■		
EFR					■					■	

Source: Compiled by the author

5.5 Shire

The late 1980s saw a wave of new biotechnology firms enter the pharmaceutical industry (Balance *et al.*, 1992; Kettler, 2001a) and Shire's 1986 biotechnology start-up coincided with this period of change in the pharmaceutical industry. By the beginning of the 21st Century Shire had evolved into a speciality pharmaceuticals firm (Guerrera and Firn, 2000). As shown in Table 5.29 from 1992 onwards Shire was active in Merger & Acquisition (M&A) activity.

Table 5.29 Shire's Merger & Acquisition (M&A) Strategic Actions

Year	Firm Acquired or Merged With	Geographical Location of firm acquired/merged with
1992	Acquired Rybar Laboratories	UK
1995	Merged with Imperial Pharmaceutical Services Ltd	England
1997	Acquired Richwood Pharmaceuticals	US
1997	Acquired Pharmavene Inc	US
1999	Acquisition of Fuisz Technologies units	Germany, France and Italy
1999	Merged with Roberts Pharmaceutical	US
2001	Merged with Biochem Pharma Inc	Canada

Source: Compiled by the author from various issues of the *Financial Times*, *Scrip* and *Mergerstat*: 1992-2002.

M&A started with the acquisition of Rybar Laboratories in 1992, followed by the 1995 merger with another British firm, Imperial Pharmaceutical Services Ltd. All future acquisitions were outside of the UK. The acquisition of Richwood Pharmaceuticals in 1997 provided Shire with a "US marketing base" (*Scrip*, 1997d:9). Shire expanded its M&A activity to the US with the acquisition of Pharmavene Inc. and in 1999 it merged with the US firm Roberts Pharma. M&A activity was completed in 2001 with the second cross border merger, which was with Biochem Pharma. Table 5.30 outlines the large number of strategic actions that Shire realised in relation to a Network & Acquisition Based Product Development (NABPD) strategy.

Table 5.30 Shire's Network & Acquisition Based Product Development (NABPD) Strategic Actions

Year	Strategic Action	Firm	Product	Country
1994	Agreement on development rights	Synaptec	Galantahmine, an acetylcholinesterase inhibitor for Alzheimer's disease	Worldwide rights outside NAFTA countries, Japan and four Far East territories
1994	Agreement on development rights	MacFarlanSmith	Galantahmine, an acetylcholinesterase inhibitor for Alzheimer's disease	Scotland
1995	20-year licensing agreement	Istituto Gentili	Development licence relating to bisphosphonate neridronate	10 EU countries plus Switzerland,Australia, New Zealand and South Africa
1995	Marketing agreement	Sigma-Tau	Carnitor (levocarnitine)	Shire to market the product in UK and Ireland
1995	Collaboration agreement for third-party manufacturing	Regent Laboratories	Combined oestrogen-progestogen hormone replacement therapy	
1995	Acquisition of marketing rights	Nycomed	Calcium products	South Africa and certain territories in the Middle East and Asia
1995	Joint development agreement	Seiksui	Transdermal delivery system	Rights outside Japan
1995	Acquisition of rights	Obtained from an individual:Dr Fob Snorrason	Galanthime in ME	
1995	Acquisition of worldwide marketing rights	Co-development project with Johnson Matthey	A phosphate binding agent	Worldwide
1996	Co-development and marketing agreement	Janssen	Potential Alzheimer's therapy – galanthamine	Worldwide
1997	Acquisition of distribution rights in the UK	Hoechst Marion Roussel	A range of gynaecological products	United Kingdom
1997	Acquisition of exclusive distribution rights	Recordati	Urge incontinence therapy, Unispas (flavoxate)	UK, Ireland, South Africa, Thailand and 11 other countries
1997	(Shire & Janssen)acquisition of worldwide manufacturing and supply rights of synthetic galanthamine and marketing rights to Waldheim's version of Nivalin	Waldheim Pharmazeutika	Synthetic galanthamine and Nivalin	Worldwide for synthetic galanthamine and Nivalin for Austria and certain Eastern European countries
1998	Acquisition of exclusive worldwide rights	Neurosearch	A series of AMPA antagonists for the treatment of CNS disorders	Worldwide
1998	Acquisition (buy back) of worldwide rights	Elan's Athena Neuroscience subsidiary	Carbatrol (sustain-released carbamazepine)	Worldwide rights
1998	Agreement to develop an improved formulation	Searle	Product not specified[3]	-
1999	Acquisition of intellectual property rights	Arenol (Shire's former supplier)	For the manufacture of the active ingredient of its two most important drugs	-
2000	Product acquisition	Suivay	Gastrointestinal product	Spain
2000	Licensing in	D-Pharm	Valproic acid analogue DP-VPA	Worldwide development and marketing rights
2000	Acquisition of rights	Salix Pharmaceuticals	The ulcerative colitis product, Colazide (balsalazide disodium)	Thirteen European countries plus Ireland
2000	Licensing agreement	Cortex	Development of Cortex's ampakine molecules for the treatment of attention deficit hyperactivity disorder[4]	Worldwide
2000	Licensing in	CeNeS	Parkinson's compound SPD 451	-
2001	Vaccine deal	Berna Biotech	Vaccines	Europe
2001	Research and licensing agreement	CeNeS	Dopamine D1-agonist programme for the treatment of Parkinsons disease	-
2001	Licensing in	Devco Pharmaceuticals	The product was a Dopamine, fHT and noradrenaline re-uptake inhibitor	-
2001	Acquisition of marketing and sales rights	ML Laboratories	Adept	Throughout Europe
2002	Licensing in marketing and development rights	Giuliani	Mesalazine technology	North America, Europe, (excluding Italy) and Japan
2002	Licensing in of rights	Skyepharma	Actinic keratosis treatment, Solaraze	European marketing rights

Source: Compiled by the author from various issues of the *Financial Times* and *Scrip*: 1992-2002.

[3] Shire lost an agreement signed with Searle in the previous year to develop an improved formulation of one of the US company's products after it ended development of the chemical entity. This strategic action was terminated in 1999.

[4] Shire Pharmaceuticals terminated a licensing agreement with Cortex Pharmaceuticals covering the development of Cortex's ampakine molecules for the treatment of attention deficit hyperactivity disorder.

A large proportion of Shire's NABPD strategic actions related to acquisition of rights and licensing in agreements. They were focused upon development, marketing and distribution rights. Shire's NABPD agreements included those with biotechnology companies such as the licensing in agreement with the Israeli firm D-pharm. There was only evidence of two of Shire's alliances being prematurely terminated (with Searle and Cortex Pharmaceuticals) despite Kettler's (2001b) findings that nearly one third of biotechnology-pharmaceutical alliances fail. As Table 5.31 illustrates, prior to 2002 Shire realised only two organic growth strategic actions, both relating to increasing the size of its salesforce.

Table 5.31 Shire's Organic Growth (OG) Strategic Actions

Year	Strategic Action	Countries
1997	Hiring of a second UK salesforce	United Kingdom
1999	Increase in US salesforce	US
2002	Investment of $18.5 m in a new global vaccine research centre at its existing site in Quebec	Canada

Source: Compiled by the author from various issues of the *Financial Times* and *Scrip*: 1992-2002

It was suggested that the establishment of Shire's own global vaccine research centre in 2002 was to allow Shire to develop its competence with regard to internal Research & Development (R&D). It had been previously criticised for its reliance on an in-licensing strategy in order to develop its late stage product development pipeline (*Scrip*, 2002b:9). Table 5.32 shows that Shire only realised one OCD strategic action, relating to the new Spanish subsidiary.

Table 5.32 Shire's Organic Concentric Diversification (OCD) Strategic Actions

Year	Strategic Action	Firm created	Country
1999	Opening of an operating subsidiary in Madrid	New subsidiary	Spain

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

As shown in Table 5.33 Shire was involved in a variety of PD&LO strategic actions focused upon licensing out agreements. These included marketing arrangements and the licensing out of patent rights.

Table 5.33 Shire's Product Divestment & Licensing Out (PD&LO) Strategic Actions

Year	Strategic action	Firms involved	Products involved	Countries
1997	Licensing out agreement	Searle	Betarange line	UK, Ireland, South Africa and a further 36 countries in African and the Middle East
1997	Licensing out of marketing rights[5]	Janssen	Nivalin	Austria and Eastern Europe
1997	Licensing out agreement	Athena Neurosciences	Carbatrol	US
1999	Sale of 30 non-strategic products[6].	Integrity Pharmaceuticals	-	-
2002	Licensing out of patent rights	Emory University and the University of Georgia Research Foundation	Amdoxovir	-
2002	Sale of four products	Purdue Pharma	-	US

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

Licensing out agreements and product divestments were a source of income generation for Shire. For example, Shire received royalties from Janssen for the licensing out of marketing rights to Nivalin. Another possible reason for the product divestments was Shire needing to reduce any possible overlaps in its product line as a result of its merger and acquisition activity during 1992-2001 (Table 5.29). Shire's retrenchment (TR) strategic actions (Table 5.34) focused upon the discontinuation of two R&D projects in 1998 and a further three R&D programmes in 2000.

Table 5.34 Shire's Retrenchment (TR) Strategic Actions

Year	Strategic action
1998	Discontinuation of two R&D projects: controlled-release versions of dihydroergotamine for migraine and acicolvir for herpes infections
1999	Sale of US to Integrity Pharmaceuticals
2000	Closure of sites in the United States and United Kingdom
2000	Discontinuation of three R&D programmes: LY 315535, tazofelone and ProAmatine

Source: Compiled by the author from various issues of the *Financial Times* and *Scrip*: 1992-2002.

The reasons for the 1998 rationalisation of the product line were stated as being as a result of a review of the product portfolio after the "acquisitions of Pharmavene and

[5] This refers only to the taking over of marketing by Janssen, the rest of this co-development deal referred to in Table 5.30.

Richwood Pharmaceutical" (*Scrip*, 1998b:10). The closure of the sites in the US and the UK were part of the integration process following the acquisition of (merger with) Roberts (*Scrip*, 2000b). No reason was reported for the discontinuation of the three R&D programmes in 2000. But, in the pharmaceutical industry high R&D costs are coupled with a high risk of failure with many developments not making it to market (Kettler, 1998; Cunningham, 2001; Orsenigo *et al.*, 2001). Therefore, it may be preferable to reverse decisions than to make commitment to areas that show possible signs of failure or no longer have a strategic fit. As shown in Table 5.35 Shire was floated on the London Stock Exchange in 1996. The issue of shares raised £40m for the company and gave Shire a market capitalisation of £107 million (*Scrip*, 1996a).

Table 5.35 Shire's External Finance Raising (EFR) Strategic Actions

Year	Strategic action	Firms involved	Products involved	Countries
1996	Floatation on the London Stock Exchange	N/A	N/A	United Kingdom
1998	Initial public offering on the US stock exchange	N/A	N/A	US
2001	Placement of an offering of $35 million guaranteed convertible notes	N/A	N/A	Placed with institutional investors largely in the US
2002	$3.5 million government grant towards the cost of a new research centre	N/A	N/A	Canada

Source: Compiled the author from various issues of the *Financial Times* and *Scrip*: 1992-2002.

From 1996 onwards Shire appeared to support its expansion through External Finance Raising (EFR) strategic actions. As was seen in Table 5.33 Shire also had an additional income stream from product divestments and licensing out agreements as well as revenue from product sales. As part of the EFR strategic actions Shire sought to strengthen its position in the US market through an Initial Public Offering (I.P.O.) on the US stock exchange in 1998 and the placing of guaranteed convertible bonds primarily with US institutional investors.

[6] Also see Table 5.34 sale of US plant to Integrity Pharmaceuticals

Shire's strategic outcome was its 2001 merger with the Canadian firm Biochem Pharma. The reasons for the merger were stated as:

> *"This merger ... will further broaden and diversify our revenue base, strengthen our early-phase product pipeline and provide greater financial strength to capitalise on our search and development capability."*
>
> Rolf Stahel, Shire's CEO cited in *Scrip*, 2000c:6

Table 5.36 summarises the strategic actions realised by Shire during 1992-2002.

Table 5.36 Summary of Shire's Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
M&A	■			■		■		■		■	
NABPD			■	■	■	■	■	■	■	■	■
JV											
OCD								■			
OG						■		■			■
D&D											
PD&LO						■		■			■
TR							■	■	■		
EFR					■		■			■	■

Source: Compiled by the author

It is noted that Shire did not realise strategic actions relating to the strategies of Joint Venture and Divestment & Demerger.

5.6 Galen

The Northern Ireland integrated pharmaceutical company Galen was founded in 1968 (Galen Holdings plc, 2001). Galen was included in the sample because it had survived without being acquired or merged. In 1992 Galen was reported as having a pharmaceuticals strategy focused upon competing with branded generics, with its products distributed throughout the UK and other geographical markets (*Scrip*, 1992d). Until 1997 Galen primarily realised strategic actions relating to Organic Growth (Table 5.37).

Table 5.37 Galen's Organic Growth (OG) Strategic Actions

Year	Strategic Action	Countries
1992	New antibiotics plant	Northern Ireland
1994	£7.3 million expansion programme	
1995 – 1997	3 year £17.4 million expansion programme	
1997	Establishment of a clinical trials operation	US
2000	Expansion of UK salesforce	UK

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

Galen was active in investing finances in OG strategic actions, particularly during the period of 1994 – 1997 when in excess of £17.4 million was invested. The 1994 expansion programme focused upon new facilities for R&D and production, and was planned to lead to the creation of 116 new jobs (*Scrip*, 1994b). The expansion programmes during 1995 – 1997 included providing a new clinical trials services company in Northern Ireland, creating more jobs and the provision of new manufacturing facilities (*Scrip*, 1995b). The year 2000 saw expansion of the UK salesforce as the firm prepared for new product launches (*Scrip*, 2001c). As shown in Table 5.38 there was only evidence of one strategic action relating to the Organic Concentric Diversification (OCD) strategy, this related to the establishment of Syngal in 1997.

Table 5.38 Galen's Organic Concentric Diversification (OCD) Strategic Actions

Year	Strategic Action	Name	Country
1997	Establishment of a new division	Syngal	-

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

Apart from the divestment of cough and cold products in 1992 Galen did not appear to have been involved in either product divestment or licensing out (Table 5.39).

Table 5.39 Galen's Product Divestment & Licensing Out (PD&LO) Strategic Actions

Year	Strategic action
1992	Divestment of cough and cold products

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

As Table 5.40 shows Galen did not enter into any mergers or acquisitions until 1998. From then it focused upon concentrated M&A activity with the majority of the acquired firms based in the US. The acquisitions of J Dana, Interactive Clinical Technologies, Applied Clinical Concepts and the pharmaceutical division of the US Duke Clinical Research Institute were in order for Galen to develop its range of clinical trials businesses and expand the services that it offered (*Scrip*, 1999b;2000d). The $372.1 million acquisition of Warner Chilcott and the acquisition of the hormone replacement therapy business from Bristol Myers Squibb expanded the products that Galen offered in women's healthcare.

Table 5.40 Galen's Merger & Acquisition (M&A) Strategic Actions

Year	Firms acquired or merged with	Geographical locations
1998	Acquired J Dana	US
1999	Acquired Interactive Clinical Technologies	US
1999	Acquisition of three companies associated with a product range and development acquisition from Bartholomew Rhodes	UK
2000	Acquired Warner Chilcott	US
2000	Acquired Applied Clinical Concepts	US
2000	Acquired Pharmaceutical division of the US Duke Clinical Research Institute	US
2001	Acquisition of hormone replacement therapy business from Bristol Myers Squibb	

Source: Compiled by the author from various issues of *Scrip*, the *Financial Times* and *Mergerstat* 1992-2002

Just as the acquisitions referred to were not reported as starting until 1998 a similar situation occurred with regard to Galen's Network & Acquisition Based Product Development (NABPD) strategic actions (Table 5.41).

Table 5.41 Galen's Network & Acquisition Based Product Development (NABPD) Strategic Actions

Year	Strategic Action	Firm	Product	Country
1998	Acquisition of rights	Sanofi	Controlled release antiarthritic/analgesic product for night pain	
1999	Acquisition of product range and development pipeline	Bartholomew Rhodes	The range included sustained-release cardiovascular and anti-inflammatory products	UK
2002	Acquisition of US rights to two products	Bristol Myers Squibb	The antibiotic Duricef and Moisturel, an over-the-counter skin cream	US
2002	Acquisition of US sales and marketing rights	Lilly	Sarafem	US

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

None of Galen's NABPD strategic actions related to Galen engaging in collaborative R&D projects or licensing in technologies that could be used for internal research and development. This suggested that development was either internal or through acquisitions rather than collaboration. This suggestion was borne out through the following quote: "supplement internal growth through selective acquisition" (Galen Holdings plc, 2000:4). As illustrated in Table 5.42 the majority of Galen's strategic actions relating to Divestment & Demerger (D&D) were realised in 2002.

Table 5.42 Galen's Divestment & Demerger (D&D) Strategic Actions

Year	Strategic Action
1997	Chemists business sold before floatation
2002	Disposal of Galen's clinical trial services unit (CTS)
2002	Sale of Interactive Clinical Technologies (ICT)
2002	Divestment of Chemical Synthesis Services

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

Of specific interest here is that all of the divestments listed for 2002 were to a group headed by Allen McClay, the founder of Galen, who had left in the autumn of 2001 (*Financial Times*, 2002c). The sale of CTS helped Galen to become a pharmaceutical

product focused company (*Scrip*, 2002c). The sale of ICT meant that Galen was no longer involved in clinical services (*Scrip*, 2002d). Chemical Synthesis Services was also part of Galen's clinical trials businesses (Jenkins, 2002). Interactive Clinical Technologies was a US firm purchased in 1999 (see Table 5.40). As shown in Table 5.43 Galen did not realise any External Finance Raising (EFR) strategic actions until 1997 apart from a capital grant in 1992.

Table 5.43 Galen's External Finance Raising (EFR) Strategic Actions

Year	Strategic Action	Countries
1992	Capital grant from the Northern Ireland Industrial Development Board	Northern Ireland
1997	Floatation on the London Stock Exchange	UK
1999	Share sale and share placing	UK & Ireland
2001	Share offering	UK and US

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times* 1992-2002

In 1997 Galen started realising EFR strategic actions. From 1998 to 2002 this was combined with the M&A and NABPD strategic actions, with only one OG strategic action being reported in this time. Galen was floated on the London Stock Exchange in 1997. This initial issuing of shares was followed by a share sale and share placing in 1999 and a share offering in 2001. Prior to 1997, apart from the 1992 capital grant Galen had not raised finance from external sources. The floatation and subsequent share offerings coincided with the period where Galen placed an emphasis upon the acquisition of products and companies based in the US. Table 5.44 summarises the strategic actions realised by Galen during 1992-2002.

Table 5.44 Summary Of Galen's Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
M&A							■	■	■	■	
NABPD							■	■			■
JV											
OCD						■					
OG	■		■	■	■	■			■		
D&D						■					■
PD&LO	■										
TR											
EFR	■					■		■		■	

Source: Compiled by the author

It is noted that Galen did not realise any strategic actions relating to Joint Ventures or Retrenchment.

5.7 Bioglan

The British firm Bioglan was founded in 1932 by Menzies Sharp as a vitamins company. Fifty years later (1982) Terry Sadler borrowed £176,000 in order to buy the firm. £30,000 of the money was borrowed from three credit cards (*Scrip*, 1997e; *Financial Times*, 1999). Explaining the decisions affecting the purchase Mr Sadler said:

> *"The strategy was simple……We had to sell more of the existing product range and expand the portfolio. I also decided to start generic drug development. I chose this area because generics were relatively simple to develop, required smaller promotional expenditure compared with branded products, and they can be fast cash generators."*
>
> (Brimicombe, 1999:17)

Terry Sadler provides an example of the entrepreneurial spirit that Rogowsky (1996) claimed was partly responsible for directing firms in the pharmaceutical industry to develop competitive niches. By 1989 Bioglan was operating in both generics and dermatology. Bioglan had also acquired a range of products and started on the R&D process. In 1994 it "diversified into drug delivery" (Brimicombe, 1999:17). Table 5.45 contains the empirical data relating to Bioglan's Network and Acquisition Based Product Development (NABPD) strategic actions for 1992-2002.

Table 5.45 Bioglan's Network & Acquisition Based Product Development (NABPD) Strategic Actions

Year	Strategic action	Firm	Product	Country
1997	Co-promotion agreement	Altana's Savage division	Micanol	-
1998	Acquisition of licence and rights	Zeneca	Long-term licence for Hibitane obstetric and antiseptic creams as well as Zeneca's rights to the Synalar range of steroids	-
1998	Collaboration	SmithKline Beecham Consumer Healthcare	EsGel	-
1998	Global drug delivery deal	Novo Nordisk[7]	Biosphere delivery system	Global
1999	Acquisition of sales and development rights	Allergan	Zorac (tazorotene)	UK, Ireland, Denmark, Sweden, Finland and other countries
1999	Acquisition of a US dermatology range	Medicis Pharmaceuticals	-	United States
2000	Acquisition of development and market rights	CeNeS[8]	"selected compounds using CeNes's Depocore Drug Delivery System" – Moraxen a rectal slow-release morphine formulation	European marketing rights
2000	Exclusive licence for the commercialisation of doxepin	Winston Laboratories	Doxepin	UK, Europe and some Asian countries
2000	Licensing in	Skyepharma[9]	Solaraze	European rights
2000	Acquisition of five anti-inflammatory dermatologicals	Novartis	Five prescription steroid products, including Locacorten, Locasalen and Sicorten	German rights
2000	Collaboration	Glaxo Wellcome	Crystacide	Latin America, Caribbean
2001	Acquisition of pain products	Pharmacia	Immediate release morphine products	Pharmacia sold the products in Sweden
2001	Acquisition of marketing rights to Solaraze in the US, Canada and Mexico	Skyepharma	Solaraze	US, Canada and Mexico
2001	Dermatology product portfolio	Hexal	12 products including treatments for acne and eczema	Germany
2001	Expansion of dermatology franchise. Bioglan acquired the option to acquire rights from Novartis to steroid products in an additional 35 countries to those it already held in Germany	Novartis	Locacorten and Sicorten	A further 35 (geographical) markets including Italy, Spain, the Middle East, Africa, Asia and Australasia
2001	Development and commercialisation agreement	Arakis	AD177 antiproiferative treatment for Psoriasis	-

Source: Compiled by the author from various issues of the *Financial Times* and *Scrip*: 1992-2002.

The first network and acquisition based product development strategic action realised was the co-promotion agreement between Altana's Savage Division and Bioglan for the product Micanol. From 1998 onwards the number of related strategic actions reported increased from two and three each year (1998 to 1999) to five in 2000 and 2001. The

[7] Agreement was terminated in 2001

[8] This agreement was terminated in 2001

[9] North America rights were subsequently sold to Quintiles Transnational in 2001. Skyepharma bought back the European rights in 2002 for a nominal sum and subsequently sold the European distribution rights to Shire Pharmaceuticals

increased number of network-based strategic actions from 1997/1998 onwards concurs with the empirical research conducted by Pammolli and Riccaboni (2001:48) of a "relatively recent phenomenon of a growing division of labour between the companies and organisations that discover new products and the companies that develop and market them".

Some of the arrangements focused upon cooperative partnerships relating to product development such as the Novo Nordisk global drug delivery deal in 1998 for the Biosphere drug delivery system. NABPD strategic actions also included co-promotion and collaborations, but predominantly focused upon the acquisition of products and product portfolios. These included the US dermatology range acquired from Medicis Pharmaceuticals in 1999 and the acquisition of pain products from Pharmacia in 2001. In addition to outright acquisition of products Bioglan purchased rights, such as the German rights to the dermatology franchise from Novartis in 2000, which was expanded to an option for an additional 35 countries in 2001.

Bioglan appears to have taken a knowledge-based approach to its product development strategy, such that it could learn from alliance partners as well as from its own internal experiences of both developing product and marketing products for other firms. Bogner and Thomas (1996) identified an approach to resource based management that combines both internal and external learning through the development of network relationships. This appears to match the description of Bioglan's product development strategy. This approach enables a firm to establish "the flexibility needed to continually reposition itself in a rapidly changing environment." (Bogner and Thomas, 1996:175). Child and Faulkner's (1998:314) view of network relationships was that "the evolution of alliances can proceed along different paths and lead to quite different outcomes. It can incur periodic crises and often leads to termination of the cooperation".

The data indicated that of twelve network based relationships entered into by Bioglan only two of these were terminated. The agreement with CeNes was terminated by CeNes in 2001 as was the agreement with Novo Nordisk. Although the press speculated that Skyepharma would terminate the agreement for Solaraze this did not happen, although Bioglan did have to transfer the North American rights to Quintiles. The actions of both Cenes and Novo Nordisk demonstrated how, in a crisis situation these

"partners" will focus on their own survival even if it means the demise of the cooperative partner. Table 5.46 refers to Bioglan's Merger & Acquisition (M&A) strategic actions.

Table 5.46 Bioglan's Merger & Acquisition (M&A) Strategic Actions

Year	Firms acquired	Notes	Geographical locations
1994	Hydro Pharma	Renamed Bioglan AB	Sweden
1995	Tripharma	-	Ireland
1995	Biogram	26% share	Sweden
1996	Goldham	50% interest	Germany
1997	Pharmasol	-	United Kingdom
1997	Euroderma	-	United Kingdom
1998	Mosaique (holding company of Laboratoire CS)	50% share	France
1999	Winston Laboratories	19% share	United States
2000	Mosaique (holding company of Laboratoire CS)	Remaining 50% share	France
2000	CeNeS Pharmaceuticals	1.1% minority share	US
2000	United Nordic Pharma	-	Denmark
2000	Laegmiddelforsyning	Dansk Lagemiddelforsyning was an associated company of United Nordic Pharma	Denmark

Source: Compiled by the author from various issues of *Scrip*, *Financial Times* and *Mergerstat*: 1992-2002.

As shown in Table 5.46 Bioglan placed its emphasis on acquisitions focused primarily on buying companies outside of the United Kingdom. The acquisitions were focused upon its four core therapeutic areas of generics (e.g. Tripharma), drug delivery (e.g. Biogram, a biotechnology company), pain management (e.g. Winston Laboratories) and dermatology (e.g. Hydro Pharma). Sales and marketing capability was also developed through the acquisition of Dansk Lagemiddelforsyning. There was no evidence that Bioglan Pharma plc had attempted to diversify outside of pharmaceuticals via acquisitions. In the majority of acquisitions Bioglan Pharma plc appeared to attain complete control of the companies with the exception of Goldham, Winston Laboratories, Biogram and CeNeS. As shown in Table 5.47 Bioglan realised only two strategic actions with regard to Organic Concentric Diversification (OCD).

Table 5.47 Bioglan's Organic Concentric Diversification (OCD) Strategic Actions

Year	Strategic Action	Firm created	Country
1996	Establishment of a US subsidiary	-	United States
1999	Establishment of a wholly owned subsidiary	Bioglan Pharma GmbH	Germany

Source: Compiled by the author from various issues of *Scrip* and *Financial Times*: 1992-2002.

In 1996 Bioglan established its US subsidiary and in 1999 established Bioglan Pharma GmbH, which was responsible for marketing dermatological products in Germany. This purchase showed a change in direction because originally products in Germany had been sold by the firm Goldham which Bioglan acquired a 50% share of in 1996 (Table 5.46) and then sold to Sanochemia Pharmzeutika in 1999/2000 (Table 5.50). Bioglan Pharma GmbH was established to allow Bioglan to reacquire the rights to Crystacide, Micanol and Furacin, products which had originally been owned by Goldham Bioglan. As shown in Table 5.48 Bioglan's Organic Growth (OG) strategic actions were focused upon the development of its sales and marketing infrastructure during 1999-2001.

Table 5.48 Bioglan's Organic Growth (OG) Strategic Actions

Year	Strategic action	Countries
1999	Establishment of a salesforce in the United States	**United States**
2001	Increase in dermatology salesforce in Germany	**Germany**
2001	Building up of marketing infrastructure	-

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times*: 1992-2002.

The 2001 data supports the view that Bioglan was expanding in order to support the proposed acquisition of the Bristol Myers Squibb skincare division by "building up the marketing infrastructure to support sales of the BMS range" (Croft, 2001:26). As shown in Table 5.49, Bioglan restructured its generics subsidiary in 1999 and then proceeded in 2001 to undertake an organisation wide restructuring.

Table 5.49 Bioglan's Retrenchment (TR) Strategic Actions

Year	Strategic Action
1999	Restructuring and rebranding of the generics business Bioglan Generics Ltd
2001	Restructuring which included 15% reduction in the workforce and reduction in the research and development budget

Source: Compiled by the author from various issues of *Scrip* and *Financial Times*: 1992-2002.

This restructuring, together with divestments in 2001/2002 (Table 5.50), demonstrates an increase in reversals in strategic actions both prior to and after Bioglan's liquidation in 2002. Pearce II and Robinson (1994) suggested that this approach can help a firm that is facing problems and refer to it as a turnaround strategy. They note that its success does depend upon the severity of the situation. For Bioglan the strategic actions were insufficient for it to be able to survive.

Table 5.50 Bioglan's Divestment & Demerger (D&D) Strategic Actions

Year	Strategic Action
1999	Divestment of 50% of Goldham Bioglan Pharma GmbH to Sanochemia Pharmazeutika
2000	Divestment of a further 25% of Goldham Bioglan Pharma GmbH to Sanochemia Pharmzeutika
2001	Divestiture of Genplus Ltd (a telesales business)
2001	Putting its generic drugs contract manufacturing and pain medicines up for sale
2002 – prior to Bioglan going into receivership	Sale of Bioglan's Scandinavian generic drug operations to its management
2002 - prior to Bioglan going into receivership	Divestment of United Nordic Pharma and Dansk Laegmiddelforsyning
2002 – after Bioglan went into receivership	
2002	Divestment of Bioglan Pharma Inc
2002	Divestment of Bioglan Generics Ltd
2002	Divestment of CS Dermatologies
2002	Divestment of Bioglan Laboratories
2002	Divestment of Bioglan Pharma GmbH
2002	Divestment of the entire Swedish drug delivery business
2002	Divestment of Bioglan AB

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times*: 1992-2002.

A comparison of the M&A strategic actions (Table 5.46) with those for D&D (Table 5.50) shows that with the exception of Goldham Bioglan Pharma GmbH none of the other businesses that had been acquired were put up for sale or divested until November 2001. The reasons for the move to divestment strategic actions in December 2001 appears to be summed up in the following "the debt forced Bioglan to put its generic drugs contract manufacturing and pain medicines up for sale in an effort to save its core dermatology division" (Financial Times, 2001:14). "Skyepharma has acquired

Bioglan's entire Swedish drug delivery business...the move is part of the continuing sell-off of Bioglan's assets by its administrators" (*Scrip*, 2002e:13). The remaining assets were sold off, as evidenced by the divestment of firms such as CS, Bioglan Pharma Inc and Bioglan Generics Ltd as going concerns. The use of external sources of raising finance was a frequent theme of Bioglan's strategy from 1996 until it went into administration in February 2002. This is illustrated in Table 5.51.

Table 5.51 Bioglan's External Finance Raising (EFR) Strategic Actions

Year	Strategic action	Firms involved (where applicable)	Products involved (if applicable)
1996	Private placement	-	-
1998	Agreement leading to a $5million investment in Bioglan	Novo Nordisk	Biosphere drug delivery system
1998	Institutional placing on the London Stock Exchange and the placing of £20 million ($32 million) shares	-	-
1999 (June/July)	2-for-23 placing and open offer of 6.8 million shares	Re: Acquisition of product range from Medicis	-
1999(December)	Issue of 3.9 million new shares	Fund 19% acquisition of Winston Laboratories.	-
2000	Block listing of 4,500,000 shares on the London Stock Exchange and an identical listing on the Irish Stock exchange	-	-
2001	Issuing of 1,854,169 new shares	As part of a funding arrangement to acquire a dermatology portfolio from Hexal	

Source: Compiled by the author from various issues of *Scrip*, *Financial Times* and *Mergerstat*: 1992-2002

From the initial placing on the London Stock Exchange in 1998 the subsequent years saw the issuing of new shares or block listing of shares every year preceding it being forced into liquidation. The external financing strategic actions demonstrate how some of Bioglan's product acquisitions were financed. For example, a 2-for-23 placing and open offer were made so that Bioglan could purchase a product range from Medicis. External finance was also used to make firm acquisitions such as the issuing of 3.9 million new shares so that Bioglan could purchase 19% of Winston Laboratories. Table 5.52 shows the Product Divestment & Licensing Out (PD&LO) strategic actions realised by Bioglan.

Table 5.52 Bioglan's Product Divestment & Licensing Out (PD&LO) Strategic Actions

Year	Strategic action	Firms involved (where applicable)	Products involved (where applicable)
1995	Licensing out of marketing rights	Oclassen Pharmaceuticals	Micanol (anthralin)
1995	Licensing out of rights to Micanol for France	Medeva	Micanol
1996	Licensing of two dermatologicals	Medeva	Micanol (dithranol) and Crystacide
1998	Marketing deal which provided Elan with UK rights to the products	Elan	A cream used to treat the pain of osteoarthritis and another for discomfort caused by eczema
1999	Licensing and supply agreement	Glaxo Wellcome	Crystacide (hydrogen peroxide)
2000	Extended marketing rights	CeNeS	Aerosol formulation of an opiate analgesic
2000	Licensing agreement	Sakai	ES-Gel
2001	Licensing agreement	Skyepharma	Crystalip, Dermastick and ES-Gel
2002 – prior to going into receivership	Divestment of rights	Quintiles Transnational	Solaraze

Source: Compiled by the author from various issues of *Scrip* and the *Financial Times*: 1992-2002

As well as the acquisition of firms and products a number of the strategic actions shown confirm that Bioglan had entered into agreements for other firms to market its products. This is illustrated by the licensing out of (marketing) rights for Micanol to Oclassen in 1995 and to Medeva (for France in 1995 and then a further agreement in 1996). Other examples include the marketing deal with Elan in 1998 and with Sakai in 2000 for ES-Gel. As was seen by the strategic actions relating to Divestments (Table 5.50) and Retrenchment (Table 5.49) prior to February 2002 the Board of Bioglan appeared to be implementing strategic actions that would enable Bioglan Pharma plc to survive as an organisation. But eventually the lender decided that it could no longer continue to finance Bioglan Pharma Plc. In February 2002 Bioglan went into administration and this was followed by the liquidation of the business and the selling off of the various companies. Pearce II and Robinson (1994) argued that liquidation is a grand strategy as a firm attempts to liquidate certain assets. However, in the case of Bioglan the decision to liquidate was not made by the Board of Directors but by external stakeholders, in this case the lenders when they would not continue financing the firm's operations. Table

5.53 summarises, in chronological order, the strategic actions realised by Bioglan during 1992-2002.

Table 5.53 Summary of Bioglan's Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
M&A			■	■	■	■	■	■	■		
NABPD						■	■	■	■	■	
JV											
OCD					■			■			
OG								■		■	
D&D								■	■	■	■
PD&LO				■	■		■	■	■	■	■
TR								■		■	
EFR					■		■	■	■	■	

Source: Compiled by the author

It is noted that Bioglan did not realise any Joint Venture strategic actions.

5.8 Chapter Summary

As was discussed in the introduction the aim of this chapter was to present the results relating to the strategic actions realised by the firms in the sample. This was achieved by identifying and chronologically ordering strategic actions that had been reported in *Scrip,* the *Financial Times* and *Mergerstat* during the period January 1st 1992 to December 31st 2002. During the chapter chronological summaries were presented of the strategic actions realised by each firm and were categorised with regard to relevant grand strategies.. These were presented in relation to six firms that had arrived at different strategic outcomes. The tabulated results also referred to, where appropriate, the geographical location of the realised strategic actions. These results will now be discussed in Chapter Six with regard to patterns in the evolution of the strategic actions and grand strategies and also how they relate to internationalisation strategies. This addresses the sub questions R2 and R4.

CHAPTER SIX
GRAND STRATEGIES: SELECTION AND EVOLUTION

6.1 Introduction

As discussed in Section 2.8, evolutionary theory underpins the concepts of incremental and emergent strategy which are two of the strategies on the 'continuum of strategy processes' discussed in Chapter Two (Section 2.3). That section concluded that in order to understand the strategy process scholars need to explore what firms actually did rather than what they had planned. As detailed in Chapter Four a methodological framework was designed. This allowed the qualitative collection and analysis of longitudinal data on the strategic actions that were realised by the firms in the sample during 1992-2002. In Chapter Five these results were chronologically presented for six firms that had arrived at different strategic outcomes, namely LEK (acquired), Shire (merged), Pierre Fabre (demerged), Bioglan (liquidated), Asta Medica (disbanded and divested) and Galen (survived without being acquired or merged). In Chapters One and Four a set of sub questions were presented, labelled R1 to R4. Question R1 was addressed in Chapter Four with the development of a categorisation of a detailed set of strategic actions and grand strategies realised by firms in the pharmaceutical industry. Section 6.2 discusses the grand strategies that were realised by each of the firms in the sample. In Section 6.3 this is developed into a discussion about how the grand strategies and strategic actions evolved (Question R2). This includes the presentation of an Empirical Typology of Pharmaceutical Grand Strategy Evolution. Section 6.4 proceeds to address the sub question R4 through exploring the strategic actions realised in relation to how internationalisation strategies evolved during 1992-2002. Section 6.5 contextualises the data about how the grand strategies and strategic actions evolved. Finally, Section 6.6 presents the conclusions drawn from the empirical data with regard to strategy evolution in the pharmaceutical industry during 1992-2002.

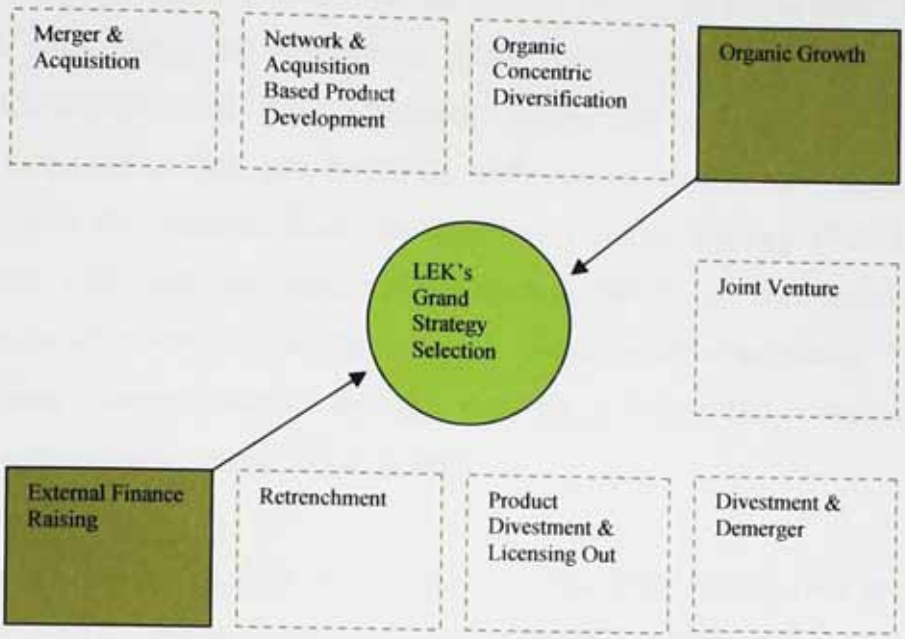
6.2 Grand Strategy Selection

As discussed in Chapter Four, the categorisation of strategic actions used for the empirical data collection was based upon an adaptation of Pearce II and Robinson's (1994) set of grand strategies. Pearce II (1982:31) said that "grand strategies are typically formulated to promote synergy in operations over a period of at least five years." This has been interpreted as meaning that a grand strategy was realised for five years if relevant strategic actions were realised in at least three years of any five year period. Therefore, with regard to the empirical data, this has been defined as 'strategic actions are considered to form the relevant grand strategy if they are realised for at least three years in any five year period'.

Pearce II (1982:29) developed a "grand strategy selection matrix" which was devised in order to guide managers as to the most appropriate combination of grand strategies to select. For example, an internal emphasis or external focus in order to overcome weaknesses or maximise strengths. However, Pearce II's (1982) matrix is prescriptive rather than descriptive of the grand strategy selections that firms had realised. Also, his selection matrix only highlights a maximum of four grand strategies for each of the four quadrants. The other key concern is that although it allows for a turnaround strategy (quadrant II) it does not show how strategies should or could evolve over time. For this thesis, rather than using Pearce II's (1982) matrix, the grand strategies realised by each of the firms in the sample were modelled to identify similarities and differences in grand strategy selection for each of the firms during 1992-2002. As well as identifying patterns in grand strategy selection it also discusses the realised strategies in relation to the strategic group literature.

As shown in Figure 6.1, of the nine grand strategies that were identified as being realised by the firms in the sample LEK only realised two of these, those relating to External Finance Raising (EFR) and Organic Growth (OG). LEK was the firm that was acquired and it selected the smallest number of grand strategies of any firms in the sample. It was also only one of two firms in the sample that realised an Organic Growth strategy, the other being Galen.

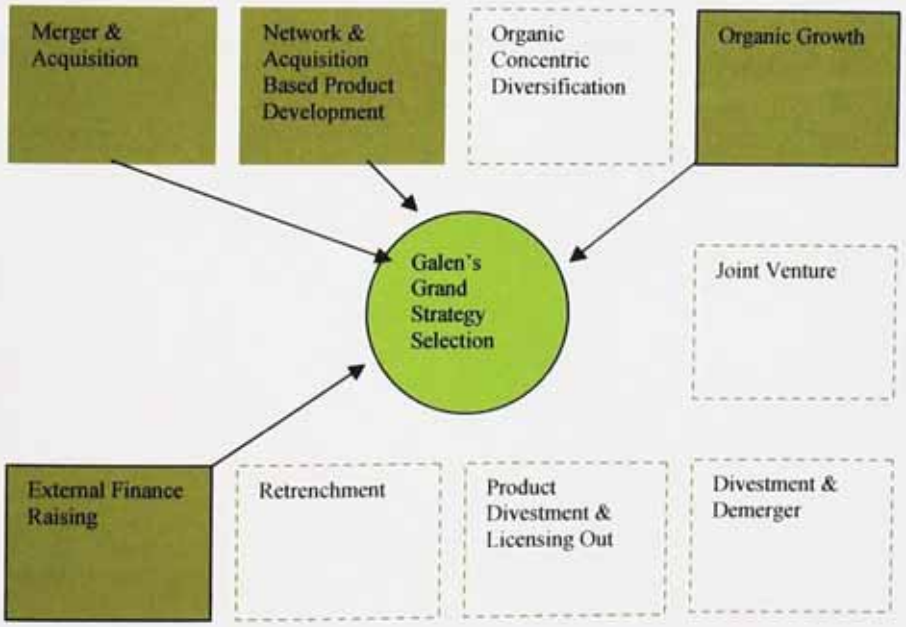
Figure 6.1 A Model of LEK's Grand Strategy Selection 1992-2002



Source: Compiled by the author

As shown in Figure 6.2 as well as realising an Organic Growth (OG) strategy, like LEK Galen also realised an External Finance Raising (EFR) strategy.

Figure 6.2 A Model of Galen's Grand Strategy Selection 1992- 2002

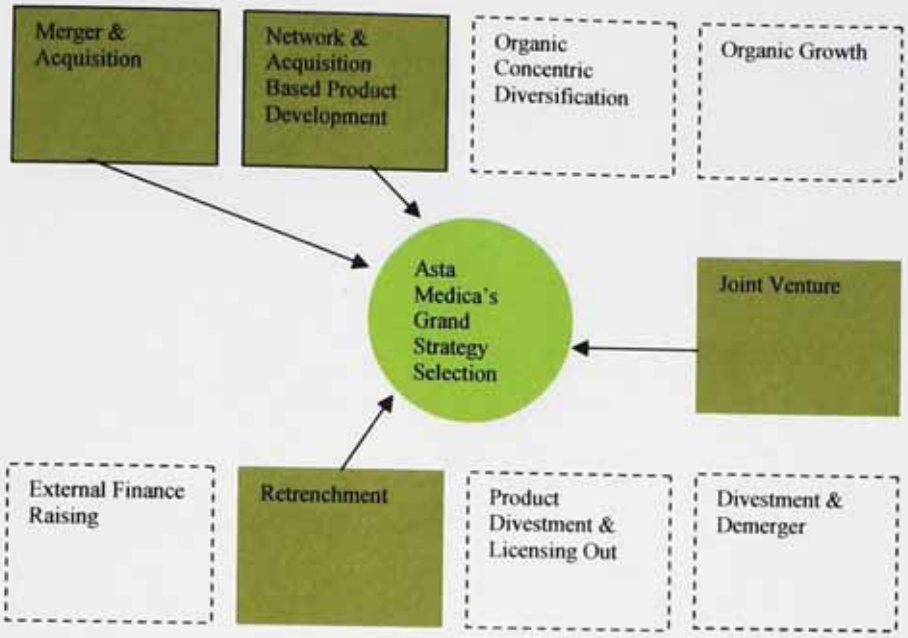


Source: Compiled by the author

However, in comparison to LEK, over the period 1992-2002 Galen combined these two strategies with Merger & Acquisition (M&A) and Network and Acquisition Based Product Development (NABPD) strategies. Galen combined grand strategies with an external emphasis (M&A and NABPD) with one of an internal emphasis (Organic Growth) with the funding from an External Finance Raising (EFR) strategy. In comparison, LEK did not realise either formal (M&A) or collaborative (NABPD) strategies, in other words those strategies that had an external emphasis. LEK did raise finance from external sources through its EFR strategy. Galen was the firm that survived without being merged or acquired.

As shown in Figure 6.3, like Galen, Asta Medica also realised four grand strategies during 1992-2002. In comparison to Galen, Asta Medica did not realise grand strategies relating to External Finance Raising (EFR) or Organic Growth (OG). Asta Medica focused upon a Joint Venture (JV) strategy in addition to the other external emphasis strategies of Merger and Acquisition (M&A) and Network and Acquisition Based Product Development (NABPD). Asta Medica was only one of two firms in the sample to realise a Retrenchment (TR) grand strategy, the other being Shire (Figure 6.6). Although Webb and Pettigrew (1999) suggested that it is a viable option for a firm to combine growth and retrenchment strategies these did precede Asta Medica being disbanded and divested by its parent company, Degussa.

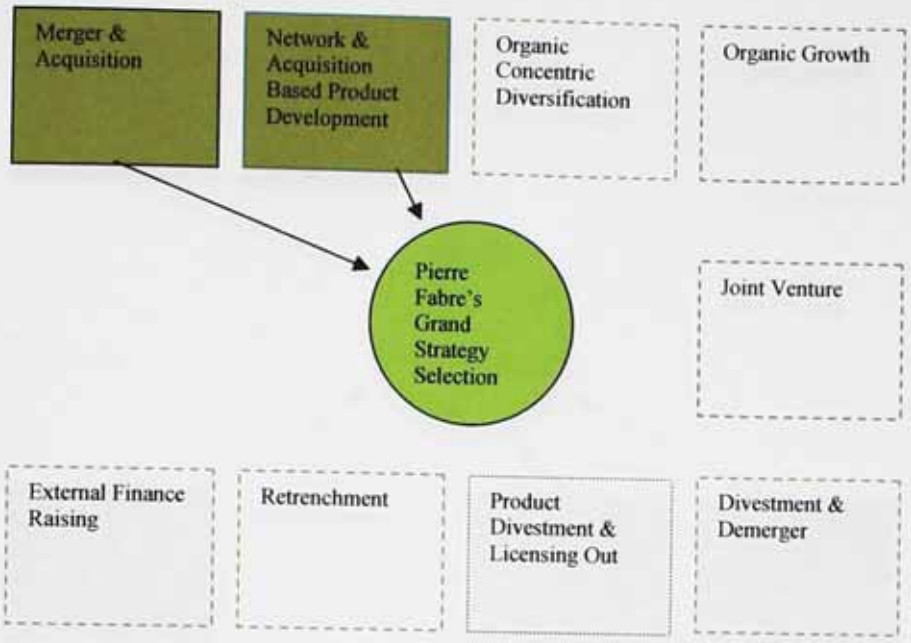
Figure 6.3 A Model of Asta Medica's Grand Strategy Selection 1992-2002



Source: Compiled by the author

As shown in Figure 6.4, like all of the other firms in the sample, apart from LEK, Pierre Fabre realised grand strategies relating to Merger and Acquisition (M&A) and Network and Acquisition Based Product Development (NABPD). Pierre Fabre was one of only two firms that did not realise an External Finance Raising (EFR) strategy, the other being Asta Medica. However, unlike Asta Medica, Pierre, Fabre did not realise a Joint Venture (JV) or Retrenchment (TR) strategy.

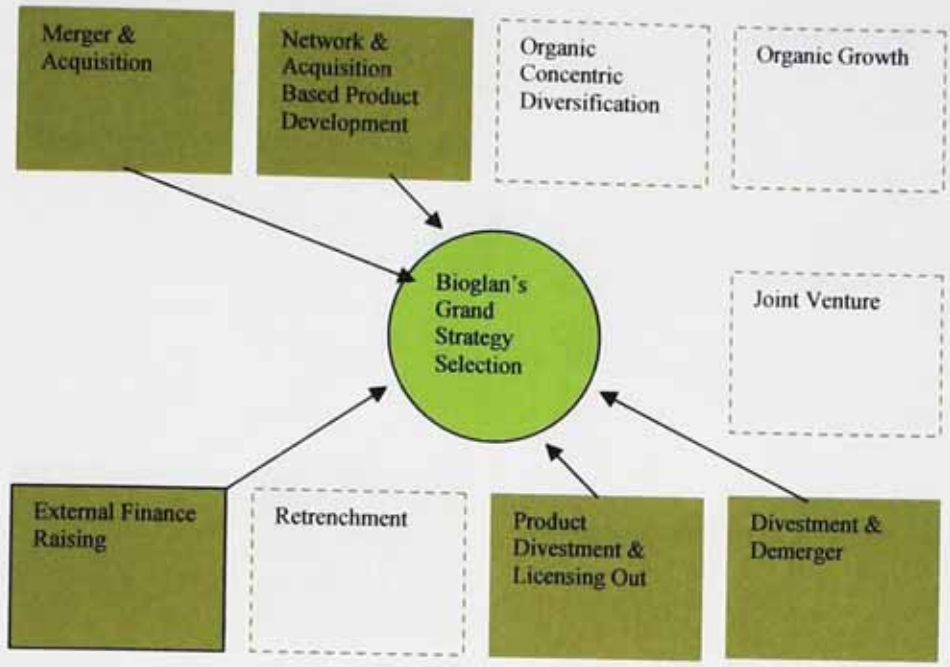
Figure 6.4 A Model of Pierre Fabre's Grand Strategy Selection 1992-2002



Source: Compiled by the author

As shown in Figure 6.5, unlike Pierre Fabre Bioglan realised grand strategies for External Finance Raising (EFR) and Divestment & Demerger (D&D). Also, Bioglan was the only firm that realised a Product Divestment and Licensing Out (PD&LO) strategy. Bioglan realised five different grand strategies in comparison to the two realised by Pierre Fabre. Bioglan's strategic outcome was its liquidation.

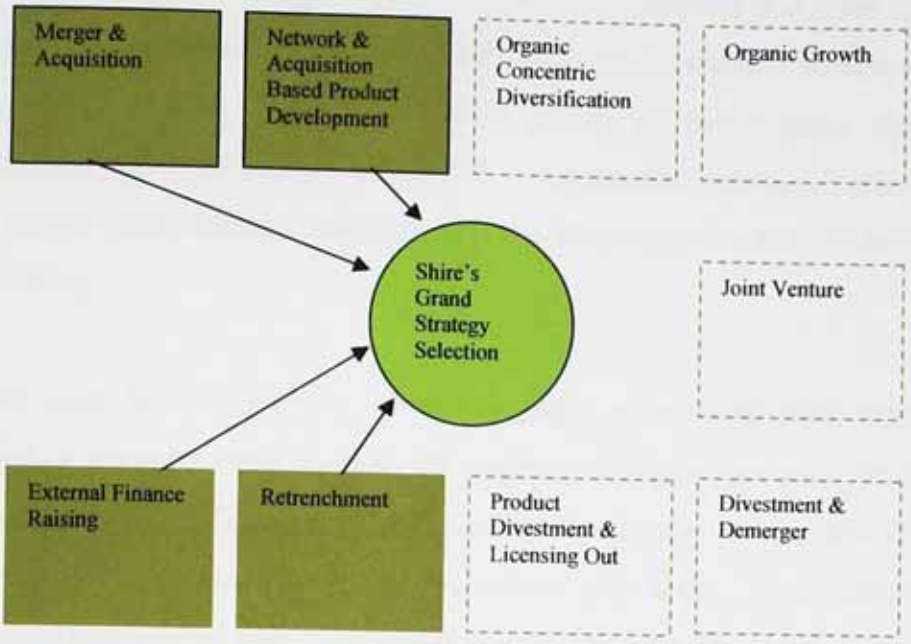
Figure 6.5 A Model of Bioglan's Grand Strategy Selection 1992-2002



Source: Compiled by the author

Like Bioglan and Galen, the other UK speciality niche pharmaceutical firm, Shire (Figure 6.6) realised grand strategies of Merger and Acquisition (M&A), Network and Acquisition Based Product Development (NABPD) and External Finance Raising (EFR). However, Shire did not realise any of the other grand strategies implemented by either Bioglan or Galen. Shire did realise a retrenchment strategy, which was not a strategy selected by either Bioglan or Galen. Shire's strategic outcome was its merger with Biochem Pharma.

Figure 6.6 A Model of Shire's Grand Strategy Selection 1992-2002



Source: Compiled by the author

As has been discussed, each of the firms in the sample packaged their grand strategies in a different way for the period 1992-2002. Also, Pearce II (1982) suggested four combinations in his grand strategy selection matrix, but as has been shown six combinations were shown in the above models, one for each of the firms. A possible reason for the difference between the results of this thesis and Pearce II's (1982) matrix was that he had focused upon prescriptive selections whilst I have shown the grand strategies that were actually realised by firms. This adds weight to the suggestion in Chapter Two that strategy researchers should explore what has happened, been realised, rather than that which is planned or prescribed. What the results from the models do indicate is that firms realised unique patterns of strategy evolution, as indicated in each of the firms combining different grand strategies into their overall realised strategy for 1992-2002. This supports the findings of Balance *et al.* (1992) that in the pharmaceutical industry firms will only realise a few of the many strategic options available to them. Also, as the models show each firm in the sample realised a different grand strategy mix and arrived at a different strategic outcome thus suggesting a possible link between grand strategy selection and strategic outcome. Table 6.1 summarises the grand strategies and strategic actions that were realised by each of the firms in the sample, based upon the empirical data in Chapter Five. Table 6.1 indicates where firms realised a relevant strategy, using the definition given in section 6.2.

However, despite the definition of strategic actions that constitute a grand strategy this still leaves the issue of strategic actions that were realised but that were not necessarily part of an overall grand strategy, i.e. that there was no consistency in action (Kay, 1993; Mintzberg *et al.*, 1998). These have been classed as incremental strategic actions (Lindblom, 1959;1979; Quinn, 1980;1991). Incremental strategic actions were those strategic actions that were not realised with the frequency required to be interpreted as being a strategy.

As can be seen from Table 6.1, of the available grand strategies, strategic actions constituting a strategy were realised for eight of the nine potential grand strategies. Strategic actions were also realised with regard to Organic Concentric Diversification (OCD) but these were insufficient to demonstrate a strategy. As discussed none of the firms realised exactly the same combination of grand strategies as any other firm in the sample. Each packaged them in a unique way not only with regard to the number and type of grand strategies but sometimes with regard to the chronological ordering. For example, Galen realised an Organic Growth (OG) strategy and then changed direction with a grand strategy that combined both Merger & Acquisition (M&A)/Network & Acquisition Based Product Development (NABPD) but with no further Organic Growth (OG) strategic actions.

The strategic group literature proposed that firms that were homogenous in nature followed similar strategies (Porter, 1979; Mascarenhas, 1989; McGee and Segal-Horn, 1990; McGee *et al.*, 1995; Thomas and Pollock, 1999). But, as can be seen with regard to Bioglan, Shire and Galen, the three British speciality pharmaceutical firms, all had realised M&A/NAPBD/External Finance Raising (EFR) strategies but then differed with regard to the other five strategies of Organic Growth (OG), Divestment & Demerger (D&D), Retrenchment (TR), Product Divestment & Licensing Out (PD&LO) and Organic Concentric Diversification (OCD). The same could be applied to LEK and Galen who were both focused upon generic pharmaceutical products at the beginning of the study. This is possibly because the strategic group literature focused upon competitive rather than grand strategies. However, as Pearce II (1982) argued, grand strategies themselves can potentially create competitive advantage. Despite being very different types of firm Asta Medica had selected a set of grand strategies that were similar to Shire with regard to M&A/NAPD/TR but differed with regard to Joint

Venture (JV) and External Finance Raising (EFR). This, therefore, demonstrates how the pre-selection of variables for analysis, as used in Strategic Group Analysis (SGA), can distort the results showing similarities that may not exist. However, as will be discussed in Section 6.5, although some of the firms share some similar characteristics, they were all unique, i.e. heterogeneous in nature. This is a point that is not referred to in the Strategic Group literature as its emphasis is upon identifying similarities.

Table 6.1 Grand Strategies and Incremental Strategic Actions Realised[1]

	Mergers & Acquisition (M&A)	Network & Acquisition Based Product Development (NAPBD)	Joint Venture (JV)	Organic Growth (OG)	Divestment & Demerger (D&D)	Retrenchment (TR)	Product Divestment & Licensing Out (PD&LO)	External Finance Raising (EFR)	Organic Concentric Diversification (OCD)
Bioglan	Strategy	Strategy	None	Incremental strategic actions	Strategy	Incremental strategic actions	Strategy	Strategy	Incremental strategic actions
Shire	Strategy	Strategy	None	Incremental strategic actions	None	Strategy	Incremental strategic actions	Strategy	Incremental strategic actions
Galen	Strategy	Strategy	None	Strategy	Incremental strategic actions	None	Incremental strategic actions	Strategy	Incremental strategic actions
LEK	Incremental strategic actions	Incremental strategic actions	Incremental strategic actions	Strategy	None	None	Incremental strategic actions	Strategy	Incremental strategic actions
Pierre Fabre	Strategy	Strategy	Incremental strategic actions	Incremental strategic actions	Incremental strategic actions	Incremental strategic actions	Incremental strategic actions	None	Incremental strategic actions
Asta Medica	Strategy	Strategy	Strategy	Incremental strategic actions	Incremental strategic actions	Strategy	Incremental strategic actions	Incremental strategic actions	Incremental strategic actions

Source: Compiled by the author

[1] 'Strategy' is the term used to indicate when strategic actions are realised for at least three years in any five year period for any specific grand strategy. 'Incremental strategic actions' are those that were realised by a firm but did not meet the 'strategy' criteria.

6.3 Grand Strategy Evolution

As is shown in Table 6.1, all of the firms in the sample have combined grand strategies with incremental strategic actions. However, this still does not help to explain how, in overall terms, the strategies evolved during the eleven years for each of the firms. Strategy has been considered as a linear or sequential plan (Chandler, 1962; Ansoff, 1968; Chaffee, 1985; Andrews, 1991). However, emergent strategy appears to imply that firms are not necessarily moving in a "forward" direction. Evolutionary theory underpins both emergent and incremental strategies and thus the discussion of findings will contribute to current understanding about how grand strategies evolved, i.e. changed, over an eleven year period. When interpreting how the grand strategies have evolved, added to this interpretation is the view that firms undergo turnaround strategies. Pearce II and Robinson (1994) referred to turnaround strategies as being retrenchment strategies which can also be combined with divestment strategies. As discussed previously Pearce II (1982) based his grand strategy selection matrix on whether emphasis was upon an internal or external focus. This evolution of strategies in the pharmaceutical industry with regard to internal/external emphasis is particularly relevant as the industry has moved from an historical base of largely organic growth (Coombs and Metcalfe, 2002) to one with a high level of merger activity (Allen *et al.*, 2002) and is characterized by its complex system of network relationships which have led to the sharing of capabilities and knowledge (Bower, 1993; Henderson and Cockburn,1994; Kettler, 1997; Walsh and Lodorfos, 2002). In interpreting the empirical data it was found that strategies relating to M&A/NABPD/PD&LO/JV were externally focused whilst those with an emphasis upon OG/OCD were internally focused. The same related to whether or not firms had placed emphasis upon an EFR strategy. The following summarises how the data was interpreted in order to identify similarities and differences between the firms in how the strategic actions and grand strategies identified from the empirical data have evolved:

- Emergent – grand strategies combined with incremental strategic actions that provide an overall consistency in actions based upon whether they had an internal/external emphasis and whether firms had realised an external finance raising strategy;

- Incremental – strategic actions realised with no evidence of them forming a grand strategy;

- Turnaround – a strategy of retrenchment and/or divestment & demerger;

- Linear direction – no evidence of a retrenchment or divestment & demerger (D&D) strategy or the premature termination of strategic actions;

All of the firms in the sample had combined grand strategies with incremental strategic actions, an approach that can be compared with the concept of emergent strategy (Mintzberg and Waters, 1985; Mintzberg, 1987). From these interpretations the findings were developed into an Empirical Typology of Pharmaceutical Grand Strategy Evolution (Figure 6.2) that reflects the dynamic nature of how strategies and strategic actions are realised.

Table 6.2 An Empirical Typology of Pharmaceutical Grand Strategy Evolution

Emergent strategy	External emphasis with external finance	External emphasis with internal finance	Internal emphasis with external finance	Internal emphasis with internal finance
Incorporating turnaround strategy of divestment	Bioglan	-	-	-
Incorporating turnaround strategy of retrenchment	Shire	Asta Medica	-	-
Incorporating isolated turnaround strategic actions	Galen	Pierre Fabre	-	-
Linear direction	-	-	LEK	-

Source: Compiled by the author

As summarised in Table 6.2, there are similarities and differences in how each of the firms realised their strategies. Bioglan, Shire and Galen evolved strategies that towards the end the 1992-2002 period had an external emphasis that were accompanied by external finance raising strategies. This therefore supports the view of the strategic group literature that firms that are homogenous in nature, i.e. the three speciality pharmaceutical firms, will follow similar strategies. However, an area that appears to be neglected in the strategic group literature, is that firm strategies can evolve in different ways with regard to the extent to which they include turnaround strategies such as divestment or retrenchment or isolated strategic actions, as illustrated for these three firms in Table 6.2. By including these factors in the analysis it can actually be seen that firms were not that similar with regard to their realised strategies, thus disagreeing with the strategic group literature. These differences can be related to Deephouse's (1999) discussion about whether firms should be different or the same, and to the proposal that all firms are unique (Penrose, 1959; Hannan and Carroll, 1995; Kaplan and Johnson, 1998), which is discussed in Section 6.5. It can also be related to the weaknesses of analytical techniques used in Strategic Group Analysis and other quantitative approaches which were discussed in Section 4.4.2. Asta Medica and Pierre Fabre both realised strategies with an external emphasis that was financed internally rather than externally, again the difference was how the strategies evolved. LEK was the only firm in the sample to have an internal emphasis and to evolve its strategy in a linear manner.

As was discussed in Chapter Four the firms in the sample were chosen because they had arrived at different strategic outcomes. As can be seen with regard to Figures 6.1-6.6 and Table 6.2 they have also realised their grand strategies and strategic actions in different ways. This would suggest that it is possible to tentatively suggest that there are relationships between strategy evolution and strategic outcome. This could be illustrated from Table 6.2 with regard to Bioglan. An emergent strategy that includes divestments, external emphasis and external finance leads to a strategic outcome of liquidation. Another example illustrated in Table 6.2 relates to LEK. An emergent strategy that has a linear direction which includes an internal emphasis with external finance leads to a strategic outcome of being acquired.

It is not possible from this qualitative exploratory study to confirm whether there is a causal relationship between the strategy process and the strategic outcome. This could

be tested by other researchers but does not fall within the scope of this thesis. As will be discussed in Section 6.6 there are other factors that could have potentially shaped the strategic outcome of the firm as well as the evolution of its grand strategies and strategic actions. As discussed in the literature review the pharmaceutical industry has evolved into a global oligopoly. Section 6.4 seeks to develop an understanding of the globalisation process in the pharmaceutical industry through exploring the evolution of strategic actions with regard to internationalisation.

6.4 Evolution of Internationalisation Strategic Actions and Strategies

Internationalisation was given a high prominence by Webb and Pettigrew (1999) who identified it as one of the key strategy types that they explored as part of their study into temporal patterns of strategy development in the UK insurance industry. Although Pearce and Robinson (1994) did not class globalisation as a grand strategy they did refer to it with regard to a market development strategy, although they did not discuss it in terms of strategy evolution. Similarly, Ansoff's (1968) description of market development was prescriptive rather than descriptive of what firms had done. The discussion in this section therefore helps to develop understanding of the evolutionary processes for this type of strategy and thus addresses the sub question R4.

During the coding of the data to identify how the grand strategies had evolved it became clear that there were four key geographical themes with regard to internationalisation/globalisation markets. These were:

- Western Europe
- Central and Eastern Europe (CEE)
- US
- Rest of world

From the tabulated results given in Chapter Five, summaries of the internationalisation strategic actions for each firm are provided; these are illustrated using the colour key in Table 6.3.

Table 6.3 Colour Key for Summaries of Internationalisation Strategic Actions

All internationalisation strategic actions	
Western Europe	
CEE Market	
US	
Rest of world	

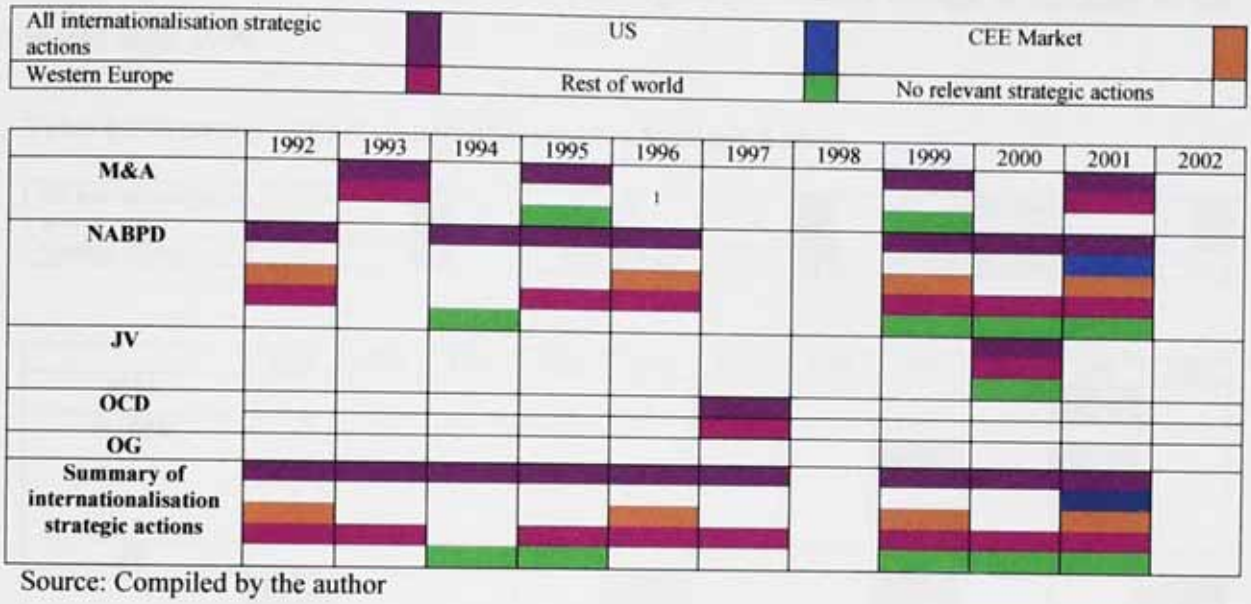
The purpose of this section is to explore and compare similarities and differences in the internationalisation of the strategies in comparison to the overall grand strategies discussed in Section 6.3. I have, therefore, underpinned the discussion with the same theory in order to focus upon strategy evolution. The strategic actions have been interpreted by applying a similar definition to that used for identifying when strategic actions form a grand strategy. In summary, 'strategic actions are considered to form a strategy for the relevant geographical market if they are realised for at least three years in any five year period'. Further research, which does not fall within the scope of this thesis, could discuss these in relation to specific theories of internationalisation.

It is recognised that there are internationalisation strategic actions that do not relate to grand strategies, e.g. exporting, but for the purposes of this study internationalisation strategic actions are only those that were identified during the coding of the empirical data in relation to grand strategies. This discussion only refers to expansion into international markets as issues of withdrawal and retrenchment have already been discussed in relation to the grand strategies. Specifically, these are strategic actions relating to Merger & Acquisition (M&A), Network & Acquisition Based Product Development (NABPD), Joint Venture (JV), Organic Concentric Diversification (OCD) and Organic Growth (OG). Consideration was also given to including PD&LO but as this included product divestments it was considered that this could not be fully considered as an expansion strategy within this discussion.

6.4.1 Pierre Fabre

Pierre Fabre commenced its internationalisation strategic actions in 1992 with strategic actions related to both the Western European and C.E.E markets (Table 6.4).

Table 6.4 Summary of Pierre Fabre's Internationalisation Strategic Actions



Source: Compiled by the author

Pierre Fabre used the following strategic actions to extend its geographical markets: Joint Ventures (JVs), Acquisitions (M&A), Organic Concentric Diversification (OCD) and Network & Acquisition Based Product Development (NAPBD) strategic actions. Various ad hoc strategic actions were subsequently realised with regard to the CEE market. With the exception of 2001, no strategic actions were reported in relation to the US market. In comparison strategic actions relating to the Western European market were realised for the majority of the year 1992 – 2002. Although it realised strategic action(s) relating to the "rest of the world" in 1995 Pierre Fabre did not start to realise a "rest of the world" strategy until the late 1990's.

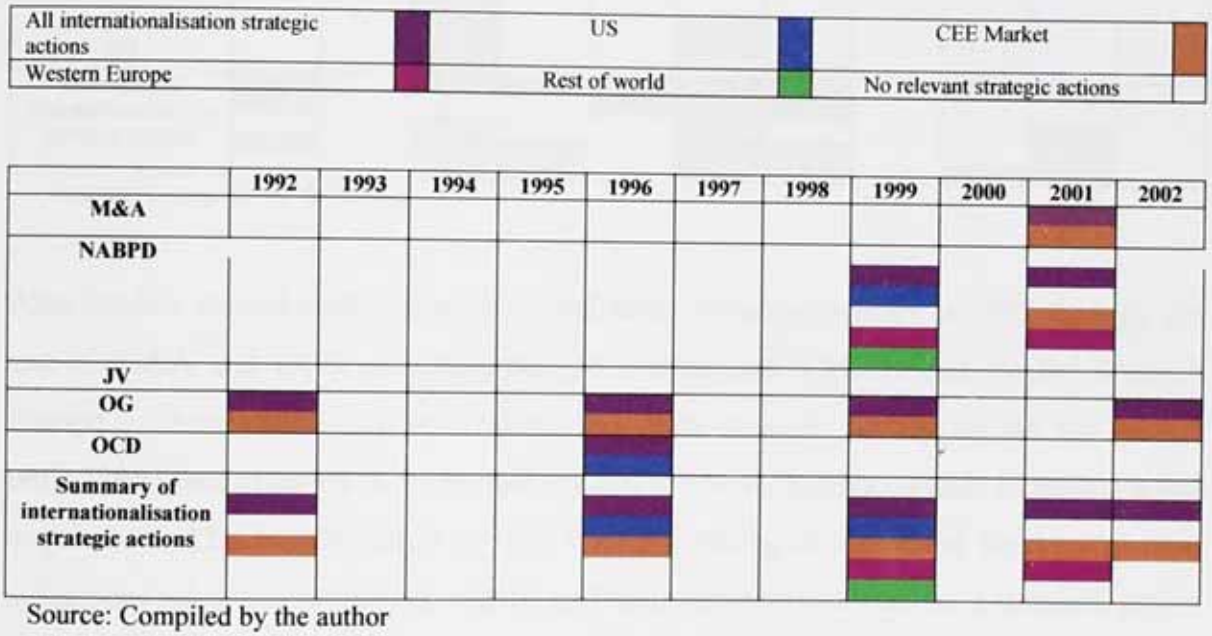
Pierre Fabre therefore appeared to have developed its most local market, Western Europe, before progressing onto a wider "rest of the world" strategy that excluded the US, despite the US being regarded as the largest market for pharmaceutical sales (Walton, 2001). By 2002 Pierre Fabre was operating in 130 countries with 45% of sales and 74% of employees being overseas (Pierre Fabre, 2002). Pierre Fabre's

internationalisation strategy appeared to be driven by its concern that it was "too dependent on the French market" (*Scrip*, 1998c:11).

6.4.2 LEK

As shown in Table 6.5 LEK's relevant strategic actions with regard to internationalisation. These started with the CEE market in 1992 followed by the US market in 1996. None were reported with regard to Western Europe or the Rest of the world until 1999.

Table 6.5 Summary of LEK's Internationalisation Strategic Actions



Source: Compiled by the author

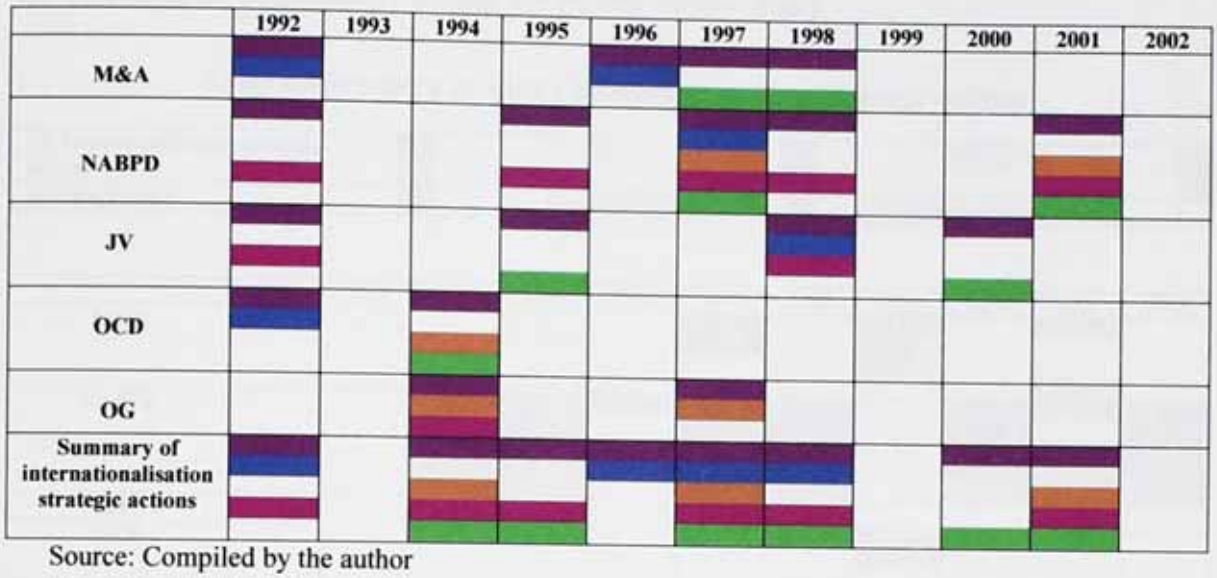
LEK focused upon developing specific strategic actions in the CEE market from 1992 but, until 2001, these had been focused upon organic growth. LEK only realised strategic actions for the US market in 1996, with the establishment of a US company, and a collaboration agreement with Ethical Holdings in 1999. LEK only realised one strategic action with regard to the "rest of the world" which was a collaboration agreement with Ethical Holdings that included the Japanese market.

6.4.3 Asta Medica

Table 6.6 provides a summary of the strategic actions that Asta Medica realised that contributed to its internationalisation.

Table 6.6 Summary of Asta Medica Internationalisation Strategic Actions

All internationalisation strategic actions		US	CEE Market
Western Europe		Rest of world	No relevant strategic actions



Source: Compiled by the author

Asta Medica started realising internationalisation strategic actions in 1992 through the use of M&A and OCD to access the US market and NABPD and JV for Western Europe. Asta Medica did not realised any more strategic actions for the US market until 1996 when it added to its minority share in Muro Pharmaceuticals to enable a full acquisition. This was followed in 1997 with a licensing in agreement for Andrx. This agreement related to worldwide rights, and therefore was recorded as a strategic action for all geographical markets. In 1998 Asta Medica completed its strategic actions for the US market with the establishment of the joint venture Wallace Laboratories/ASTA Medica. The strategic actions for Western Europe evolved from 1992-2001. These were mainly through NABPD and Joint Venture strategic actions. The exception was in 1994 with the new plant facility in France. Asta Medica only realised incremental strategic actions for the CEE market. These were realised in relation to OG and NABPD strategic actions. Asta Medica realised a strategy for the "rest of the world" market that started in 1994 with relevant strategic actions realised up to 2001.

6.4.4 *Shire*

As shown in Table 6.7, Shire started implementing strategic actions to develop itself in the CEE market consistently during the period 1994 – 2002.

Table 6.7 Summary of Shire's Internationalisation Strategic Actions

All internationalisation strategic actions		US		CEE Market							
Western Europe		Rest of world		No relevant strategic actions							

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
M&A											
NABPD											
JV											
OCD											
OG											
Summary of internationalisation strategic actions											

Source: Complied by the author

There is sufficient consistency in behaviour to tentatively suggest a specific CEE market development strategy using NABPD strategic actions. However, an examination of the specific strategic actions demonstrates that those relating to the CEE were part of an overall European/worldwide agreements. A large number of Shire's NABPD agreements were related to activities outside of the UK (Shire's country of origin) including the Middle East, Asia, Australia and New Zealand and thus contributed to the globalisation of the organisation's business. In 1997 Shire acquired two US firms, Richwood Pharmaceuticals and Pharmavene. Entry into the US market via acquisition has been shown to be more likely to result in exit from the market rather than entry through Greenfield investments (Li, 1995). Yet, Shire appeared to build upon its 1997 acquisition with its 1999 merger with Roberts Pharmaceutical and thus developed its presence in the US. Its other strategic actions in relation to the "rest of the world" did not occur until 2001 with its merger with the Canadian firm Biochem

Pharma and the 2002 investment in a global vaccine research centre, which was also based in Canada.

6.4.5 Galen

As shown in Table 6.8, Galen did not realise any strategic actions outside of the UK until 1997. From 1997 all of Galen's internationalisation strategic actions were focused upon the US, primarily in the form of acquisitions.

Table 6.8 Summary of Galen's Internationalisation Strategic Actions

All internationalisation strategic actions		US		CEE Market	
Western Europe		Rest of world		No relevant strategic actions	

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
M&A											
NABPD											
JV											
OCD											
OG											
Summary of internationalisation strategic actions											

Source: Compiled by the author

Although Galen was a British firm all of Galen's reported acquisition activity, apart from the companies associated with Bartholomew Rhodes, related to firms based in the United States. This was concentrated in the period 1998 to 2000 which appears to have been a very intense period for Galen's acquisition strategy. Galen did not realise any strategic actions with regard to the CEE, Western Europe or "rest of the world" markets.

6.4.6 Bioglan

As shown in Table 6.9, Bioglan did not realise any strategic actions relating to international markets until 1994. Prior to 1998 these were focused upon the Western European and US markets.

Table 6.9 Summary of Bioglan's Internationalisation Strategic Actions

All internationalisation strategic actions		US	CEE Market
Western Europe		Rest of world	No relevant strategic actions

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
M&A											
NABPD											
JV											
OCD											
OG											
Summary of internationalisation strategic actions											

Source: Compiled by the author

The majority of Bioglan's strategic actions for Western Europe related to acquisitions and its NABPD strategy. In addition there were OG and OCD strategic actions relating to Germany. These were the 1999 establishment of a German subsidiary and the 2001 increase in Bioglan's salesforce for Germany. With regard to the US market Bioglan also combined M&A, NABPD, OCD and OG strategic actions. In 1998 strategic actions also began to be realised for the CEE and "rest of world" markets. For both of these markets Bioglan only realised strategic actions relating to a NABPD strategy. In summary, Bioglan realised strategic actions that related to internationalisation strategies for all of the markets apart from the CEE

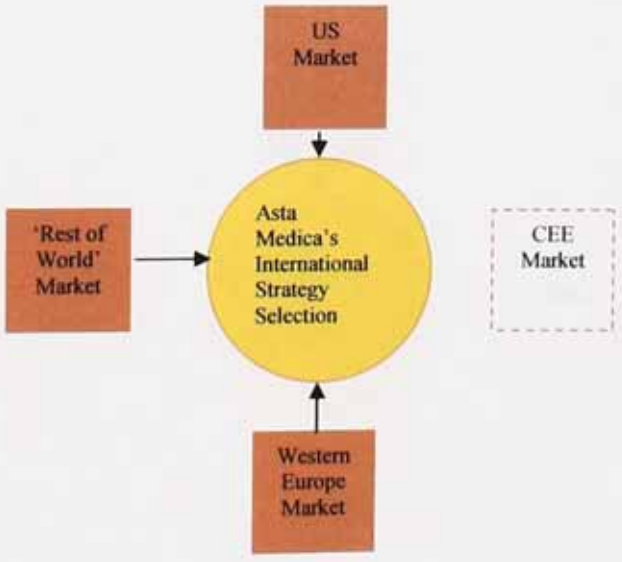
In Section 6.3 the grand strategies selected by the firms for 1992-2002 were compared. The conclusion was drawn that each firm had realised a unique package of grand strategies. The discussion now proceeds to explore whether the same applies to the internationalisation strategy selections for 1992-2002. As Figure 6.7 shows Shire realised internationalisation strategies for all four markets that were identified through the empirical analysis. Shire was the only firm in the sample to realise internationalisation strategies for all four markets. All firms realised internationalisation strategic actions but some placed more, and in the case of Galen, all of their strategic attention on specific geographical markets for the grand strategies.

Figure 6.7 Shire's International Strategy Selection

Source: Compiled by the author

As shown in Figure 6.8, Asta Medica realised internationalisation strategies for all of the markets apart from the CEE market

Figure 6.8 Asta Medica's Strategy Selection



In comparison LEK only realised internationalisation strategy was for the CEE market (Figure 6.9).

Figure 6.9 LEK's International Strategy Selection

Source: Compiled by author

Galen also only realised a strategy for one market, the US (Figure 6.10)

Figure 6.10 Galen's International Strategy Selection

Source: Compiled by author

In comparison to LEK and Galen, Pierre Fabre did not realised internationalisation strategies for either the US or CEE markets but did realise them for the "rest of the world" and Western Europe (Figure 6.11).

Figure 6.11 Pierre Fabre's International Strategy Selection Mix

Source: Compiled by author

So for the five firms compared so far each chose a unique international strategy selection for 1992-2002. However, as can be seen from Figure 6.12 Bioglan's international strategy selection mix is the same as that for Asta Medica (Figure 6.8).

Figure 6.12 Bioglan's International Strategy Selection

Source: Compiled by author

This means that the two firms that failed to survive, Asta Medica and Bioglan, had similar international selection mixes whilst those that survived packaged their choices in different ways.

With regard to R4 all of the firms in the sample realised strategies outside their country of domicile. With some firms this was directed at specific international markets, e.g. Galen and the US, for others there appears to be evidence of a sequential internationalisation strategy development approach starting with the closest geographical market e.g. Western Europe and then progressively developing other markets. These findings support the view that the grand strategy strategic actions contributed to the internationalisation of the pharmaceutical industry.

6.5 Contextualising the Strategy Evolution Process

As identified in Section 6.3, each of the firms selected different grand strategy packages and realised them in different ways. Each of the firms had been considered heterogeneous in nature, particularly because they had each arrived at different strategic

outcomes. But, as has been discussed, there were also some similarities. For example, Galen, Bioglan and Shire were all British niche speciality pharmaceutical firms. However, as discussed in Chapter Two, every firm is unique (Penrose, 1959; Hannan and Carroll, 1995; Kaplan and Johnson, 1998). The uniqueness of organisations results from various factors such as their history, the way in which they were started as well as their consequent evolution. Referring to the literature reviewed in Chapter Three, in order to understand the nature of strategic change in the pharmaceutical industry, it is important to consider factors that have the potential to shape the strategies of firms. As discussed in Chapter Three the pharmaceutical industry is one in which there is a high level of risk because of the role of technology and its associated risks. There is also the threat from generic substitutes as patents expire and the industry has been the subject of regulatory change. Cockburn *et al.* (2000:1123) suggested that the key to competitive advantage in the pharmaceutical industry may be how and when firms "identify and respond to environmental cues". Although from the empirical data it is not possible to identify how firms did respond to environmental cues it was possible to identify factors that could potentially create a breakpoint (Strebel, 1990) in the firm's operating environment. For these reasons this section outlines firm specific factors that had the potential to shape the strategy evolution process.

Pierre Fabre considered 1995 to be a "transitional year" as it split its activities into two divisions (*Scrip*, 1995c:13) yet there was little reflection of this change with regard to its grand strategies with the only change in strategy being the start of a PD&LO strategy in 1997. In 1999 Pierre Fabre announced that he would step down from his role as chairman. Pierre Fabre had to make strategic decisions in relation to regulatory changes. Specifically these involved restructuring both French and Italian operations due to national regulatory changes in each of these countries. In 1999 Pierre Fabre restructured itself with the firm appearing to indicate that this was because of healthcare reforms in France (*Scrip*, 2000d).

The evolution of grand strategies explored for LEK coincides with a major change for this organisation and its operating environment. LEK was a generics pharmaceutical firm based in Slovenia. The early 1990s signalled change for pharmaceutical firms in Slovenia with regard to economic and healthcare reforms, and in 1994 LEK became a public company (LEK, 2004). LEK was based in Slovenia, one of the "first transition

companies where growth resumed" (Centre For Co-Operation With The Economies In Transition, 1997:2). However, in 1999 LEK was facing a number of potential problems including "economic difficulties in Russia, the war in Kosovo and a suspension of three of its products in the US" (*Scrip*, 1999d:14).

During the mid 1990s, Asta Medica encountered a number of problems including increased competition from generic substitutes, the loss of its rights to beta-interferon (*Scrip*, 1999d) and the "emerging markets crisis" (Firn, 2000:33). This was accompanied by Asta having a history of fluctuating sales and profits. Part of the reason for Asta Medica's internationalisation strategy may be because of German health reforms which were reported during the 1990s as affecting Asta Medica in its domestic market (*Scrip*, 1993; *Scrip*, 1998d).

In 2002 Shire's top selling product Adderall was also facing generic competition (*Scrip*, 2002g), a problem faced by a number of pharmaceutical firms during the 1990s/early 21st Century as products came off-patent. The start of the TR strategic actions coincided with an explosion at Arenol in 1998. Arenol was the supplier of Shire's two top selling products and the fire meant that the company had to temporarily stop supplying the products. This appears to support Stebel's (1992) view that breakpoints in a firm's operating environment can lead to a change if the aim of the firm is to maintain strategic fit with its environment. It is noted that Shire continued with its expansion strategies of M&A, NABPD, OCD and OG, thus supporting the findings of Webb and Pettigrew (1999) that firms can simultaneously combine expansion and withdrawal strategies. This appears to have led to Shire's share price dropping by one third because the explosion severely affected its ability to supply its top two products to the market (*Scrip*, 1998e).

In 2002 Galen faced problems with regard to its relationship with another speciality pharmaceutical firm, Elan, which had been facing problems due to allegations of accounting mispractice (Jenkins, 2002a). In the same year there was also a cancer fear with regard to hormone replacement therapy, one of the therapeutic markets served by Galen. Galen's share price underwent a variety of ups and downs. For example, in 2002 it fell as shareholders were concerned about Galen's relationship with Elan (*Scrip*, 2002h) but, in the same year, the share price also increased "after the regulator issued an

"approval letter" for the company's menopause treatment" (Jenkins, 2002b:22) but, as this was the final year of data collection, it was not possible to ascertain if this potentially shaped Galen's grand strategies. Alongside these changes, as was discussed in Section 5.6 Allen McClay, the founder of Galen, left in the autumn of 2001 (Jenkins, 2002a).

Bioglan's main breakpoint appeared in 2001 due to both its failure to acquire the Bristol Myers Squibb skincare division and its financial problems that were identified in the same year. The data suggests that part of the reason for the ending of Bioglan Pharma Plc was due to Bioglan and Bristol Myers Squibb not being able to reach agreement about the proposed acquisition of BMS's skincare division whilst BMS was making strategic decisions not to proceed with the agreement. These decisions were being made whilst Bioglan built up its marketing infrastructure in anticipation of the acquisition but this did not result in an agreement being made. In turn this led to the press highlighting financial difficulties at Bioglan. During the same period the agreements with both CeNes and Novo Nordisk went into reverse with both firms cancelling their agreements with Bioglan (*Scrip*, 2001d).

As summarised in Table 6.10, all firms in the sample faced forces that had the potential to shape both strategy evolution and strategic outcomes. In some cases these were unique for the relevant firm, for example, the departure of the Chairman/Founder or a product specific problem. In other situations firms were affected by the same or similar changes such as the 'emerging markets crisis' or healthcare reforms. As Table 6.10 indicates, all the Western European firms that realised External Finance Raising strategies, faced financial problems and/or volatile share prices.

Table 6.10 Potential Forces For Strategic Change

	Problems with other firms	"Emerging markets" crisis	Economic reforms	Healthcare reforms/regulation	Product specific problems	Departure of chairman/founder	Financial problems/volatile share price	Increased competition from generic substitutes
Pierre Fabre	-	-	-	Yes	-	Yes	-	-
LEK	-	Yes	Yes	Yes	Yes	-	-	-
Asta Medica	-	Yes	-	Yes	Yes	-	Yes	Yes
Bioglan	Yes	-	-	-	-	-	Yes	-
Shire	-	-	-	-	Yes	-	Yes	Yes
Galen	Yes	-	-	-	Yes	Yes	Yes	-

Source: Compiled by the author

The Shire-Biochem partnership therefore appears to support the view that mergers have been used to overcome problems relating to patent expiry (James, 2002). It was also reported that analysts were concerned in 2001 that Shire did not have sufficient new products in its pipeline (Anon, 2002). Pursche (1996) suggested that the reasons for mergers in the pharmaceutical industry were to reduce costs but for Shire, as highlighted by the merger with Biochem, the benefit appeared to be linked to high growth rates as three years after the merger Shire reported "the growth rates for revenues were 19% for 2003 over the prior year" (Shire, 2004a:). This is a different finding from the perspective of Heracelous and Murray (2001) that the majority of pharmaceutical mergers led to reduced rather than increased market share post merger. In contrast to Heracelous and Murray (2001), Koenig and Mezick (2004) found that pharmaceutical firms that had merged were more productive after the merger. Yet by 2004 Shire described itself as "one of the world's fastest growing speciality pharmaceutical companies (Shire, 2004b:1) thus suggesting that the merger with Biochem Pharma appears to have been a successful cross border merger.

The aim of this section was to contextualise the data with regard to details about potential problems and breakpoints in each firm's operating environment. It was noted that all firms encountered specific factors that had the potential to shape the strategy evolution process. These include healthcare reforms (Pierre Fabre, LEK and Asta Medica), product specific problems (Asta Medica, Shire and Galen) and increased competition from generic substitutes (Asta Medica and Shire).

As well as these factors each firm also differed with regard to its founding and its internal decision makers and this highlights how strategy evolution can be path dependent for each firm. As Nelson and Winter (1982) proposed, evolution is path dependent but there are many variables that can shape this path dependency and the final strategic outcome. Path dependency is a factor that is discussed further in Chapter Seven with regard to coevolution.

In conclusion, all firms in the sample evolved their grand strategies during 1992-2002, with all encountering problems that could potentially shape the evolutionary process. This section has highlighted some of the potential forces for change, which are both internal and external to the firm. As was discussed in Chapter Two, there has been

debate as to whether it is the environment that determines the fate of the organisation or the strategic choices that the firm makes. In Chapter Seven, this is explored further with regard to the application of coevolution theory.

6.6 Chapter Summary

The aim of this Chapter was to address the sub questions R2 and R4. Following on from a discussion about how the overall grand strategies had evolved for each of the six firms in the sample, the findings led to an Empirical Typology of Pharmaceutical Grand Strategy Evolution (Table 6.2). This typology focused upon how the strategies of firms had emerged thus seeking to overcome what Webb and Pettigrew (1999:2) classed as the static nature of other forms of strategy typology such as those by Ansoff (1987) and Porter (1980). As was seen in this chapter all of the firms in the sample realised emergent strategies that incorporated incremental strategic actions.

Firms varied in the number of grand strategies that they realised and the length of time that they followed each one. Firms sometimes realised strategic actions but with little consistency so they could not be classed as strategies but instead were referred to as incremental strategic actions. However, no firm in the sample followed an overall incremental strategy (Lindblom, 1959;1979; Quinn, 1980;1991) as all firms realised an emergent strategy (Mintzberg and Waters, 1982;Mintzberg 1987) to some extent. There was no clear support for the view that strategy is realised in a linear one way direction (a planned approach) with the exception of LEK. In contrast there were examples of strategic reversals, e.g. termination of Bioglan's agreements with CeNeS and Novo Nordisk, and Pierre Fabre's demerger from bioMerieux and turnaround strategies being evolved at the same time as expansion strategies such as M&A. Although all of the firms had the same strategic choice set of grand strategies they selected and packaged them in different ways even when the firms were similar in nature. In addition they all arrived at different strategic outcomes. Taggart (1993) proposed that regulatory changes related to the 1992 single market changes meant that only globally focused pharmaceutical firms would survive. All the firms in the sample did realise strategic actions outside their country of domicile, but as the findings that have been discussed show, the firm in the sample that survived, Galen, had focused its internationalisation

strategies purely on the US market, thus disagreeing with the proposal made by Taggart (1993). However, the term 'survive' is not simple to define because as Carroll and Hannan (2000) acknowledged mergers and acquisitions can be classed as ending or beginning events. Instead, a perspective could be applied that they are neither but the result is a new organisational form as firms have sought to adapt to the changing environment. This will be explored further in Chapter Seven which develops the study into a focus on temporal patterns of strategy development and how the strategic actions coevolved for each of the firms in the sample.

CHAPTER SEVEN
FROM EVOLUTION TO COEVOLUTION

7.1 Introduction

Chapter Six explored how the realised strategic actions of the firms in the sample evolved during 1992-2002. This chapter proceeds to explore these in more depth through the discussion of the results in relation to temporal patterns in, and processes of, strategic action coevolution. It therefore addresses the sub question R3. Understanding how strategic actions changed in these middle sized firms can lead to understanding of the dynamics relating to the bipolarisation of an industry, particularly as it has been argued that this size of firm will either be acquired or fail to survive (Kurdas, 1998; Hannan and Freeman, 1997). This in turn relates to theories of environmental determinism (i.e. for those that fail to survive) and strategic choice (the strategic actions that were realised). Coevolution theory has been proposed as an integrating theory in the environmental determinism versus strategic choice debate. Lewin and Volberda (1999) proposed that coevolution provides a theoretical lens that will unify studies into understanding processes of adaptation and determinism. For this thesis it leads to a model of coevolution in the pharmaceutical industry (Figure 7.3) which is discussed in Section 7.5.

7.2 Temporal Patterns and Coevolution: Strategic Actions

The purpose of this section is to explore the strategic actions that were realised by the firms in the sample in order to identify patterns of temporal development and coevolution. Specifically, this section addresses the sub question R3. This is achieved by comparing the strategic actions that were realised by each of the firms during the period 1992-2002 and analysing these in relation to:

- Patterns of strategy coevolution
- Patterns of convergence and divergence with regard to each grand strategy
- First movers and last movers for each grand strategy

Before exploring whether there were processes of coevolution in the strategic actions that were realised it is first important to identify the definition of coevolution that is being applied in this thesis as there have been various interpretations in the management literature about what is meant by the term (Murmann, 2003) and how it can be explored. Lewin and Volberda (1999:527) proposed that coevolution is "conditions of simultaneous evolution that persist over long time periods" although they do not define what is meant by a "long time". As was discussed in Chapter Six, Pearce II (1982) proposed that actions constituting a grand strategy should happen over a minimum period of five years, and this minimum period therefore forms the same basis for the analysis of coevolution. It therefore encompasses and extends the definition of strategy used for discussing the results in Chapter Six to be 'strategic actions are considered to be coevolving if the strategic actions relating to a specific grand strategy are simultaneously realised between two firms in at least three years in any five year period'. Whilst exploring how the strategic actions coevolved the discussion will also explore what Webb and Pettigrew (1999) described as temporal patterns of strategy development. This involves identifying whether there were first movers or last movers for different strategies and periods of divergence/convergence of the strategies. This therefore contributes towards a richer picture of strategy evolution and coevolution for Bioglan, Galen, Shire, Asta Medica, Pierre Fabre and LEK.

7.2.1 Merger & Acquisition (M&A) Strategic Actions

All the firms in the sample realised strategic actions relating to Merger and Acquisition (M&A) (Table 7.1).

Table 7.1 Merger & Acquisition (M&A) Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Shire											
Asta Medica											
Pierre Fabre											
LEK											
Galen											

Source: Compiled by the author

As shown in Table 7.1 Shire and Asta Medica were first movers with regard to M&A strategic actions with LEK being the last mover. Bioglan, Galen, Pierre Fabre and Asta Medica entered into periods of M&A strategic action coevolution at various periods during 1992-2002. A period of convergence was noted in 1998 when four of the six firms were involved in M&A activity. In 1999 the same number of firms were also involved. This was followed by a distinct period of divergence in 2002 when no firms were realising M&A strategic actions. This supports Webb and Pettigrew's (1999) findings that strategy development within an industry can witness ebbs and flows when observed over a period of years.

7.2.2 Network & Acquisition Based Product Development (NABPD) Strategic Actions

As illustrated in Table 7.2, Pierre Fabre and Asta Medica were first movers with regard to strategic actions relating to NABPD strategic actions. The last mover was LEK in 1999.

Table 7.2 Network & Acquisition Based Product Development (NABPD) Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Shire											
Asta Medica											
Pierre Fabre											
LEK											
Galen											

Source: Compiled by the author

Until 1997 two or three firms realised relevant strategic actions in each year. However subsequent years saw the number of firms realising these strategic actions increase and in 1998, 1999 and 2001 all firms except Galen were realising relevant strategic actions. Five of the firms in the sample coevolved their strategic actions for NABPD with each of them coevolving with three to four other firms. The exception was LEK.

7.2.3 Joint Venture (JV) Strategic Actions

As indicated in Table 7.3, only three firms realised strategic actions relating to JV with Asta Medica being both the first mover and the most active with regard to this strategy.

Table 7.3 Joint Venture (JV) Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Shire											
Asta Medica											
Pierre Fabre											
LEK											
Galen											

Source: Compiled by the author

The other two firms were Pierre Fabre and LEK, who was the last mover, only realising relevant strategic actions in 1999. There was little evidence of convergence with just two firms realising relevant strategic actions in 2000 and no evidence of coevolution.

7.2.4 Organic Concentric Diversification (OCD) Strategic Actions

All firms in the sample realised strategic actions relating to Organic Concentric Diversification (OCD) (Table 7.4).

Table 7.4 Organic Concentric Diversification (OCD) Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Shire											
Asta Medica											
Pierre Fabre											
LEK											
Galen											

Source: Compiled by the author

There was a period of convergence in 1997 with half of the firms realising OCD strategic actions but from 2000 onwards there were no OCD strategic actions realised.

Asta Medica was the first mover with regard to OCD and Shire the last mover. There was no evidence of coevolution.

7.2.5 Organic Growth (OG) Strategic Actions

As shown in Table 7.5, all firms in the sample realised Organic Growth (OG) strategic actions.

Table 7.5 Organic Growth (OG) Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan								■		■	
Shire						■		■			■
Asta Medica	■		■			■					
Pierre Fabre				■							
LEK	■			■	■		■	■		■	■
Galen	■		■	■	■	■			■		

Source: Compiled by the author

LEK and Galen were the only two firms that entered into a period of coevolving these strategic actions in comparison to five firms for NABPD (Table 7.2). Punctuated intervals of convergence were noted with three firms (but not necessarily the same firms) realising OG strategic actions in each of the years 1992, 1995, 1997 and 1999 in comparison to no firms in 1993 and only one firm in 1998 and 2000. Galen, Asta Medica and LEK were all first movers with Bioglan being the last mover.

7.2.6 Divestment & Demerger (D&D) Strategic Actions

As illustrated in Table 7.6, there was no evidence of Divestment & Demerger (D&D) strategic actions coevolving.

Table 7.6 Divestment & Demerger (D&D) Strategic Actions

= years that the strategic actions were not realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Shire											
Asta Medica											
Pierre Fabre											
LEK											
Galen											

Source: Compiled by the author

.

In comparison to the M&A strategic actions (Table 7.1) there was lower overall D&D activity in the first half of the timescale with only Galen and Pierre Fabre realising D&D strategic actions prior to 1999. If the argument that M&A was not as beneficial as pharmaceutical firms had perceived it to be (Henderson, 2000) then the Pierre Fabre/bioMerieux demerger appears to support that view. However, there appears to be a stronger argument, when considering the low level of D&D in comparison to M&A that M&A does have benefits. However, there may be time lags between M&A and D&D that were outside the scope of the timescale for the empirical data that was collected. The highest number of firms realising this strategic action in any one year was in 2002 (three firms).

7.2.7 Product Divestment & Licensing Out (PD&LO) Strategic Actions

As illustrated in Table 7.7, Galen was the first mover with regard to PD&LO but Bioglan was the firm in the sample that realised relevant strategic actions for the longest period of time.

Table 7.7 PD&LO Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Shire											
Asta Medica											
Pierre Fabre											
LEK											
Galen											

Source: Compiled by the author

Asta Medica was the last mover. There was a definite period of convergence with regard to PD&LO from 2001-2002 with three firms realising PD&LO strategic actions in each year, although not necessarily the same firms. This compares to 1993-1994 when none of the firms were realising relevant strategic actions. There was no evidence of coevolution for PD&LO.

7.2.8 Retrenchment (TR) Strategic Actions

As illustrated in Table 7.8, in 1999 four firms realised Retrenchment (TR) strategic actions which was also one of the years of convergence for Organic Growth (OG) (Table 7.5).

Table 7.8 Retrenchment (TR) Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Shire											
AstaMedica											
PierreFabre											
LEK											
Galen											

Source: Compiled by the author

The findings also appear to support the view of Webb and Pettigrew (1999) who found that firms can be withdrawing from one business or market area, whilst simultaneously growing other parts of the business. This was also referred to with regard to the Empirical Typology of Pharmaceutical Grand Strategy Evolution (Chapter Six, Table 6.2). Asta Medica was a first mover with its retrenchment strategic actions and Bioglan the last mover. There was no evidence of coevolution for the TR strategic actions.

7.2.9 External Finance Raising (EFR) Strategic Actions

As Table 7.9 shows LEK and Galen were the first firms in the sample to report strategic actions relating to the raising of external finance, although these appear to be very firm specific.

Table 7.9 External Finance Raising (EFR) Strategic Actions

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan					■		■	■	■	■	
Shire					■		■			■	■
AstaMedica					■					■	
Pierre Fabre											
LEK	■	■	■		■						
Galen	■					■		■		■	

Source: Compiled by the author

For Galen the 1992 strategic action refers to a development grant rather than investment by individuals or firms gaining a financial interest in the firm. It is particularly interesting to note that no firms realised EFR strategic actions in 1995 yet there were periods of convergence in the year immediately following (1996) and in 2001 with four firms realising the strategic actions. There was no evidence of coevolution for the EFR strategic actions and Pierre Fabre did not realise any relevant strategic actions. In comparison to the other firms Asta Medica's EFR strategic actions were driven through its parent company (Degussa). There appears to be a similar pattern with regard to EFR strategic actions for Bioglan and Shire. This started in 1996 when Bioglan made a private placement and Shire floated on the London Stock Exchange. They were both still realising EFR strategic actions in 2001, with Shire continuing into 2002. The third

British speciality pharmaceutical firm in the sample, Galen, also followed a similar route with an IPO in 1997, a share sale in 1999 and a share offering in 2001. In contrast the privately owned Pierre Fabre did not report any strategic actions with regard to the raising of external finance either before or after its merger with bioMerieux.

This section has presented the results with regard to patterns of temporal development and coevolution for the grand strategies realised by the firms in the sample. The next section presents results in a similar way, but with regard to how the strategic actions related to internationalisation in each of the geographical markets that were identified in the coding.

7.3 Internationalisation Strategies: Patterns of Temporal Development and Strategic Action Coevolution

The key focus of this section is to explore temporal patterns of strategy development and coevolution of strategic actions relating to internationalisation. These will be compared and contrasted in relation to the findings of the grand strategies discussed in the last section.

7.3.1 The Western Europe Market

As illustrated in Table 7.10, the first movers into the Western European market were Pierre Fabre, Asta Medica and Shire who were all realising relevant strategic actions in 1992.

Table 7.10 Summary of Strategic Actions Relating to Western Europe Market

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Pierre Fabre											
LEK											
Asta Medica											
Shire											
Galen											

Source: Compiled by the author

Of the firms that realised these strategic actions the last mover was the Slovenian firm LEK. Galen did not realise any strategic actions relating to the Western European market. There was a period of convergence in 2001 (five firms). The one firm that diverged from this process was Galen who survived without being acquired or merged. Four of the firms coevolved their strategic actions for the Western European market; Bioglan, Pierre Fabre, Asta Medica and Shire.

7.3.2 The US Market

The picture for the US market is different to that of internationalisation into Western Europe, as shown in Table 7.1.

Table 7.11 Summary of Strategic Actions Relating to the US Market

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Pierre Fabre											
Galen											
LEK											
Asta Medica											
Shire											

Source: Compiled by the author

Asta Medica was a first mover in 1992. Apart from this for the period 1992-1995 no other strategic actions were realised with regard to the US market. The exception was Shire who started a US strategy from 1995 that continued through until 2002. The situation from 1996 onwards was very different to that for 1992-1995. From 1996 at least three firms realised relevant strategic actions in each of the subsequent years with a period of convergence (four firms) in 1998-1999. It is also noted that Pierre Fabre only realised US strategic action(s) in 2001 and was the last mover with regard to the US market. Three firms were involved in periods of coevolution with regard to their US strategic actions. These were Bioglan, Galen and Shire, the three speciality pharmaceutical firms.

The US was a country in which Walton (2001:97) argued that it was important for pharmaceutical firms to develop a "marketing presence". Walton (2001) explained that although there was concern in the US in 1994 about possible healthcare reforms in Europe, the reality was that healthcare reforms were actually being implemented. The findings from the empirical data do not support this with regard to a reduction of internationalisation strategies in Western Europe but do appear to support it with regard to expansion into the US as noted by the 1998/1999 period of convergence. Therefore a conclusion can be drawn that regulatory changes in Europe were shaping the strategies of European firms so that they developed a presence in the US.

7.3.3 The Central and Eastern Europe (CEE) Market

With regard to the CEE market the first movers were Pierre Fabre, LEK and Asta Medica with the last mover being Bioglan (Table 7.12).

Table 7.12 Summary of Strategic Actions Relating to the CEE Market

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Pierre Fabre											
Galen											
LEK											
Asta Medica											
Shire											

Source: Compiled by the author

There was a period of convergence in 2001 (4 firms) with a period of divergence in 1993 (0 firms). Although five out the six firms in the sample realised strategic actions relating to the CEE market there was no process of coevolution. The only firm not realising strategic actions relating to the CEE market was Galen. It is noted that some of the strategic actions that led to development in the CEE market were actually worldwide agreements that related to all of the geographical markets discussed in both this and the previous chapter. The only firms that implemented specific strategic actions were the Slovenian (CEE) firm LEK, and the German based Asta Medica. They both realised Organic Concentric Diversification (OCD) and Organic Growth (OG) strategic actions in relation to the market. LEK was the only firm to make acquisitions (in 2001).

7.3.4 The Rest of World Market

As shown in Table 7.13 the first movers for the rest of the world market were Asta Medica, Pierre Fabre and Shire, although none of these realised relevant strategic actions until 1994.

Table 7.13 Summary of Strategic Actions Relating to the Rest of World Market

= years that the strategic actions were not realised
= years that the strategic actions were realised

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bioglan											
Pierre Fabre											
Galen											
LEK											
Asta Medica											
Shire											

Source: Compiled by the author

This compares to all of the other markets where at least one firm was involved in each from 1992. The last mover was LEK who only realised relevant strategic actions in one year. Galen did not realise any relevant strategic actions. There was a period of convergence in 2000 to 2001 (four firms). There were periods of coevolution for Asta Medica, Shire and Bioglan.

7.4 Temporal Patterns and Coevolution in the Pharmaceutical Industry

A summary of the findings from the discussion of temporal patterns and coevolution for each of the individual firms is given in Table 7.14.

Table 7.14 Summary of Temporal Strategy Development and Strategy Coevolution

Company	Grand strategy first mover	Grand strategy last mover	Grand strategy strategic action coevolution	Internationalisation first mover	Internationalisation last mover	Internationalisation coevolution	Strategic Outcome
Bioglan	None	OG TR EFR	M&A NABPD	None	CEE	Western Europe US Rest of world	Liquidated
Shire	M&A	OCD EFR	NABPD	Western Europe Rest of world	None	Western Europe US Rest of world	Merged
Galen	OG PD&LO EFR	None	M&A NABPD OG	None	None	US	Survived
LEK	OG EFR	M&A NABPD JV	OG	CEE	Western Europe Rest of world	None	Acquired
Asta Medica	M&A NABPD JV OCD OG TR	PD&LO D&D EFR	M&A NABPD	Western Europe US CEE Rest of world	None	Western Europe Rest of world	Disbanded and divested
Pierre Fabre	M&A NABPD D&D	None	M&A NABPD	Western Europe CEE Rest of world	US	Western Europe	Demerged

Source: Compiled by the author

7.4.1 Temporal Patterns of Strategy Development

Webb and Pettigrew (1999) identified a clear first mover with regard to the strategies they discussed. In contrast, the findings for this thesis failed to identify any one firm that was a first or last mover for all of the strategies. Asta Medica was first mover for six of the nine grand strategies and there was no clear overall last mover. These findings may differ because the data has been collected from the pharmaceutical industry rather than the insurance industry context of Webb and Pettigrew's (1999) research. This is possibly because industries have different patterns of industry evolution as path dependency results from different trajectories. For example, technological developments such as biotechnology and genomics for pharmaceuticals, which in turn can shape different patterns of interdependence as illustrated by the number of firms in the sample being involved in strategies of M&A, NAPBD, JV and PD&LO i.e. both formal and informal coevolving networks of actors.

Asta Medica was a first mover for all of the geographical markets but there was no overall last mover. Specific periods of convergence were noted for each of the geographical markets. Although there was little strategic activity with regard the US market until 1995 there was period of convergence in 1998/1999 with a total of five firms in the sample realising relevant strategic actions in this period. This was followed in 2000 with four firms realising strategic actions for the rest of the world. In 2001 four firms were realising strategic actions for both the CEE and rest of the world markets. 2001 was the period of convergence for the Western European market with five of the firms realising relevant strategic actions. There was a higher number for this market than for any other geographical area in this year. This may have been due to European regulatory changes during the 1990s, such as the creation of the European single market and the creation of the European Medicines Evaluation Agency (EMEA) (Taggart, 1993; Matraves, 1999; Braithwaite and Drahos, 2000). These regulatory changes had the potential to encourage more strategic activity within Western Europe from European pharmaceutical firms, including the Eastern European firm LEK. Periods of strategic action convergence suggest a "mimetic isomorphism" (Mintzberg *et al.*, 1998:295) as the firms have become increasingly institutionalised within the environment which led to a process of them copying the strategic actions realised by other firms, for example

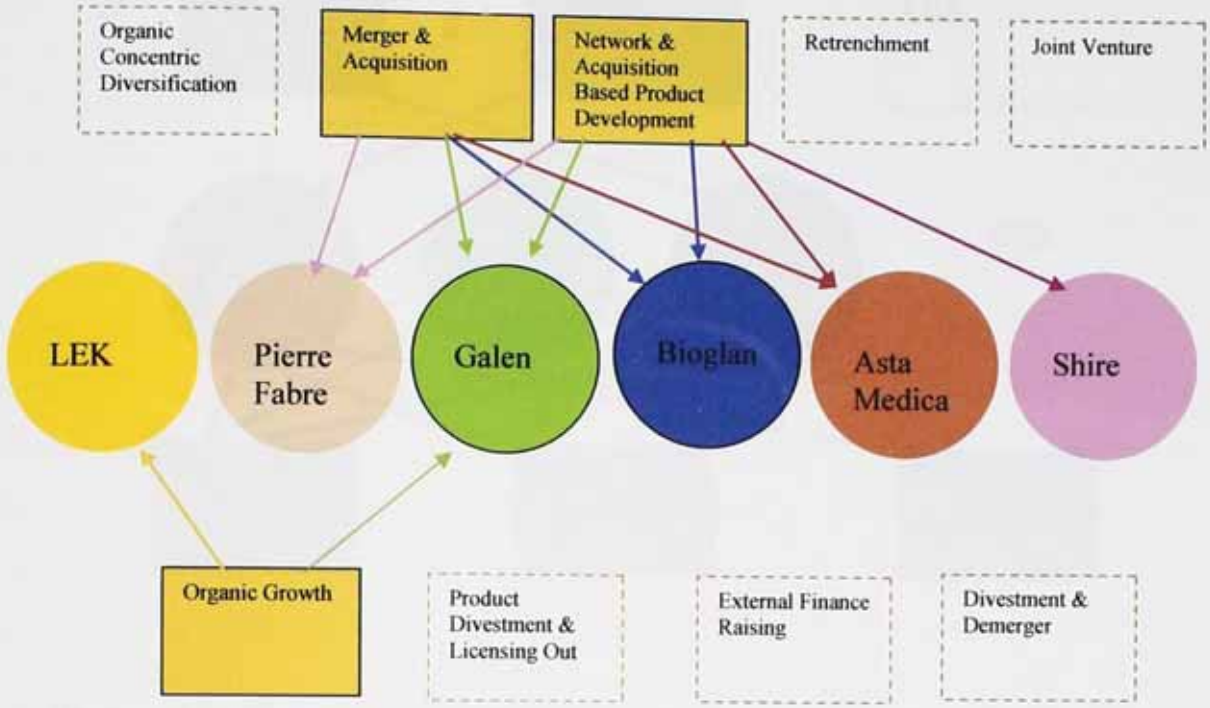
with regard to internationalisation development in the Western European market (Table 7.10).

Bioglan, the firm that was liquidated, was the only firm not to be a first mover for any of the grand strategies or any of the internationalisation strategies. This therefore suggests institutionalisation with regard to Bioglan's strategic actions. Asta Medica, the firm that was disbanded and divested, was a first mover for more grand strategies than any other firm. It was also the only firm to be a first mover for all of the internationalisation grand strategies. This therefore suggests that an emphasis upon being a first mover is not a source of competitive advantage in the pharmaceutical industry. In contrast as was shown with regard to the strategic actions for Western Europe, Galen, the firm that survived, was the only firm in the sample not to realise strategies for this market instead concentrating on the US market. From this perspective Galen was not conforming to industry recipes (Spender, 1989) about how to conduct business and could be regarded as being revolutionary (Hamel, 1996) with its overall internationalisation strategy rather than becoming institutionalised. There were no other clear patterns of temporal strategy development or coevolution that could be related to the strategic outcomes of the firms in the sample.

7.4.2 Grand Strategy Strategic Action Coevolution

As discussed earlier, Lewin and Volberda (1999) proposed that coevolution provided a theory that could bridge the gap in the environmental determinism versus strategic choice debate. Figure 7.1 presents all of the grand strategies and maps them with regard to how firms had coevolved relevant strategic actions. For example, Shire coevolved strategic actions in relation to the grand strategy of Network & Acquisition Based Product Development (NABPD). The grand strategies that are boxed with a dashed line illustrate those where there was no evidence of strategic actions coevolving. These relate to the grand strategies of Organic Concentric Diversification (OCD), Retrenchment (TR), Joint Venture (JV), Divestment & Demerger (D&D), Product Divestment and Licensing Out (PD&LO) and External Finance Raising (EFR).

Figure 7.1 A Model of Firms and Grand Strategy Strategic Actions That Coevolved

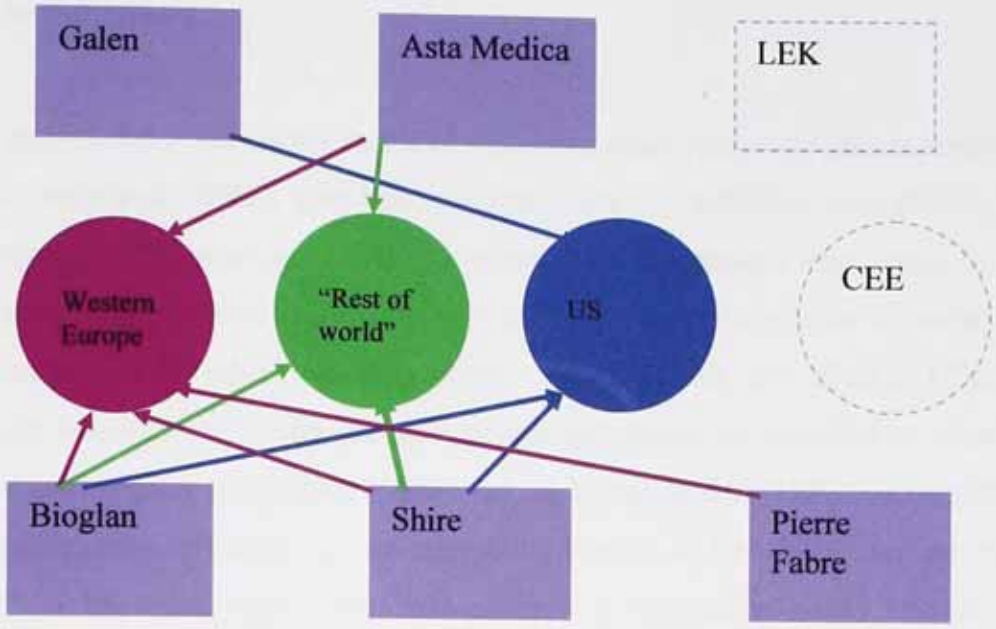


Source: Compiled by the author

With regard to the strategic actions that were realised processes of coevolution were seen for those relating to the strategic actions of Merger & Acquisition (M&A), Network & Acquisition Based Product Development (NABPD) and Organic Growth (OG). All of the firms were involved in processes of grand strategy strategic action coevolution. Galen was involved in periods of coevolution for three of its grand strategies in comparison to LEK who only entered into a period of coevolution for one strategy.

Processes of coevolution were seen in all of the internationalisation markets with the largest number of firms (four) involved in coevolution processes for Western Europe and all three speciality pharmaceutical firms entering into processes of coevolution in the US. This is illustrated in Figure 7.2.

Figure 7.2 A Model of the Coevolution of Internationalisation Strategic Actions



As illustrated in Figure 7.2, all firms apart from LEK were involved in processes of strategic action coevolution with regard to the identified international regions. These processes were seen for all of the geographical markets apart from Central and Eastern Europe (CEE). The only firms to coevolve strategic actions in the US were the three speciality pharmaceutical firms, suggesting a similar strategy for firms that shared some homogeneous characteristics. However, as discussed in Chapter Six, they realised their grand strategies in different ways and only entered into periods of coevolution for a limited number of grand strategies. They also only did not enter into periods of coevolution for the CEE or "rest of the world" markets. Again, this is in disagreement with the SGA literature that proposes that firms that are homogeneous in nature will overall follow similar strategies. There was no clear evidence that any one firm was coevolving with the overall globalisation of the pharmaceutical industry, with different firms placing emphasis on different markets at different times. So, for example, Asta Medica was a first mover for all of the geographical markets whilst Galen only focused upon the US and did not start this strategy until 1997. Having explored the findings with regard to strategic action coevolution, the chapter continues to focus on two concepts that have been proposed as being extremely important in understanding processes of coevolution. These are interdependence and path dependence.

7.4.3 Interdependence

It has been argued that a significant factor of the coevolution process is interdependence (Carney and Gedajlovic, 2002). This links with the work by McKelvey *et al* (2004:112) and their research into pharmaceutical innovation. They proposed that actors in the pharmaceutical industry were coexisting and that this in turn leads to dynamics of further interaction with other relevant parties. As Futuyma and Slatkin (1983:3) proposed with coevolution "reciprocal genetic changes might be expected to occur in two or more ecologically interacting species" or, as Roughgarden (1983:57) suggested, that "coevolution may influence several interacting species and possibly even an entire community". It has been argued that this process of interaction needs to exist for coevolution to take place and that the firms must be different from each other in some way (Volberda and Lewin, 2003). For example this can be related to the 'webs of influence' (Braithwaite and Drahos, 2000) or 'policy networks' (Rhodes, 1999) that have been proposed occur with regard to regulation. It also relates to the interaction of firms with regard to, for example, NABPD and JV strategic actions.

Firms can evolve into different organisational forms as a result of M&A activity. Also, changes in organisational form can be related to the networks that all of the firms have established (Djelic and Ainamo, 1999), which was identified through the NABPD and JV strategic actions in Chapter Four. McKelvey *et al*. (2004:112) state that "learning and selection principles within a population of actors.....affect the long-term outcomes of the system". A process of coevolution could occur with each informal and formal partnership as the evolution of each firm is shaped in some way from its experiences with the alliance/merged/acquired partners. Focusing upon alliances and joint ventures Koza and Lewin (1998) suggested that alliances would shape various factors in a firm including strategy and the environments within which it operated. As was shown in Table 6.1, all of the six firms in the sample realised NABPD and M&A strategic actions. This therefore links to the interdependence perspective of coevolution proposed by Carney and Gedajlovic (2002) and is illustrated by the Bioglan example from the empirical data. As the following illustrates the findings of the empirical

research suggest, tentatively, that the realised strategic actions of Bioglan did coevolve with the strategic actions of other firms and that had some impact upon its strategic outcome, although this is not inferring a direct cause and effect relationship. The data suggests that part of the reason for the ending of Bioglan Pharma Plc was due to Bioglan and Bristol Myers Squibb (BMS) not being able to reach agreement about the proposed acquisition of BMS' skincare division. The strategic actions were coevolving whilst Bioglan built up its marketing infrastructure in anticipation of the acquisition but this did not result in an agreement being made. However, it did lead to the press highlighting financial difficulties at Bioglan. During the same period, as discussed in Section 6.5, the agreements with both CeNes and Novo Nordisk, instead of continuing to coevolve went into reverse with both firms cancelling their agreements with Bioglan (*Scrip*, 2001d). Skyepharma was also put into a position where it had to reacquire European marketing rights to Solaraze from Bioglan and then sold them to Shire (Jenkins, 2002c). This illustrates how the strategic actions of Bioglan, Skyepharma and Shire had coevolved: if Bioglan had not relinquished the European marketing rights to Solaraze then Shire would not have been able to acquire them. With regard to the Solaraze product the process of coevolution is made even more interesting in the case of Bioglan Pharma. Quintiles acquired the US marketing rights to Solaraze and then, following Bioglan's break up, proceeded to buy the assets of the US subsidiary. This therefore also emphasises the nature of interdependence in coevolving relationships such as NABPD agreements.

At the micro level this has been shown with the case of Bioglan where its interdependence related not just to customers but also to firms with which it was cooperating and not necessarily competing. As was seen from the longitudinal tracking of Bioglan's grand strategies from 1992-2002 there are various examples of its strategic actions and strategies coevolving with the strategic decisions of other firms. With Bioglan it was possible to see how coevolution happened in relation to other firms. These are most clearly articulated with regard to other pharmaceutical firms with acquisition (products and firms) and network based arrangements, and with other stakeholders through the external finance raising strategy. Similarly the strategic choices of other stakeholders, namely lenders, also had an impact upon the strategic outcome of Bioglan. As discussed it was the decisions of the lenders as to when

Bioglan Pharma plc ceased trading. Finally the data also showed Bioglan's strategies had also coevolved with the evolution of the pharmaceutical industry as it became a global oligopoly. As can be seen with the case of Bioglan strategies both evolve and coevolve thus supporting the view that coevolution theory adds an extra dimension to our understanding of the strategy process.

With regard to technological coevolution a process of interdependence can be shown. As was discussed in Chapter Three, Kurdas (1998) and Rothermel (2000) illustrated how symbiotic relationships occurred between pharmaceutical firms and biotechnology companies as they worked together to develop biopharmaceutical products. In a similar vein there was evidence from the empirical data that pharmaceutical firms had started to enter into interdependent relationships with genomics specialists. This is illustrated by Pierre Fabre's agreements with Genfit and Celera Genomics. As was identified in Chapter Five a number of the internationalisation strategic actions were as a result of interdependence with other firms in the forms of cross border NABPD arrangements, mergers, acquisitions and PD&LO strategic actions. This supports the view of McKelvey *et al.* (2004) whose study into sectoral patterns in the pharmaceutical industry identified that interdependency moved forward the internationalisation of the pharmaceutical industry.

7.4.4 Path Dependence

Internationalisation strategies can change the structure of an industry, and if they are focused upon expansion (rather than withdrawal) they can lead to it becoming increasingly globalised. Similarly mergers and acquisitions can lead to the consolidation of an industry and, as has been seen, the pharmaceutical industry has become a global oligopoly. This process of strategies shaping industry structure can be linked to Carney and Gedajlovic's (2002) view that path dependency is an important component for understanding the coevolution process. They argue that the outcomes of organisational strategies can shape the local environment which in turn affects the actions of other actors affected by this environment. So, for example, established pharmaceutical firms entered into mutually beneficial relationships with biotechnology firms rather than risk the new technology being competence destroying which could

have potentially led to pharmaceutical firms being unable to survive. This process of path dependency can be related to the S-C-P paradigm (perspective) that industry structure shapes firm strategies (Bain, 1956; Mason, 1959) which in turn shape industry structure (Scherer, 1980).

As discussed previously the pharmaceutical industry had become increasingly consolidated and internationalised as it had emerged into a global oligopoly thus suggesting that firms in the industry had increasingly realised consolidation strategies such as mergers and acquisitions, and internationalisation strategies, for example entering into new geographical markets. These grand strategy strategic actions could in turn shape the structure of the industry (S-C-P paradigm), a process of path dependency. This was illustrated by the periods of convergence for M&A, NAPBD and PD&LO strategic actions. Also with regard to these strategies it was shown that all firms were altering their organisational form either as a result of acquiring more firms, merging with partners and/or developing their organisational form with regard to a network form or joint venture. This therefore suggests a process of adaptation as the industry was evolving into a global oligopoly and suggests that firms were coevolving their strategic actions as the industry structure evolved, i.e. being path dependent.

In turn this process can lead to further industry consolidation as all of the firms in the sample were involved with mergers or acquisitions and these were spread over a number of years. These were strategies that shaped the pharmaceutical industry structure by reducing the number of firms and increasingly the size of those that had made the mergers and acquisitions. These findings would suggest that individual firm strategies did shape industry structure with regard to consolidation, thus supporting the path dependency perspective that strategies shape the industry environment. However, firms did not all adapt at the same time. For example Pierre Fabre did not implement any cross border mergers or acquisitions until 1997, Galen did not until 1998 (and those were all focused on the US market) and LEK did not until 2001. In contrast to this Asta Medica showed evidence of M&A activity in 1992 but did not engage in any cross border acquisitions after 1998.

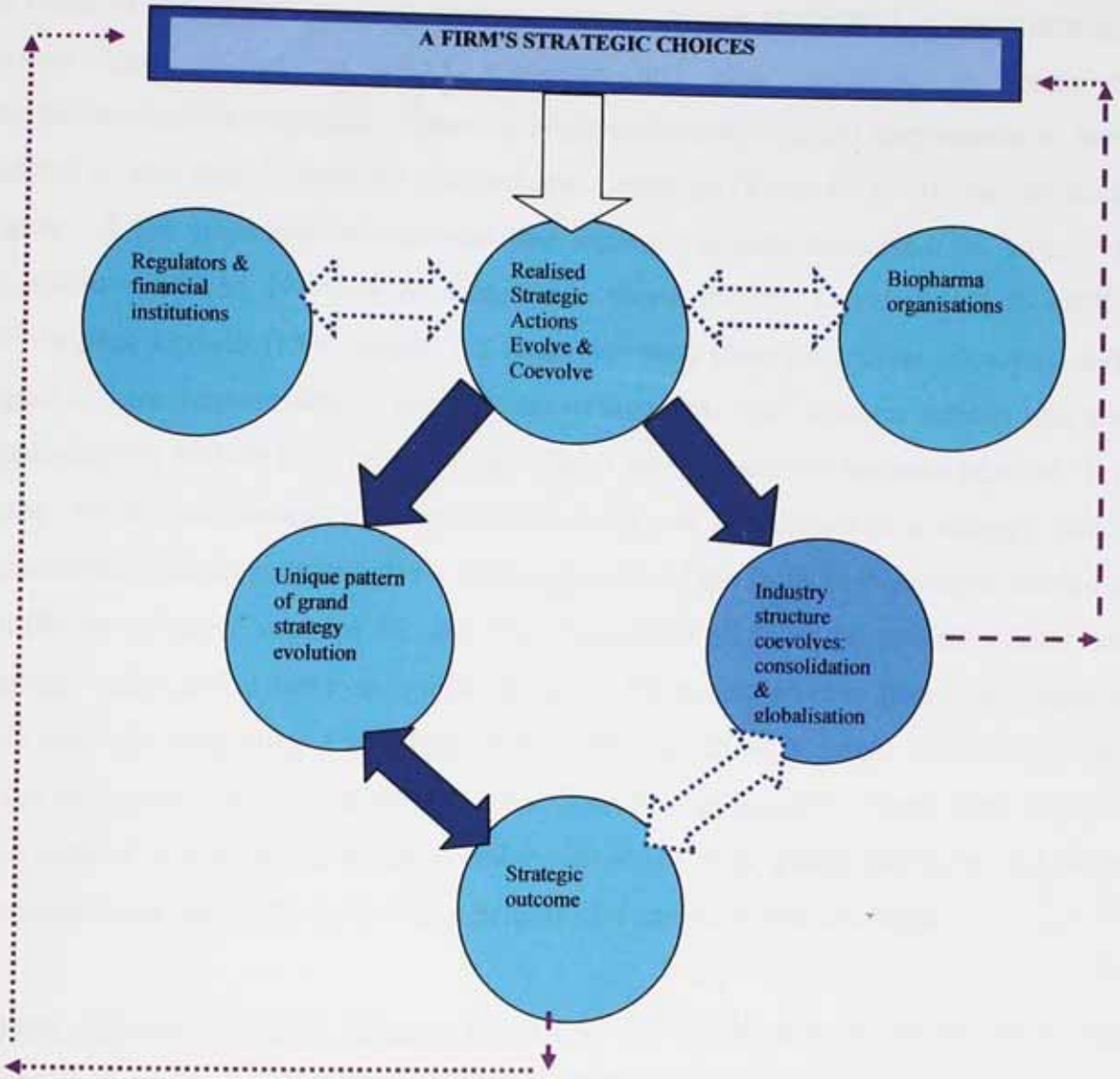
As was shown by the empirical data all the firms in the sample realised internationalisation strategic actions. In turn these strategies increase the globalisation of the industry structure leading to a process of path dependency as firms sought to increase their geographical coverage. For some, (for example Asta Medica) this resulted in strategic actions for all the geographical markets. For others (such as Galen) it led to increased presence in a particular international market with a move away from strategic actions focused upon the country of origin. It can also be seen from the empirical data that there was a process of path dependency with regard to the internationalisation of firms and their strategies. This is illustrated with all of the firms realising internationalisation strategic actions by 1997 although some did limit the geographical markets that they were involved with. This suggests that a process of partial coevolution was occurring as the pharmaceutical industry structure internationally evolved leading to what was termed by the beginning of the 21st Century as a global oligopoly (Kettler, 2001b).

With regard to national path dependency McKelvey *et al* (2004:113) said that "institutional/country-specific factors are particularly important for explaining the different patterns visible at different levels". This view is supported by the example of LEK, the only non-Western European firm. LEK realised the lowest level of strategic actions with regard to Western Europe. A possible reason for this was that it has been noted in the literature that the standards of products in CEE countries were not necessarily as high as in Western markets, but with the potential accession to the E.U. of countries such as Slovenia emphasis was placed upon increasing product quality to meet these standards. This may explain why LEK, despite becoming an international company did not begin its strategic actions with regard to Western Europe until 1999 and were quite limited in comparison to the previous firms mentioned. Also, LEK was the only firm in the sample to have an internal emphasis rather than the external emphasis of all of the other firms in the sample. As shown in Figure 7.1 LEK also coevolved strategic actions relating to a smaller number of grand strategies than those of the other firms in the sample. However, the findings of Galen contradict this view. Galen was one of three British firms and yet of all the firms in the sample it was the only one to focus solely on the US market with its grand strategies whilst all of the other firms realised strategies in at least two of the geographical markets that were identified.

7.5 A Model of Coevolution in the Pharmaceutical Industry

The following section synthesises the findings from discussions in Chapters Six and Seven. The result is a model that depicts a theory of coevolution in the pharmaceutical industry. The model (Figure 7.3) summarises the empirical data from the thesis in order to address the research question: How did the realised strategies of a heterogeneous set of firms coevolve during the period of pharmaceutical industry consolidation from 1992-2002? As the model shows the emphasis is upon the strategy process and how this relates to strategic actions evolving and coevolving into grand strategies. It also illustrates that the strategic actions coevolved with changes in the pharmaceutical industry structure as it consolidated and globalised.

Figure 7.3 A Model Of Pharmaceutical Industry Coevolution



A Firm's Strategic Choices: Firms make strategic choices as to the strategic actions and grand strategies that are going to be implemented. However, these strategic choices may not necessarily become realised strategic actions. For this reason the empirical data for this thesis focused upon those strategic actions that were actually realised rather than those that were planned, and this is depicted in the model of pharmaceutical industry coevolution.

Realised Strategic Actions Evolve and Coevolve: As was shown from the empirical data all firms in the sample realised strategic actions during 1992-2002. These strategic actions were related to grand strategies and also discussed in terms of internationalisation strategies. These strategic actions were either incremental or were realised so that they formed the relevant grand strategy (Table 6.1). As was shown in Figure 7.1 the empirical data showed that strategic actions coevolved for Merger & Acquisition (M&A), Network & Acquisition Based Product Development (NABPD) and Organic Growth (OG). Figure 7.2 illustrated how strategic actions coevolved with regard to internationalisation. This process of coevolution of strategic actions was also highlighted in Section 6.4.2 with the example of Bioglan and the Solaraze product. It is noted that not all strategic actions coevolve and not all amount to a strategy which demonstrates consistency over time. Although each of the firms in the sample arrived at a different strategic outcome the data has shown that all firms coevolved at least one strategic action for at least one grand strategy with that of another firm in the sample, thus strongly suggesting that firms in the pharmaceutical industry were coevolving grand strategies during 1992-2002. As was illustrated in Figure 7.1 there were no firms that entered into a period of coevolution for all of their grand strategies and some strategies were not found to have any periods of strategic action coevolution.

Unique Patterns of Grand Strategy Evolution: The model depicts the empirical data which showed that for all firms these strategic actions resulted in the evolution of two or more grand strategies. No firm realised its package of grand strategies in the same pattern as any other firm in the sample (Section 6.3) and thus grand strategy evolution was unique for each of the firms. As was discussed in Chapter Six, although all of the firms in the sample had the same strategic choice set they chose to build the strategic actions into different patterns of emergent strategy. Therefore, as well as showing that heterogeneous firms do coevolve their strategic actions the empirical data from this thesis has shown that firms follow unique patterns of strategy evolution and coevolution.

In discussions about core competences, resources and skills, reference has been made to how firms package these in unique ways in order to achieve competitive advantage (Barney, 1991; Porter, 1996) and their work suggests that 'unique' equals 'successful'. However, unique does not necessarily mean successful. As has been seen in the

empirical findings although each firm followed a unique patterns of strategy evolution and coevolution these preceded different strategic outcomes, which included liquidation and being disbanded.

Industry Structure Coevolves: Consolidation and Globalisation: As well as strategic actions forming unique patterns of strategy evolution and coevolution it was also found that they coevolved with the structure of the pharmaceutical industry as it globalised and consolidated. Specifically these relate to strategic actions which related to Merger & Acquisition and Internationalisation Strategic Actions (MAISAs). As was discussed previously the pharmaceutical industry structure became increasingly globalised and all firms in the sample realised internationalisation strategic actions. This suggests a process of coevolution with firms' strategic actions and the increasingly global structure of the pharmaceutical industry as it evolved into a global oligopoly. Similarly, all firms in the sample realised strategic actions relating to mergers and acquisitions, each action reduced the number of firms in the industry and thus contributed to the consolidation of the pharmaceutical industry. Thus the findings strongly suggest that as the pharmaceutical industry evolved into a global oligopoly a process of coevolution was occurring between the MAISAs. Although it is possible that other areas of industry structure may have coevolved with other strategic actions this was not an area explored in this study, and thus is not depicted in the model.

Strategic Outcomes: As discussed in Chapter Three the pharmaceutical industry evolved into a global oligopoly as incumbent firms arrived at a number of different strategic outcomes. Some of these strategic outcomes (which can sometimes be the same as strategic actions) can potentially coevolve with the industry structure. For example, a cross border merger contributes to global consolidation and similarly the liquidation of a firm increases the concentration of the industry. But (as noted on the model through the dotted line) this may not always be the case, dependent upon what the firm's strategic outcome actually was.

As the model has indicated there are various factors that although endogenous to firms within the pharmaceutical industry, have the ability to coevolve with changes both in the pharmaceutical industry structure and with the strategy dynamics of individual firms. These factors include regulators, financial institutions and biopharma

organisations which includes firms that can be involved in the discovery, development, marketing and/or manufacturing of products for the biopharmaceutical industry.

Regulators and Financial Institutions: Regulatory change can both affect how firms behave and be affected by firms' attempts to influence the regulatory decision process, for example, through policy networks (Nunan, 1999; McKelvey *et al*, 2004). Section 6.5 illustrated regulatory changes and healthcare reforms that related specifically to firms including Pierre Fabre, LEK and Asta Medica. With regard to financial institutions, as was shown by the empirical data (Chapter Five) five out of the six of the firms realised strategic actions relating to the raising of external finance. This highlights the reliance of pharmaceutical firms upon the financial markets as they seek to resource expensive and risky product development programmes. The financial markets have also been responsible for driving the globalisation of industries due to an increase in financial concentration (Chesnais, 1993).

Biopharma Organisations: As discussed in Chapter Two as well as the S-C-P paradigm stating that changes in industry structure can shape the conduct of the firm, it also proposed that the conduct (strategy) of incumbent firms can shape the industry structure. Therefore incumbent firms have the ability to shape the strategic actions realised by other firms. Interdependence (Section 7.4.3) also highlights the ability of incumbent firms to shape the strategic actions of other firms, and hence the coevolution of the pharmaceutical industry. For example, all of the firms in the sample were involved in NABPD agreements with partners including other pharmaceutical firms, genomics firms, universities and government bodies. Also, as illustrated in Table 6.10, firms' strategic actions are potentially shaped by the actions of competitors. For example, for a manufacturer of branded pharmaceutical products the competitors could include the producers of generic substitutes (Chapter Three, Chapter Six and Table 6.10).

The model supports the concept of the S-C-P paradigm (Bain, 1956; Mason, 1959; Scherer, 1980) but proposes that it is extended to a paradigm of coevolution thus supporting the work of other management researchers seeking to develop an understanding of coevolution in relation to changes in firms and their environments (Lewin and Volberda, 1999; Murmann, 2003). The testing of the model does not fall

within the remit of this thesis but it does provide a basis for future research into industry and firm coevolution. Suggestions for future research are outlined in Chapter Eight. The model proposes, based upon the thesis findings, that the above factors lead to a cyclical process of coevolution as pharmaceutical structure, firm strategies and strategic outcomes create a dynamic environment. Firms will not all adapt and coevolve with the changed environment simultaneously (Carney and Gedajlovic, 2002). This helps to explain why, as shown in the model, there appear to be unique patterns of strategy evolution. However, as shown in the exploration of patterns in temporal strategy development there was some evidence of institutionalisation (mimetic isomorphism) as shown by periods of strategic action convergence. Although it was found that some firms coevolved strategic actions for the same grand strategies (for example, Asta Medica and Pierre Fabre both coevolved strategic actions with regard to M&A and NABPD) they did not follow exactly the same pattern with regard to how they realised all of the relevant strategic actions for each of these grand strategies.

As can be seen in Figure 7.3, forces that are endogenous and exogenous to each firm, coevolve with a cyclical process of changes in industry structure preceding patterns in the evolution and coevolution of grand strategies which in turn precede different strategic outcomes. The overall nature of the coevolutionary process, which includes factors of interdependence and path dependency, highlights problems with a planned linear approach to strategy because of the difficulties in ascertaining how strategic decisions will coevolve. As it is difficult to identify which coevolving processes will have strongest impact (Carney and Gedajlovic, 2002) it would appear that firms are disadvantaged if they focus upon being a first mover, as shown by the Asta Medica example. That is not to say that being a last mover is advantageous as Galen was the only firm that was not a last mover for any of the grand or internationalisation strategies. It did not appear to be institutionalised into following industry rules, for example, it was the only firm to focus its internationalisation strategy purely on the US market. This suggests the possibility that Galen was the firm that was able to survive without being acquired or emerged because its management were better able to respond to the changing nature of coevolving forces.

Although the focus of the analysis has been upon the strategic actions and grand strategies that were realised, it must be noted that these were actioned by actors within

each firm. In other words everything realised by the firm was as a result of decisions made by actors directly involved with the organisation. These may be internal actors such as managers or key stakeholders who have a financial investment in the organisation. It must be accepted that it is these actors who make the choices as to how the firm adapts to changes in its external environment. Their ability to respond to change and make these decisions can differ from company to company (Penrose, 1959; Hamel and Prahalad, 1993; Jarzabkowski, 2001) which helps to explain why firms evolve and coevolve their strategies in different ways. In addition actors, whether they are managers within the organisation, political policy makers or other key stakeholders such as bankers and competitors have the ability to influence strategy development within an organisation. The role of actors in the coevolutionary process could be explored further by future researchers as could the testing of the model outlined in Figure 7.3. This is discussed further in Chapter Eight, the concluding chapter of this thesis.

7.6 Chapter Summary

Lewin and Volberda (1999) had proposed that coevolution theory provided a unifying theoretical lens with regard to the environmental determinism debate. As shown in Chapter Four the six firms chosen for the sample had arrived at different strategic outcomes, including those that had not survived and those that undergone organisational transformation as a result of being acquired or merged. Thus they provided appropriate units of analysis to explore whether coevolution theory did provide the insight suggested by Lewin and Volberda (1999). In order to investigate this Chapter Seven has focused upon addressing sub question R3 and the main research question. This has been achieved through exploring temporal patterns in strategy development and processes of strategic coevolution, with regard to both the grand strategies and internationalisation. The discussion also focused upon interdependence and path dependence, as these are considered to be important parts of the coevolution process. The key conclusions with regard to coevolution were that:

- All firms in the sample coevolved strategic actions

- All firms in the sample realised strategic actions relating to internationalisation which, in turn, coevolved with the structure of the pharmaceutical industry as it became increasingly globalised

- All firms in the sample realised strategic actions relating to M&A which, in turn, coevolved with the structure of the pharmaceutical industry as it became increasingly consolidated

- As all firms also realised NABPD strategic actions this suggests patterns of coevolution with the partner firms (Koza and Lewin, 1998)

The main research question was: How did the realised strategies of a heterogeneous set of firms coevolve during the period of pharmaceutical industry consolidation from 1992-2002? In response it was found that strategic actions that formed realised strategies coevolved both with the strategic actions of other firms and with the structure of the pharmaceutical industry as it became increasingly consolidated and globalised. The Model of Pharmaceutical Industry Coevolution (Figure 7.3) synthesised the thesis findings with regard to how strategic actions and grand strategies realised by firms in the pharmaceutical industry are part of a coevolutionary process. The next chapter concludes this thesis by clarifying its contributions whilst acknowledging the limitations of the research. Suggestions are also made with regard to how the thesis findings can contribute to future research.

CHAPTER EIGHT
CONCLUSIONS

8.1 Introduction

It has been proposed that any doctoral thesis should provide a 'contribution to knowledge' and that the author of such a thesis is an 'apprentice' (Phillips and Pugh, 2000). Acknowledging and accepting these perspectives these conclusions address both of these points. Following a summary of the main findings, reasons as to why this thesis makes new contributions to existing knowledge and understanding of strategic change in the pharmaceutical industry are offered by consideration of:

- The development of a theory of coevolution for the pharmaceutical industry;
- The development of a methodological framework for exploring strategic change in the pharmaceutical industry; and
- The development of techniques to help strategic decision making.

Following this, and acknowledging that the doctoral studies have very much reflected an apprenticeship, the chapter proceeds to acknowledge and discuss the limitations of the research. But, of course, one does not finish working once the apprenticeship has ended. This is a beginning rather than the end. Hence, the chapter presents proposals for how the key research findings can be developed in the future. This leads into a discussion about the personal journey that has been have travelled, a reflection of the learning journey during the doctoral studies process, and how this has changed my attitudes and behaviour towards the role of being an academic.

8.2 Summary of Thesis Findings

The overall aim of this thesis was to identify how the grand strategies of firms in the pharmaceutical industry had coevolved during the industry consolidation of 1992-2002. As discussed in Chapters One and Four, four sub questions (R1-R4) were developed in order to address the main research question. This section begins with a discussion about how these sub questions were addressed. It then proceeds to discuss the main findings with regard to the research question.

As the aim of the thesis was to identify how strategic actions and grand strategies had evolved and coevolved during the period 1992-2002 it was felt necessary to have a detailed categorisation of strategic actions that had been realised by firms in the pharmaceutical industry (Chapter Four). Using a variety of techniques, strategic actions realised by pharmaceutical firms were empirically identified and categorised into a framework of 23 grand strategies. A summary of the categorisation was presented in Table 4.1 and discussed in detail in Appendix B, thus addressing the sub question R1: What strategic actions were realised by firms in the pharmaceutical industry during 2001-2002? The discussion of the categorisation includes examples of firms that have actually realised relevant strategic actions and the criteria for strategic actions to be included/excluded for each of the grand strategies (Langley *et al.*, 2004; Langley *et al.*, forthcoming).

This categorisation was then adapted as a methodological framework for categorising the strategic actions of the firms in the sample and chronologically mapping them. The adapted categorisation was summarised in Table 4.4 and presented in detail in Appendix E. The adapted categorisation was then used to identify the strategic actions realised by the firms in the sample. The results were presented in Chapter Five and then discussed in Chapter Six in order to address the sub question R2: 'How did the realised grand strategies of a heterogeneous set of firms evolve during the period of pharmaceutical industry consolidation from 1992-2002?'. Specifically R2 was addressed with the findings discussed in Section 6.3. In summary it was found that each firm packaged its strategic actions and grand strategies in a unique way. This was not only with regard to

the number and type of grand strategies realised but sometimes with regard to the chronological ordering. This thus indicated different patterns in how they combined grand strategies and how they evolved. This was depicted in Table 6.2 through an empirical typology of pharmaceutical grand strategy evolution.

Having explored how the grand strategies and strategic actions had evolved the next sub questions, R3, explored how the strategic actions had coevolved: How did the realised strategic actions of a heterogeneous set of firms coevolve with each other's strategic actions during 1992-2002? As discussed in Section 7.2 strategic actions are considered to be coevolving if the strategic actions relating to a specific grand strategy are simultaneously realised between two firms in at least three years in any five year period. Tables 7.1 to 7.9 chronologically mapped the strategic actions realised by every firm for each of the grand strategies in order to identify patterns in strategic action coevolution. As was shown in Figure 7.1 the empirical data showed that strategic actions coevolved for Merger & Acquisition (M&A), Network & Acquisition Based Product Development (NABPD), Organic Growth (OG) and External Finance Raising (EFR). Tables 7.10 to 7.13 chronologically mapped the strategic actions realised by each of the firms in relation to the four international markets of the United States (US), Central and Eastern Europe (CEE), Western Europe and the Rest of the World in order to identify patterns in internationalisation strategic action coevolution. Figure 7.2 illustrated that all firms, apart from LEK, were involved in processes of strategic action coevolution with regard to the identified international markets. These coevolution processes were seen for all markets apart from Central and Eastern Europe.

As well as focusing upon how the internationalisation strategic actions coevolved the focus of R4 was upon internationalisation strategies: How did a heterogeneous set of firms realise internationalisation strategies during the period of pharmaceutical industry consolidation from 1992-2002? This sub question was addressed in Section 6.4 where it was found that all of the firms in the sample realised strategies outside their country of domicile. Some firms focused their internationalisation strategies on one specific market, for example, Galen and the US (Figure 6.10) or LEK and the CEE market (Figure 6.9). In contrast Shire (Figure 6.7) realised strategies for all of the international markets that had been identified in the analysis, whilst the other firms realised strategies for two or more of the international markets. These findings showed that all firms

realised strategic actions outside their country of domicile and thus suggested that the grand strategy strategic actions contributed to the internationalisation of the pharmaceutical industry.

The sub questions were developed in order to address the main research question: 'How did the realised strategies of a heterogeneous set of firms coevolve during the period of pharmaceutical industry consolidation from 1992-2002?' The findings that led to addressing the research question were synthesised in the development of a model that illustrated pharmaceutical industry coevolution (Figure 7.3) which was discussed in Section 7.5. In summary it was found that strategic actions that formed realised strategies coevolved both with the strategic actions of other firms and with the structure of the pharmaceutical industry as it became increasingly consolidated and globalised. Patterns of strategic action coevolution were identified for all of the firms in the sample, but not for all of the strategies or all the geographical markets. These findings were discussed in relation to issues of interdependence and path dependency. In interpreting the findings it was found that a number of forces, both external and internal to the organisation, shaped and were shaped by the strategy evolution process. This suggests a process of coevolution between these forces and the strategies and strategic actions realised by incumbent firms.

The empirical data from the pharmaceutical industry drove the research to develop the generic grand strategies of Pearce II and Robinson (1994) into one that was focused upon classifying the strategic actions that were actually realised by firms operating in the pharmaceutical industry. The extension from 14 to 23 grand strategies emphasises that generic frameworks cannot necessarily be applied to all industries, which suggests that such tools would be more beneficial to strategic analysts if they were context specific.

The findings have supported the literature which asserts that strategy is an evolutionary process that incorporates incremental strategic actions (Lindblom, 1959; 1979; Quinn, 1991) and is emergent in nature (Mintzberg, 1987; 1994). This has been achieved by analysing strategic actions and grand strategies in their context, which led to the Empirical Typology of Pharmaceutical Grand Strategy Evolution, rather than the generic, static nature of strategic planning models produced by Ansoff (1968), Porter

(1980) and Pearce II (1982). As was illustrated in Section 6.2 individual strategy evolution was different for each firm, as they each selected different grand strategy mixes. These findings were therefore in disagreement with Pearce II's (1982) prescriptive model of grand strategy selection. The empirical data also challenged the literature that strategy is a linear process (Chandler, 1962; Ansoff, 1968; Andrews, 1991) through its identification of growth and turnaround strategies being combined, incremental strategic actions that do not demonstrate consistency in behaviour, and strategic actions being prematurely terminated. With regard to temporal strategy development the empirical findings for this thesis agreed with those of Webb and Pettigrew (1999) that strategy development within an industry can witness ebbs and flows when observed over a period of years with regard to periods of strategic action convergence and divergence (Section 7.2.1).

As the firms were selected because they were heterogeneous in nature, particularly in relation to their strategic outcomes, this would appear to support the proposal in the strategic group literature that it is firms which are homogenous in nature that follow similar strategies. However, as was also shown each of the firms in the sample coevolved at least one of their strategies thus contradicting the strategic group proposition but appearing to support Deephouse's (1999) proposal that firms attempt to achieve a strategic balance between being similar and being different to competing firms.

Exploring strategic actions realised by firms prior to different strategic outcomes provides a depth to the factors that precede transformations and ending events, thus overcoming what Davis (1996) had identified as a weakness of the work by population ecologists and corporate demographers. This thesis contributes to our understanding about how strategies coevolve and suggests that this is an area that requires further exploration as we seek to understand the impact of strategy formation on the outcome of firms. The research has confirmed that processes of coevolution occur between firms and their environment. It therefore supports Lewin and Volberda's (1999) view that rather than the outcome of a firm being an issue of strategic choice versus environmental determinism it is actually a result of a coevolutionary process. It has also confirmed that the strategic actions of firms do coevolve but it has taken this a stage further than that achieved in previous studies by focusing upon the grand strategies of

middle size firms in the pharmaceutical industry which have arrived at different strategic outcomes.

8.3 Contributions to Knowledge

In this section the contributions of the thesis with regard to theory, method and practice are discussed. Previous studies into firm and strategy evolution have tended to be guided by paradigms. More specifically these related to the Structure-Conduct-Performance paradigm (Bain, 1956; Mason, 1959; Scherer, 1980), the Strategic Group concept (Porter, 1979; McGee and Thomas, 1986; Thomas and Venkatraman, 1988), the strategic choice perspective (Astley and Van de Ven, 1983; Hrebiniak and Joyce, 1985; Child, 1995), and environmental determinism (Hannan and Freeman, 1977; Astley and Van de Ven, 1983; Hrebiniak and Joyce, 1985; Carroll and Hannan, 1995). In the strategy literature there have been discussions about whether strategies are planned (Chandler, 1962; Ansoff, 1968; Andrews, 1991), emergent (Mintzberg and Waters, 1985; Mintzberg, 1994), revolutionary (Hamel, 1996) or incremental (Lindblom, 1959;1979; Quinn, 1991). The aim of this thesis has been to develop an understanding of how realised strategies and strategic actions have evolved and coevolved; to understand processes of strategic change that precede different strategic outcomes.

The contributions of this thesis centres around how the realised strategies and strategic actions of six heterogeneous middle sized pharmaceutical firms preceded different strategic outcomes, and how they coevolved both with other incumbent firms and industry structure. This has been achieved through the exploration of how the strategic actions and grand strategies of individual firms were realised and how they evolved during 1992-2002. The strategic actions that were empirically derived included both those with an external and an internal emphasis incorporating organic, network and acquisitive strategic actions. The analysis then proceeded to focus upon strategic development relating to temporal patterns and coevolution in grand strategies for the six firms in the sample, all of which were operating in the global pharmaceutical industry. The research therefore aligned itself with recent recommendations in the literature that, rather than working within specific paradigms or defending particular schools of

thought, strategy studies should encompass a multiple theoretical lens perspective (Hoskisson *et al.*, 1999; Lewin and Volberda, 1999; Thomas and Pollock, 1999:127).

In contributing to theories based around the strategic choice versus environmental determinism debate the study has demonstrated that the survival of firms is not necessarily shaped by one or the other, rather that the firm and its strategic actions coevolve with changes in the industry structure, the strategic actions of other incumbent firms and the decisions made by key stakeholders. Further, firms in the pharmaceutical industry can also have their fates affected by technological issues such as new technology or product withdrawals and, as shown in the literature review, they can in turn shape these issues. Specifically, Chapter Two refers to the symbiotic relationships between pharmaceutical firms and biotechnology companies. In comparison to studies which have focused upon the "puzzle of competitive strategy" (Thomas and Pollock, 1999) the emphasis of the research has been on grand, rather than business level, strategies which has allowed the analysis to focus upon the coevolution of a number of strategic actions, including those relating to internationalisation, networks, mergers and acquisitions. In addition, the sample includes firms that have arrived at different strategic outcomes such as being liquidated and, therefore, includes those that have failed, which Thomas and Pollock (1999) proposed should be an important focus of strategy studies in the 21st Century. This thesis has therefore contributed to understanding of strategic change in the pharmaceutical industry by using coevolution theory to explore how firm strategies are shaped and shape changes in the external environment.

The thesis has used longitudinal rather than cross sectional data to explore how firms' strategic actions and grand strategies were realised, rather than focusing upon those that were planned but not necessarily actioned. The data has been used to explore how strategies evolved and thus contributes to the literature on the process of strategy and in particular work into realised strategies (Mintzberg and Waters, 1985). It contributes to the environmental determinism versus strategic choice debate by using coevolution as the theoretical lens (Lewin and Volberda, 1999). It differs from the mainstream perspective of the S-C-P paradigm that industry structure shapes business level strategies (Bain, 1956; Mason, 1959; Scherer, 1980) by instead placing emphasis on

grand strategies (Pearce II and Robinson, 1994). It has provided a different perspective to the literature relating to corporate demography (Carroll and Hannan, 2000) by exploring the strategies that were realised prior to a vital event rather than focusing upon how this affects a number of firms in an industry. With regard to the view that middle sized firms are either unable to survive or are acquired as an industry evolves (Hannan and Freeman, 1997; Kurdas, 1998) it has demonstrated that this is not a theory that can be generalised as shown by the demerger of Pierre Fabre and the survival of Galen for more than eleven years.

The key contributions of this thesis relate to:

- Coevolution theories and perspectives
- The research methodology
- Strategy theories and perspectives
- Its contributions and implications for practice

These are discussed in sections 8.3.1 to 8.3.4 and summarised in section 8.3.5.

8.3.1 Coevolution Theories and Perspectives

The overall aim of this thesis has been to identify how the grand strategies of firms in the pharmaceutical industry have coevolved during the industry consolidation of 1992-2002. Chapter Four presented the development of a categorisation of strategic actions realised by firms in the pharmaceutical industry during 2001 to 2002. As Lewin and Volberda (1999:527) stated, their vision of coevolution studies that combine "microevolution, industry macroevolution, environmental and technological evolution and coevolution processes within such as system" were rarely met because of the difficulty of collecting appropriate data that can be sequenced and, as they emphasised, if coevolution is going to be a unifying framework then a substantial amount of empirical research still needs to be conducted. The empirical research for this thesis has

made developments with regard to this ambitious aim. It has categorised the strategic actions of firms in the pharmaceutical industry and then sequenced the data for firms that had arrived at different strategic outcomes. This led to the identification of patterns in the evolution and coevolution of strategic actions and grand strategies. As well as focusing upon these patterns of strategic change forces that had the potential to shape the evolution and coevolution process were identified. These findings have been considered in relation to McKelvey *et al's* (2004:113) study into sectoral innovation in the pharmaceutical industry which proposed that "there is a simultaneous interaction among firms; specificities, sectoral actors, national contexts and international trends". The culmination of the research for this thesis has been the development of a model of pharmaceutical industry coevolution which was illustrated in Figure 7.3. A summary of the issues considered in the analysis of the data that led to the development of the model of pharmaceutical industry coevolution are listed below:

- Firms having a broad strategy focus (e.g. grand strategies) as opposed to narrow strategic focus (e.g. network strategies).
- The exploration and discussion of patterns in strategy evolution for individual firms rather than a discussion in general terms or , an aggregation of the information.
- The exploration and discussion of temporal patterns in strategy development (i.e. first and last movers, periods of divergence and convergence).
- The identification of patterns of grand strategy strategic action coevolution between firms whilst also identifying grand strategies where the strategic actions did not coevolve.
- A discussion of patterns of strategy development in relation to strategic outcomes that included firms that had failed to survive the period of study.
- Related patterns of strategy evolution of incumbent firms and how the relevant strategic actions coevolved with changes in industry structure.
- A discussion of patterns in strategy evolution and coevolution in relation to issues of path dependence and interdependence.

A review of academic papers that have researched strategy coevolution (Djelic and Ainamo, 1999; Koza and Lewin, 1999; Carney and Gedajlovic, 2002; Flier *et al*, 2003;

Lampel and Shamsie, 2003) explored how the authors had considered these issues. The review found that even when the papers had resulted in the development of models of coevolution no one study had considered all of the above issues. This does not appear to have been achieved in any other research, particularly in relation to the pharmaceutical industry. This thesis has therefore made a significant contribution to existing knowledge by considering all of these issues in its analysis of the empirical data and using this to develop a model of pharmaceutical industry coevolution.

With regard to coevolution theory, the thesis makes its contribution by demonstrating that coevolution is part of an overall cyclical process. It was identified that during this process each firm realises a unique pattern of strategy evolution and coevolution, that these precede a number of different outcomes which in turn shape the industry structure. Rather than adopting the approach of the S-C-P paradigm which focuses upon performance this thesis explored strategic outcomes that followed from periods of grand strategy and strategic action evolution and coevolution. The principle of S-C-P that industry structure shapes the conduct of firms which in turn shapes industry structure helps to explain why the pharmaceutical industry evolved from being highly fragmented to that of a global oligopoly. This thesis has extended this concept further by identifying that the strategic actions, relating to firm conduct, coevolve with both with the structure of the industry and the strategic actions of incumbent firms. As discussed in Chapter Five this is a very complex process where coevolution occurs not just as a result of these processes but by forces of interdependence and path dependency and including the coevolutionary actions of a variety of industry stakeholders including the firms themselves, regulators and those involved with the financial markets. Furthermore, at different times different firms are either leaders or followers with regard to strategy implementation, despite operating within the same industry structure. Thus, the coevolution process is also shaped by temporal patterns in strategy development.

These findings therefore propose a more complex theory of coevolution than that suggested by writers such as Djelic and Ainamo (1999), Koza and Lewin (1999), Carney and Gedajlovic (2002), Flier *et al* (2003) and Lampel and Shamsie (2003). This thesis has thus contributed to and developed our understanding of the simple question 'How do firm strategies coevolve?' This has helped to bridge divides in the ecology

literature about how incumbent species and their communities coevolve and the economics literature about the relationship between industry structure and firm conduct.

8.3.2 Research Methodology

The design of the methodological framework has helped to develop understanding of strategic actions realised by firms in the pharmaceutical industry. This was achieved through the collection of empirical data that could be used to compare and contrast realised strategic actions and grand strategies for a number of different firms using the same basis for analysis. As was discussed in the previous section this thesis has made a contribution to existing knowledge about coevolution by exploring and explaining how strategic actions and grand strategies evolved for firms in the sample prior to their strategic outcomes. It then used this information to explore temporal patterns and periods of coevolution, patterns in path dependency and interdependence and discussed them in relation to the coevolving actions of other key stakeholders. The findings therefore offered a level of depth that had not been covered by the papers referred to in the previous section where the contribution to coevolution was discussed. As this approach had not been followed before for middle sized firms in the pharmaceutical industry a unique research methodology had to be designed that would allow the collection of the appropriate data and its subsequent qualitative analysis.

The strategic variables were not pre-selected but allowed to emerge during the data collection process, firstly through the development of the methodological framework and then through the adaptation of the framework to a sample of six firms that had arrived at different strategic outcomes. It did not use any 'forcing' of variables into specific categories and if, during the data collection process, strategic actions had emerged that could not be accommodated in the adapted methodological framework then a new categorisation would have been added (although this was not necessary).

The empirical data collected to produce the categorisation (Chapter Four) also illustrated that pharmaceutical firms realised a far wider range of strategic actions than that proposed by researchers who had focused upon the source of competitive advantage in the pharmaceutical industry as being either marketing or R&D based. As Pearce II

(1982) proposed, grand strategies can be a source of competitive advantage and as was shown in Table 4.1 strategic actions relating to twenty three grand strategies were identified as having been realised by firms in the pharmaceutical industry during January 1st 2001 to December 31st 2002 (Langley *et al.*, 2004, Langley *et al.*, forthcoming). This categorisation therefore provides the basis of a methodological framework for developing existing understanding of strategy development in the pharmaceutical industry. This methodological framework was then adapted and applied to the data collection for the six firms in the sample.

8.3.3 Strategy Theories and Perspectives

In Chapter Two, different perspectives on the strategy process were reviewed. The empirical findings challenge the view that strategy should follow a linear plan. Referring to Table 6.2 only one of the firms (LEK) supported the view that strategy is a linear process, and even this was combined with what appeared to be ad hoc incremental strategic actions. In comparison, the five other firms appeared to realise emergent strategies combined with incremental strategic actions. The findings also supported the work of Webb and Pettigrew (1999) that strategies for expansion can be combined with strategic withdrawals. The findings for Bioglan, Shire and Asta Medica supported Pearce II and Robinson's (1994) proposal that firms can undertake turnaround strategies.

Another body of literature that focuses upon realised strategies is that relating to Strategic Group Analysis (SGA) (see Chapter Two). In summary this literature proposes that it is not the industry that shapes the performance of firms but the strategic groups in the industry which have their own levels of performance and mobility barriers. The argument is centred on firms being allocated to each strategic group on the basis that they are homogeneous in nature and will therefore follow broadly similar strategies. In contrast, the findings from this thesis challenge the Strategic Group perspective. All the firms were different from each other on the basis of factors such as age, main products, nationality and/or they arrived at different strategic outcomes. Yet, despite these differences, they all entered into periods of strategy coevolution at some point during the timeframe studied. In other words, they all at some point realised at

least one grand strategy that was the same as that of another firm despite the heterogeneous nature of the firms in the sample. The firms that were the most similar in nature, i.e. the three British speciality pharmaceutical firms of Bioglan, Shire and Galen, as with the other firms in the sample, realised unique patterns of strategy evolution. In other words, despite sharing similarities they were not homogeneous with regard to the realisation of all grand strategies. Thus, these findings challenge the main argument of the Strategic Group literature although it is acknowledged that the focus of Strategic Group research has tended to be on business level rather than grand strategies. Although SGA studies focused upon strategy at the business level the one factor that unites the literature is that strategy is about competitive advantage, and as it has already been argued, grand strategies are also a source of competitive advantage. Therefore, if different strategies within the overall grand master strategy mix evolve in different ways, some with consistency and some without consistency, then this suggests that scholars need to refocus our thinking about studying strategic change.

8.3.4 Contribution and Implications for Practice

Due to the nature of the findings being context specific it is felt that the findings can be adapted to be used as tools and techniques for strategists working within pharmaceutical firms. Pearce II (1982) argued that the grand strategies that he had identified[1] could be selected by firms into an appropriate mix in order achieve certain goals such as maximising strengths through an internal emphasis. However, the grand strategies that he identified were generic, rather than industry specific. In comparison the grand strategies and strategic actions in this thesis were specific to the pharmaceutical industry and thus provide firms with a set of strategic choices that are available to them. When making decisions as to how they could be applied the empirical typology of pharmaceutical strategy evolution (Table 6.2) shows how firms combined an external/internal emphasis, external/internal finance and emergent strategy with a linear direction/turnaround strategic actions and related these to possible strategic outcomes as illustrated by each of the six firms. This information could be combined in order to

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[1] Also see Pearce II and Robinson (1994)

show pharmaceutical strategists the strategic choices available to them and the possible outcomes of the selections made. It is noted that this is historical data and is designed provide a guide rather than to be predictive. However, in comparison to some of the tools currently used in strategic decision making, e.g. Ansoff's (1968) product portfolio matrix or Porter's (1980) generic strategies, it is more detailed, industry specific and dynamic in nature.

8.3.5 Summary of Contributions

Table 8.1 summarises the contributions made by this thesis with regard to theory, method and practice. It has summarised them with regard to those that it has supported, those that it has added new understanding to, those that it has challenged and, more significantly the new contributions made by the findings from this thesis.

Table 8.1 Contributions to Theory, Method and Practice

Contributions	Supported	Added	Challenged	New
Theory	Coevolution theory Theories of emergent and incremental strategy Temporal patterns in strategy development	Understanding about how firms and their environments coevolve Understanding about the relationship between strategic actions/grand strategies, strategic outcomes and industry structure	The findings of Strategic Group Analysis The perspective that strategy is a linear process	Theory of coevolution in the pharmaceutical industry
Method	Use of strategic actions to understand patterns in strategy development	Understanding about the range of strategic actions realised by firms in the pharmaceutical industry	The pre selection of variables to identify realised strategies	Methodological framework for understanding strategic change in the pharmaceutical industry
Practice	Strategic actions and realised strategies used by firms in the pharmaceutical industry	Produced a categorisation of strategic actions specific to the pharmaceutical industry that could be used for selecting appropriate grand strategies	The use of static strategic analysis tools (e.g. Ansoff, 1968; Porter, 1980)	Techniques to help strategic decision making in the pharmaceutical industry focused upon evolutionary and coevolutionary processes

Source: Compiled by the author using an adaptation of the Harris *et al.* (2002) framework

8.4 Re-visiting the Limitations

When originally writing the research design the main limitations of the method were discussed. As the research was actually conducted further limitations were identified, and these are discussed in this section.

8.4.1 Method Limitations

With regard to the categorisation of strategic actions and grand strategies that formed the basis of the methodological framework it is noted that a limitation of the empirical data that was collected was based on material collected from two years of *Scrip*. The data contains some bias as it was primarily based upon strategic actions that were reported in the media. However, this was supplemented by information from the literature and triangulated with feedback from two industry experts.

An issue that had not been considered in the initial research design was the extent to which data was collected on the "core" firm. This issue was highlighted with the analysis of strategic actions implemented by Asta Medica. Asta Medica was both a subsidiary (of Degussa) and a parent company (for example of AWD). In turn, AWD had its own subsidiaries. A judgement was therefore made that if a strategic action was implemented by the direct parent in relation to the firm being analysed then this would be appropriately coded as a strategic action for the firm. So, for example, when Degussa decided to split Asta Medica up into four firms this was regarded as a strategic action of Asta Medica splitting itself up. Equally if a strategic action related directly to Asta Medica's role as a parent, for example by purchasing a subsidiary this would be recorded as a strategic action for Asta Medica, but not if one of Asta Medica's subsidiaries had acquired another firm. In this study this was only a limitation with regard to Asta Medica because none of the other firms in the sample had a parent company prior to their strategic outcomes.

A considerable amount of the data collection was focused upon identifying strategic actions in order to develop the categorisation used for the methodological framework. As discussed in Chapter Four it was felt that documentary sources were preferable to

use rather than interviews that may reflect bias or a justification after the event. However, it has now been realised that once the data had been analysed the findings could have been developed further in order to understand why firms made the decisions that they did. Interviews and internal documents could also clarify whether there had been any strategic actions that had been prematurely terminated without being reported in the media. It is also noted though, that two of the firms no longer existed when the data collection process started and, that of the four remaining firms, three had/now have their head offices overseas (LEK, Pierre Fabre and Galen)[2]. However this would have made additional data collection through interviews and accessing internal documents cost and time prohibitive. Although the lack of interviews is acknowledged as a limitation these could be followed through in further research.

8.4.2 Boundary Limitations

This thesis has focused purely on one industry and a set of six middle sized firms. It is acknowledged that this could be criticised for a possibly narrow focus by researchers who feel that a large number of firms should be studied or that cross industry comparisons should be conducted. However, some strategy researchers are beginning to think that it is becoming increasingly important for strategy research to be context specific. This thesis has focused upon what Pettigrew *et al.* (2001:699) classed as the "contexts of change". These context specific factors have included:

- Endogenous forces involved in the coevolving process shaping the structure of the pharmaceutical industry and its incumbent firms (Figure 7.3)

- Potential breakpoints that may have affected strategy evolution for each individual firm

These contextual factors have been limited because they have not included, for example technological information about new product registrations, but they have provided a context for understanding how the grand strategies of a heterogeneous set of firms coevolved during the pharmaceutical industry consolidation of 1992-2002.

[2] Galen changed its name to Warner Chilcott in 2004 and has established its headquarters in the US

This thesis involved three stages of data collection:

- Stage One: Preliminary interviews.

- Stage Two: Development of a methodological framework based upon a categorisation of all pharmaceutical strategic actions reported in *Scrip* for a two year period.

- Stage Three: Chronological mapping and analysis of strategic actions and grand strategies for the sample of six firms.

The findings from Stage Two could be generalised to firms in the whole pharmaceutical industry although it is noted that the categorisation was derived from a two year timescale. In turn the six firms studied enable the results to be more generalisable to European pharmaceutical producers because they were firms spread across four different countries and included biotechnology, generic and branded pharmaceutical manufacturers. Each of the firms arrived at a different strategic outcome and, to some extent, had different characteristics. In summary the boundary limitations were that the firms in the sample:

- Were all from Europe

- Only included middle sized pharmaceutical firms

- Did not include organisations that were purely research based e.g. university departments or organisations that were specifically contract based with regard to either pharmaceutical research, manufacturing or marketing.

The research was limited to 1992-2002 which saw the pharmaceutical industry become a global oligopoly with a high level of new entrants. This would suggest the possibility that strategic actions and strategies would have been different in, for example, the 1980s, when the industry was highly fragmented and had not witnessed any new entrants for a long period of time.

8.5 Areas For Further Investigation

By its nature this thesis has been an exploratory study. It is anticipated that future research could be conducted to apply and test some of the findings in order to develop further understanding about strategic and industry change (evolution and coevolution), particularly in the pharmaceutical industry. This section specifically focuses upon suggestions for future investigation with regard to the methodological framework, the model of pharmaceutical industry coevolution and the empirical typology of pharmaceutical strategy evolution.

8.5.1 Application of the Methodological Framework

A categorisation of strategic actions was developed during the empirical research (Chapter Four; Langley *et al.* 2004, Langley *et al.*, forthcoming). This could be used to both continue the research started in this thesis and to explore other areas of strategic change. As well as being applied to the pharmaceutical industry it could be used as a starting point for exploring processes of strategy evolution and coevolution in other industries.

The categorisation can be used by other researchers exploring strategic change in the pharmaceutical industry. It can be used to explore patterns in strategy evolution, temporal development and coevolution for a wider sample of firms in order test the proposition that grand strategies of firms in the pharmaceutical do follow unique patterns of strategy evolution and coevolution. Furthermore, the methodological framework can be used to collect data from a wider range of published sources than those used here. Examples include interviews and internal documentation and it could be adapted for both qualitative and quantitative analysis. As was discussed in the research design chapter (Chapter Four) the original categorisation of strategic actions had to be revised due to the type of data used for the empirical research. In future research the data could be expanded. For example, data could be collected on new product/New Chemical Entity (NCE) registrations from the US Food and Drug

Administration (FDA) and the European Medical Evaluation Agency (EMEA) in order to identify how new products were developed by the organisation (organic product development) as well that which had already been identified with regard to network and acquisition based product development.

The application of the methodological framework to more firms and/or through the collection of data from a wider range of sources, means that it can be used as a tool to increase our understanding of strategic change in the pharmaceutical industry. By adopting the methodological approach used in this thesis researchers could focus their attention on collecting and analysing data on the strategic actions realised by specific firms. It is hoped that this will then lead to more researchers undertaking microstate adaptation studies to increase our understanding of patterns in strategic change.

With regard to applying the research to other industries this is possible through the adaptation of the methodological framework. As acknowledged the strategic actions that were identified for the categorisation instrument were specific to the pharmaceutical industry. Researchers could test and amend as appropriate the strategic actions that were identified for the pharmaceutical industry in other contexts. This could be achieved by identifying if there were examples for each of the strategic actions so as to decide whether to include or exclude them for research into the strategies of individual firms. This may need to be developed further to incorporate strategic actions that were realised in other industries but not in pharmaceuticals. This could be achieved by following the stages involved in developing the methodological framework for this thesis which are detailed in Langley *et al.* (2004) Although, of course, the stages identified above would need to be undertaken in order to ensure that the categorisation was as detailed as it feasibly could be.

The methodological framework enabled empirical data to be collected that subsequently led to the development of an empirical typology of pharmaceutical strategy evolution and the model of pharmaceutical strategy coevolution. How these can both be used in future investigations is discussed in Sections 8.5.2 and 8.5.3.

8.5.2 *The Model of Pharmaceutical Industry Coevolution*

The model of pharmaceutical industry coevolution (Figure 7.3) was developed through findings from the empirical data and findings from the literature review. As was argued in Chapter Five, actors internal to the firm are responsible for making the decisions that lead to the realisation of strategic actions relating to grand strategies, whilst actors (key stakeholders) outside the organisation can shape the strategic decisions that the firm makes. It is therefore proposed that future research should focus upon managers' and key stakeholders' perceptions as to why they made the decisions that shaped the coevolutionary processes that were found in the pharmaceutical industry. The research findings could be developed to contribute to these areas of research through a case study approach such as, hypothetically, the case of LEK. Why did LEK agree to be acquired by Novartis, and in turn what reasons do the managers of Novartis give for acquiring LEK? How do the managers of LEK view the regulatory process in relation to the strategic actions that they realised? These questions could be focused around a central research question "How did the managers of LEK perceive the role of endogenous forces in shaping the evolution of their strategic actions during 1992-2002? This case study approach could potentially be applied to other firms that survived, e.g. Galen, in order to compare findings to identify internal factors such as managerial perceptions, leadership and culture that may explain why firms evolved their strategies in unique patterns. However, it is noted that there would be limitations in such a project related to the perceptions of managers (Chapter Four) and that due to the different organisation transformations and strategic outcomes managers that were at the organisation during 1992-2002 may no longer be contactable.

Lewin and Volberda (1999) proposed that future studies into coevolution could use event history analysis in order to develop understanding about microstate adaptation and coevolutionary processes. This method could be used to test the model of pharmaceutical industry coevolution by exploring relationships between events that result from the actions of regulatory bodies and their relationships with the realisation of strategic actions and grand strategies. By testing the various components of the pharmaceutical industry coevolution model over time this could further develop the model in order to further define our understanding of the coevolutionary processes between endogenous forces, strategic actions, strategic outcomes and pharmaceutical

industry structure. Having reviewed the potential options for future development of the model of pharmaceutical coevolution the following section outlines proposals for the next stages of the research after the thesis.

8.5.3 The Empirical Typology of Pharmaceutical Strategy Evolution

The empirical typology of pharmaceutical strategy evolution was based upon empirical data collected over a specific eleven year period (1992-2002) focused upon six European middle size firms that had arrived at different strategic outcomes. It is proposed that the next stages of the research could focus upon the testing and development of this typology by changing the variables that were explored. This would involve two new samples:

- Six middle size American pharmaceutical firms that had arrived at the same strategic outcomes as the firms in the sample for this thesis.
- Six "large" European pharmaceutical firms that had also arrived at similar strategic outcomes.

These findings would in turn test a proposition of this thesis that pharmaceutical firms realise "unique patterns in strategy evolution and coevolution", one of the components underpinning the model of pharmaceutical industry coevolution proposed through the findings from this thesis. It is known that the data for collecting this information is available through accessing the companies pages of *Scrip*, the *Financial Times* and *Mergerstat*. Potential ways of developing this research are as follows:

- Pattern matching six American firms that were similar to the six European firms in order to identify potential similarities and/or differences in the relationships between strategy evolution and strategic outcomes. It would explore further if factors relating to geographical origin shape this process. This could be used to compare and contrast the grand strategies realised by US and European middle sized pharmaceutical firms.

- Carrying out a similar exercise to the one above but adapting the original sample for six "large" pharmaceutical firms to identify if the relationships between strategy evolution and strategic outcomes are potentially shaped by the size of the organisation. The first reason for this approach is to test the strength of the typology with regard to the complete pharmaceutical industry. Secondly, to explore whether there are differences in grand strategy evolution for large firms compared to middle sized firms, particularly as it had been proposed that middle sized firms have difficult in surviving without being acquired (Hannan and Freeman, 1997; Kurdas, 1998). Although, as previously discussed the findings from this thesis have challenged this view.

- Through the use of pattern matching it will be possible to test the proposition that arose from the empirical typology of pharmaceutical strategy evolution (Table 6.2) that there are relationships between the evolution of firms' strategic actions and grand strategies and the subsequent strategic outcomes. These findings could also be used to test and develop the Empirical Typology of Pharmaceutical Industry Evolution.

- A proposition that underpinned the model of pharmaceutical industry coevolution (Figure 7.3) was that pharmaceutical firms realised "unique patterns of strategy evolution". The above findings could therefore be used to test and develop the theory of pharmaceutical industry coevolution proposed in this thesis by exploring issues with regard to a firm's country of origin and/or its size and whether there appear to be relationships with these and how firms' grand strategies coevolve.

Findings from further research could be developed into tools for developing strategic thinking relevant to the strategic choices that need to be made by firms operating in the pharmaceutical industry.

8.6 Learning and Personal Reflection

Prior to commencing this thesis I had personal experience of the strategy making process in one organisation. As I became more involved with the organisation I realised that in this one organisation most of the decision-making was made behind closed doors both by management and directors. Different "splinter" groups had their own objectives and individuals sought to use their power in order to gain support for their preferred approach. I witnessed phone calls and lunchtime discussions that illustrated how the decision making process was mainly being conducted outside of the Boardroom. As the organisation's Chief Executive said, "we can write the minutes prior to the meeting". This highlighted how little of the real decision-making was undertaken in the official forum of the Board meeting. For example, I noticed that strategic actions were not necessarily implemented by senior management in the way that the Board had agreed, but instead were adapted in order to fit with departmental agendas.

A new corporate plan meant change. Several of the senior managers either could not understand why this was necessary and/or had very fixed views about the changes that were required. At this stage the Chief Executive voiced his view that he did not want the resulting corporate strategy document to be left to gather dust on a shelf, as it had at the last company where he had been employed. It was to be designed so that it could be implemented! It took two years of consultation for the final plan before a final version was agreed. After this senior managers continued with their original plans, some of which had been incorporated into the corporate strategy. With regard to the proposed new initiatives, some were started but few were successfully completed. This appeared to be as a result of other issues arising, such as pressure to maximise short-term profits and changes in staff, as well as the lack of commitment to certain of the initiatives.

As I started this thesis I reflected upon these experiences in this organisation, and considered them in relation to the strategic planning literature that I had been taught at undergraduate level. I realised that the formal long-term approach to strategic planning was not necessarily the guide to the strategic actions that were implemented and the strategy that emerged. I felt that it was important that if one was to research and write

to a high academic level in a business related discipline, then it was necessary to focus upon the realities of the area that one was researching in order to apply theory to practice.

My experience emphasised to me the need to study strategies that had been realised rather than those that had been planned because this experience had shown that planning does not necessarily convert into action. One final point that it highlighted was people's perceptions of the strategy process. Personal experience has shown that managers "talk the talk" of strategy. They also justify actions after the event, which may be different to factors that affected the decisions whilst they were in progress. This underpinned the research method of focusing upon realised strategies that had been reported in the press as they had occurred rather than internal documentary sources, such as minutes of meetings that may have focused upon actions that were not necessarily implemented. However, in the early stages of my doctoral studies I had not realised the importance of narrowing the study so that it could be completed in the equivalent of three full-time years. In addition I did not realise how time consuming relatively small amounts of research can be. Therefore I decided, in the early stages, that I wanted to map the strategic action paths of all of the firms in the pharmaceutical industry from 1976, when the biotechnology revolution started, through to the present day.

The frustrations incurred during my doctoral studies have helped me in a number of ways, both in terms of my own future research and for the supervision of students writing undergraduate and postgraduate dissertations (including doctoral theses). These lessons are in no particular order. Assess what the student is capable of when they first start their research by asking them to write a literature review on a chosen topic within a short timescale. Focus the research question and ensure that it is feasible for the data to be collected within the required timescales but also understand that research is an emergent process and that flexibility is needed in terms of dealing with challenges and timescales. Perseverance – for various personal reasons I always knew that I was fortunate enough to have sufficient personal strength to deal with problems and challenges and to keep pushing myself – but I never realised that writing the thesis would need more energy than finding a house when I was homeless! Writing up has taught me to keep going that extra mile and to find an inner strength that I never knew I

had – but it has also taught me not to burn myself out, which I came very close to doing several times during the research process. I very much feel that a balance needs to be achieved between working hard at research and combining this with relaxation in order to maximise productivity. Although I do admit that I believe in the work-life balance, I am not always successful in achieving it! Added to the above comment, studying for a PhD is a lonely process. As I draw to an end with writing it up I realise that friends I have known for twenty years are more fed up with it than I have sometimes been. From this I have learnt that it is important in the future that I have other interests that I can discuss with people who are not necessarily related to the academic research I will be undertaking. Having a number of options to discuss will, I feel, help me to develop networks of contacts that I work with to develop all areas of my academic career which include research, teaching and income generation. I have combined these roles during my career to date and it would be satisfying to continue to develop all areas in the future.

Also, when thinking about networks, talking to people who have completed their doctoral theses has been an enormous help. Most specifically, when they have discussed it from the perspective of problems that they have encountered both with the PhD process and balancing other areas of their lives. Talking to them has made me realise that I am not the only one who has had problems and doubts during the process, and it was further helped by the fact that they had achieved their doctorates despite numerous hurdles. These discussions have made me realise the importance of becoming involved in external research groups who are studying areas similar to mine in order to share ideas and be able to overcome problems rather than attempting to recreate the proverbial wheel.

Finally, my doctoral studies have helped develop my ability to challenge the views of others. I have realised that I can contribute a new understanding to areas that have already been strongly researched by experienced academics. The presentation of a full paper from this thesis at the British Academy of Management conference to writers whose papers and books I had learnt from made me realise that I have the ability to achieve my dreams and ambitions.

8.7 Chapter Summary

This thesis was driven by a desire to understand what was happening at the firm level whilst industries were becoming larger and increasingly internationalised, with particular reference to the globalisation and consolidation of the pharmaceutical industry. Coevolution provides a theoretical lens that helps to bridge the gap between the environmental determinism and strategic choice debates. Thomas and Pollock (1999:138) proposed that in order to understand strategy researchers need to address the question "with whom and how do firms compete". The findings from this thesis suggest that they had omitted an important part of the puzzle. As the thesis has shown there are unique patterns of how strategies and strategic actions both evolve and coevolve, and that these strategies are realised within a coevolving industry environment. Therefore, these findings suggest that in order to understand the puzzle of strategy, the emphasis needs to be moved to 'with whom and how do firms coevolve?'

APPENDIX A

INDICATIVE INTERVIEW PLAN FOR COMPANIES

1. How would you outline the structure of the pharmaceutical industry as it is at this point in time?

2. What do you feel are considered to be important areas of strategy development for firms in the pharmaceutical industry?

3. How do you feel the structure of the pharmaceutical industry has changed during the past twenty years?

4. What do you consider to be the major changes that have affected the pharmaceutical industry during the past twenty years?

5. What do you consider to be the major changes that have affected your organisation during the past twenty years?

6. What do you feel has caused the changes discussed in points 4 and 5 above?

7. In what ways have these changes affected the strategies of your organisation?

8. What effect do you think Government policy has had on the pharmaceutical industry during the past 20 years?

9. How do you feel that regulation of the pharmaceutical industry has changed during the past twenty years?

10. How do you feel that regulatory changes have affected your firm's strategies during the past twenty years?

11. How do you feel that regulatory changes have affected the strategies of other firms in the pharmaceutical industry during the past twenty years?

12. Are there ways in which you feel your organisation is able to influence the UK policy making process?

Note: All interviews were tape recorded and data treated as confidential.

INDICATIVE INTERVIEW PLAN FOR ABPI

12 Whitehall, London, SW1A 2DY

Tel: 020 7747 1414

Interviews held on Tuesday 25th September 2001

Stage 1 questions – General Industry Structure

1. How would you outline the structure of the pharmaceutical industry as it is at this point in time?

2. On what basis do you feel that firms in the pharmaceutical industry compete?

3. How do you feel the competitive environment of the pharmaceutical industry has changed during the past twenty years?

4. What you consider to be the major changes that have affected the pharmaceutical industry during the past twenty years?

5. What do you feel has caused these changes?

6. What effect do you think Government policy has had on the pharmaceutical industry during the past 20 years?

7. Is there anyone else in the industry who you would suggest that I speak to?

Stage 2 Questions – Regulatory Changes

1. There are various Government departments involved in the policy making process with regard to the pharmaceutical industry, eg Department of Health, Dti, the Treasury etc. What do you consider each of their objectives to be for the pharmaceutical industry and have these changed during the past twenty years?

2. Who would you describe as the main actors/interest groups/government officials/departments involved in the policy making process for the pharmaceutical industry?

3. How does this vary with the areas of policy under consideration?

4. How would you describe the relationship between the government and the various interest parties in developing/refining regulation?

5. Regulation of the pharmaceutical industry is aimed at various stages of the product pipeline from NCE development through to marketing and monitoring of products. Could you please outline the main pieces of regulation that affect each stage of development?

6. The pharmaceutical industry has been subjected to increased regulation in some areas and de-regulation or re-regulation in others. How would you describe the main direction of industry specific regulation during the past twenty years (e.g. has it been to focus more on improving safety, reducing profits, moving the cost from the government to the individual?)

7. Is there anyone else who you would suggest that I speak to?

APPENDIX B
THE FINALISED CATEGORISATION OF STRATEGIC ACTIONS AND GRAND STRATEGIES

Grand Strategy	Definition of Grand Strategy	Criteria for Exclusions/ Qualifications	Strategic Actions Derived From The Text Analysis
Cooperative concentration (market penetration) strategy	Actions relating to an existing product in an existing therapeutic market that involves some form of cooperative arrangement.	Must be focused upon an existing dominant technology (Pearce and Robinson, 1994). This must be a pharmaceuticals product and not one involving biotechnology, genomics or proteomics. Cooperative arrangements include strategic alliances, licensing in agreements, co-promotion, co-marketing, franchising, consortia and outsourcing. However this category does not include cooperative arrangements relating to the external raising of finance. This means those that involve the firm having equity placed in it by the partner firm or licensing out agreements.	Product refined and relaunched; product withdrawal for commercial reasons; use of a contract salesforce to sell an existing product; patent extension strategic actions e.g. appeal to court for patent extension or legal action against a firm in respect of a patent; salesforce to sell another firm's products that complement its own products; re-branding of an existing product; price cut or price increase; divestment of a single product, product line or product portfolio.
Organic concentration (market penetration) strategy	Actions relating to an existing product in an existing therapeutic market that have been implemented by the firm itself	Must be focused upon an existing dominant technology (Pearce and Robinson, 1994). This must be a pharmaceuticals product and not one involving biotechnology, genomics or proteomics	Product refined and relaunched; product withdrawal for commercial reasons; patent extension strategic actions e.g. appeal to court for patent extension or legal action against a firm in respect of a patent; re-branding of an existing product, price cut or price. increase; divestment of a single product, product line or product portfolio

Cooperative market development strategy	Strategic actions relating to entry into a new therapeutic market through a cooperative arrangement	Strategic actions relating to entry into a new therapeutic market through a cooperative arrangement. The source must make reference to this being a new therapeutic market for the firm. Cooperative arrangements include strategic alliances, licensing in agreements, co-promotion, co-marketing, franchising, consortia and outsourcing. However this category does not include cooperative arrangements relating to the external raising of finance. This means those that involve the firm having equity placed in it by the partner firm or licensing out agreements.	Launching a product into a new therapeutic market
Organic market development strategy	Strategic actions relating to entry into a new therapeutic market that have been implemented by the firm itself	The source must make reference to this being a new therapeutic market for the firm.	Launching a product into a new therapeutic market
M&A market development strategy	Strategic actions relating to entry into a new therapeutic market through M&A activity	The source must make reference to this being a new therapeutic market for the firm.	Acquisition of a single product, product line or product portfolio.
M&A product development Strategy	Acquisition rather than internal development or a product or process using technology that was already used by the firm.	This does not include biotechnology, proteomics, genomics or gene libraries. The source must not state that the technology was new to the firm.	Acquisition of a single product, product line or product portfolio.

Cooperative product development (R&D)strategy	The cooperative development of an existing product or process using technology that was already used by the firm.	This does not include biotechnology, proteomics, genomics or gene libraries. The source must not state that the technology was new to the firm. Cooperative arrangements include strategic alliances, licensing in agreements, co-promotion, co-marketing, franchising, consortia and outsourcing. However this category does not include cooperative arrangements relating to the external raising of finance. This means those that involve the firm having equity placed in it by the partner firm or licensing out agreements.	Product gains regulatory approval, has patent granted or is launched onto the market for the first time.
Organic product development (R&D) strategy	The development of an existing product or process using technology that was already used by the firm.	This does not include biotechnology, proteomics, genomics or gene libraries. The source must not state that the technology was new to the firm.	Product gains regulatory approval, has patent granted or is launched onto the market for the first time.

Cooperative innovation (R&D) strategy	Cooperative development of a product or process, through a cooperative arrangement, relating to biotechnology, proteomics, genomics and gene libraries or any technology that the source states as being new to the firm.	This can also include development of a new chemical entity (NCE), and development of a class of product that had not existed prior to the beginning of the study (1st January 1992) e.g. a super statin. Cooperative arrangements include strategic alliances, licensing in agreements, co-promotion, co-marketing, franchising, consortia and outsourcing. However this category does not include cooperative arrangements relating to the external raising of finance. This means those that involve the firm having equity placed in it by the partner firm or licensing out agreements.	Product, process or NCE gains regulatory approval, has patent granted or is launched onto the market for the first time.
Organic Innovation (R&D) strategy	Internal development of a product or process, relating to biotechnology, proteomics, genomics and gene libraries or any technology that the source states as being new to the firm.	This can also include development of a new chemical entity (NCE), and development of a class of product that had not existed prior to the beginning of the study (1st January 1992) e.g. a super statin.	Product, process or NCE gains regulatory approval, has patent granted or is launched onto the market for the first time.
Cooperative innovation (Information Technology) strategy	Actions that relate to information technology, ecommerce or ebusiness through a cooperative arrangement	Cooperative arrangements include strategic alliances, licensing in agreements, co-promotion, co-marketing, franchising, consortia and outsourcing. However this category does not include cooperative arrangements relating to the external raising of finance. This means those that involve the firm having equity placed in it by the partner firm or licensing out agreements.	Launch of an internet site, development of new software, advertising on the internet, accessing a global database

Organic innovation (Information Technology) Strategy	Actions that relate to information technology, ecommerce or ebusiness through internal development		Launch of an internet site, development of new software, advertising on the internet, accessing a global database
Horizontal integration	Merger or acquisition involving a firm that is broadly similar but that is not in the same supply chain e.g. a pharmaceutical firm acquiring a pharmaceutical firm.	This is focused upon the merger or partial or full acquisition of a business The text must be interpreted in light of the firm's main area of activity The text must report that the relevant paperwork has been signed or regulatory approval given for the merger or acquisition	Successful completion of a merger or acquisition of a business
Vertical integration	Merger or acquisition involving a firm that is a customer or supplier eg a pharmaceutical firm acquiring a marketing organisation.	This is focused upon the merger or partial or full acquisition of a business The text must be interpreted in light of the firm's main area of activity The text must report that the relevant paperwork has been signed or regulatory approval given for the merger or acquisition	Successful completion of a merger or acquisition of a business
M&A concentric diversification strategy	Merger or acquisition of a firm that "may be related to some distinctive competence or asset of the core business" (Mintzberg, 1991 p79) e.g. a pharmaceuticals firm acquiring a generics business.	This is focused upon the merger or partial or full acquisition of a business It does not include a business that is broadly similar or part of the supply chain The text must be interpreted in light of the firm's main area of activity The text must report that the relevant paperwork has been signed or regulatory approval given for the merger or acquisition	Successful completion of a merger or acquisition of a business

Organic concentric diversification strategy	Internal generation of a separate business	The spin off or creation of a new business which must be solely owned	Spin off of a company, creation of subsidiary, affiliate company, new business or business unit
Conglomerate diversification strategy	Involving a firm that is completely unrelated to the pharmaceutical technology or healthcare industry and that does not fit the criteria for concentric diversification.	This is focused upon the merger or partial or full acquisition of a business The text must be interpreted in light of the firm's main area of activity The text must report that the relevant paperwork has been signed or regulatory approval given for the merger or acquisition	Successful completion of a merger or acquisition of a business
Retrenchment strategy	A strategy focusing upon restructuring, asset and cost reduction but does not include the sale of any parts of the firm	To be interpreted alongside strategic actions that have been coded as reversed.	Closure of a plant, implementation of a redundancy programme.
Organic growth strategy	Corporate expansion activities which include an increase in assets and expenditure.	This does not include the acquisition or merger of businesses or increases that are product specific	Increase in staff, opening or acquisition of a new plant, opening of a new R&D facility, expansion of facilities or assets eg plant, workforce
Divestment strategy	The sale of complete businesses ie business units, subsidiaries etc as going concerns.	This does not include the selling off of parts of the firm e.g. a plant or a product line. This does include a demerger.	Divestment of a business, subsidiary, spin off, wholly owned business or business unit
Liquidation strategy	The selling off of parts of a company as a result of the actions of an administrator. This includes the sale of complete businesses ie business units, subsidiaries, spin offs, or wholly owned businesses as going concerns as well as plants and product lines.	It may also include a firm dissolving subsidiary companies or assets but not include the sale (divestment) of complete businesses i.e. business units, subsidiaries, spin offs, or wholly owned businesses as going concerns by the company itself.	Divestment of a plant facility

Joint venture	The creation of a third "daughter" firm by two partner firms.	Text will refer to either joint venture or jointly owned affiliate company, business, business unit or spin off	Spin off of a company, creation of subsidiary, affiliate company, new business or business unit
External finance raising strategy	This form of strategy focuses upon how pharmaceutical firms have raised investment through arrangements with external organisations. firm or licensing out agreements.	Includes any cooperative arrangement where the firm has had equity placed into it by the partner firm. Does not include the selling (liquidation or divestment) of assets	Gaining equity investment as a result of a cooperative arrangement, bank loan, Initial Public Offering (IPO), further issuing of shares, debenture investment, licensing out arrangements.

DISCUSSION OF THE CATEGORISATION

Concentration (Market Penetration) Strategies

- ***Organic concentration (market penetration)***
- ***Cooperative concentration (market penetration)***

Strategic actions for market penetration strategies are those that relate to an existing product in an existing therapeutic market. From the empirical data market penetration strategies were categorised as cooperative concentration and organic concentration strategies. For the purposes of analysing strategic change these are considered to be pharmaceuticals/biotechnology products that do not incorporate genomics or proteomics technology which are categorized under innovation R&D below.

Relevant strategic actions identified for organic market penetration included products being refined and relaunched, such as Roche relaunching the weight-loss drug Xenical. This may also refer to product withdrawal for commercial reasons, such as ImtemMune's action with regard to Infergen. Although the majority of product withdrawals were because of issues such as safety, firms also discontinued products during the development stage for commercial reasons. For example, this was the reason why YM Biosciences stopped development of the vaccine EGF-P64k, despite its completion of what appeared to be a successful Phase II study. Japan Tobacco decided to concentrate primarily on prescription products rather than its originally wider focus that had included over-the-counter and consumer healthcare products, although it did not completely divest all of the non-core products. Chugai also appeared to be taking action to increase its concentration on prescription drugs rather than other medical areas.

Patent extension strategic actions are also relevant to organic market penetration strategies as they are used to extend the life of a product. This may be achieved through an appeal to court for patent extension or legal action against a firm in respect of a patent. This is illustrated by Pharmacia having brought a patent infringement suit against Alcon with regard to the Xalatan trademark. Gideon Richter also brought a case against five Japanese generics firms with regard to famotidine.

Relevant strategic actions for cooperative concentration also included use of a contract salesforce to sell an existing product e.g. Lilly sought to develop US sales of Evista by searching for a "contract sales force" or a salesforce to sell another firm's products that complement its own products and co-marketing arrangements, e.g. the agreement for Merck KGaA to co-market Novartis' product Starlix.

Market Development Strategies

- ***Organic market development***
- ***Cooperative market development***
- ***M&A market development***

Market development strategies are those which facilitate a firm's movement into a new therapeutic market. From the empirical data market development strategies were identified relating to organic, cooperative arrangements and product acquisition. For organic market development it was considered that strategic actions must relate to entry into a new therapeutic market that had been implemented by the firm itself. This is illustrated by Ranbaxy entering into the area of diabetes. In comparison cooperative market development strategic actions related to those where a partnership was entered into. For example, Pfizer and Serono had a copromotion agreement which allowed Pfizer to enter into the multiple sclerosis market. A R&D based collaboration with XTL Biopharmaceuticals provided Dyaz with entry into the area of infectious disease products. Serono entered into the psoriasis market through the granting of a license from Genentech to market Raptiva.

Product acquisitions (M&A market development) are another popular source of market development strategic action for firms in the pharmaceutical industry. This could relate to the acquisition of a single product or product line (portfolio) but not acquisitions of complete organisations. Bioglan realised a relevant strategic action to enter into the "moderate to severe pain control market" through the purchase of a product portfolio from Pharmacia.

Product Development Strategies

- ***Organic product development (R&D)***
- ***Cooperative product development (R&D)***
- ***M&A product development***

The development of an existing product or process using technology that was already used by the firm. Product development strategic actions do not refer to products or processes based upon relatively 'new' technologies such as genomics or proteomics. Also, the source must not state that the technology is new to the firm. Product development strategies have been categorised as those that are organic, cooperative and acquisition based. Relevant strategic actions can include products gaining regulatory approval, having patents granted and/or launched onto the market for the first time.

M&A based product development strategic actions are those that meet the product development criteria and refers to acquisitions of a single product, product line or product portfolio. It does not refer to the acquisition of whole firms. Relevant examples included King Pharmaceuticals extending its hypertension and women's healthcare product line through the acquisition of rights to four Bristol-Myers Squibb products and Alpharma increasing its portfolio of generic liquid pharmaceuticals through the acquisition of eight approved ANDAs from UDL Laboratories. Cooperative product development was illustrated by Tanabe granting rights to Senju for developing, manufacturing and marketing the tablet form of bepotastine into an ophthalmic formulation. Another example refers to Choong Wae developing a compound from Janssen into a new formulation which resulted in a patent being granted for itraconazole for the local South Korean market. Organic product development includes firms developing various products in the R&D/product pipeline based upon a specific technology. This was illustrated through the example of RTP Pharma and the application of its IDD technology.

Innovation (R&D) Strategies

- ***Organic Innovation (R&D)***
- ***Cooperative innovation (R&D)***

Innovation R&D strategies refer to the development of a product or process relating to a change in technology. This may be a technology that is new to the firm or one based upon "new" technologies such as proteomics or genomics. Strategic actions can include the product, process or new chemical entities gaining regulatory approval, having a patent granted or being launched onto the market for the first time. This can also include development of a class of product that had not previously existed, such as a superstatin illustrated by AstraZeneca's development and launch of Crestor. These strategic actions were categorised on the basis of whether they applied to an organic innovation (R&D) strategy or those that related to cooperative agreements. No empirical examples were found to support a categorisation for acquisition-based innovation (R&D) strategies.

With regard to organic innovation (R&D) strategic actions, genomics research examples reported in *Scrip* during 2001-2002 included the setting up of subsidiaries to focus upon genomics and proteomics research. These included the establishment of the genomics focused CenoFunction by the Japanese firm Hisamitsu. Another new subsidiary was ZoeGene Corp, established by Mitsubishi Chemical to focus upon both proteomics and genomics research. Other firms, such as Sumitomo Pharma started building new pharmaceutical R&D facilities that could incorporate genomics research.

There were also a number of different types of strategic action that referred to cooperative innovation (R&D) strategic actions. These included pharmaceutical firms entereing into licensing in arrangements to access technology for genomic research, such as GlaxoSmithKline's agreement with Valentis for its "gene regulation platform technology". Firms such as GlaxoSmithKline and Novo Nordisk licensed a gene library from the Swedish firm BioInvent International. Entry into proteomics agreements included an alliance between MediChem Life Sciences and Celgene and a drug discovery partnership between Oxford GlycoSciences and the US based Institute for Systems Biology.

Innovation (Information Technology) Strategies

- ***Organic innovation (Information Technology)***
- ***Cooperative innovation (Information Technology)***

Innovation (information technology) strategies refer to actions realised by pharmaceutical and biotechnology firms that relate to information technology, e-commerce or e-business through internal development. Innovation (information technology) strategies were identified both as organic and as cooperative. Relevant cooperative strategic actions included the formation of a software company by Pfizer, IBM and Microsoft targeted at producing software products to provide doctors with electronic services for activities such as prescribing. With regard to organic innovation (information technology) strategic actions Aventis set up an internet site to help doctors communicate with patients by allowing them to carry out a number of activities online, such as ordering repeat prescriptions and making appointments. The internet was also used by some firms as part of their advertising campaigns, for example Nycomed Amersham used this medium as part of its promotion for OncoSeed.

Integration Strategies

- ***Horizontal integration***
- ***Vertical integration***

Both horizontal and vertical strategic actions were identified. Horizontal integration refers to merger or acquisition involving a firm that is broadly similar but that is not in the same supply chain e.g. a pharmaceutical firm acquiring a pharmaceutical firm. This is focused upon the merger or partial or full acquisition of a business and is illustrated by Shire's acquisition of BioChem Pharma and Amgen's acquisition of Immunex which led to the creation of the "world's largest biotech company".

Vertical integration refers to the acquisition of a firm that was in a different part of the supply chain from the acquisitive firm, usually a customer or a supplier. For example,

the outsourcing firm Global Health Care Partners (GHCP) acquiring the contract manufacturer Laboratoires Thissen. Nextpharma acquired Thissen as part of its business filling a missing gap in Nextpharma's supply chain.

Diversification Strategies

- ***Joint venture***
- ***Organic concentric diversification***
- ***M&A concentric diversification***
- ***Conglomerate diversification***

Joint venture refers to the creation of a third "daughter" firm by two or more partner firms such as the firm formed by Schering-Plough and Merck & Co. In comparison organic concentric diversification refers to an organisation diversifying through the creation of new businesses. These could include the spin off of a company, creation of subsidiary, affiliate company, new business or business unit. Examples from the empirical data included the creation of Gencell, a company spun off by Aventis Pharma and Takeda America holdings establishing the subsidiary company Takeda Research Investment (TRI). M&A concentric diversification strategic actions relate to merger with or acquisition of a firm that "may be related to some distinctive competence or asset of the core business" (Pearce II and Robinson, 1994:79) e.g. a pharmaceuticals firm acquiring a generics business. It does not include a business that is broadly similar or part of the supply chain. In contrast conglomerate concentric diversification refers to merger and acquisition activity involving a firm that is completely unrelated to the pharmaceutical technology or healthcare industry and that does not fit the criteria for concentric diversification. Bayer's acquisition of the crop science business of Aventis meets this criteria.

Organic growth

Organic growth refers to corporate expansion activities which include an increase in assets and expenditure. This does not include the acquisition or merger of businesses or increases that are product specific. Strategic actions identified from the empirical data included an increase in staff, opening or acquisition of a new plant, opening of a new R&D facility and expansion of facilities or assets. Examples include the expansion of production facilities by EMS Sigma Pharma, Sumitomo Pharma's expansion of its "pharmaceutical R&D facilitiy in Osaka" and the establishment of new "genotyping facility" and an increase in employees by Sequenom.

Retrenchment

Retrenchment refers to a strategy focusing upon restructuring, asset and cost reduction. Relevant strategic actions include closure of a plant or implementation of a redundancy programme but do not include the sale of any parts of the firm. This type of strategy can be illustrated by restructuring at firms such as Aventis, ICN and GlaxoSmithKline.

Divestment Strategy

A divestment strategy relates to strategic actions that involve the sale of complete businesses such as business units or subsidiaries as going concerns. This does not include the selling off of parts of the firm e.g. a plant or a product line but does include demergers. Relevant strategic actions include Akzo Nobel's divestment of Rosemont Pharmaceutical and Pierre Fabre's demerger from bioMerieux,

Liquidation Strategy

It has been argued that liquidation is a grand strategy as a firm attempts to liquidate certain assets (Pearce II and Robinson, 1994:79). As part of this strategy a firm may dissolve subsidiary companies or assets, but this does not include those that are sold off (divested) as going concerns. For example Nexell Therapeutics' decision to liquidate

Oxford Molecular, and Japan Tobacco dissolving Lifix. Liquidation may also refer to the selling off of parts of a company as a result of the actions of an administrator. This includes the sale of complete businesses i.e. business units, subsidiaries, spin offs, or wholly owned businesses as going concerns as well as plants and product lines. For example, after Bioglan went into receivership in 2002 various parts of the firm including Bioglan Pharma Inc, Bioglan Generics and Bioglan AB were sold.

External Finance Raising Strategy

An external finance raising strategy refers to strategic actions that focus on financing arrangements through external organisations. These can include equity partnerships and/or licensing agreements. This includes any cooperative arrangement where the firm has had equity placed into it by the partner firm. This does not include the selling (liquidation or divestment) of assets. Relevant strategic actions include gaining equity investment as a result of a cooperative arrangement, bank loans, Initial Public Offering (IPO), further issuing of shares, debenture investment and licensing out arrangements. During 2001-2002 Skyepharma was one of the firms that issued new shares and Teva Pharmaceutical industries placed a debenture offering. Initial Public Offerings were made by a number of firms including Far East Pharmaceutical Technology and biotechnology companies such as the German firm Morphochem. Sources of raising external finance through network based relationships included licensing out arrangements by Pierre Fabre with Cypress Bioscience and Lilly. Celltech placed equity finance into NeoGenesis as part of a research collaboration, and similarly Atrix Laboratories received an equity investment from Pfizer as part of an alliance agreement.

APPENDIX C
EUROPEAN PHARMACEUTICAL FIRMS

Company Name	Country of origin	Position In Top 200 Ranking Of Pharmaceutical Companies By Turnover For Year 2000
Active Biotech	Sweden	154
Akzo Nobel	The Netherlands	21
Almirall-Prodesfarma	Spain	75
Amarin	UK	157
ASTA Medica	Germany	65
AstraZeneca	UK	5
Aventis	Germany	6
Bayer	Germany	17
Bial	Portugal	141
Bioglan	UK	143
Biora	Sweden	175
Biotest	Germany	119
Boehringer Ingelheim	Germany	18
Byk Gulden	Germany	45
Cangene	Canada	153
Celltech	UK	96
CeNeS Pharmaceuticals	UK	186
Cerep	France	195
Chiesi	Italy	193
Cortecs	UK	179
DSM	The Netherlands	79
Elan	Ireland	56
Esteve	Spain	95
F Hoffmann-La Roche	Switzerland	10
Faes	Spain	123
Ferrer	Spain	117
Flamel Technologies	France	182
Forest Laboratories	US	53
Fournier	France	86
Galen	UK	140
Gerolymatos	Greece	166
GlaxoSmithKline	UK	1
Grunenthal	Germany	68
Innogenetics	Belgium	189
IsoTis	The Netherlands	197
Itafarmaco	Italy	122
KRKA	Slovenia	107
Lacer	Spain	128
Lafon	France	131
LEK	Slovenia	111
Lundbeck	Denmark	66
M L Laboratories	UK	177

Medivir	Sweden	171
Merck KGaA	Germany	28
Modex Corp	Switzerland	196
Norgine Europe	The Netherlands	135
Novartis	Switzerland	11
Novo Nordisk	Denmark	29
Nycomed Holdings	Denmark	90
Orion Pharma	Finland	91
Pierre Fabre	France	77
Pliva	Croatia	102
Polifarma	Italy	158
Provalis	UK	178
Reckitt Benckiser	UK	74
Recordati	Italy	105
Rhein Biotech	The Netherlands	150
Richter	Hungary	103
Sanofi-Synthelabo	France	19
Schering AG	Germany	30
Schwarz Pharma	Germany	67
Serono	Switzerland	47
Servier	France	36
Shire	UK	80
Siegfried Group	Switzerland	116
Sigma-Tau	Italy	74
SkyePharma	UK	152
Solvay	Belgium	39
STADA	Germany	89
Theramex	Principality of Monaco	130
UCB	Belgium	49
Valpharma	Republic of San Marino	198
Vianex	Greece	124
Zambon	Italy	101

Source: Compiled by the author from Scrip Pharmaceutical League Tables 2001

APPENDIX D

EUROPEAN FIRMS IN THE SAMPLE AND DETAILS OF STRATEGIC OUTCOMES REPORTED IN *SCRIP* DURING THE PERIOD JANUARY 1ST 2001 – DECEMBER 31ST 2002

Company Name in *Scrip* Pharmaceutical League Table (2000)	Results of Search into Name Change	Strategic Outcome Recorded
Active Biotech	No name change	No change
Akzo Nobel	No name change	No change
Almirall-Prodesfarma	No name change	No change
Amarin	Changed its name in 1999 from Ethical Holdings	No change
ASTA Medica	No name change	Disbanded and divested by Degussa
AstaZeneca	No name change	No change
Aventis	No name change	No change
Bayer	No name change	No change
Bial	No data available	No data available
Bioglan	No name change	Went into administration and then liquidated
Biora	No data available	No data available
Biotest	No name change	No change
Boehringer Ingelheim	No name change	No change
Byk Gulden	Changed name to Altana Pharma	No change
Cangene	No name change	No change
Celltech	No name change	No change
CeNeS Pharmaceuticals	No name change	No change
Cerep	No name change	No change
Chiesi	No name change	No change
Cortecs	No name change	No change
DSM	Name changed to Royal DSM	No change
Elan	No name change	No change
Esteve	No name change	No change
F Hoffmann-La Roche	No name change	No change
Faes	No name change	No change
Ferrer	No name change	No change
Flamel Technologies	No name change	No change
Fournier	No name change	No change
Galen	No name change	No change
Gerolymatos	No data available	No data available
GlaxoSmithKline	No name change	No change
Grunenthal	No name change	No change
Innogenetics	No name change	No change
IsoTis	No name change	Merged with Modex Therapeutics
Itafarmaco	No data available	No data available
KRKA	No name change	No change

Lacer	No data available	No data available
Lafon	No name change	Acquired by Cephalon
LEK	No name change	Acquired by Novartis
Lundbeck	No name change	No change
ML Laboratories	No name change	No change
Medivir	No name change	No change
Merck KGaA	Rebranded as EMD in North America and Merck elsewhere	No change
Modex Corp (also referred to as Modex Therapeutics)	Changed name to IsoTis	Merged with IsoTis
Norgine Europe	No data available	No data available
Novartis	No name change	No change
Novo Nordisk	No name change	No change
Nycomed Holdings (also referred to as Norgine Pharma)	No name change	Acquired by a consortium of investors led by CSFB Private Equity
Orion Pharma	No name change	No change
Pierre Fabre	No name change	Demerged from BioMerieux
Pliva	No name change	No change
Polifarma	No data available	No data available
Provalis	No name change	No change
Reckitt Benckiser	No name change	No change
Recordati	No name change	No change
Rhein Biotech	To trade under the name Berna Biotech	Acquired by Berna Biotech
Richter	No name change	No change
Sanofi-Synthelabo	No name change	No change
Schering AG	No name change	No change
Schwarz Pharma	No name change	No change
Serono	No name change	No change
Servier	No name change	No change
Shire	No name change	Merged with Biochem Pharma
Siegfried Group	No name change	No change
Sigma-Tau	No name change	No change
SkyePharma	No name change	No change
Solvay	No name change	No change
STADA	No name change	No change
Theramex	No data available	No data available
UCB	No name change	No change
Valpharma	No data available	No data available
Vianex	No data available	No data available
Zambon	No name change	No change

Source: Compiled by the author based on data from various issues of *Scrip* 2001-2002

APPENDIX E

ADAPTED CATEGORISATION USED FOR THE FINAL CODING

Grand Strategy	Definition of Grand Strategy	Criteria for Exclusions/qualifications	Strategic Actions Derived From The Text Analysis
Network and acquisition based product development strategy	Refinement of an existing product or development of a new product or licensing in a product through a cooperative arrangement. This includes internal development of a product, chemical, New Chemical Entity (NCE) or process, through a cooperative arrangement. Innovative equals products that have been developed using biotechnology, proteomics, genomics and other gene therapies. This includes products that are in clinical trials but have not yet been launched	Cooperative arrangements include strategic alliances, licensing in agreements, co-promotion, co-marketing, franchising, consortia and outsourcing. However this category does not include cooperative arrangements relating to the external raising of finance. This means those that involve the firm having equity placed in it by the partner firm or licensing out agreements.	Product refined and relaunched; use of a contract salesforce to sell an existing product; patent extension strategic actions e.g. appeal to court for patent extension or legal action against a firm in respect of a patent; salesforce to sell another firm's products that complement its own products; licensing in a product in order to market it, re-branding of an existing product; price cut or price increase;. launching a product into a new therapeutic market Product gains regulatory approval, has patent granted or is launched onto the market for the first time.
Cooperative innovation (Information Technology) strategy	Actions that relate to information technology, ecommerce or ebusiness through a cooperative arrangement	Cooperative arrangements include strategic alliances, licensing in agreements, co-promotion, co-marketing, franchising, consortia and outsourcing. However this category does not include cooperative arrangements relating to the external raising of finance. This means those that involve the firm having equity placed in it by the partner firm or licensing out agreements.	Launch of an internet site, development of new software, advertising on the internet, accessing a global database
Organic innovation (Information Technology) Strategy	Actions that relate to information technology, ecommerce or ebusiness through internal development		Launch of an internet site, development of new software, advertising on the internet, accessing a global database

Merger & Acquisition This incorporates: Horizontal integration Vertical integration M&A concentric diversification strategy	Merger or acquisition involving a firm that is broadly similar but that is not in the same supply chain e.g. a pharmaceutical firm acquiring a pharmaceutical firm.	This is focused upon the merger or partial or full acquisition of a business The text must be interpreted in light of the firm's main area of activity The text must report that the relevant paperwork has been signed or regulatory approval given for the merger or acquisition	Successful completion of a merger or acquisition of a business
	Merger or acquisition involving a firm that is a customer or supplier e.g. a pharmaceutical firm acquiring a marketing organisation	This is focused upon the merger or partial or full acquisition of a business The text must be interpreted in light of the firm's main area of activity The text must report that the relevant paperwork has been signed or regulatory approval given for the merger or acquisition	Successful completion of a merger or acquisition of a business
	Merger or acquisition of a firm that "may be related to some distinctive competence or asset of the core business" (Mintzberg, 1991 p79) e.g. a pharmaceuticals firm acquiring a generics business.	This is focused upon the merger or partial or full acquisition of a business It does not include a business that is broadly similar or part of the supply chain The text must be interpreted in light of the firm's main area of activity The text must report that the relevant paperwork has been signed or regulatory approval given for the merger or acquisition	Successful completion of a merger or acquisition of a business
Organic concentric diversification strategy	Internal generation of a separate business	The spin off or creation of a new business which must be solely owned	Spin off of a company, creation of subsidiary, affiliate company, new business or business unit

Conglomerate diversification strategy	Involving a firm that is completely unrelated to the pharmaceutical technology or healthcare industry and that does not fit the criteria for concentric diversification.	This is focused upon the merger or partial or full acquisition of a business. The text must be interpreted in light of the firm's main area of activity. The text must report that the relevant paperwork has been signed or regulatory approval given for the merger or acquisition.	Successful completion of a merger or acquisition of a business.
Retrenchment strategy	A strategy focusing upon restructuring, asset and cost reduction but does not include the sale of any parts of the firm.	To be interpreted alongside strategic actions that have been coded as reversed.	Closure of a plant, implementation of a redundancy programme.
Organic growth strategy	Corporate expansion activities which include an increase in assets and expenditure.	This does not include the acquisition or merger of businesses or increases that are product specific.	Increase in staff, opening or acquisition of a new plant, opening of a new R&D facility, expansion of facilities or assets eg plant, workforce.
Liquidation strategy	The selling off of parts of the firm e.g. a plant or a product line by an administrator.	Does not include the sale of complete businesses ie business units, subsidiaries, spin offs, or wholly owned businesses as going concerns.	Divestment of a plant facility. Divestment of a business, subsidiary, spin off, wholly owned business or business unit because the company has gone into administration.
Divestment & Demerger strategy	The sale or partial sale of complete businesses ie business units, subsidiaries etc as going concerns.	This does not include the selling off of parts of the firm e.g. a plant or a product line. This does include a demerger. This does not include divestments that have occurred due to the company going into administration.	Divestment of a business, subsidiary, spin off, wholly owned business or business unit.
Joint venture	The creation of a third "daughter" firm by two partner firms.	Text will refer to either joint venture or jointly owned affiliate company, business, business unit or spin off.	Spin off of a company, creation of subsidiary, affiliate company, new business or business unit.

External finance raising strategy	This form of strategy focuses upon how pharmaceutical firms have raised finance through arrangements with external organisations.	Does not include the selling (liquidation or divestment) of assets or licensing out agreements. This category does not include cooperative arrangements relating to the external raising of finance which involve the firm having equity placed in it by the partner firm.	Gaining equity investment as a result of a cooperative arrangement, bank loan, Initial Public Offering (IPO), further issuing of shares, debenture investment.
Product divestment and licensing out strategy	This form of strategy relates to a firm entering into or expanding licensing out agreements, the granting of marketing rights to products or divesting products	This does not include divestment of a complete firm and does not include using another firm's salesforce to sell the product. It does include cooperative agreements which involve payments being received from the partner firm(s), for example milestone payments.	Divestment of a single product, product line or product portfolio or entering into/expanding licensing out agreements related to pharmaceutical products e.g. granting a firm access to marketing rights to a product or patent rights.

APPENDIX F
PUBLICATIONS AND CONFERENCE PAPERS

The following papers were based upon the literature review, data collection and data analysis conducted for my doctoral studies.

Peer Reviewed Conference Proceeding

Langley, A., Kakabadse, N. and Swailes, S. (2004). 'A Methodological Framework For Analysing Strategic Change In The Pharmaceutical Industry', *British Academy of Management Conference*. 19 pages.

Forthcoming Publication

Langley, A., Kakabadse, N. and Swailes, S. (Forthcoming). 'Grand Strategies and Strategic Actions In The Pharmaceutical Industry: 2001-2002', *Technology Analysis & Strategic Management*. 33 pages.

Papers Under Review

Langley, A., Kakabadse, N. and Swailes, S. The Evolution & Coevolution Of Realised Strategies Prior To Liquidation: The Case Of Bioglan Pharma Plc.,30 pages.

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