ALLIANCE PORTFOLIO DIVERSITY

A Study of the Impact of Multilevel Factors on the Diversity in Pharmaceutical Multinational Corporations' Alliance Portfolios

Copenhagen Business School

M.Sc. Strategy, Organization & Leadership

Master Thesis, August 2012

Student Information

Helena Elisabeth Harton Reichwald

Counsellor Information

Professor Bo Bernhard Nielsen

Strategic Management and Globalization

Number of characters: 171.945

Executive Summary

Many companies apply cooperative strategies to attain competitive advantage and are, as a consequence hereof, often engaged in multiple simultaneous alliances, constituting an alliance portfolio. Whilst numerous research scientists have explored the topic of strategic alliances, alliance portfolio research remains limited and existing literature is primarily dominated by empirical studies of the relation between portfolio diversity and performance. These limitations to existing literature induce opportunities for further research and have inspired this research thesis to investigate the very driving forces of diversity in alliance portfolios, which represents a, at present, relatively unexplored topic. Specifically, in conformation to the assumption that strategic alliances and, hence, alliance portfolios are naturally embedded in a multilevel context and that this context will have influence on portfolio diversity, this thesis explores the impact of multilevel factors on the diversity in pharmaceutical multinational corporations' alliance portfolios. In continuation hereof, this thesis demonstrates the complex and multilevel nature of alliance portfolios by applying the pharmaceutical industry to exemplify how factors at different levels influence portfolio diversity. Analysis of the multilevel context of alliance portfolios has enabled this author to identify a number of factors at the industry-, country-, and company-level, respectively, that may affect the diversity in the alliance portfolios of pharmaceutical companies. These identified factors have been applied in developing a number of propositions on the causal effects of multilevel factors on portfolio diversity and, subsequently, these propositions have been applied in developing a framework for predicting the diversity in pharmaceutical companies' alliance portfolios. In order to descriptively and tentatively 'test' the propositions and, thus, the framework, empirical observations of 27 pharmaceutical multinational corporations and their alliances are introduced and lay the foundation for a discussion on multilevel complexity, which addresses the simultaneous influences that the multilevel factors induce. Generally, this research thesis serves to advance the alliance portfolio research field by offering an integrated, multilevel approach to analyzing and predicting alliance portfolio diversity. Moreover, this thesis serves to provide strategic directions for managers operating within the pharmaceutical industry by drawing attention to both the opportunities and challenges of cooperation and the many factors that have to be incorporated in the cooperative strategies that are to enable these industry players to attain multiple goals through a number of simultaneous alliances.

Table of Content

i Introduction to the Concept of Strategic Alliance

According to Michael Porter (1985), competitive advantage is essential for a company's performance in competitive markets. In order to create and sustain competitive advantage, companies enact various strategies; one of which may be cooperation. A cooperative strategy may be considered a company's attempt to realize objectives through cooperation with other organizations rather than in competition with them. According to John Child, David Faulkner, and Stephen Tallman (2005: 1), '*a cooperative strategy can offer significant advantages for companies that are lacking in particular competencies or resources to secure these through links with others possessing complementary skills or assets; it may also offer easier access to new markets, and opportunities for mutual synergy and learning*'. In continuation hereof, Porter (1990: 66) argues that cooperation through alliance with other organizations may offset competitive disadvantages, while preserving independence and foregoing the need for a costly merger. These potential advantages of cooperation may create the very rationales for companies to enter strategic alliances with one or more partner organizations; an unmistakable trend that has altered business landscapes through the past decades (Reuer: 2004: 1). However, it is vital to note that despite the promising potentials of cooperation, some research scientists, including Porter, consider alliances as transitional devices based on the argument that companies have to create and sustain competitive advantage through an internal rather than external focus, in order to succeed in the long term (Porter: 1990: 67).

While strategic alliances represent a practice increasingly exploited by organizations, they equally represent a field of study increasingly explored by research scientists. At present, there exist numerous empirical and theoretical studies on the concept of strategic alliances developed from different research streams, such as economic perspectives, real options perspectives, learning perspectives, relational perspectives, etc. (Reuer: 2004). These studies offer valuable insight into the complex organizational structure of alliances, as they explore the topics of cooperation motives, partner and form selection, interorganizational trust, negotiation, governance, management and control, organizational learning, and performance and evaluation (Child et al: 2005). As the extensive volume of strategic alliance research may indicate, alliances can differ on a number of parameters. For example, strategic alliances can differ in *function*, which represents the activities, such as research and development, manufacturing, marketing, etc., for which a company utilizes an alliance, *partner*, which represents the type of partner, in terms of industry, organization type, nationality, etc., with which a company allies, and *governance*, which represents the structures with which a company manages an alliance (Jiang et al: 2010: 1137). Both the parameter of partner and governance are crucial to the performance of an alliance and, consequently, companies have to be due diligent in the selection of partners and governance structures, which is a notion of significance, when considering the fact that strategic alliances have a failure rate that is projected by research scientists to range as high as 70 percent (Reuer: 2004: 2).

i.i Existing Literature on Strategic Alliance Portfolio

In comparison to research on strategic alliances, there exists only a limited amount of research literature on alliance portfolios. According to Ulrich Wassmer (2010), strategic alliances have become an essential part of corporate strategy and, consequently, many companies are engaged in multiple simultaneous alliances with different partners, constituting an alliance portfolio. In continuation hereof, an alliance portfolio is commonly defined as '*the aggregate of all strategic alliances maintained by a focal company*' (Wassmer: 2010: 2), which is a definition that comprises various types of cooperative agreements between two or more partner organizations. As previously mentioned, there exist several rationales for companies to enter strategic alliances and, thus, every alliance within a portfolio will have its own purpose. Hence, an alliance portfolio will be constituted by a number of different cooperative agreements that all support a given company's strategic agenda through their individual purposes and the combination of these purposes will constitute a portfolio characterized by either homogeneity or heterogeneity. According to Werner Hoffmann (2007: 831), the pursuit of multiple goals through a number of simultaneous alliances will enable a company to obtain greater overall alliance benefits; however, one may argue that increased alliance portfolio complexity will have an effect on the overall performance, which may not be unambiguously positive.

Existing literature on strategic alliance portfolios provides evidence of the fact that there are many different dimensions, through which one can define alliance portfolio diversity or complexity, and one may argue that the inconsistency in these conceptualizations indicates the infancy of the alliance portfolio research field. Portfolio diversity may be defined through the *number*, *dispersion*, *redundancy*, and *linkage intensity* of the alliances within a portfolio (Hoffmann: 2007: 834), through the *alliance types* and *geographical locations* within a portfolio (Duysters & Lokshin: 2011: 571), or through the previously mentioned dimensions of *function*, *partner*, and *governance* (Jiang et al: 2010: 1137). The concepts of alliance portfolio 'diversity' or 'complexity' have served as foundation for many empirical studies, addressing the relation between alliance portfolio configuration and performance. The findings of these studies are, however, somewhat ambiguous, which may further indicate the infancy of this research field. Geert Duysters and Boris Lokshin (2011) argue that portfolio complexity is positively associated with performance, as complexity facilitates learning and innovativeness, but only to a certain degree, as organizations have limited management capacity to deal with this complexity. On the contrary, Ruihua Jiang, Qingjiu Tao, and Michael Santoro (2010), as well as Anthony Goerzen and Paul Beamish (2005), argue that portfolio diversity is negatively associated with performance, but only to a certain degree, as organizations become more adept at dealing with costs, and as learning and resource benefits accumulate. In continuation hereof, many of the existing studies support the argument that companies need to develop capabilities for managing alliance portfolios, in order to create and capture value and, thereby, improve the overall performance (Lavie: 2009; Sarkar et al: 2009; Heimeriks et al: 2009).

i.ii Specification of the Chosen Research Area

The existing literature on strategic alliance portfolios is limited and primarily dominated by empirical studies on the relation between portfolio diversity and performance. These limitations induce numerous opportunities for further research. Namely, the very driving forces of diversity in alliance portfolios represent a, at present, relatively unexplored research topic. Hoffmann (2007) is, to this author's knowledge, the only research scientist, who has attempted theorization on this topic by describing, how a company's strategy, characterized by intentions of *shaping*, *adapting to*, or *stabilizing* a given business environment, may have determining influence on alliance portfolio configuration in terms of size and partner dispersion. In conformation to Hoffmann's notion that corporate strategy has a determining influence on alliance portfolio configuration, it becomes interesting to conduct research on the factors that determine corporate strategies, as these indirectly will determine cooperative strategies and, thus, alliance portfolio diversity. According to Mike Peng (2009), corporate strategy is formed by institutional conditions and transitions, industry-based competition, and company-specific resources and capabilities, and based on this notion, one may argue that country-, industry-, and company-level factors have an indirect, yet determining, influence on alliance portfolio diversity, as portfolio diversity is considered the outcome of an overall corporate and, moreover, cooperative strategy. This argument creates the very foundation for the research area of this thesis, which will attempt to create an understanding of how multilevel factors affect the diversity in an alliance portfolio by analyzing the multilevel context in which a portfolio is created and by developing a number of propositions and a framework for predicting portfolio diversity.

The concept of alliance portfolio diversity indicates that there exists a degree to which a portfolio is or is not diverse, and basic assumptions of this research thesis are that alliance portfolios can, as point of departure, exhibit the highest possible degree of diversity, and that industry-, country-, and company-level factors will have a moderating effect on this degree of diversity. As indicated in the previous section, there exist many different dimensions of the concept portfolio diversity, and the ones that will be applied in this research thesis are: i) *portfolio function diversity*, ii) *portfolio partner diversity*, iii) *portfolio location diversity*, and iv) *portfolio governance diversity*, as they are considered to represent highly relevant aspects of portfolio diversity and are, in continuation hereof, often applied in strategic alliance research. The first dimension represents the range of activities within an alliance portfolio, the second dimension represents the range of partner types within an alliance portfolio, the third dimension represents the geographical spread of activities within an alliance portfolio, and the fourth dimension represents the range of governance structures within an alliance portfolio. The inclusion of all these four dimensions will enable a nuanced understanding of the concept alliance portfolio diversity and each of the dimensions will be divided into subcategories, which will be explained in the section *Methodology*.

i.ii.i The Relevance of Multilevel Research

The purpose of a multilevel research approach is to advance existing research literature by integrating theories operating at different levels and specifying the links between concepts from different levels of analysis (Nielsen: 2010: 3). According to Bo Bernhard Nielsen (2010), existing research on strategic alliances primarily operates at a single level of analysis, neglecting the multilevel nature of alliances, which includes an individual-, a company-, an interorganizational-, an industry-, and a country-level. Consequently, there exists potential for improving theorization, which will be attempted in this thesis through research analysis at three different levels, namely the country-, industry-, and company-level, and analysis of the complex interactions between these. In relation to alliance portfolios, the basic assumptions of this research approach are that portfolios are embedded in a multilevel context and that this context will have crucial influence on alliance portfolio diversity. Hence, theorization based on merely one level of analysis will result in unilateral simplification; however, it is vital to note that multilevel research induces increased complexity and in conformation to this research approach, the researcher is increasingly challenged methodologically.

The three chosen levels of analysis are highly intertwined and the combination of these is considered to contribute to an integrated understanding of the context in which alliance portfolios are configured and, thus, portfolio diversity. Companies and, moreover, alliances are naturally embedded in country-specific contexts, and in the light of globalization and increased corporate internationalization, the country-level of analysis appears to be lucrative, as it enables the researcher to gain insight into the opportunities and challenges of international strategies. Each country-specific environment will encompass unique advantages and constraints, and the significance of these highly depends on the industry in question (Porter: 1990: 69). Consequently, the country-level of analysis necessitates inclusion of the industry-level. In order to decrease the complexity of this thesis and, thereby, enable the research to provide in-depth insight, one particular industry has been chosen as focal point of analysis, namely the pharmaceutical industry. The pharmaceutical industry is unique in character and analysis hereof will enable the research to provide insight into the competitive premises that dictate the corporate strategies and, thus, the cooperative strategies of the industry players. However, despite the fact that industry factors may have a strong influence on these strategies, company-level factors are also considered of great consequence and, therefore, this analysis level is also included in the research. In order to further decrease the complexity of this thesis, the research will exclusively focus on multinational corporations, based on an assumption from prior research that states that small or medium sized companies will have different rationales for cooperation, compared to large established corporations (Hoffmann: 2007: 850). Based on these research specifications, the following research question has been developed and will lay the foundation for this research thesis.

i.ii.ii Research Question

How do industry-, country-, and company-level factors affect the diversity in pharmaceutical multinational corporations' alliance portfolios?

This research question will lay the foundation for analysis of:
i) *The multilevel context of alliance portfolios*
ii) *The multilevel factors in alliance portfolio diversity*

The latter analysis will enable the development of a:
Framework on the diversity in pharmaceutical multinational corporations' alliance portfolios

i.iii Research Contributions and Delimitations

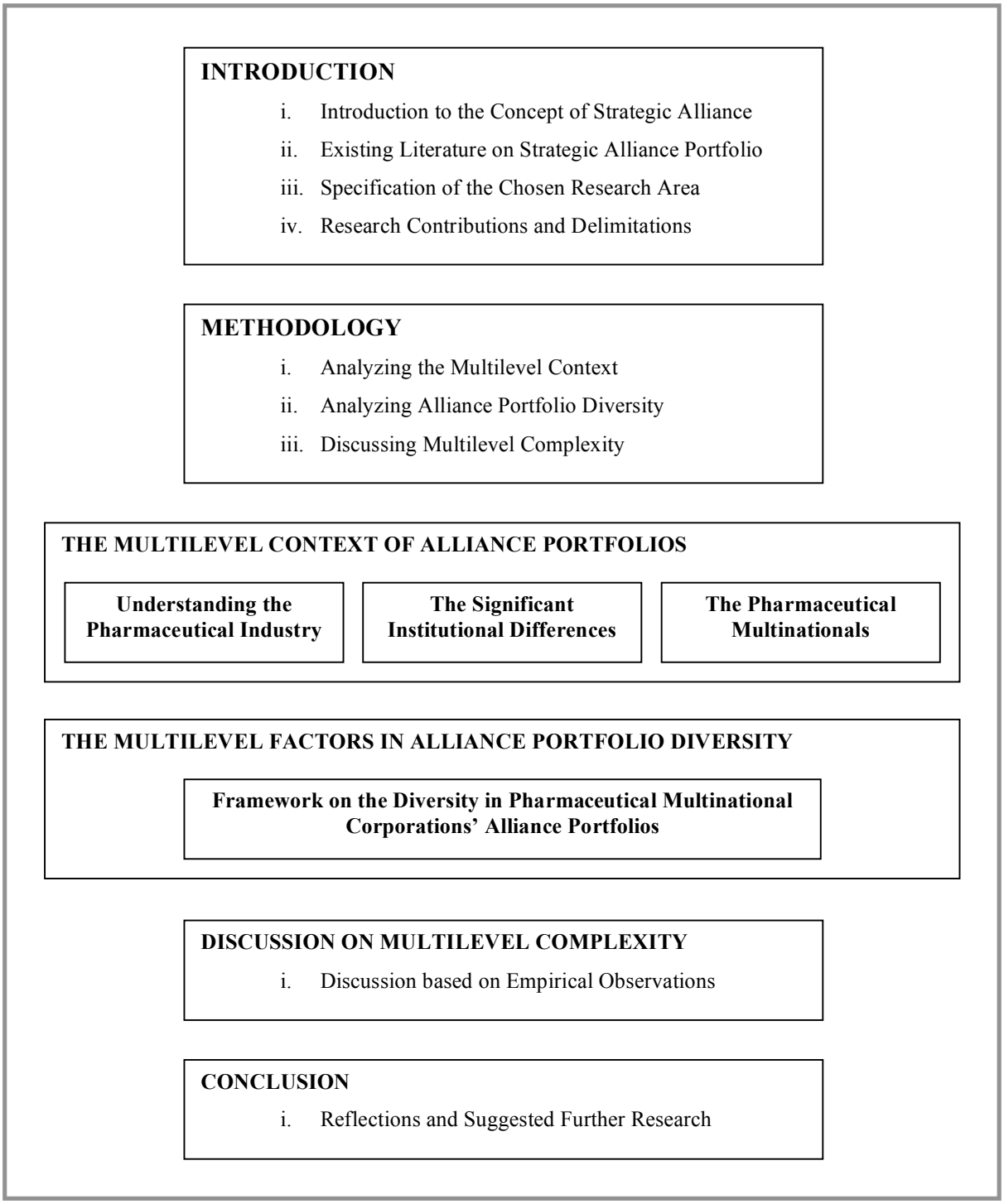
This research thesis will contribute to existing literature on strategic alliance portfolios in a number of ways. Firstly, this thesis will, to this author's knowledge, represent the first multilevel research conducted in the field of alliance portfolios. Through a multilevel research approach, it will attempt to provide a nuanced understanding of the context in which alliance portfolios are configured and, in continuation hereof, the determining effect that factors at the country-, industry-, and company-level have on portfolio diversity in the four dimensions, namely function, partner, location, and governance, respectively. Secondly, it will advance the alliance portfolio research field by developing a number of propositions and a framework that serve to provide insight into the multilevel nature of alliance portfolios and predict the diversity in pharmaceutical multinational corporations' alliance portfolios. The propositions that will constitute this framework will, subsequently, be discussed and related to descriptive statistics, which are to be developed based on empirical observations of 27 pharmaceutical multinational corporations' alliance portfolios from 1989 to 2008. These discussions will serve to provide indications of how empirical data relates to the developed propositions and framework and, thus, of the impact that the multilevel factors simultaneously have on the diversity in pharmaceutical multinational corporations' alliance portfolios.

As well as contributions, there are a number of delimitations to this research thesis. Fundamentally, the multilevel research approach induces a certain level of complexity, which further increases with the notion that each of the selected levels of analysis is dynamic in nature, constituting a moving target. Consequently, the developed framework will be based on multilevel research, which reflects current country-, industry-, and company-level factors without a historical perspective. Hence, the applicability of the framework may decrease with changes in the research variables, which are likely to evolve over time. Another delimitation to this research thesis is founded in the exclusion of the individual and the interorganizational level of analysis. The exclusion of the individual level is made in attempt to reduce research complexity, however, it

is important to note that this level of analysis is relevant and has enabled prior research to provide insight into the potential threat of agency hazards (Reuer & Ragozzino: 2006). In continuation hereof, the exclusion of the interorganizational level of analysis is made in conformity to the portfolio approach, which centers the focal company rather than the dyadic relationships; however, it is vital to note that some theoretical constructs at this level of analysis may be included in developing the research propositions. Furthermore, research delimitations are found in the exclusive focus on the pharmaceutical industry and on multinational corporations. In addition to these latter delimitations, the research will exclusively focus on the market for prescription drugs and, thus, on the corporations that produce and market these products. Moreover, the research will exclusively focus on multinational corporations with home base in developed markets, based on the notion that developed and emerging market companies differ fundamentally in their competencies and strategic orientations (Khanna & Palepu: 2010: 165). The consequence hereof is that the generalizability of the developed propositions and framework will be limited, as it is not likely to be applicable to other industries, to small and medium sized companies, to the market segment of drugs that do not require prescriptions, or to emerging market companies. A final delimitation is found in the fact that descriptive statistics will be applied to provide indications of the relation between the developed propositions and empirical observations, inhibiting verification or falsification. These delimitations are made in order to reduce the complexity of the thesis and, thereby, enable in-depth research to be conducted within the given frame of formality demands, and they should be perceived as indications of future research opportunities within the field of alliance portfolio diversity.

ii Research Structure

The structure of this research thesis is presented through the following illustration:



iii Methodology

The specification of the chosen research area has lead to a number of methodological, theoretical, and empirical considerations that, moreover, have led to a number of selections and, inevitably, even more de-selections. Methodologically, this thesis will be founded in an *explanatory research design*, which, according to Mark Saunders, Philip Lewis, and Adrian Thornhill (2007: 134), implies that the research aims to establish causal relationships between variables. This research design appears suitable, as the aim of this thesis is to explain the relationships between multilevel variables and their causal effects on alliance portfolio diversity. In continuation hereof, the research philosophy underlying this thesis is the epistemological position named *realism*, representing a post-positivism philosophy, which argues that reality exists independent of the human mind, indicating conformation to the ontology of *objectivism* (Saunders et al: 2007: 104). Realism represents an epistemology that is typically adopted in business and management research, and there exist two branches of this position, namely *direct realism* and *critical realism*. The former argues that what we experience through our senses accurately portrays the world, while the latter argues that what we experience are sensations or images of the world (Saunders et al: 2007: 105). Furthermore, direct realism suggests that the world is relatively unchanging and that it operates at merely one level. On the contrary, critical realism emphasizes the importance of multilevel studies, acknowledging the complex nature of reality and the need of addressing different levels and their interaction with each other; a phenomenon can only truly be understood, if the social structures that have given rise to it are addressed through the practical and theoretical processes of the social sciences (Saunders et al: 2007: 105). This latter notion indicates that critical realism is highly aligned with the fundamental assumptions of this research thesis. Therefore, this author conforms to this epistemological position and, as a consequence hereof, the research approach will be founded in *deduction* and, thus, existing theories will be applied to develop new propositions on causal relationships between variables and these propositions will be discussed against quantitative data. It is vital to note that the theories that will be applied may be founded in other epistemological positions than critical realism; however, in conformation to the assumptions of post-positivistic philosophy, they will be employed to propose law-like generalizations through a deductive research approach.

In the following sections, the methodological approach to i) analyzing the multilevel context of alliance portfolios, ii) analyzing the multilevel factors in alliance portfolio diversity, and iii) discussing multilevel complexity based on empirical observations will be presented and argued, providing the reader with a chronological overview of this thesis. The first section will present and argue for the selected theories and data that will be applied in the analysis of the multilevel context. It is vital to note that these theories and data will not be described in the methodology, in order to minimize the level of redundancy in the thesis, as such descriptions, and theoretical discussions, will appear throughout the analysis. The second section will

present and argue for the selected dimensions and subcategories of alliance portfolio diversity, as well as describe how the factors identified at the context analysis level will be analyzed against these dimensions. The third, and last, section will present the data that will be applied in the discussion on multilevel complexity.

iii.i Analyzing the Multilevel Context of Alliance Portfolios

As previously mentioned, alliance portfolios are perceived as multilevel phenomena and, thus, a multilevel research approach is perceived to enable an integrated understanding of these phenomena, as it reveals the richness of social behavior and draws attention to the context in which behavior occurs (Nielsen: 2010: 2). However, whilst multilevel research has its benefits, it also entails a level of complexity that methodologically challenges the researcher. Namely, careful attention to the levels of *theory*, *measurement*, and *analysis*, has to be paid in order to avoid research discrepancies (Nielsen: 2010: 2). This author attempts to meet these challenges in multilevel research by making a clear distinction between the levels of theory, measurement, and analysis in analyzing the multilevel context of alliance portfolios, and the chosen levels of theory and data, including the country-, industry-, and company-levels, will be presented and argued in the following discussions. Due to the fact that the country- and company-levels of analysis appear to be constrained by industry-specific factors, this latter level of analysis will serve as reference point and, thus, be analyzed prior to the others. It is important to note that the analysis of the multilevel context will neither address strategic alliances nor alliance portfolios, but serve as foundation for the subsequent analysis section on the multilevel factors in alliance portfolio diversity.

In analyzing the multilevel context of alliance portfolios, the first section *Understanding the Pharmaceutical Industry* will apply theory and data at the industry-level of analysis. In regard to theory, Porter's (1980) *Five Forces Framework* will be applied, as this will enable the research to provide insight into the competition and the nature of the industry infrastructure. Theoretical references will primarily be given to Porter's *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (1980) and, thus, only limitedly to other authors' interpretation of Porter's framework. However, as the five forces framework represents a technique for analyzing industries in general, recent data on the pharmaceutical industry is included in this analysis section, in order to enable in-depth knowledge to be generated about this particular industry. It is vital to note that secondary data will be applied, as the data required in the industry analysis, as well as the other levels of analysis, are readily available from a number of reliable sources, and this data will be of a quantitative nature. Specifically, the sources, from which the data is obtained, include Evaluate Pharma, European Federation of Pharmaceutical Industries and Associations, World Health Organization, Datamonitor, Boston Consulting Group, Reuters, and a number of academic journals reputed for quality

journalism. The data obtained from these, arguably highly reliable, sources all serve to provide insight at the industry-level, ensuring an alignment between the applied theory and measurement.

In analyzing the multilevel context of alliance portfolios, the second section *The Significant Institutional Differences* will apply theory and data at the country-level of analysis. In contrast to the industry-level of analysis, this section will apply a number of theories, including *institutional theory* by Douglass North (1990) and William Richard Scott (2001), *theory on culture* by Geert Hofstede (2012), *theory on emerging and developed markets* by Tarun Khanna and Krishna Palepu (2010) and Anil Gupta and Haiyan Wang (2009), c*lassic and contemporary location theory* by Shelly Kimelberg and Lauren Nicoll (2012), *theory on foreign direct investment* by Mike Peng and Klaus Meyer (2011), and finally *theory on regionalization* by Alan Rugman (2005). The reason for including all of these theories is that they all conform to the institutional perspective, except for classic and contemporary location theory, and, in continuation hereof, complement each other by offering different theoretical angles within this perspective. Hence, the combination of these theories is to ensure a nuanced overview of the opportunities and challenges of international operations in the pharmaceutical industry. Data is to be included throughout this analysis section in order to support the theories and provide in-depth insight into the industry-specific challenges and opportunities. Specifically, the sources, from which the data is obtained, include World Health Organization, The World Bank, European Federation of Pharmaceutical Industries and Associations, and a number of academic journals reputed for quality journalism; all of which are to ensure alignment between the applied theory and measurement.

Finally, in analyzing the multilevel context of alliance portfolios, the third section *The Pharmaceutical Multinationals* will apply theory and data at the company-level of analysis. In regard to theory, Porter's (1985) *generic strategies* and *the resource-based view* by Robert Grant (1991) and Jay Barney (1991) will be applied, as this will enable the research to provide insight into company internal perspectives; in contrast to the theories at the industry- and country-levels of analysis, which argues from company external perspectives. In this section, there will not be introduced new data; both as the data analyzed in the other sections will have provided sufficient insight to discuss the company internal perspective, and as this thesis does not represent a case study, whereby one or few organizations are to be emphasized. The final part of the company-level analysis will include the *theory of transaction cost economics* by Oliver Williamson (1998), which is arguably a theory that operates on the border between the company-level and the interorganizational level of analysis, as transactions constitute the core theoretical construct. Despite hereof, the theory is included and it serves to both complement the resource-based view and to bridge the two main analysis sections, *The Multilevel Context of Alliance Portfolios* and *The Multilevel Factors in Alliance Portfolio Diversity*.

iii.ii Analyzing the Multilevel Factors in Alliance Portfolio Diversity

With point of departure in the analysis of the multilevel context of alliance portfolios, the effect that multilevel factors have on the diversity in pharmaceutical multinational corporations' alliance portfolios will be analyzed and discussed. According to David Harrison and Katherine Klein (2007), much of the existing literature on diversity neglects to properly and consistently conceptualize the diversity phenomenon, often causing inconclusive research findings, which is evident in the literature on alliance portfolios, as existing research, addressed in the thesis introduction, both argue positive and negative association between portfolio diversity and performance. As diversity represents a unit-level construct, it can be applied in the description of diversity of a given attribute within a unit, and in this case, an alliance portfolio (Harrison & Klein: 2007: 1200). Diversity may be conceptualized in three different ways, namely through *separation*, which can indicate differences amongst alliances in terms of their positions on a horizontal continuum, *variety*, which can indicate differences amongst alliances in terms of their categorical affiliations, and *disparity*, which can indicate differences amongst alliances in terms of their possession of valued attributes (Harrison & Klein: 2007: 1207). This author will conform to the diversity conceptualization variety by dividing each of the four selected dimensions, namely function, partner, location, and governance, into a number of subcategories. The four dimensions and their respective subcategories will be presented and argued in the following discussions and will lay the foundation for the analysis section *The Multilevel Factors in Alliance Portfolio Diversity*, whereby theoretical and empirical perspectives from the context analysis will be integrated and applied in developing propositions that are related to each of the dimensions, respectively, and, subsequently, in developing a framework on the diversity in pharmaceutical multinational corporations' alliance portfolios. This framework will comprise of the developed propositions and it advances the alliance portfolio research field by offering an integrated, multilevel approach to predict alliance portfolio diversity. It is vital to note that propositions and, thus, not hypotheses are developed; the difference being that hypotheses are to be tested and that propositions are not, indicating that this thesis will not directly test but rather discuss the propositions against empirical data, which will be addressed in the following section *Discussing Multilevel Complexity based on Empirical Observations*.

In analyzing the multilevel factors in alliance portfolio diversity, the first section *Multilevel Factors in Function Diversity* will address the function dimension of portfolio diversity. This dimension is divided into the following four subcategories, which are considered to represent typical functions for alliances in the pharmaceutical industry and are related to the activities, in which the alliance partners engage:

Portfolio Function Diversity

i. *Research and Development*
ii. *Manufacturing*
iii. *Marketing*
iv. *Licensing*

Based on this sub-categorization of the function dimension, an alliance portfolio is considered to be characterized by maximum diversity, if all of the four categories are present, moderate diversity, if two or three categories are present, and minimum diversity, if only one of the categories is present; a principle that is applicable for all of the four dimensions of diversity. This author is aware of the fact that there exist a number of other functions that could be included in this categorization; however, in respect of the frame of formality demands that is associated with this thesis and in attempt of reducing complexity, only the four listed categories will be included in the discussions on alliance portfolio function diversity.

In analyzing the multilevel factors in alliance portfolio diversity, the second section *Multilevel Factors in Partner Diversity* will address the partner dimension of portfolio diversity. This dimension is divided into the following three subcategories, which are related to the partner organizations' industry positioning:

Portfolio Partner Diversity

i. *Same Industry*
ii. *Related Industry*
iii. *Unrelated Industry*

This categorization of partner organizations' industry positioning will be conducted based on the acknowledged Standard Industrial Classification (SIC) code list. Specifically, the first subcategory *same industry* will include organizations operating within the industry group *drugs*, ranging from SIC codes 2830 to 2839, the second subcategory *related industry* will include organization operating within the industry group *chemicals and allied products*, ranging from SIC codes 2800 to 2899 (2830 to 2839, exclusive), and the third subcategory *unrelated industry* will include organizations operating within all other industry groups, ranging from SIC codes 100 to 2799 and 2900 to 9995 (US Securities and Exchange Commission: 2012). Prior research has often drawn upon this categorization method to operationalize business relatedness in corporate portfolios (Hoskisson et al: 1993), however, it is vital to note that this method may lead to misspecifications due to the simplistic nature of this classification system (Nielsen: 2010: 7). Furthermore,

this author is aware of the fact that this sub-categorization of the alliance portfolio partner dimension excludes other, potentially valuable, categories such as partner nationality and organization type.

In analyzing the multilevel factors in alliance portfolio diversity, the third section *Multilevel Factors in Location Diversity* will address the location dimension of portfolio diversity. This dimension is divided into the following five subcategories, which are related to the location of the activities, in which the alliance partners engage, in terms of both market type and region:

Portfolio Location Diversity

i. *Developed Market, Home Region*
ii. *Developed Market, Host Region*
iii. *Emerging Market, Host Region*
iv. *Emerging Market, Home Region*
v. *Supranational*

This categorization of the location dimension of alliance portfolio diversity will be conducted based on both a classification of market types, including emerging and developed markets (cf. Appendix ix.v), and a classification of regions, whereby home region implies that the alliance activities are located in the same region as the focal company and host region implies that the alliance activities are located in a different region than the focal company. Note, that the differences between the market and region types will be addressed in the analysis of *The Significant Institutional Differences* in the multilevel context of alliance portfolios. The fifth subcategory of the location dimension, namely *supranational*, does not encompass a specification of neither market nor region type, as this refers to alliance activities that are located across markets and regions and, potentially, across the market type classifications. However, it is vital to note that the data does not account for the exact meaning of the term supranational and that the assumption that it refers to cross market and region operations is an interpretation made by this author.

Finally, in analyzing the multilevel factors in alliance portfolio diversity, the fourth section *Multilevel Factors in Governance Diversity* will address the governance dimension of portfolio diversity. This dimension is divided into the following two subcategories, which are related to the governance structure that is applied in alliance formation:

Portfolio Governance Diversity

iv. *Non-Equity*
v. *Equity*

This categorization of the governance dimension of alliance portfolio diversity is made in conformation to the often-applied dichotomous distinction between governance structures, namely non-equity or equity arrangements. Whilst a non-equity governance structure represents a contractual relationship between two or more partner organizations, an equity governance structure represents establishment of an administrative hierarchy that grants the partner organizations ownership shares and access to direct organizational monitoring and control.

iii.iii Discussing Multilevel Complexity based on Empirical Observations

The analysis sections will serve to generate insight into both the multilevel context of alliance portfolios and the multilevel factors in alliance portfolio diversity. In attempt to hedge the challenges of multilevel research, this author will make a clear distinction between the three different levels of theory, measurement, and analysis throughout the analysis sections and, as a consequence hereof, the developed propositions and framework will reflect, how each level individually may have impact on alliance portfolio diversity. However, this author acknowledges the complexity of multilevel phenomena and, thus, the fact that the three levels interact and induce simultaneous influences on portfolio diversity. In order to address this complexity, empirical observations will be introduced and lay the foundation for a discussion on multilevel complexity and, thus, on the impact that the multilevel factors may simultaneously have on the diversity in pharmaceutical multinational corporations' alliance portfolios. Moreover, the empirical observations will serve to descriptively and tentatively 'test' the theoretically founded propositions, enabling the research to relate theory to practice. The methodological approach to the applied data will be founded in descriptive statistics and this author acknowledges the fact that the data will, thus, not enable testing of the propositions, as this kind of statistics does not generate insight into the actual correlation between the multilevel variables and portfolio diversity, but rather provide empirical indications. The limitation of applying descriptive statistics is, thus, that the researcher will have to make assumptions about the correlation between the variables and, in this case, assumptions about how the multilevel factors may have affected portfolio diversity, indicating that logic leaps and false assumptions may pose a viable threat to validity. Despite hereof, it is considered of great value to include empirical observations, as these will enable the research to not only advance existing theory by offering an integrated, multilevel approach to predict alliance portfolio diversity but also provide insight into the actual diversity in pharmaceutical companies' alliance portfolios.

With access granted by professor Bo Bernhard Nielsen, the empirical observations have been drawn from the *Worldscope* database, which includes data on the world's 2,000 largest companies based on sales in 2005. This data has been matched with available information on the strategic alliances of these companies from the *Thomson One Banker SDC Platinum Module*, which contains information about publicly announced strategic alliances of all companies dating back to 1989. Based on this matching exercise, the

initial sample has been reduced by including only companies operating within the industry group *drugs* and, thus, the SIC codes 2833 to 2836. This final reduction has yielded a total of 27 companies with 739 strategic alliances, which indicates a certain, however questionable, level of generalizability of the empirical data, as these 27 companies and their alliances are to provide indications of trends in the entire industry. In respect of the research delimitations, this author has researched each of these 27 companies and, thereby, assured that they all represent pharmaceutical multinational corporations that produce and market prescription drugs and that they all have home base in a developed market, in accordance with the market type specifications provided in Appendix ix.v. The data has subsequently been processed and is presented in four frequency tables in Appendix ix.i to ix.iv, which address the portfolio function, partner, location, and governance diversity dimensions, respectively. Each of these tables encompasses a list of the 27 companies included in the empirical data and an overview of, in which regions these companies have their home base. Thereby, the tables provide the reader with an overview of the alliance portfolios, within the four diversity dimensions, respectively, of each of the 27 companies and the aggregate hereof is listed at the bottom. The first table *Portfolio Function Diversity* (Appendix ix.i) is the result of a frequency study of the four subcategories within the function dimension. It is vital to note that a number of the alliances in the database include agreements within more than one function, and as the alliances are listed by the number of functions, instead of the actual number of alliances, the aggregate becomes 1.089 alliances. The following tables *Portfolio Partner Diversity* (Appendix ix.ii), *Portfolio Location Diversity* (Appendix ix.iii), and *Portfolio Governance Diversity* (Appendix ix.iv) are the result of frequency studies of the subcategories within the partner, location, and governance dimension, respectively; the aggregate of each of these studies amounting to 739 alliances. In regard to location diversity, two of the subcategories have been merged into one, as the percentages of alliances within these categories are very small, namely emerging market in home and host region. Based on these frequency studies and the calculated aggregates, four pie charts, which provide overview of the percentage-wise spread of the subcategories within each of the four diversity dimensions, respectively, has been developed (cf. *Discussion on Multilevel Complexity, figures vi.i-vi.iv*) and will serve as foundation for the discussion section.

iv Analysis I: The Multilevel Context of Alliance Portfolios

Prior to identifying and discussing the effect that industry-, country-, and company-level factors will have on pharmaceutical multinational corporations' alliance portfolio diversity, it is considered vital to analyze the multilevel context, in which alliance portfolios are created. Consequently, this first main analysis section, *The Multilevel Context of Alliance Portfolios*, will include analysis of the pharmaceutical industry, the institutional environments and their attractiveness, and the multinational pharmaceutical companies. This section will lay the foundation for the following main analysis section, *The Multilevel Factors in Alliance Portfolio Diversity*.

iv.i Understanding the Pharmaceutical Industry

An industry may be defined as a group of companies that produce products, which are similar to each other (Peng: 2009: 34). In continuation hereof, the pharmaceutical industry consists of a group of companies, which develop, produce, and market drugs that are approved for use as medications for the purpose of preventing or treating diseases. This industry is global in character and is often referred to as one of the most profitable industries, representing a substantial market with 662 billion USD in 2010 worldwide sales of prescription drugs (Evaluate Pharma: 2010). The reason for the global and profitable nature of this particular industry may be founded in the fact that the products developed by this industry hold the potential of improving and sustaining human life, making it possible to realize the hopes and dreams of millions of people. Alongside the growth of the human population, the spread of diseases, and the individual's buying power, the demand for new and improved drugs will be growing continuously, creating corporate incentives for large scale research and development (R&D) investments. In fact, this industry holds the highest ratio of R&D investment to net sales, which amounts to approximately 18.9 percent of the total worldwide business R&D expenditure (European Federation of Pharmaceutical Industries and Associations: 2011: 10). These investments in R&D have increased significantly during the past decades; however, a global R&D spend analysis conducted by Evaluate Pharma (2010) provides evidence to the fact that the R&D investment growth rate per year has been declining in recent years, which indicates changes in the industry internal behavior. In order to enable an enhanced understanding of the pharmaceutical industry, the changes that it appears to be undergoing and its internal competitiveness and profitability may be assessed through an industry analysis based on recent data.

Industry competition is a concept traditionally applied by Adam Smith (1776) in his *model of perfect competition* arguing the central role of *the invisible hand*, which essentially is a natural phenomenon that guides free markets and capitalism through competition for scarce resources. Perfect competition is, however, a condition that is rarely observed in the real world and in order to theoretically rectify the inadequacy of Smith's model, a more realistic branch of economics, namely industrial organization economics, has later emerged. One of the primary contributions to this branch of economics is Porter's *Five Forces Framework* introduced in *Competitive Strategy* (1980), which represents a highly acknowledged framework for industry analysis. The basic proposition of this framework is that the structure of an industry has strong influence on the formation of corporate strategy, and that this structure and, moreover, the state of competition in an industry depend on five basic competitive forces (Porter: 1980: 3). These five forces are derived from industrial organization economics, and they include three forces of horizontal competition; i) the intensity of rivalry amongst competitors, ii) the threat of substitute products, and iii) the threat of new entrants; and two forces of vertical competition; vi) the bargaining power of suppliers, and v) the bargaining power of buyers. The strengths of these competitive forces in an industry jointly determine the intensity of

industry competitiveness and profitability (Porter: 1980: 6). Furthermore, the strongest forces are the ones that will have the strongest influence on the strategies, enacted by the companies within the industry. The strength of the five forces in the pharmaceutical industry will be individually, and subsequently collectively, assessed in the following sections.

iv.i.i Rivalry Amongst Competitors

There exist a number of factors that determine the intensity of competitive rivalry in an industry, and these factors are subject to continuous change (Porter: 1980: 21). Two factors that are highly relevant in regard to the current competitive condition of the pharmaceutical industry are i) the growth of the industry and ii) the number of competing companies. Generally, the pharmaceutical industry has during recent years experienced a decline in the annual growth rate, both in terms of worldwide sales of prescription drugs and in terms of R&D investments. According to the global R&D spend analysis conducted by Evaluate Pharma (2010), both the sales and investment growth rates have declined from 11 percent in 2004 to 2 percent in 2010, which indicates that the R&D budgets are being reduced proportionally to the prescription sales. As one of the main growth drivers of this industry is innovation, facilitated by the significant R&D investments in new drug discovery and development, the decline in the R&D growth rate may threaten the industry growth. In continuation hereof, the corporate incentive to invest heavily in R&D is declining due to four current trends in the pharmaceutical industry: i) increasing R&D costs, ii) increasing drug development times, iii) declining per drug productivity, and iv) the growth of generic drugs (Gassmann et al: 2004: 4).

It has been estimated that developing a new drug, at present, requires an investment of approximately 1.2 billion USD and takes 12 to 13 years to bring to market (Kesic: 2011: 208). Moreover, it has been estimated that only 1 out of 10,000 substances becomes a marketable product, and only 3 out of 10 drugs generate revenue that meet or exceed the average R&D costs, allowing return on investment (Reuters: 2002). Based on these estimations and the general growth of generic drugs, it appears rational that pharmaceutical companies choose to rethink their R&D budgets. However, reduction of these budgets may threaten not only the growth of the industry but also the growth of the companies that rely heavily on new drug development. According to the World Health Organization (2012), generic drugs are defined as '*pharmaceutical products, usually intended to be interchangeable with innovator products, which are manufactured without a license from the innovator company and marketed after the expiry date of the patent or other exclusive rights*'. Hence, the introduction of these drugs threatens the profitability of the original drugs, as the return on investment in new drug development is most probable to be realized in the years, in which intellectual property rights protect the given drug. In continuation hereof, the industry internal rivalry consists in two different groups of competitors, namely the innovators that discover and develop new drugs and the imitators that copy these original discoveries. At present, generic drugs account for 69 percent of the

prescriptions dispensed worldwide; however, only for 16 percent of the money spent on prescription drugs (Generic Pharmaceutical Association: 2012), indicating that pharmaceutical innovation is more profitable than pharmaceutical imitation. The combination of declining industry growth rates and the general growth in generic drugs contribute to intensified rivalry amongst competitors, as these will be inclined to fiercely compete for the existing market shares (Porter: 1980: 18).

In regard to the number of competing pharmaceutical companies, one may argue that this industry is dominated by large multinational corporations, which is a statement supported by the fact that the ten globally leading pharmaceutical companies command an over 43 percent market share of the global market for prescription drugs. Furthermore, the ten globally leading generic pharmaceutical companies command an over 37 percent market share of the global market for generic drugs (Kesic: 2011: 218). Based on this notion, one may be prone to reason that the intensity of rivalry amongst competitors is limited, due to the fact that a relatively low number of competitors is likely to induce a recognition of mutual interdependence (Peng: 2009: 35). However, in the light of declining industry growth and an evident consolidation trend in the pharmaceutical industry, the rivalry appears rather intensified than limited. In recent years, a large number of pharmaceutical companies have strategically chosen to engage in mergers and acquisitions or alliances (Kesic: 2011: 214), which may facilitate product portfolio expansion, R&D productivity and scale, sales force expansion, cost reductions, and new targets. Specifically, a report by Datamonitor (2005) provides evidence to the fact that there have been more than 10.000 various strategic alliances in the global pharmaceutical industry in the past decade, which indicates that companies seek various ways to attain competitive advantage over their competitors.

iv.i.ii Threat of Entry

Companies generally have a strategic interest in keeping track of both their industry competitors and potential new entrants (Peng: 2009: 38). The same goes for the established companies in the pharmaceutical industry; however, the threat of new entrants in this industry is relatively low due to a number of substantial entry barriers, namely economies of scale, capital requirements, product differentiation, access to distribution channels, and ability and capacity to deal with regulatory affairs (Porter: 1980: 7-13). Entering the pharmaceutical industry is highly challenging and risky, especially as an innovator company, and the barrier of economies of scale, in terms of e.g. R&D and marketing, forces entrants to come in at large scale, as small scale operations will have significant cost disadvantages (Porter: 1980: 7). In continuation hereof, potential entrants that wish to compete in pharmaceutical innovation will need to invest a substantial amount of financial resources in new drug discovery and development, which has proven to be rather risky, as only 3 out of 10 drugs generate return on investment (Reuters: 2002). Equally, they will have to invest in marketing, in order to compete with the brand value of established pharmaceutical companies; however, it is

vital to note that marketing in this particular industry may be inhibited by governmental regulations (Parvis: 2002: 163-164). These substantial investments are not necessary, when entering the generic business; however, imitator companies are, as previously indicated, also far less profitable than innovator companies (Gassmann et al: 2004: 16). Finally, established companies have manufacturing and distribution systems that may be difficult to replicate, making it challenging for new entrants to secure competitive solutions, as well as extensive experience in dealing with regulatory affairs, representing an even more challenging part of entering and operating in the pharmaceutical industry (Gassmann et al: 2004: 16).

iv.i.iii Threat of Substitutes

Substitutes are defined as products of different industries that meet customer needs currently met by the focal industry (Peng: 2009: 42). As pharmaceutical products are highly specialized, companies in this industry are not likely to compete with companies from other industries, as products of the latter will not be able to substitute products of the former. Despite hereof, it is still relevant to discuss the role of substitutes within the pharmaceutical industry, as these will have a determining effect on drug pricing. Innovator companies have considerable latitude in setting prices for their drugs. Once they have obtained patent for their products and, hence, market exclusivity, they will naturally price their products so as to maximize profits, enacting the role of monopolists. However, market exclusivity does not necessarily entail monopoly status, as patented drugs may have similar therapeutic substitutes and, consequently, the market structure is often more properly defined as an oligopoly, in which relatively few companies have significant influence on the market prices (Cantor: 2002: 37). Intellectual property rights protection in terms of product or process patents will typically have an effective term of 20 years; however, it is vital to note that a part of this time period will be lost to the patent holders, as the 20 years include clinical trials and final administrative procedures (Cantor: 2002: 38). Once the patents expire, the generic drug producers present a new source of competition. According to a report by Boston Consulting Group (1996: 35), the introduction of generic substitutes does, however, not affect the prices of the original products till several generic equivalents are marketed. Moreover, imitator companies will price their products relative to the prices of the original products, in contrast to innovator companies that price relative to their production costs, often resulting in generic substitutes costing roughly 30 percent less than the original products; a price that will also decrease as more generic equivalents are introduced (BCG: 1996: 35). Based on these facts, one may argue that the threat of substitutes within the pharmaceutical industry is moderate, as the patent protection time period entails a very limited number of substitutes, however, upon patent expiration an increasing number of substitute products are typically launched, posing a viable threat to the original product sales, which will then have to rely on brand-conscious and price-insensitive customers.

iv.i.iv Bargaining Power of Suppliers

Suppliers are defined as organizations that provide input such as materials and services, and the bargaining power of these suppliers refers to their ability to raise prices and/or reduce the quality of the materials or services (Peng: 2009: 41). In the pharmaceutical industry, suppliers may be providers of raw materials, biotechnology companies, universities, research centers, manufacturing and distribution facilitators, and marketing agencies (Gassmann et al: 2002: 15). The bargaining power of these suppliers can be determined by a number of factors, including the possibility of substitute products or services, their reliance on the pharmaceutical industry as customer, the pharmaceutical industry's reliance on their products or services, as well as the threat of forward integration (Porter: 1980: 27). Based on these factors, one may argue that the individual group of suppliers will have a unique bargaining power. For instance, biotechnology companies provide specialized input that is not likely to be substituted and that may be designed specifically for and requested specifically by the pharmaceutical industry, resulting in moderate to strong bargaining power, which is strengthened by the fact that these companies may pose a viable threat of forward integration. Contrarily, marketing agencies will have very limited bargaining power, as their services are easily substituted and are generally not designed specifically for the pharmaceutical industry. Furthermore, this latter group of suppliers does not pose a threat of forward integration. Conclusively, the overall bargaining power of suppliers may be described as weak to moderate, as there exist groups of both extremely weak and moderate to strong bargaining power.

iv.i.v Bargaining Power of Buyers

Buyers generally compete with the industry by forcing down prices, bargaining for higher quality or more service, and playing competitors against each other (Porter: 1980: 24). In the pharmaceutical industry, buyers may be parted into two primary categories; retail drug sellers and large institutions, such as hospitals, insurance companies, and healthcare organizations (Cantor: 2002: 40). Especially the latter group of buyers represents a major countervailing force against the high prices set by pharmaceutical innovator companies, as they purchase at large volumes and are, thereby, able to negotiate prices as bilateral monopolists (Porter: 1980: 24). For an example, hospitals often exert influence on drug prices through the establishment of formularies, which are lists of drugs that they rely upon for dispensing and for achieving financial objectives (Cantor: 2002: 41), creating a prevailing incentive for pharmaceutical companies to attain sales volume by accepting thin revenue margins. The strong bargaining power of these buyers is further enhanced by the introduction of generic substitutes, as the original products then become somewhat undifferentiated (Porter: 1980: 25). However, not all buyers of pharmaceutical products possess strong bargaining power, as retail drug sellers, including independent pharmacists and chain drug stores, have only weak to moderate bargaining power, due to the smaller purchase volumes. In continuation hereof, both groups of buyers do not pose a credible threat of backward integration, as they are unlikely to acquire pharmaceutical companies.

Conclusively, the overall bargaining power of buyers may be described as moderate, as there exist groups of both weak and strong bargaining power.

iv.i.vi Industry Competitiveness and Profitability

The individually assessed forces of industry competitiveness and profitability are simplistically summarized in the following overview:

FIVE FORCES	Strength	Main Factors
Rivalry Amongst Competitors	Moderate to Strong	*Declining industry growth rates and the growth of generic drug sales induce fierce competition for market shares*
Threat of Entry	Weak	*A number of substantial barriers deter companies from industry entry*
Threat of Substitutes	Moderate	*Low threat during patent protection, high upon introduction of generics*
Bargaining Power of Suppliers	Weak to Moderate	*Groups of suppliers may have both weak and moderate bargaining power*
Bargaining Power of Buyers	Moderate	*Groups of buyers may have both weak and strong bargaining power*

Table iv.i.vii, Source: Author's own work

Based on this overview and, thus, the collective intensity of the five forces, one is prone to argue that both the overall industry competitiveness and profitability are moderate; while the strengths of the forces induce increased industry competitiveness, they also induce decreased industry profitability. Particularly the rivalry amongst competitors, bargaining power of buyers, and threat of substitutes represent the strongest forces and are, thus, the ones that will have the strongest influence on the strategies formulated and enacted by the companies within the pharmaceutical industry. The threat of substitutes creates a clear distinction between the industry innovators and imitators; the two industry groups holding very different profit potentials and risk profiles. The industry innovators generally enjoy significant profit potentials; however, drug discovery and development require substantial investments, both financially and time-wise, and are associated with a high level of risk. Contrarily, the industry imitators possess limited profit potentials; however, pharmaceutical product imitation is also far less risky than innovation. The growth of the latter industry group invokes changes in the industry forces, namely increased competitor rivalry, product substitutability, and buyer bargaining power, which will, according to the five forces framework, increase industry competitiveness and decrease profitability. Despite the intensification of these forces, one may argue that

this particular industry will, alongside the growth of the human population, the spread of diseases, and the individual's buying power, experience continuous and increasing demand for new and improved drugs, which ensures the overall industry profitability and, hence, the overall corporate *raison d'être*.

iv.i.vii The Critical Sixth Force

The five forces framework has later been extended, as Porter in 1990 in *The Competitive Advantage of Nations* introduced a sixth force that equally play a role in affecting industry competitiveness; related and supporting industries. This extension is endorsed by Andrew Grove (1996), who named the additional force *complementors*, which are defined as companies that sell products that add value to the products of a focal industry. While this sixth force may be crucial in some industries, it appears somewhat irrelevant in the analysis of the pharmaceutical industry, as complementors in this context would be companies that sell products that would increase the demand for prescription drugs. However, despite the arguable irrelevance of complementors, one may argue that the five forces framework is neglecting a critical sixth force in regard to the pharmaceutical industry, namely institutions, which represent a force that has significant impact on all of the components in the industry structure and, thus, affects competition through the five forces. Companies operating in this industry have to conform to a number of formal and informal constraints, which inevitably will play a significant role in strategy formation, and whilst Porter (1980: 29) acknowledges the fact that government policies may affect the structural conditions of an industry, he appears to neglect the role of informal constraints. As institutional frameworks vary from region to region, country to country, it is vital to assess these differences, in order to attain a nuanced understanding of the competitive conditions, in which multinational corporations in the global pharmaceutical industry operate. This assessment will be facilitated by an institutional analysis, conducted in the following section.

iv.ii The Significant Institutional Differences

Companies operating in the pharmaceutical industry have to conform to 'the rules of the game' in a society, which will have significant impact on both their strategies and performances. As indicated by this notion, most rules are country-specific, making cross border operations increasingly complicated, as companies have to mediate between different environments of constraints. The so-called rules of the game are addressed by institutional theory, which represents a prominent research field that is often applied in analysis of antecedents for strategy formation. A number of research scientists have been acknowledged for their research within this field, and two of the most prominent scientists are economist Douglass North and sociologist William Richard Scott, both offering an integrative view that incorporates economic and sociologic research streams. According to North (1990: 3), institutions are defined as '*the humanly devised constraints that shape human interaction*'. As implied in this definition, institutions constrain behavior by providing guidelines to what is or is not legitimate and acceptable within a given institutional framework. In

continuation hereof, there exist two complementary, and maybe even interdependent, types of institutions that constitute an institutional framework, namely formal and informal institutions, which is a division supported by the three institutional pillars identified by Scott (2001: 51), namely regulatory, normative, and cognitive pillars. Formal institutions encompass regulatory constraints in terms of laws, regulations, and rules enforced by national or supra-national authorities (North: 1990: 47), while informal institutions encompass normative and cognitive constraints in terms of norms, cultures, and ethics (North: 1990: 36). The difference between these two types is founded in the degree to which the institutions in question are formalized (North: 1990: 46), and they are complementary and interdependent in the sense that informal institutions may compensate limitations to formal institutions and visa versa. The constraints, that institutions formally or informally enforce, serve to reduce uncertainty in a society by creating a stable structure to behavior through the processes of coercive, normative, and mimetic isomorphism (DiMaggio & Powell (1983: 150-154). However, it is important to note that institutions are not fixed variables, as they are subject to constant, yet often incremental, change (North: 1990: 6).

The pharmaceutical industry is one of the most formally regulated industries, especially in Europe and North America (Koenig & MacGarvie: 2011: 1), and, hence, pharmaceutical companies have to conform to a variety of laws and regulations in order to avoid formal sanctioning. According to a multi-country study of drug regulations conducted by the World Health Organization (2002: 25), most country governments choose to regulate the pharmaceutical industry based on the objective of '*ensuring the safety, efficacy, and quality of drugs available to the population*'. In order to ensure the realization of this objective, governmental authorities may enforce legal regulations and control in different areas through various means. Generally, there exist four main regulatory functions in the pharmaceutical industry, namely i) product registration, ii) licensing of manufacturing, importation, and distribution, iii) control of drug promotion and information, and iv) price control:

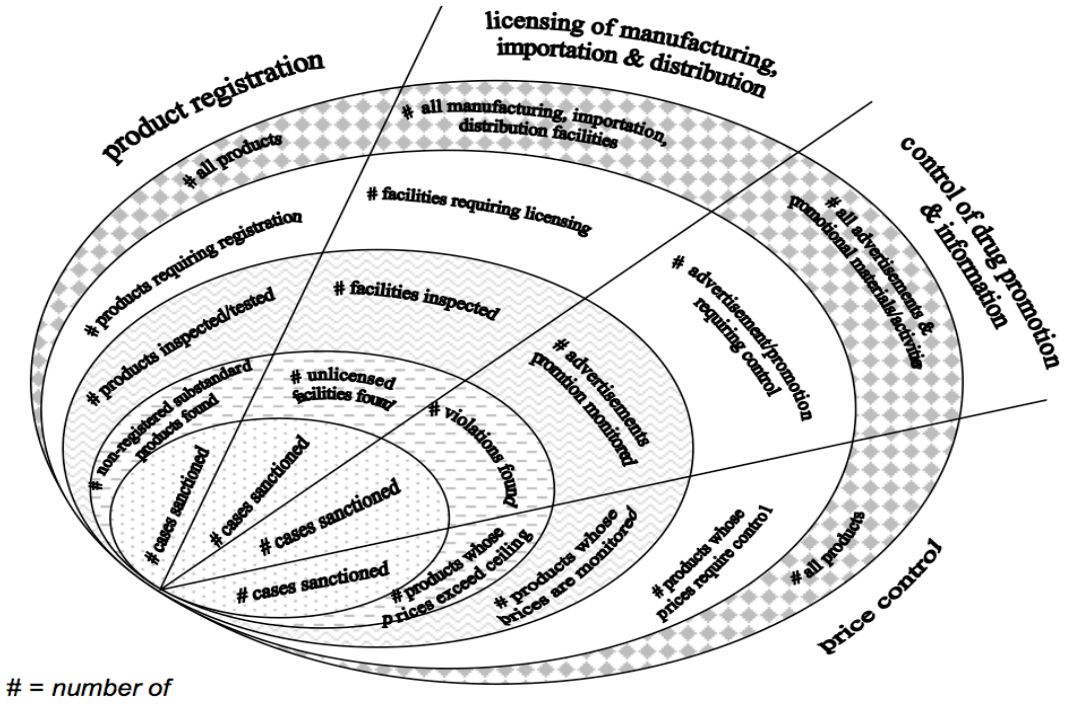


Figure iv.ii, Source: World Health Organization (2002) p. 29

Together, these four regulatory functions serve to ensure a certain industry standard and, thus, that the drugs reaching the consumers are effective, safe, of good quality, and affordable (World Health Organization: 2002: 26). The functions encompass a variety of laws and regulations regarding drug patenting, testing, manufacturing, packaging, labeling, pricing, marketing, etc. In general, the pharmaceutical industry is characterized by a strong link between government regulations and profitability (Koenig & MacGarvie: 2011: 4), and whilst intellectual property rights are positively associated with profitability, price controls are negatively so, indicating that laws and regulations are not unilaterally negative or positive for the industry players. As the illustration (figure iv.ii) indicates by the different spheres, a large number of the industry products are subject to regulations. Many of these are monitored, which leads to the identification and sanctioning of most regulation violations. It is vital to note that the regulatory emphasis given to the different areas of pharmaceutical operations vary from country to country. Consequently, every country will have its unique formal institutional framework, and companies operating cross borders will have to strategically mediate between the given frameworks.

Equally to formal institutions, the pharmaceutical industry is subject to normative and cognitive constraints that dictate organizational behavior. Informal institutional frameworks encompass a number of norms, cultural and ethical attributes that will be of great importance to conform to, if a company is to attain the vital resource that is legitimacy. Whilst informal institutions may be complex to analyze, Geert Hofstede, a prominent scientist in the research field of culture and values, has attempted and succeeded in statistically

grouping dimensions of national cultures into four clusters. According to Hofstede, culture may be defined as '*the collective programming of the mind distinguishing the members of one group or category of people from others*' (Hofstede: 2012), and every country or region will have its unique culture, which defines what is or is not legitimate and acceptable business conduct. The four dimensions of national culture represent and are measured through the degrees of *power distance*, *individualism*, *masculinity*, and *uncertainty avoidance* that are prevailing in the given society. This framework was extended in 1991 by Michael Bond, who added a fifth dimension, namely *long-term orientation* (Hofstede: 2012). It is vital to note that the scores of a country on the different dimensions are somewhat irrelevant without comparison; it is the potential cultural distance between countries that is of importance, especially in cross border operations, where companies have to mediate between cultures. Cultural distance refers to the magnitude of cultural differences between two countries and may lay the foundation for trust asymmetry and, thus, inhibit intercultural trust and trust building between cross border alliance or trade partners (Li: 2010: 11). Besides cultural differences, countries may also possess different ethical attributes, which refers to the norms, principles, and standards of conduct (Peng: 2009: 107). Especially the operations of pharmaceutical companies may be subject to ethical constraints, and what is considered ethical business conduct in one country may be considered unethical in another. For an example, drug testing represents a highly ethics-related business operation, for which many societies hold strong opinions. Ethics is not only an important part of informal institutions, but is often deeply reflected in formal laws and regulations (Peng: 2009: 107) and, thus, ethical, as well as cultural, attributes have to be incorporated into international business strategies.

iv.ii.i Developing, Emerging, and Developed Markets

An institutional framework, comprising country-specific formal and informal institutions, represents the outcome of a complex and lengthy process, shaped by a country's history, political and social systems, and culture. The degree, to which a country has developed an institutional framework that highly reduces uncertainty and stabilizes behavior, varies, creating the rationale for constructing market categories. According to the prominent research scientists Tarun Khanna and Krishna Palepu (2010), there are three types of markets, namely developing, emerging, and developed markets, indicating that institutional progression ranges from developing to developed. However, it is vital to note that the individual markets within these categories are unique in their institutional frameworks and, therefore, the market types should only be considered indicative. Ideally, every economy would provide a range of institutions to facilitate the functioning of markets, however, developing and emerging countries fall short in a number of ways (Khanna & Palepu: 2010: 6). The institutional shortcomings may be described as *institutional voids*, creating a division between developing/emerging and developed markets, and these voids represent a prime source of higher transactional costs and operational challenges. Hence, companies operating in developed markets, such as North America, Europe, Australia, Japan, etc., can rely on a variety of institutions that minimize

sources of market failure, whilst companies operating in emerging markets, such as China, India, Brazil, Russia, etc., have to deal with limited transparency and stability (Khanna & Palepu: 2010: 15). Moreover, as institutions facilitate economic growth (Rodrik & Subramanian: 2003), the institutional voids that exist in emerging markets may arguably offer an explanation for the comparatively low gross domestic products per capita that are characteristic for these markets (The World Bank: 2012). However, despite the challenges of operating in developing/emerging economies, these markets have for decades been considered vital sources of unique opportunities for multinational corporations. The rationales for engaging in emerging markets are often founded in the quest for aggregation advantages, representing an opportunity for economies of scale by creating regional operations, and cost arbitrage advantages, representing an opportunity for exploitation of differences between regional or national markets (Ghemawat: 2007: 60). Both aggregation and cost arbitrage opportunities are characteristic for emerging markets such as China and India, as they represent *megamarkets,* based on both the growing population size and the even more rapidly growing buying power (Gupta & Wang: 2009: 10-11), as well as they represent *platforms for cost reduction*, based on the fact that these countries provide some of the lowest labor costs in the world (Gupta & Wang: 2009: 13).

When operating not only cross border but also cross market types, the institutional distance, which is defined as '*the extend of similarity or dissimilarity between the regulatory, normative, and cognitive institutions of two countries*' (Xu & Shenkar: 2002: 608), will be increasingly challenging. Consequently, companies will have to assess the challenges and risks of entering a host country that is fundamentally different to their home country, and evaluate whether or not these outweigh the opportunities associated with establishing operations in this market. Such a risk analysis could include assessment of the stability of the individual country based on factors grounded in *government*, such as the strength of the current government, rule of law, and level of corruption, *society*, such as the level of social tension, health, and education, *security*, such as the level of globalization, geostrategic conditions, and emergencies and disasters, and *economy*, such as fiscal condition, growth and investment, and external sector and debt (Bremmer: 2005: 53).

iv.ii.ii Location Attractiveness

Institutional theory enables an enhanced understanding of the unique nature of the individual institutional framework and, thus, the significant institutional differences that exist between these frameworks. However, an exclusive focus on institutional theory will not be sufficient in generating a nuanced understanding of, where pharmaceutical companies choose to locate their strategic and operational activities. According to Porter (1990: 606), companies cannot rely solely on their national circumstances to sustain their competitive advantage and, in continuation hereof, they have to selectively add to their advantages or offset home-based disadvantages by locating the individual activities in nations, which offer a favorable framework for these activities. The assessment of location attractiveness for the strategic and operational activities of

pharmaceutical companies may be conducted through the application of classic and contemporary location theory, as well as theory on foreign direct investment.

Classic location theory emphasizes access to markets, labor force, physical infrastructure, and raw materials as the key determinants of location attractiveness and, thus, location selection (Kimelberg & Nicoll: 2012: 35). The focus on access to market and resources, including labor, infrastructure, and raw materials, is endorsed by theory on foreign direct investment (FDI) that addresses the attractiveness of different locations, in which companies will potentially invest by establishing local operations (Peng & Meyer: 2011: 173-174). In regard to the determinant market access, it is interesting to note that the global market for pharmaceutical products is primarily located in developed markets, which is evident based on a report by the European Federation of Pharmaceutical Industries and Associations (2011: 14) that provides an overview of the market shares of the worldwide sales of prescription drugs in 2010; North America holding a share of 42.3 percent, Europe 29.2 percent, Japan 10.8 percent, Africa, Asia and Australia 12.4 percent, and Latin America 5.3 percent. This indicates that pharmaceutical sales are more lucrative in developed markets, in which consumers have a relatively strong buying power based on the relatively high gross domestic products per capita (The World Bank: 2012), than in developing/emerging markets. In continuation hereof, the top 15 companies by value of sales in the past two decades are all based in developed markets, specifically in North America and Europe (World Health Organization: 2004: 39). Despite the fact that developed markets hold the largest shares of sales, the economic growth in emerging markets creates an incentive for companies to invest in these in attempt to secure lucrative market positioning for present and future business. In fact, multinational corporations, from all industries, expect to attain 70 percent of their future growth from emerging markets, 40 percent from China and India alone (Eyring et al: 2011: 89).

Despite the fact that market access may play a key role in determining location attractiveness, one may argue that labor access also constitutes a vital determinant, as the pharmaceutical industry is highly knowledge intensive and the industry players rely heavily on new drug discovery, development, and marketing; all of which are activities enabled by skilled labor forces. For strategic and operational activities that are considered to be loosely linked to the location of demand, the cost of employing competitively skilled workers becomes central to selection of location (Koenig & MacGarvie: 2011: 5). According to many economists, developed markets still possess comparative advantages in state-of-the-art technologies and advanced innovation with a high concentration of workers with advanced scientific training. Moreover, developed markets and, specifically, North America and Europe are often considered to represent the epicenter of the pharmaceutical industry, as the concentration of competing, interconnected, and industry related companies and institutions is high in these markets (Kimelberg & Nicoll: 2012: 35). In continuation hereof, contemporary location theory argues that companies competing in the knowledge economy often locate strategic activities close to the epicenter or well-established clusters in order to increase opportunities

for collaboration with competitors or research institutions, foster innovation and entrepreneurship, and leverage institutionalized business and cultural practices (Kimelberg & Nicoll: 2012: 35; Porter: 2000; Peng & Meyer: 2011: 176). However, it is vital to note that despite the attractiveness of developed markets, both in terms of market and labor access, recent reports provide evidence to the fact that the location of both strategic and operational pharmaceutical activities is gradually shifting towards emerging economies (European Federation of Pharmaceutical Industries and Associations: 2011: 9), as these increasingly represent attractive platforms for innovation, offering highly cost competitive and vastly growing skilled and dedicated talent pools (Gupta & Wang: 2009: 18).

The location determinants, namely markets, resource endowments, and industry epicenter, which are emphasized by classic and contemporary location theory, are highly relevant, however, not exhaustive. Whilst theory on FDI endorses these determinants, it suggests an additional factor that is of great importance, when pharmaceutical companies select locations for their activities, namely institutions. The formal institutional framework of a host country may represent location advantages or disadvantages, and countries that offer free access and equal opportunities for foreign investors are generally more attractive to invest in than those that restrict these investors (Peng & Meyer: 2011: 177). There exist different measures with which governments can restrict FDI, namely they can completely ban FDI, allow only case-by-case approvals of FDI, or enforce ownership requirements, which means that companies are not allowed 100 percent ownership and can, therefore, only enter the country by establishing a joint venture with a local company (Peng & Meyer: 2011: 183). It is vital to note that many of these entry barriers are industry-specific. Once a company has passed the potentially enforced case-by-case or ownership barriers, it will have to conform to the local regulatory institutions that constrain business conduct as well as FDI specific regulations, such as local content requirements, if these apply in the given host country. Contrarily, host countries may provide positive incentives for foreign investors, such as tax holidays, provision of infrastructure, or even subsidies (Peng & Meyer: 2011: 184). These FDI regulations are common in developing markets, yet may also exist in developed markets, despite the fact that they have proven to be highly inefficient (McKinsey: 2004: 32). In regard to the pharmaceutical industry, the formal institutional framework plays a significant role in determining location attractiveness. Besides the potential entry barriers, regulations can favorably serve pharmaceutical companies, for example by enforcing intellectual property rights that protect innovators against imitators, as patents are to be attained in the individual countries of operation, or unfavorably serve these companies, for example by enforcing strict price regulations that reduce corporate profitability. Consequently, there may exist benefits of operating in highly developed markets as well as in markets with institutional voids; however, the latter is more risky as product and process protection is often rather limited, which may induce opportunistic behavior in competitors.

iv.ii.iii Regionalization and Barriers to Global Strategy

The notion of location attractiveness essentially implies that companies can and will select locations wherever in the world they see fit, thinking globally and acting locally. However, research conducted by Alan Rugman (2005: 6), a prominent research scientist within international business and strategy, provides evidence to the fact that most multinational corporations locate their activities within one of the regional blocks, namely Americas, Europe, and Asia-Pacific, enacting a regional rather than a truly global strategy. Based on these findings, Rugman (2005: 2) argues that globalization is a myth and that the real trend is regionalization, which should be considered a consequence of the government regulations and cultural differences that segment the world into a so-called triad of regions. Regional strategies are evident in the pharmaceutical industry, as more than 60 percent of the large multinational corporations, which represent the most internationalized companies within the industry, are home-region oriented, meaning that at least 50 percent of their sales is generated from their own region of the triad. The remaining 40 percent are primarily bi-regional, which means that more than 20 percent of their sales is generated from at least two parts of the triad and less than 50 percent from their home region; the prominent markets being North America and Europe (Rugman: 2005: 115). Moreover, R&D activities of pharmaceutical companies are highly centralized, as 50 percent of all research facilities are located in the home region of the triad, despite the fact that sales may be spread across regions (Rugman: 2005: 117). Hence, the pharmaceutical sales and R&D are primarily concentrated within North America and Europe, which, as previously mentioned, constitute the largest markets for prescription drugs. The fact that these two regions hold the largest market shares creates an imbalance that shapes the industry geography and, ultimately, the international strategies adopted by pharmaceutical companies.

The explanation for the regionalization in the pharmaceutical industry is founded in the barriers to global strategy. These barriers are fundamentally shaped by the local and regional, formal institutions (Rugman: 2005: 118). The various laws and regulations, regarding drug patenting, testing, manufacturing, packaging, labeling, pricing, and marketing, are enforced at a either national or regional level and, thus, if companies are to locate operations in other regions, they will have to integrate and conform to an institutional framework that may be substantially different from the one of their home-region. The jurisdictional procedures are more or less the same across the United States of America and the European Union, respectively, making regional or bi-regional operations relatively simple, in contrast to establishing operations in Asia or South America, where the institutional frameworks are country- rather than region-specific. As the United States of America enforces price controls that are less stringent than in the European Union, the former may be considered a more attractive location for sales activities (Rugman: 2005: 118). A final barrier to global strategy is offered by *pharmacogenetics*, which is the study of genetic differences in the response to drugs. The genetic heritage of the individual determines, what the body does to a drug and

what the drug does to the body, as well as tendencies to particular diseases (Merck: 2007), and as the heritage is largely ethnic-specific and, thus, arguably relatively region-specific, product rollouts may not always be rational and advantageous.

iv.iii The Pharmaceutical Multinationals

As previously argued, the pharmaceutical industry is characterized by internal rivalry amongst large multinational corporations. Generally, there exist two types of pharmaceutical multinationals, namely the innovators that discover and develop new drugs and the imitators that, after the expiration of intellectual property rights, produce cheaper substitutes to these new drugs. According to Porter (1985: 11), there exist two basic types of competitive advantage that companies can possess, namely differentiation and cost leadership. One may argue that whilst the pharmaceutical innovators enact strategies in pursuit of the advantage differentiation, pharmaceutical imitators enact strategies in pursuit of the advantage cost leadership; both types of strategies enabling an either broad or narrow market scope. The industry innovators generally seek to differentiate themselves from their competitors by discovering and developing unique products, more specifically new drugs, that are perceived valuable to the buyers and, thus, they seek to position themselves as differentiators. Differentiation allows an innovator to command premium prices for its products; strengthened by the fact that these products are granted a certain level of market exclusivity at the time of introduction. However, it is vital to note that differentiation only leads to superior industry performance, if the price premium achieved exceeds the costs of being unique (Porter: 1985: 120), which represents a challenge in the pharmaceutical industry, as return on R&D investments is, as previously argued, not always attained. Hence, companies pursuing the advantage of differentiation have to both secure uniqueness and cost proximity relative to their competitors, in order to gain competitive advantage.

In contrast to the strategies enacted by the innovators, the industry imitators generally seek to differentiate themselves from their competitors by identifying and exploiting all sources of cost advantage (Porter: 1985: 12-13) and, thus, they seek to position themselves as cost leaders. The imitators operate with much lower costs than the innovators, as the former avoid the substantial R&D investments by copying the discoveries of the latter. Cost leadership allows an imitator to secure higher returns than those generated by its competitors, provided that it can command prices that are equivalent or lower than the generic drug average. However, it is vital to note that cost leadership only leads to superior industry performance, if the offered products are perceived comparable or acceptable by the buyers; otherwise, the company will be forced to discount the prices well below market average, which may outweigh the benefits of its favorable cost position (Porter: 1985: 13). Hence, companies pursuing the advantage of cost leadership have to both secure cost competitiveness and proximity in the bases of differentiation relative to their competitors, in order to gain competitive advantage.

The innovators and imitators have fundamentally different approaches to pharmaceutical business and attainment of advantageous industry positioning. As previously mentioned, the innovators are far more profitable than the imitators; however, pharmaceutical innovation is also far more risky than imitation of existing products. One may argue that industry rivalry primarily exists amongst innovators and imitators, respectively, as the former compete for differentiation through new drug development, whilst the latter compete for cost leadership through cost efficient imitation of existing drugs, for which intellectual property rights have expired. Hence, the imitators do not pose a viable threat to the innovators till after a certain time period has passed, and the innovators do not pose a viable threat, but rather a crucial source of business opportunities, to the imitators, as they cannot compete at their price level and will, thus, have to rely on brand-conscious and price-insensitive buyers.

iv.iii.i Exploiting Potentials for Competitive Advantages

The pharmaceutical multinational innovators and imitators enact differentiation and cost leadership driven strategies, respectively, in attempt of securing advantageous industry positioning. According to Robert Grant (1991: 117), fundamental to the choice between differentiation and cost advantage is the resource position of the company in question. Advocating a resource-based view on competitive advantage, Grant (1991: 114) argues that strategy analysis should focus upon the link between strategy formulation and a company's internal endowments in terms of resources and capabilities, rather than upon the link between strategy formulation and a company's external environment; the latter endorsed by industrial organization economics. Two core assumptions, associated with this resource-based perspective on strategy, are that i) internal resources and capabilities provide the basic direction for a company's strategy, and that ii) resources and capabilities together constitute the primary source of competitive advantage for a company (Grant: 1991: 114). Hence, strategy formulation is founded in the quest to effectively exploit the company's resources and capabilities and, thus, its potentials for competitive advantage. In order for a company to strategically select appropriate and advantageous strategies, it will have to i) identify its resources and capabilities and ii) appraise their potential for sustainable competitive advantage. It is vital to note that companies within an industry are, in this perspective, perceived as heterogeneous, rather than homogeneous, in terms of resources and capabilities (Barney: 1991: 101) and, thus, companies will enact unique strategies in pursuit of competitive advantage, based on their unique internal resource and capability endowments.

In order for a company to be able to correctly identify its resources and capabilities, a clear distinction between the two terms is required. Whilst resources represent the productive assets of a company, capabilities represent a company's knowledge and associated routines and practices and, thus, its ability to effectively apply the resources to achieve organizational objectives (Peng & Meyer: 2011: 100). According to Grant (1991: 118), resources may be divided into six major categories, namely financial resources,

physical resources, human resources, technological resources, reputational resources, and organizational resources. Individually, these resources are insufficient to provide an advantage over competitors and, hence, while resources are the source of a company's capabilities, capabilities are the main source of its competitive advantage (Grant: 1991: 119). It may be too complex for a company to identity its resources and capabilities by viewing the company as a whole. Thus, it may be advantageous to apply a value chain perspective. The value chain provides a systemic way of examining all of the major activities that a company performs and how these activities interact (Porter: 1985: 33). As indicated by the name, the value chain is constituted by a chain of vertical activities that individually and collectively add value. By disaggregating a company into its strategically relevant activities, one is able to identify the resources and capabilities that are related to the individual activities. However, it is vital to note that some of the most crucial capabilities are founded in a company's ability to connect the different stages of the value chain and are, thus, not to be identified in but between activities. The value chain of pharmaceutical companies may, somewhat simplistically, be illustrated by the following:

Figure iv.iii.i, Source: Author's own work

Each of these activities may individually contribute to a company's relative cost position and/or create a basis for differentiation (Porter: 1985: 33); however, it is vital to note that it is the aggregate of all activities that ultimately lead to competitive advantages. In order for companies to appraise their potential for sustainable competitive advantage, they will have to evaluate the characteristics of the resources and capabilities within and between their value chain activities. Whilst literature within the resource-based perspective provides a number of different parameters, from which to determine the potentials of resources and capabilities, this author will conform to the analysis framework offered by Jay Barney (1991). According to Barney (1991: 105-106), resources and capabilities hold the potential for sustainable competitive advantages, if they possess the following four attributes: i) *value*, ii) *rarity*, iii) *imperfect imitability*, and iv) *imperfect substitutability*. A company's resources and capabilities can only be a source of sustained competitive advantage, if they are valuable in the sense that they enable the company to exploit opportunities and/or neutralize threats in the external environment. In addition, the resources and capabilities have to be rare amongst a company's current and potential competitors; otherwise, these competitors will be able to exploit the same opportunities and/or neutralize the same threats and, thereby, eliminate the advantage. Furthermore, the resources and capabilities have to be imperfectly imitable and substitutable,

meaning that competitors should not be able to neither imitate these resources and capabilities nor identify and deploy substitutes that will enable them to attain the same advantages as those of the focal company. The fourth attribute, imperfect substitutability, has later been replaced by *organization*, which refers to whether or not a company is adequately organized and, thus, ready and able to exploit the full potential of its resources and capabilities (Barney & Hesterly: 2010). The question of organization is undoubtedly highly relevant and critical; however, one may argue that the attribute of substitutability is more appropriate for the framework, as it refers directly to a characteristic of resources and capabilities, whilst organization appears to refer to a company's ability to effectively utilize its resources and capabilities, regardless of their characteristics.

According to the resource-based view, the resources and capabilities that possess all of the four attributes are the ones that hold the greatest potential for sustained competitive advantage and are, thus, fundamental to a company's strategy formulation; a company should always aspire to formulate and enact a strategy that ensures that the full potential of its core resources and capabilities are effectively exploited. The enactment of a strategy that conforms to the identified and appraised internal strengths, and weaknesses, will enable a company to attain and sustain competitive advantages and, potentially, assume an advantageous industry positioning. However, it is vital to note that companies have to focus not only on sustaining existing advantages but also on continuously creating new advantages, which requires a certain degree of flexibility and responsiveness, as the former are likely to eventually be eroded by competition (Grant: 1991: 131).

iv.iii.ii Addressing Competitive Disadvantages

The company internal perspective, advocated by resource-based theory, is important in strategy analysis; however, an exclusive focus on the internal resource and capability endowments of companies would be insufficient, as it is in comparison to competitors and, thus, in the external environment that companies can truly identify their strengths and weaknesses and their opportunities and threats (SWOT analysis). An often-applied method to assess the competitiveness of company-specific resources and capabilities relative to the ones possessed by competitors is benchmarking. Hence, pharmaceutical innovators and imitators can gain insight into their strategic industry positioning by comparing their performances against those of competitors that enact similar strategies. For an example, an innovator will typically benchmark against another innovator, competing for the same market shares, that may be more lucratively positioned in the industry than the focal company. The benchmarking methodology can both indicate organizational strengths and weaknesses; however, an inferior score does not imply that the competitor's structure and processes should be imitated, but rather that the inferiorly performing resources and capabilities should be addressed (Peng & Meyer: 2011: 113).

Competitive disadvantages, relative to competitors, may be offset by attainment of the potentially lacking resources and capabilities through internal development, internalization in terms of mergers and acquisitions, strategic alliances with one or more partner companies and organizations, or through continuous market exchanges. According to Oliver Williamson (1998), a prominent scientist within the research field of transaction cost economics, every economic exchange incurs costs upon the actors involved and, therefore, companies are to choose the most cost efficient governance structure for the particular exchange. In continuation hereof, pharmaceutical companies have to evaluate the transaction-specific attributes, which are associated with the attainment of the lacking resources and capabilities, and the governance-specific costs and competencies, which are associated with the three different governance structures, namely hierarchy, hybrid, and market, in order to be able to make the most cost efficient choice (Williamson: 1998: 34). Transaction attributes may be assessed through the following three dimensions: i) the frequency with which the transaction recurs, ii) the uncertainty to which the transaction is subject, and iii) the condition of asset specificity. In continuation hereof, governance structures may be assessed through the following four dimensions: i) incentive intensity, ii) administrative controls, iii) adaptation, and iv) contract law (Williamson: 1998: 36-37). Companies may be prone to internally develop or internalize the resources and capabilities, for which transactions are frequent, subject to uncertainty, and asset specific; however, the hierarchy governance structure may not always represent the most efficient choice, despite these transaction-specific attributes, as it entails limited incentive intensity and adaptation competencies. Consequently, it is important that both aspects of the economic exchange are taken into consideration. As previously mentioned, a significant number of pharmaceutical companies have recently engaged in mergers and acquisitions, representing submission to the hierarchy governance structure, and in strategic alliances, representing submission to the hybrid governance structure. According to Peng (2009: 279), alliances are less costly than acquisitions and allow companies the opportunity of learning from working with each other before potentially engaging in full-blown acquisitions and, therefore, one may argue that particular exchanges could advantageously be moved from market to hybrid and then, potentially, from hybrid to hierarchy, limiting the risks that are associated with immediate internalization. Hence, strategic alliances may be considered instruments of real options, creating flexibility to sequentially scale up, through acquisition, or scale down, through alliance termination, the investment.

v Analysis II: The Multilevel Factors in Alliance Portfolio Diversity

The analysis of the multilevel context of alliance portfolios provides insight into different factors that will have a determining effect on the cooperative strategies that pharmaceutical multinational corporations formulate and enact and, hence, on the diversity of their alliance portfolios. The theories applied at the three different analysis levels each conform to their own assumptions, and while industry-level theories argue that a company's strategy formulation depends upon industry factors, country-level theories argue that it depends

upon institutional factors, and company-level theories that it depends upon company internal factors. This author does not exclusively conform to neither of these arguments, as it is the combination and, thus, the multilevel approach that is considered to enable more nuanced research findings. Consequently, based on the context analysis, alliance portfolio diversity will be addressed through discussions of the effect that multilevel factors will have on the diversity of pharmaceutical multinational corporations' alliance portfolios.

As mentioned in the introduction, an alliance portfolio is commonly defined as '*the aggregate of all strategic alliances maintained by a focal company*', and such a portfolio can be diverse in a number of different dimensions, including the ones that have been chosen for this thesis, namely the function, partner, location, and governance dimensions. With point of departure in the diversity conceptualization *variety*, which indicates differences amongst alliances in terms of their categorical affiliations (Harrison & Klein: 2007: 1207), the following sections will consist of discussions on the effect that industry-level, country-level, and company-level factors will have on alliance portfolio function, partner, location, and governance diversity, respectively. Hence, fundamental to these discussions, and this thesis in general, is the assumption that multilevel factors, identified through *The Multilevel Context of Alliance Portfolios,* in fact will have an effect on alliance portfolio diversity, and this author will in the following sections develop a number of propositions that will support this assumption. This fundamental assumption is illustrated through the figure below, which will be extended to include the developed propositions in the final section of *The Multilevel Factors in Alliance Portfolio Diversity*.

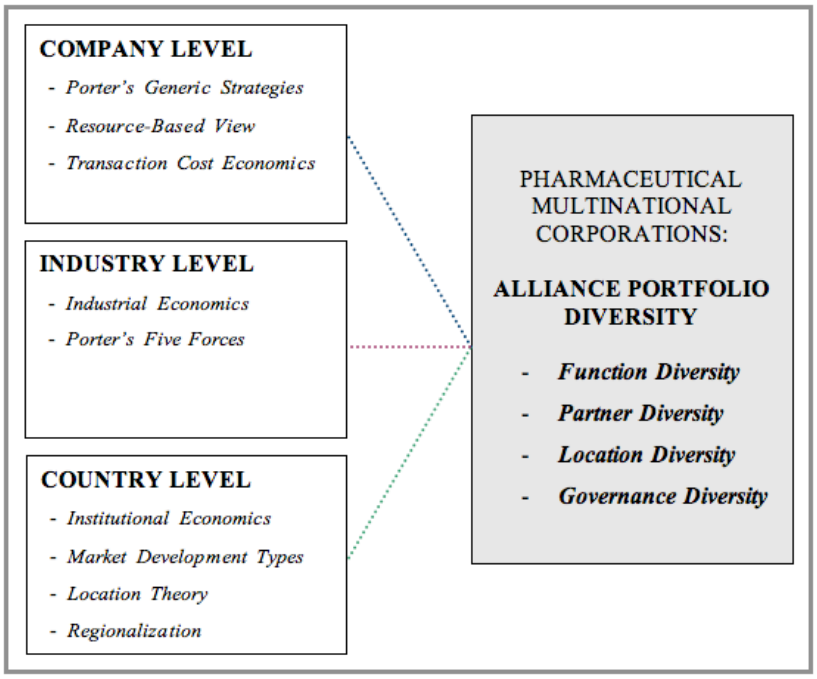


Figure v, Source: Author's own work

It is vital to note that not all of the three analysis levels and, thus, the theories applied through these will necessarily have an effect on alliance portfolio diversity in the four different dimensions, respectively. Therefore, only the theories that possess arguments that are of consequence in the discussions of function, partner, location, and governance diversity will be included in the following sections.

v.i Multilevel Factors in Function Diversity

The function dimension of alliance portfolio diversity encompasses the subcategories research and development (R&D), manufacturing, marketing, and licensing. The two former alliance functions are considered to constitute exploration alliances, where two or more partner companies cooperatively engage in upstream activities of the value chain by sharing and creating knowledge and, thereby, exploring new business opportunities (Nielsen & Gudergan: 2012: 560). Pharmaceutical R&D and manufacturing are considered to be closely linked activities overlapped by the processes of clinical trials, and companies may formulate and enact cooperative strategies that are to enhance the exploration of opportunities for both new drug discovery and new drug manufacturing. Contrarily, the two latter alliance functions are considered to constitute exploitation alliances, where two or more partner companies cooperatively engage in downstream activities, namely marketing, or licensing by exploiting existing resources and capabilities to enhance the productivity and efficiency of capital and assets (Nielsen & Gudergan: 2012: 560). Pharmaceutical companies may be prone to engage in these latter alliance functions, if a partner company possesses resources and capabilities that can facilitate enhanced productivity and efficiency by supplying marketing services or by generating profits through licensing of intellectual properties of the focal company. According to Daniel Levinthal and James March (1993: 105), the challenge for organizations is to engage sufficiently in exploitation to ensure current viability as well as to engage sufficiently in exploration to ensure future viability, creating a general incentive for pharmaceutical multinational corporations to formulate and enact cooperative strategies that will facilitate both enhanced exploration and enhanced exploitation. However, it is vital to make a clear distinction between the two, as they require different structures, processes, strategies, capabilities, and cultures and, thus, are fundamentally incompatible, necessitating alliance formation for exploration and exploitation individually (Nielsen & Gudergan: 2012: 560). The drivers of strategic alliance formation within the four different functions may be founded in both external challenges and internal needs and, specifically, the industry-level analysis, including Porter's five forces framework, and the company-level analysis, including the resource-based view, in *The Multilevel Context of Alliance Portfolios* offer a number of arguments that can be applied to develop propositions on the function diversity in pharmaceutical companies' alliance portfolios.

According to industrial organization economics and, moreover, Porter's five forces framework (Porter: 1980: 3), the structure of an industry has strong influence on the formation of corporate strategy and, in

continuation hereof, this structure and, moreover, the state of competition in an industry depend on five basic competitive forces, including three forces of horizontal competition and two forces of vertical competition. The strength of these competitive forces in an industry jointly determines the intensity of industry competitiveness and profitability and, furthermore, the strongest forces are the ones that will have the strongest influence on the strategies enacted by the industry players (Porter: 1980: 6). Based on the industry analysis conducted in the section *Understanding the Pharmaceutical Industry*, the strongest forces in this particular industry are the rivalry amongst competitors, the threat of substitutes, and the bargaining power of buyers. The rivalry amongst competitors appears to be intensified due to the declining annual industry growth rates, both in terms of worldwide sales of prescription drugs and in terms of R&D investments, inducing pharmaceutical multinational corporations to fiercely compete for the existing market shares. Furthermore, these companies are faced with a number of challenges invoked by the current industry trends, including increasing R&D costs, increasing drug development times, declining per drug productivity, and the growth of generic drugs (Gassmann et al: 2004: 4); the latter contributing to both the moderate threat of substitutes and the moderate bargaining power of buyers. Many pharmaceutical companies have engaged in cooperative strategies in order to overcome these industry challenges and, thereby, ensure their own competitiveness; specifically, pharmaceutical companies have during the past decade formed more than 10,000 various strategic alliances (Datamonitor: 2005).

Porter (1990: 66-67) argues that strategic alliances should be considered transitional devices that proliferate in industries undergoing structural changes or escalating competition and are, thus, considered corporate responses to uncertainty. The current industry trends can, therefore, be interpreted as accelerators of alliance formation, as pharmaceutical companies will arguably be induced to engage in cooperation that will facilitate R&D investment scale, reduced new drug development times, and increased new drug productivity; all of which may enable them to optimize their industry positioning in an increasingly competitive environment. These objectives, derived from the industry analysis, create the foundation for alliance formation within all of the four functions, namely R&D, manufacturing, marketing, and licensing. R&D alliances can enable pharmaceutical companies to reach the investment scale that is required for new drug discovery and development, which is estimated to amount to approximately 1.2 billion USD per drug (Kesic: 2011: 208); an investment that companies may not be able to make on their own, if they are to discover and develop several new drugs to ensure the future viability of their product portfolios, simultaneously. Manufacturing alliances can enable reduced new drug development times, as knowledge sharing and creation between two or more partners hold the potential of enhancing the process of new drug development, which may decrease the time from discovery to market, currently estimated to take 12 to 13 years (Kesic: 2011: 208). Marketing alliances can enable increased new drug productivity through optimization of buyer selection and targeting, which, according to Porter (1980: 119), constitutes a critical

part of addressing the bargaining power that is particularly strong amongst buyers, such as hospitals, insurance companies, and healthcare organizations, that purchase such large volumes that pharmaceutical companies will be prone to accept thinner revenue margins in order to secure these large-scale deals (Cantor: 2002: 41). Finally, licensing alliances can enable enhanced profitability, as the licensee is to pay royalties upon sales generated from the licensed intellectual properties (World Intellectual Property Organization: 2012), and, thus, this type of alliance may further improve drug productivity by enhancing the chances of generating revenue that meets or exceeds the R&D costs.

Consequently, pharmaceutical multinational corporations will have an incentive to create alliance portfolios that address the need for both current and future viability through exploration and exploitation, respectively. Hence, one may argue that the escalating competition in the pharmaceutical industry proliferate the formation of strategic alliances within all of the four functions, including R&D, manufacturing, marketing, and licensing, and, thus, alliance portfolio function diversity. Functional diversity represents a balanced approach to alliance portfolio management and holds the potentials of extending the focal company's value creation activities, increasing flexibility, and enhancing overall performance (Jiang et al: 2010: 1138). In continuation hereof, the following proposition has been developed:

Proposition 1*: The escalating competition in the pharmaceutical industry is positively associated with alliance portfolio function diversity.*

According to the resource-based view, strategy analysis should focus upon the link between strategy formulation and a company's internal endowments in terms of resources and capabilities, rather than upon the link between strategy formulation and a company's external environment; the latter endorsed by industrial organization economics. As argued in the section *Exploiting Potentials for Competitive Advantages*, two core assumptions associated with the resource-based perspective on strategy are that internal resources and capabilities provide the basic direction for a company's strategy and that resources and capabilities together constitute the primary source of competitive advantage for a company (Grant: 1991: 114). Hence, strategy formulation is founded in the quest to effectively exploit the company's resources and capabilities and, thus, its potentials for competitive advantage. In order for a company to strategically select appropriate and advantageous strategies, it will have to identify its resources and capabilities and appraise their potential for sustained competitive advantage; however, despite the fact that a company may possess resources and capabilities that hold this potential, escalating competition may vastly erode existing advantages (Child et al: 2005: 24). Thus, companies have to focus not only on sustaining advantages but also on creating new ones, in order to secure both current and future viability.

Based on the notions that companies are not able to create all of the resources and capabilities required for sustaining and developing competitive advantages by themselves and that resources and capabilities are heterogeneously distributed across companies, strategic alliances can be considered a viable way of gaining access to valuable resources and capabilities of partner companies that can be critical for developing the internal bases and competitive advantages of the focal company (Nielsen: 2002: 2). In alignment with the company internal perspective, the incentive for pharmaceutical multinational corporations to formulate and enact cooperative strategies will be founded in analysis of their resource and capability bases and assessment of the potential deficiencies within these. Pharmaceutical companies may perceive their own endowments as deficient, if they for instance do not possess the required financial resources to discover and develop new drugs, the technological resources to manufacture new drugs, and the reputational or organizational resources to effectively market new drugs, which represent resource deficiencies that are likely to arise due to the changes in the external environment that pharmaceutical companies have to accommodate (Child et al: 2005: 24). Thus, one may argue that it is perceived internal deficiencies that will proliferate the formation of strategic alliances within the four functions, including R&D, manufacturing, marketing, and licensing, and that deficiencies within different value chain activities will enhance alliance portfolio function diversity. Functional diversity implies that a company has gained access to many diverse resources and capabilities and, thus, enhanced its potential for creating and sustaining advantages that may enable current and future viability. In continuation hereof, the following proposition has been developed:

Proposition 2*: Deficiencies in internal resource and capability bases for different value chain activities are positively associated with alliance portfolio function diversity.*

v.ii Multilevel Factors in Partner Diversity

The partner dimension of alliance portfolio diversity encompasses the subcategories partners operating in the same industry, in a related industry, and in an unrelated industry. Partner selection is often considered one of the most critical aspects of alliance formation, and the drivers for pharmaceutical multinational corporations to engage in cooperation with partners from these three different industry categories may be founded in both external and internal rationales. Specifically, the industry-level analysis, including Porter's five forces framework, and the company-level analysis, including the resource-based view, in *The Multilevel Context of Alliance Portfolios* offer a number of arguments that can be applied to develop propositions on the partner diversity in pharmaceutical companies' alliance portfolios.

According to Porter (1980: 47), both industry and competitor analyses constitute critical aspects of formulating competitive strategies. The purpose of the competitor analysis is to gain insight about selected competitors and to figure out, which competitors are the most threatening to the focal company. Hence, this analysis can be crucial for the focal company's strategic behavior, and Porter (1980: 67-68) argues that

knowledge of the offensive and defensive moves, that the given competitors are predicted to make, can enable the focal company to attack these competitors in strategic dimensions, for which they are poorly positioned. Whilst this is not directly applicable to strategic alliances and partner selection, one may argue that pharmaceutical multinational corporations can apply the competitor analysis to formulate and enact competitor defensive and offensive cooperative strategies that will enable them to neutralize external threats through cooperation rather than direct competition. In the light of the escalating competition in the pharmaceutical industry, such cooperative strategies may be considered a viable way for companies to proactively respond to the external threats by either co-opting or blocking competition. According to Farok Contractor and Peter Lorange (2004: 30), competition can be co-opted by forming a strategic alliance with a competitor and, thereby, neutralizing the threat that this particular competitor poses, which generally constitutes a competitor defensive strategy. Similarly, competition can be blocked by forming a strategic alliance with a partner in attempt to put pressure on a shared competitor, which constitutes a competitor offensive strategy (Contractor & Lorange: 2004: 31). Hence, both competitor defensive and offensive cooperative strategies entail partnering with a company operating in the same industry as the focal company and, in continuation hereof, the following proposition has been developed:

Proposition 3*: Competitor defensive and offensive cooperative strategies are negatively associated with alliance portfolio partner diversity.*

From a company internal perspective, the resource-based view argues that *compatibility* and *complementarity* in resource and capability bases are the prominent criteria in partner selection, as it ensures a strategic fit between the partners in question. Whilst compatibility facilitates the sharing and transfer of tangible and intangible resources, complementarity facilitates synergy creation (Hitt el al: 2000: 450), and as the fundamental motivation for alliance formation is founded in gaining access to resources and capabilities across organizational boundaries, both of these criteria become critical in the partner selection process. Generally, one may argue that partner selection relies on identifying a suitable fit between task and partner characteristics and, thus, pharmaceutical multinational corporations have to identify eligible partners for both exploration and exploitation alliances, respectively. Selecting a partner from the same industry or from a related or unrelated industry hold different opportunities and challenges. Partnering with companies from the same industry may encompass a greater absorptive capacity due to compatibility in terms of backgrounds, experiences, knowledge, and technological bases, than partnering with companies from related or unrelated industries (Jiang et al: 2010: 1138). However, such partnerships may also entail conflicts of interests and invoke competitive alliance behavior, which generally increases the monitoring and safeguarding costs. Contrarily, partnering with companies from related or unrelated industries may encompass enriched resource pools and, hence, added value creation and capability development opportunities. However, partners from different industries may have fundamentally different routines and

processes, which generally decreases the level of compatibility and, thus, challenges the collaboration (Jiang et al: 2010: 1138).

One may argue that exploitation alliances, including the marketing and licensing functions, do not rely heavily on interorganizational compatibility, as focus is on creating efficiency by dividing labor rather than on combining knowledge bases (Nielsen & Gudergan: 2012: 562). Hence, the partner selection for exploitation alliances relies on the criterion of complementarity rather than on the criterion of compatibility, inducing companies to select the partner in possession of the most valuable resources and capabilities for upstream value chain activities and for exploitation of given intellectual properties, respectively, regardless of which industry the partner operates in. Contrarily, one may argue that exploration alliances, including the R&D and manufacturing functions, rely more heavily on interorganizational compatibility than exploitation alliances, as focus is on new drug discovery and development and, therefore, compatibility may enable internationalization of the partner's knowledge for innovative ends (Nielsen & Gudergan: 2012: 562). Hence, partner selection for exploration alliances relies on both the compatibility and complementarity criteria, indicating that pharmaceutical companies may be prone to select partners from the same industry. However, based on the notions that such partnerships entail a number of competitive risks and that partnerships with companies from related or unrelated industries provide enriched resource pools and, thus, added value creation and capability development opportunities, one may argue that the complementarity criterion can potentially outweigh the compatibility criterion, inducing pharmaceutical companies to select partners from related or unrelated industries. Whilst greater partner industry diversity may provide learning and resources access benefits, it also increases alliance management complexity. However, as companies are assumed to become more adept at dealing with complexity and as learning and resource benefits accumulate, they may reach a minimum degree of diversity effectiveness and can generally expect net gains surpassing this threshold (Jiang et al: 2010: 1138), indicating that pharmaceutical companies can benefit from selecting partners from all three industry groups. In continuation hereof, the following proposition has been developed:

Proposition 4*: Resource and capability complementarity in exploration and exploitation alliances is positively associated with alliance portfolio partner diversity.*

v.iii Multilevel Factors in Location Diversity

The location dimension of alliance portfolio diversity encompasses the subcategories developed market in home region, developed market in host region, emerging market in home region, emerging market in host region, and supranational; the four first categories encompassing two dimensions, namely market type and region, and the last category indicating selection of locations across market types and regions. The drivers for pharmaceutical multinational corporations to locate their alliance activities in these five different

location categories may be founded in a number of rationales. Specifically, the country-level analysis in *The Multilevel Context of Alliance Portfolios* offers different arguments, founded in institutional economics and location theory, respectively, that can be applied to develop propositions on the location diversity in pharmaceutical companies' alliance portfolios.

Institutions are, according to North (1990: 3), defined as '*the humanly devised constraints that shape human interaction*', and they serve to reduce uncertainty in a society by creating a stable structure to behavior through formal and informal guidelines to what is or is not legitimate and acceptable within a given institutional framework. As described in the section *The Significant Institutional Differences*, there are two primary types of institutions that constitute an institutional framework, namely formal and informal institutions, and the pharmaceutical industry is subject to a significant number of both types of constraints. Specifically, pharmaceutical companies have to conform to formal constraints in terms of laws and regulations regarding drug patenting, testing, manufacturing, packaging, labeling, pricing, and marketing, as well as informal constraints in terms of cultural and ethical attributes that dictate what is or is not legitimate corporate behavior. As institutions are enforced at a national or regional level, operating cross borders or cross regions generally means mediating between institutional frameworks, which poses a number of challenges, as the companies in question will have to learn about and conform to the locally enforced formal and informal constraints. In continuation hereof, locating alliance activities in emerging markets may pose an increased number of challenges for the pharmaceutical multinational corporations, compared to locating alliance activities in developed markets, as emerging markets are characterized by institutional voids, which represent a prime source of higher transactional costs and operational challenges, as well as limited transparency and stability (Khanna & Palepu: 2010: 15).

Generally, locating activities not only cross borders but also cross market types entails increased institutional distance, referring to the extend of dissimilarity between the regulatory, normative, and cognitive institutions of two countries, and potentially also increased cultural distance, referring to the magnitude of cultural differences between two countries (Xu & Shenkar: 2002: 608). Whilst cultural distance may be perceived as an integrated part of institutional distance, it is vital to note that the former may be present without the latter and visa versa. Institutional and cultural distance arguably create a number of barriers that can refrain companies from selecting emerging market locations, when they themselves are based in developed markets, as the associated risks and challenges do not necessarily outweigh the associated opportunities. In continuation hereof, research conducted by Rugman (2005: 115) provides evidence to the fact that institutional, and potentially also cultural, distance does not only refrain pharmaceutical companies from locating activities across market types but also across regions, as more than 60 percent of the large multinational corporations are home region oriented, meaning that at least 50 percent of their sales are generated from their own region of the triad. Moreover, 50 percent of all research facilities

are located in the pharmaceutical companies' home regions (Rugman: 2005: 117). Consequently, one may argue that institutional and cultural distance will induce the pharmaceutical multinational corporations to select developed market in home region locations and, in continuation hereof, the following proposition has been developed:

Proposition 5*: Institutional and cultural distance is negatively associated with alliance portfolio location diversity.*

According to Porter (1990: 606), companies cannot rely solely on their national circumstances to sustain their competitive advantage and, in continuation hereof, they have to selectively add to their advantages or offset home-based disadvantages by choosing favorable locations for their strategic and operational activities. As described in the section *Location Attractiveness*, location theory argues that access to markets and critical resource endowments are the key determinants of location attractiveness and will, thus, dictate pharmaceutical multinational corporations' choice of location for their alliance activities (Kimelberg & Nicoll: 2012: 35). In regard to the determinant market access, the primary markets for pharmaceutical products are located in developed economies, which is supported by the previously presented report on the market shares of the worldwide sales of prescription drugs in 2010 conducted by the European Federation of Pharmaceutical Industries and Associations (2011: 14). However, the importance of the market access determinant depends upon the task-specific characteristics, and whilst some activities may be closely linked to the location of demand, others may be loosely so.

According to research conducted by Pamina Koenig and Megan MacGarvie (2011: 4), exploration activities, including R&D and manufacturing, are loosely linked to the location of demand, as business innovation and ideas can be costlessly transferred to the location of production. Therefore, pharmaceutical multinational corporations will be prone to select locations for these alliance activities based on consideration of the cost of employing skilled researchers, rather than proximity to markets, and, thus, these activities will typically be located in countries with high concentration of workers with advanced scientific training (Koenig & MacGarvie: 2011: 5). Whilst developed markets may still possess comparative advantages in state-of-the-art technologies and advanced innovation, recent reports provide evidence to the fact that pharmaceutical R&D is gradually shifting towards emerging economies (European Federation of Pharmaceutical Industries and Associations: 2011: 9), due to the fact that they represent attractive low-cost platforms for innovation, offering vastly growing skilled and dedicated talent pools (Gupta & Wang: 2009: 18). Hence, pharmaceutical companies may be prone to locate their alliance activities in both developed and emerging markets in either region, indicating a potential for alliance portfolio location diversity. In contrast to the R&D and manufacturing, marketing activities are assumed to be more closely linked to the location of demand, and, according to Koenig and MacGarvie (2011: 5), companies are likely to invest in advertising in

markets with growing demand or with less stringent price regulation, as investments in influencing consumer preferences may have a higher return in these cases. Therefore, pharmaceutical companies will be prone to select locations for this alliance activity in developed markets, as these hold the largest market shares. However, it is vital to note that the vast economic growth in emerging markets indicate that these economies hold potentials of becoming lucrative pharmaceutical markets in the near future and, in continuation hereof, multinational corporations expect to attain 70 percent of their future growth from these markets, 40 percent from China and India alone (Eyring et al: 2011: 89). Consequently, one may argue that task characteristics will dictate location selection and that these hold the potential for alliance portfolio location diversity and, in continuation hereof, the following proposition has been developed:

Proposition 6*: Location strategies dictated by task characteristics are positively associated with alliance portfolio location diversity.*

v.iv Multilevel Factors in Governance Diversity

The governance dimension of alliance portfolio diversity encompasses the subcategories equity or non-equity. The selection of governance structure represents a critical aspect of strategic alliance formation, and a fundamental issue underlying this selection is the degree to which potential opportunistic behavior on the part of one or more alliance partners characterizes the relevant set of transactions, in which the partners will engage (Globerman & Nielsen: 2007: 450). The drivers for pharmaceutical multinational corporations to form alliance agreements with or without equity may be founded in a number of rationales and, specifically the company-level analysis, including the transaction cost economics perspective, and the country-level analysis, including the institutional economics perspective, in *The Multilevel Context of Alliance Portfolios* offer arguments that can be applied to develop propositions on the governance diversity in pharmaceutical companies' alliance portfolios.

According to the transaction cost perspective, intermediate asset specificity and low uncertainty are conditions that may lead to a preference for hybrid forms of governance structure, namely strategic alliance (Williamson: 1991: 82), and it is the transaction-specific attributes, including the degree of uncertainty and asset specificity associated with carrying out the given alliance activities, that will determine the extend, to which the risk of opportunism is prevalent and, thus, which governance mode, namely equity or non-equity, will be more favorable. Additional to transaction attributes, existing literature on selection of governance structure suggests the importance of relational capital, which is defined as encompassing mutual trust and respect (Thuy & Quang: 2005). In continuation hereof, it is vital to consider these different aspects when forming a strategic alliance, as this will enable the partner companies to choose the governance mode that is associated with the least possible number of risks and costs. In conformation to the often applied dichotomous distinction between governance structures, one may argue that pharmaceutical multinational

corporations can either choose to form non-equity arrangements, representing the option closest related to the market structure, or equity arrangements, representing the option closest related to the hierarchy structure. The latter type of governance mode encompasses establishment of an administrative hierarchy that grants the partner companies access to direct organizational monitoring and control. This structure generally takes longer time to negotiate and organize as well as entails higher administrative and exit costs than the non-equity structure; however, these costs will not necessarily outweigh the risks, which are more likely to be invoked in non-equity governance structures (Murray & Kotabe: 2005: 1526). Consequently, the choice between these two will rely on an evaluation of the risks and costs associated with cooperation.

One may argue that exploration alliances, including R&D and manufacturing, encompass a relatively high level of asset specificity, as the nature of the shared resources and capabilities will most likely be characterized by tacitness and complexity, which generally increases the incentive to form equity arrangements (Peng: 2009: 199). In continuation hereof, these alliances may also encompass a relatively high level of uncertainty depending on the ratio of common benefits, which are those that accrue to each partner in an alliance from the collective application of the learning that both companies go through as a consequence of being part of the alliance, relative to private benefits, which are those that a company can earn unilaterally by picking up skills from its partner and applying them to its own operations in areas unrelated to the alliance activities, as a higher ratio of private to common benefits leads to greater departures from cooperative towards competitive behavior, invoking learning races that will lead to alliance termination by the partner that attains its benefits first (Khanna et al: 1998: 194). Moreover, the level of uncertainty depends on the relational capital that the partners share, which is generally strengthened by prior interorganizational interactions, interorganizational interdependence measured by the resource commitments made by the partners, and similarity of competencies that will enable the partners to interpret each other's behaviors (Globerman & Nielsen: 2007: 453-454). Therefore, one may argue that it is the perceived level of risk associated with cooperation that will dictate, whether or not pharmaceutical companies will be induced to establish an administrative hierarchy that grants the partners access to direct organizational monitoring and control; however, as equity is associated with higher administrative and exit costs than the non-equity structure, the level of risk may not outweigh these costs.

In contrast to exploration alliances, exploitation alliances, including marketing and licensing, are focused on creating efficiency by dividing labor rather than on combining knowledge bases (Nielsen & Gudergan: 2012: 562). Thus, one may argue that despite of the fact that these alliance activities may encompass a relatively high level of asset specificity, they will be characterized by a low level of uncertainty based on the notion that supply or licensing agreements do not entail the risk of opportunism. Both a marketing service supplier and a licensee will have incentive to optimize the sale of the given products, as the former typically receives a percentage of the generated sales and the latter derive the majority of the sales generated from the

licensed intellectual properties. In continuation hereof, it is most likely that the risks associated with exploitation oriented cooperation will not outweigh the costs of forming equity arrangements and, thus, pharmaceutical companies will be prone to select non-equity governance structures. Conclusively, one may argue that it is the general level of risk relative to cost of equity formation that will dictate alliance portfolio governance diversity and, in continuation hereof, the following proposition has been developed:

Proposition 7*: A general lower or higher level of risk relative to cost of equity formation is negatively associated with alliance portfolio governance diversity.*

As argued in the discussion on alliance portfolio location diversity, both institutional and cultural distance induce a number of risks and challenges, which may have consequences for not only selection of location but also selection of governance structure. Thus, in alignment with the institutional perspective, one may argue that environmental attributes, equally to transaction-specific attributes, will have a determining effect on governance, if the given alliance activities constitute cross border transactions. Specifically, some governments restrict foreign direct investment (FDI) by enforcing ownership requirements, which means that companies are not allowed 100 percent ownership and can, therefore, only enter the country by establishing a joint venture with a local company (Peng & Meyer: 2011: 183). These FDI regulations are common in developing and emerging markets and force companies to choose an equity governance mode, indicating that institutional distance can have coercive influence on alliance portfolio governance diversity. Moreover, one may argue that institutional, as well as cultural distance, may encompass a level of uncertainty that outweighs the costs of establishing equity structures, which grant the partner companies access to direct organizational monitoring and control and, thus, reduce the risks associated with cooperation in institutional and cultural frameworks that may be fundamentally different to that of the focal company. In continuation hereof, as the level of uncertainty depends on the relational capital that the partners share, which is generally weakened by cultural distance both in terms of organizational and national culture (Nielsen & Gudergan: 2012: 560), laying the foundation for trust asymmetry and, thus, inhibiting interorganizational trust and trust building (Li: 2010: 11), one may argue that pharmaceutical companies will be prone to choose an equity governance mode; both in order to reduce risk and to enable interorganizational interdependence and, thereby, trust building through enhanced resource commitments. Consequently, one may argue that both institutional and cultural distance may have impact on governance diversity and, in continuation hereof, the following proposition has been developed:

Proposition 8*: Institutional and cultural distance is negatively associated with alliance portfolio governance diversity.*

v.v Framework on Alliance Portfolio Diversity

Based on the discussions on multilevel factors in alliance portfolio diversity and the developed propositions on function, partner, location, and governance diversity, respectively, the following framework on the diversity in pharmaceutical multinational corporations' alliance portfolios has been developed in attempt to provide an understanding of how multilevel factors can affect portfolio diversity and, in continuation hereof, predict the level of diversity in these companies' alliance portfolios:

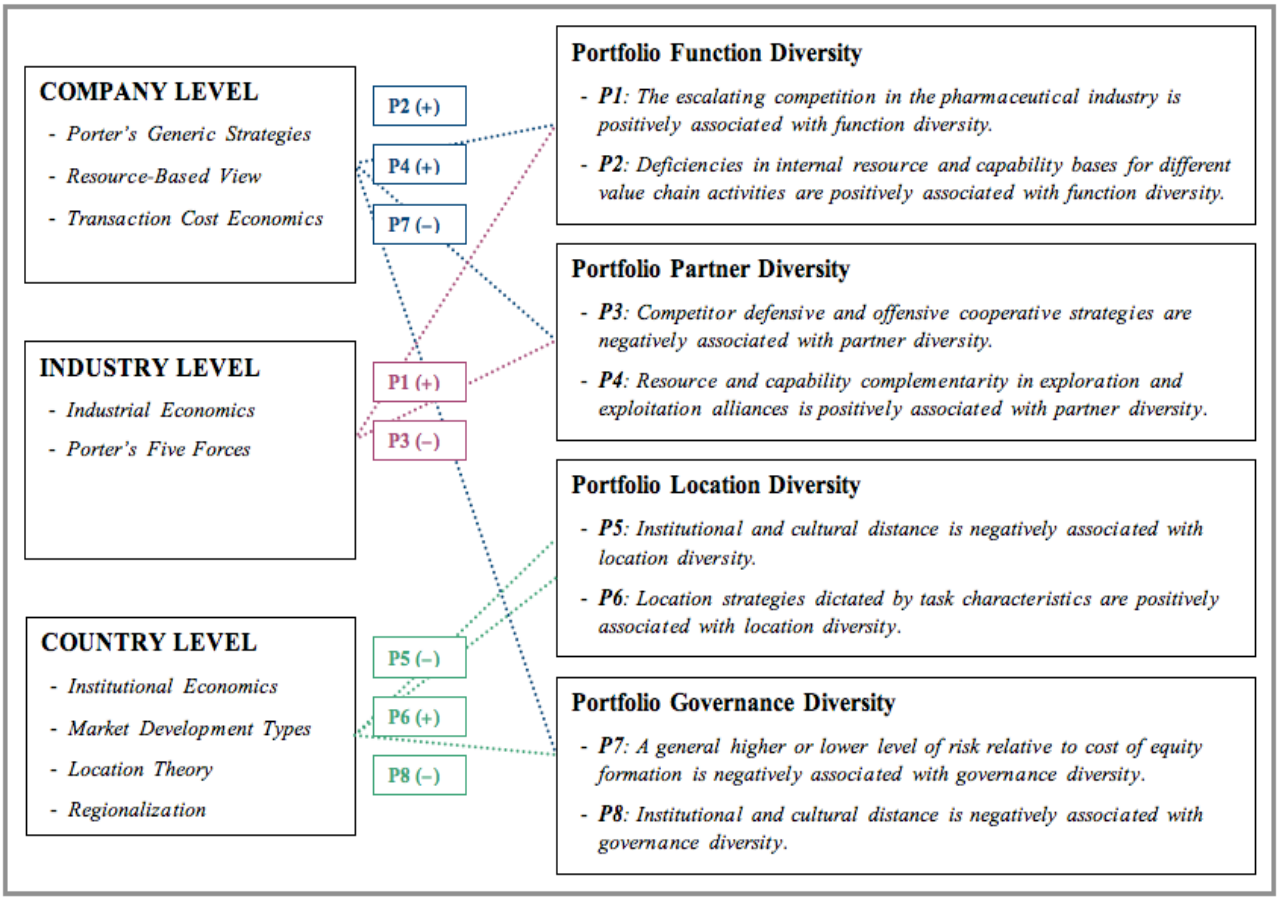


Figure v.v, Source: Author's own work

vi Discussion on Multilevel Complexity

The analyses of the multilevel context, based on which pharmaceutical multinational corporations create their alliance portfolios, and of the multilevel factors, which affect the diversity in their alliance portfolios in the four different dimensions, respectively, provide insight into the multilevel nature of alliance portfolio diversity. In attempt to hedge the challenges of multilevel research, a clear distinction between the three different levels of theory, measurement, and analysis have been made throughout the analysis sections and, as a consequence hereof, the developed propositions and framework reflect, how each level individually may have impact on alliance portfolio diversity. However, this author acknowledges the complexity of

multilevel phenomena and, thus, the fact that the three levels interact and induce simultaneous influences on portfolio diversity. In order to address this complexity and to descriptively and tentatively 'test' the propositions, empirical observations will be introduced and lay the foundation for the following discussions on multilevel complexity in each of the four dimensions of diversity. Based on data on 27 pharmaceutical companies and their alliance portfolios, this author has created four frequency tables (cf. Appendix ix.i-ix.iv) and four pie charts (cf. the following sections) providing overview of the portfolio diversity in the four dimensions, function, partner, location, and governance, respectively. With point of departure in these descriptive statistics, the following sections will include discussions on the relation between the eight developed propositions and the empirical data and, thus, on the impact that the multilevel factors may simultaneously have on the diversity in pharmaceutical multinational corporations' alliance portfolios.

vi.i Alliance Portfolio Function Diversity

The alliance portfolio diversity dimension function has been proposed to potentially be characterized by a high level of diversity, as both the escalating competition in the pharmaceutical industry and deficiencies in internal resource and capability bases for different value chain activities are argued to be positively associated with diversity. Based on the empirical observations, the aggregate of function diversity in the 27 pharmaceutical multinational corporations' alliance portfolios is illustrated by the following chart:

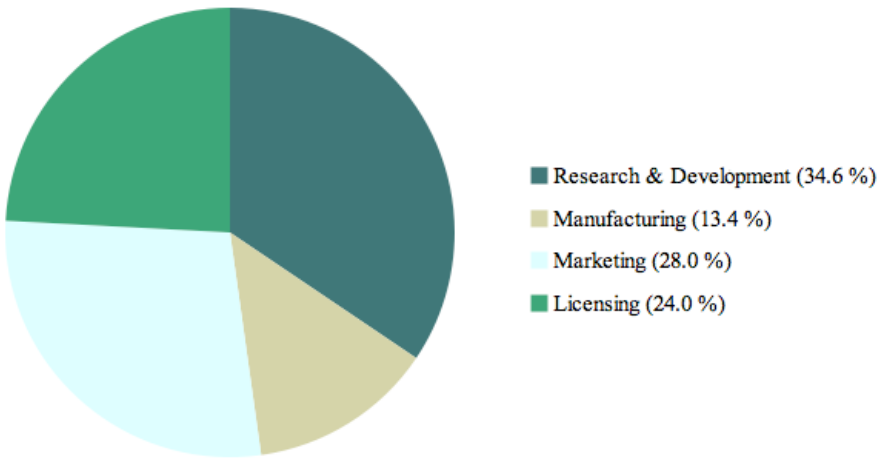


Figure vi.i, Source: Author's own work

This chart illustrates maximum function diversity, as all of the four subcategories, including R&D, manufacturing, marketing and licensing, are present; R&D holding the largest percentage-wise share and manufacturing holding the lowest percentage-wise share, which creates a balance between exploration and exploitation activities, as 48 percent is devoted to the former and 52 percent to the latter. There may be many factors causing the pharmaceutical multinational corporations to engage in strategic alliances within these four functions, enabling them to ensure both current and future viability through enhanced exploration

and exploitation. Specifically, in alignment with the arguments presented in the analysis of multilevel factors in function diversity, the current trends in the pharmaceutical industry, invoking increased industry internal rivalry, can be considered influential factors that accelerate alliance formation, as this will enable the companies to hedge the challenges, which they are facing in creating and sustaining competitive advantage. These industry challenges are highly connected with the company internal perspective, as the increasing R&D costs, increasing drug development times, and declining per drug productivity are likely to induce deficiencies in resource and capability bases. The pharmaceutical companies may, due to the industry changes, experience that they do not possess the required financial resources to discover and develop new drugs, the technological resources to manufacture new drugs, and the reputational or organizational resources to effectively market new drugs and, thereby, are not able to create and sustain competitive advantage through their own operations, strengthened by the notion that existing advantages are likely to be vastly eroded in an increasingly competitive environment. Consequently, one may argue that both the proposition developed based on the industry-level analysis and the proposition developed based on the company-level analysis appear to have impact on the function diversity in pharmaceutical multinational corporations' alliance portfolios, and that these two propositions are highly connected and, thereby, support each other by inducing simultaneous influences.

vi.ii Alliance Portfolio Partner Diversity

The alliance portfolio diversity dimension partner has been proposed to potentially be characterized by a moderate level of diversity, as competitor defensive and offensive cooperative strategies are argued to be negatively associated with diversity, whilst resource and capability complementarity in exploration and exploitation alliances are argued to be positively associated with diversity. Based on the empirical observations, the aggregate of partner diversity in the 27 pharmaceutical multinational corporations' alliance portfolios is illustrated by the following chart:

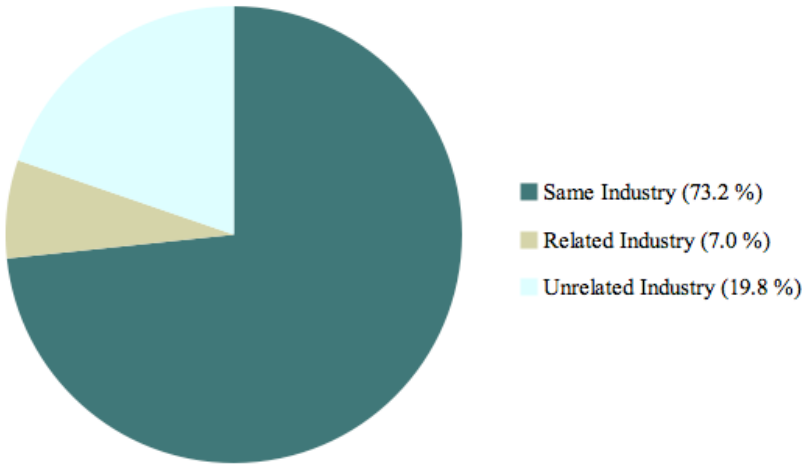


Figure vi.ii, Source: Author's own work

This chart illustrates moderate partner diversity, as all of the three subcategories, including partners operating in the same industry, in a related industry, and in an unrelated industry, are present, however, rather unevenly spread, as the category partners from the same industry holds the significantly largest percentage-wise share, namely 73.2 percent. There may be many factors causing the pharmaceutical multinational corporations to primarily select partners operating in the same industry. Specifically, in alignment with the arguments presented in the industry-level analysis of the multilevel factors in partner diversity, strategies of either co-opting or blocking competition are associated with this choice of partner subcategory. However, it is vital to note that the fact that the pharmaceutical companies prove to favor partners from the same industry does not necessarily mean that the majority of their alliances represent competitor defensive or offensive cooperative strategies. In continuation hereof, the company-level analysis argues that, despite of the risks associated with partnering with a company operating in the same industry, such partnership encompass a greater level of compatibility in terms of backgrounds, experiences, knowledge, and technological bases, than partnerships with companies from related or unrelated industries, which generally supports processes of sharing and transferring tangible and intangible resources. Furthermore, the alliance activities may be highly specialized and, thus, require partnership with companies that possess highly specialized assets, limiting complementarity to partners in the same industry. Hence, whilst some of these industry internal alliances may be formed in attempt to co-opt or block competition, others may simply be formed in attempt to gain access to valuable resources and capabilities and, thereby, create interorganizational synergies. The final 26.8 percent, which represents alliances with partners operating in either a related or an unrelated industry, may be explained through the fact that such partnerships enable enriched resource pools and, hence, added value creation and capability development opportunities. These partnerships are likely formed in cases, where interorganizational complementarity goes beyond industry borders and outweighs the need for interorganizational compatibility, and they indicate that competitive advantage, enabling companies to hedge competition, can be achieved outside the industry. Conclusively, one may argue that both the proposition developed based on the industry-level analysis and the proposition developed based on the company-level analysis may have impact on the partner diversity in pharmaceutical multinational corporations' alliance portfolios and induce simultaneous influences and that an exclusive focus on one of these levels may not be sufficient in understanding portfolio partner diversity.

vi.iii Alliance Portfolio Location Diversity

The alliance portfolio diversity dimension location has been proposed to potentially be characterized by a moderate level of diversity, as institutional and cultural distance is argued to be negatively associated with diversity, whilst location strategies dictated by task characteristics are argued to be positively associated with diversity. Based on the empirical observations, the aggregate of location diversity in the 27 pharmaceutical multinational corporations' alliance portfolios is illustrated by the following chart:

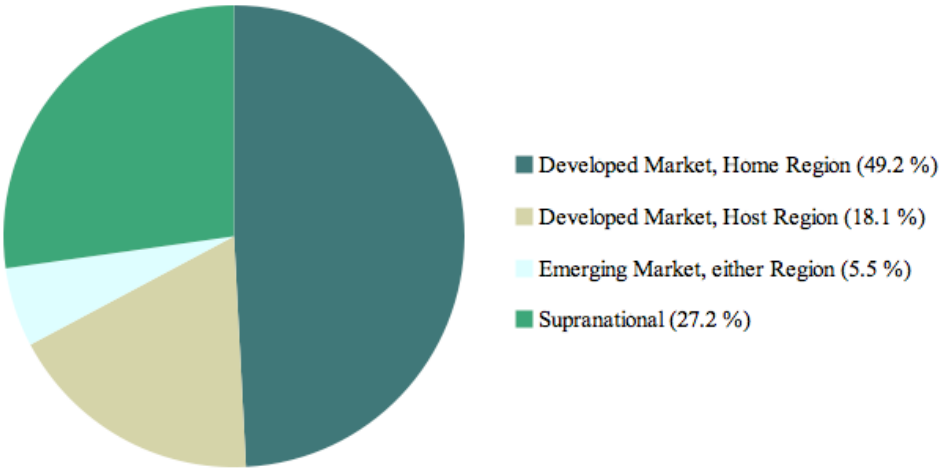


Figure vi.iii, Source: Author's own work

This chart illustrates moderate location diversity, as all of the four subcategories, including developed market in home region, developed market in host region, emerging market in either region, and supranational, are present, however, somewhat unevenly spread, as the category developed market in home region holds the largest percentage-wise share, namely 49.2 percent. There may be many factors causing the pharmaceutical multinational corporations to primarily select locations for their alliance activities in a developed market in their home region. Specifically, in alignment with the arguments presented by the institutional perspective, institutional and cultural distance refrains companies from locating strategic and operational activities in countries with regulative, normative, and cognitive constraints that are significantly different from those in their home country. Moreover, the institutional voids that are characteristic for emerging markets may induce risks that outweigh the opportunities associated with establishing operations in these markets, which appears evident, as only 5.5 percent of the alliance activities are located in emerging economies. In continuation hereof, merely 18.1 percent of the activities are located in a host region, which is a fact that supports the research findings on regionalization in the pharmaceutical industry by Rugman (2005). However, despite the evident tendency to select developed market in home region locations, one is not to neglect the fact that a total of 27.2 percent of the 739 alliances encompass activities that are located supranationally and, thus, across markets and regions. This may be explained from a location theory point of view, which argues that locations for alliance activities are not to be selected based on institutional or cultural distance but based on location attractiveness in terms of market access and resource endowments, enabling companies to selectively add to their advantages and/or offset home-based disadvantages. Therefore, by locating activities supranationally, the pharmaceutical companies enable themselves to tap into the markets and resources of two or more countries and regions at the same time. Whilst the data does not indicate, whether or not supranational means across market types, one may argue that the pharmaceutical companies could benefit from locating strategic and operational activities in both developed and emerging markets, based on both the substantial economic growth and the cost, and increasingly also skill,

competitiveness of the local talent pools in the latter market type. In continuation hereof, there may exist internationalization trends at the industry-level that induce the companies to gradually globalize, rather than regionalize, their strategies, in order to stay competitive and access new markets and, thus, pursue opportunities for future growth, for which strategic alliances represent a viable tool, as they enable companies to test the profitability of new markets. Conclusively, one may argue that both the proposition developed based on institutional economics and the proposition developed based on location theory may have impact on the location diversity in pharmaceutical multinational corporations' alliance portfolios and induce simultaneous influences and that an exclusive focus on one of these theoretical perspectives may not be sufficient in understanding portfolio location diversity.

vi.iv Alliance Portfolio Governance Diversity

The alliance portfolio diversity dimension governance has been proposed to potentially be characterized by a low level of diversity, as both a general lower or higher level of risk relative to cost of equity formation and institutional and cultural distance are argued to be negatively associated with diversity. Based on the empirical observations, the aggregate of governance diversity in the 27 pharmaceutical multinational corporations' alliance portfolios is illustrated by the following chart:

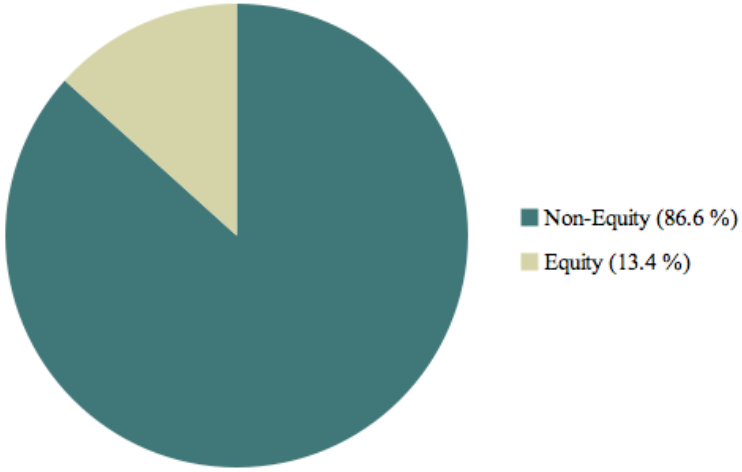


Figure vi.iv, Source: Author's own work

This chart illustrates moderate governance diversity, as both of the subcategories, including non-equity and equity governance modes, are present, however, rather unevenly spread, as the category non-equity holds the significantly largest percentage-wise share, namely 86.6 percent. There may be many factors causing the pharmaceutical multinational corporations to primarily select the non-equity governance mode. Specifically, in alignment with the arguments presented in the company-level analysis of the multilevel factors in governance diversity, companies will conform to a non-equity governance structure, if the perceived level of risk associated with cooperation does not outweigh the cost of equity formation. In continuation hereof, it is

interesting to note that despite of the fact that the pharmaceutical multinationals primarily engage in cooperation with companies operating in the same industry and, thus, with competitors, they primarily choose not to establish equity and, thereby, access to direct organizational monitoring and control. This indicates that the threat of opportunism on the part of one or more alliance partners is not perceived prevalent, which may be founded in a moderate to high level of relational capital shared by the partners and/or a higher ratio of common to private benefits in the alliance activities. Contrarily, the 13.4 percent of the alliances, for which equity governance structures have been chosen, may arguably either represent exploration alliances, rather than exploitation alliances, as the former are more commonly associated with risk than the latter, or, based on arguments offered by institutional economics, international alliances, whereby institutional and/or cultural distance induces a need for enhanced monitoring and control opportunities. The latter argument is, however, as indicated, only applicable to alliances, whereby the activities are not located within developed markets in the home region and, as argued in the analysis of the multilevel factors in governance diversity, institutional distance may not only induce but force companies to form equity through formal FDI ownership requirements. Conclusively, one may argue that both the proposition developed based on the company-level analysis and the proposition developed based on the country-level analysis may have impact on the governance diversity in pharmaceutical multinational corporations' alliance portfolios and induce simultaneous influences and that an exclusive focus on one of these levels may not be sufficient in understanding portfolio governance diversity.

vii Conclusion

The research question of this thesis, which lays the foundation for a study of the impact of industry-, country-, and company-level factors on the diversity in pharmaceutical multinational corporations' alliance portfolios, has been addressed by analyzing the multilevel context, based on which the portfolios are created, by analyzing the multilevel factors, which affect the diversity in the portfolios in the four different dimensions, respectively, and, finally, by discussing multilevel complexity, based on empirical observations of the alliance portfolios of 27 pharmaceutical multinational corporations. With point of departure in industry-, country-, and company-level theory and data, this thesis provides evidence of the competitiveness and current trends in the pharmaceutical industry, of the opportunities and challenges of internationalization, and of the resource and capability requirements for pharmaceutical companies to create and sustain competitive advantage. Specifically, the industry-level analysis indicates intensified rivalry amongst competitors, which appears to be accelerated by the declining annual industry growth rates, both in terms of worldwide sales of prescription drugs and of investments in research and development, and the current industry trends, including increasing research and development costs, increasing drug development times, declining per drug productivity, and the growth of generic drugs; all of which induce the pharmaceutical companies, including both innovators and imitators, to fiercely compete for the existing market shares. In

continuation hereof, the country-level analysis indicates that there exist a number of barriers for pharmaceutical companies to engage in global strategies. These barriers are founded in the dissimilarities between the regulative, normative, and cognitive constraints that dictate corporate behavior within an either national or regional framework and, thus, in the challenges and risks of operating cross borders and, moreover, cross market types. As a consequence hereof, the challenges and risks of global strategies may outweigh the opportunities offered by internationalization that generally enables companies to selectively add to their advantages or offset home-based disadvantages choosing favorable locations for their strategic and operational activities. Finally, the company-level of analysis indicates the differences between innovator and imitator companies and argues that it is the company internal resource and capability bases that provide strategic directions and lay the foundation for attainment of competitive advantages. Moreover, this level of analysis suggests that strategic alliances can be applied to offset competitive disadvantages, offering a bridge to the analysis of multilevel factors in alliance portfolio diversity.

Based on the findings of the analysis of the multilevel context, in which pharmaceutical multinational corporations create their alliance portfolios, factors at the industry-, country-, and company-levels are identified and applied in discussions on their effect on portfolio diversity within the four dimensions, namely function, partner, location, and governance, respectively. These discussions have resulted in the development of eight propositions that argue, how company-level factors have a positive effect on function and partner diversity and a negative effect on governance diversity, how industry-level factors have a positive effect on function diversity and a negative effect on partner diversity, and how country-level factors have both a positive and a negative effect on location diversity and a negative effect on governance diversity. These propositions have laid the foundation for the development of a framework that illustrates the effects that each of the analysis levels has on alliance portfolio diversity. Whilst some of the propositions support each other by inducing either positive or negative influences on portfolio diversity, others conflict by inducing contradictory influences, and in order to address these supporting or conflicting effects, empirical data has been introduced, enabling a discussion on the complex and simultaneous impact that multilevel factors have on the diversity in pharmaceutical multinational corporations' alliance portfolios. This final discussion, based on empirical observations of 27 pharmaceutical companies and their alliance portfolios, enables the research thesis to provide a nuanced understanding of, how industry-, country-, and company-level factors affect the diversity in the alliances portfolios by simultaneously inducing incentives to select certain functions, partners, locations, and governance structures.

All of these research findings serve to advance the alliance portfolio research field by offering an integrated, multilevel approach to analyzing alliance portfolio diversity. As argued in the introduction, the existing literature on strategic alliance portfolios is limited and primarily dominated by empirical studies of the relation between portfolio diversity and performance. Therefore, this research thesis can be considered a

contribution to the existing research, as it addresses the very driving forces of portfolio diversity and offers new theorization on the topic by integrating existing theories and, thereby, enabling the development of a framework for predicting the diversity in pharmaceutical multinational corporations' alliance portfolios. In continuation hereof, this research thesis demonstrates the complex and multilevel nature of alliance portfolios by applying the pharmaceutical industry to exemplify how factors at different levels influence portfolio diversity, and, based on the findings of this thesis, one may argue that the multilevel research approach has proven to be lucrative, as it enables research to move beyond the simplifications that can be associated with analysis at merely one level. Besides the theoretical implications of this thesis, one may argue that it provides insight into the factors that are critical to pharmaceutical companies and their alliance portfolios and may, thus, serve to provide strategic directions for managers operating within the pharmaceutical industry, as it draws attention to both the opportunities and challenges of cooperation and the many factors that have to be incorporated in the cooperative strategies that are to enable these industry players to attain multiple goals through a number of simultaneous alliances.

vii.i Reflections and Suggested Future Research

As described in the introduction, this research thesis has contributed to existing literature on strategic alliance portfolios in a number of ways; namely by offering the, to this author's knowledge, first multilevel research conducted within alliance portfolio research field and by presenting eight propositions and a framework on the diversity in pharmaceutical multinational corporations' alliance portfolios. The purpose of this research thesis has fundamentally been to provide a nuanced understanding of the context in which alliance portfolios are created and the influence that multilevel factors have on alliance portfolio diversity. However, whilst this thesis may have offered some valid contributions to existing literature on strategic alliance portfolios, it encompasses a number of delimitations, which could and should be addressed by future research. In continuation of this research thesis, it could be interesting to test the developed propositions and, thereby, investigate the actual correlation between multilevel factors and alliance portfolio diversity, as the descriptive statistics included in the discussion section merely provide empirical indications. Furthermore, research could profit from multilevel studies of other industries and/or the impact of industry-specific factors, which may prove that the propositions that have been developed on the pharmaceutical multinational corporations' alliance portfolios through this research thesis are in fact applicable to other industries. Moreover, it could be interesting to conduct research on, how multilevel factors and the influence that they have on portfolio diversity may vary with company size, addressing the delimitation that excludes small and medium sized companies, as well as with company home base location, addressing the delimitation that excludes emerging and developing market based companies. Finally, future research could, in conformation to the multilevel research approach, include the individual level of analysis, as it would be

interesting to investigate, how the role of individual may have impact on alliance portfolio diversity, which represents a research area that is, at present, only limitedly addressed in existing literature.

viii References

Barney, Jay: 1991: '*Firm Resources and Sustained Competitive Advantage*': Journal of Management (vol 17, no 1, pp 99-120)

Barney, Jay & Hesterly, William: 2010: '*VRIO Framework*' (in '*Strategic Management and Competitive Advantage*'): Pearson (pp 68-86)

Boston Consulting Group: 1996: '*Sustaining Innovation in the US Pharmaceuticals: Intellectual Property Protection and the Role of Patents*': Report commissioned by PhRMA and 12 pharmaceutical companies

Bremmer, Ian: 2005: '*Managing Risk in an Unstable World*': Harvard Business Review (June, pp 51-60)

Cantor, David: 2002: '*Prescription Drugs: Factors Influencing Their Pricing*' (in '*The Pharmaceutical Industry: Access and Outlook*' edited by E. Parvis): Nova Science Publishers (pp 35-45)

Child, John; Faulkner, David & Tallman, Stephen: 2005: '*Cooperative Strategy: Managing Alliances, Networks, and Joint Ventures*': Oxford University Press

Contractor, Farok & Lorange, Peter: 2004: '*Why Should Firms Cooperate? The Strategy and Economics Basis for Cooperative Ventures*' (chapter 1 in '*Strategic Alliances: Theory and Evidence*' edited by Jeffrey Reuer): Oxford University Press

Dow Jones: 2011: '*Total Stock Market Indexes*': Dow Jones Indexes (pp 1-4)

Duyster, Geert & Lokshin, Boris: 2011: '*Determinants of Alliance Portfolio Complexity and Its Effect on Innovative Performance of Companies*': Journal of Product Innovation Management (vol 28, no 4, pp 570-585)

Datamonitor: 2005: '*Merger and Acquisition*': Datamonitor New York

DiMaggio, Paul & Powell, Walter: 1983: '*The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields*': American Sociological Review (vol 48, pp 147-160)

European Federation of Pharmaceutical Industries and Associations: 2011: '*The Pharmaceutical Industry in Figures: 2011 Update*': EFPIA Library

Evaluate Pharma: 2010: (downloaded March 20th 2012)
http://www.evaluatepharma.com/Universal/View.aspx?type=Story&id=217946&sectionID=&isEPVantage=yes

Eyring, Matthew; Johnson, Mark & Nair, Hari: February 2011: '*New Business Models in Emerging Markets*': Harvard Business Review (February, pp 88-95)

Gassmann, Oliver; Reepmeyer, Gerrit & Von Zedtwitz, Maximilian: 2004: '*Leading Pharmaceutical Innovation: Trends and Drivers for Growth in the Pharmaceutical Industry*': Springer-Verlag Berlin

Generic Pharmaceutical Association: 2012: (downloaded April 25th 2012)
http://www.gphaonline.org/about-gpha/about-generics/facts

Ghemawat, Pankaj: 2007: '*Managing Differences: The Central Challenge of Global Strategies*': Harvard Business Review (March, pp 59-68)

Globerman, Steven & Nielsen, Bo Bernhard: 2007: '*Equity versus Non-Equity International Strategic Alliances Involving Danish Firms: An Empirical Investigation of the Relative Importance of Partner and Host Country Determinants*': Journal of International Management (vol 13, pp 449-471)

Goerzen, Anthony & Beamish, Paul: 2005: '*The Effect of Alliance Network Diversity on Multinational Enterprise Performance*': Strategic Management Journal (vol 26, no 4, pp 333-354)

Grant, Robert: 1991: '*The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation*': California Management Review (vol 33, no3, pp 114-134)

Grove, Andrew: 1996: '*Only the Paranoid Survive*': Doubleday New York

Gupta, Anil & Wang, Haiyan: 2009: '*Getting China and India Right: Strategies for Leveraging the World's Fastest Growing Economies for Global Advantage*': Jossey-Bass

Harrison, David & Klein, Katherine: 2007: '*What's the Difference? Diversity Constructs as Separation, Variety, or Disparity in Organizations*': Academy of Management Review (vol 32, no 4, pp 1199-1228)

Heimeriks, Koen; Klijn, Elko & Reuer, Jeffrey: 2009: '*Building Capabilities for Alliance Portfolios*': Long Range Planning (vol 42, pp 96-114)

Hitt, Michael; Dacin, Tina; Levitas, Edward; Arregle, Jean-Luc & Borza, Anca: 2000: '*Partner Selection in Emerging and Developed Market Contexts: Resource-Based and Organizational Learning Perspectives*': Academy of Management Journal (vol 43, pp 449-467)

Hoffmann, Werner: 2007: '*Strategies for Managing a Portfolio of Alliances*': Strategic Management Journal (vol 28, pp 827-856)

Hofstede, Geert: 2012: (downloaded April 25th 2012)
http://geert-hofstede.com/national-culture.html

Hoskission, Robert; Hitt, Michael; Johnson, Richard & Moesel, Douglas: 1993: '*Construct Validity of an Objective (Entropy) Categorical Measure of Diversification Strategy*': Strategic Management Journal (vol 14, no 3, pp 215-235)

Jiang, Ruihua; Tao, Qingjiu & Santoro, Michael: 2010: '*Alliance Portfolio Diversity and Firm Performance*': Strategic Management Journal (vol 31, pp 1136-1144)

Khanna, Tarun; Gulati, Ranjay & Nohria, Nitin: 1998: '*The Dynamics of Learning Alliances: Competition, Cooperation, and Relative Scope*': Strategic Management Journal (vol 19, pp 193-210)

Khanna, Tarun & Palepu, Krishna: 2010: '*Winning in Emerging Markets: A Road Map for Strategy and Execution*': Harvard Business Press

Kesic, Dragan: 2011: '*Strategic Development Trends in the World Pharmaceutical Industry*': Managing Global Transitions (vol 9, no 3, pp 207-223)

Kimelberg, Shelly McDonough & Nicoll, Lauren: 2012: '*Business Location Decisions in the Medical Device Industry: Evidence from Massachusetts*': Economic Development Quarterly (vol 26, no 1, pp 34-49)

Koenig, Pamina & MacGarvie, Megan: 2011: '*Regulatory Policy and the Location of Bio-Pharmaceutical Foreign Direct Investment in Europe*': Journal of Health Economics (pp 1-16)

Lavie, Dovev: 2009: '*Capturing Value from Alliance Portfolios*': Organizational Dynamics (vol 38, no 1, pp 26-36)

Levinthal, Daniel & March, James: 1993: '*The Myopia of Learning*': Strategic Management Journal (vol 14, pp 95-113)

Li, Peter Ping: 2010: '*Intercultural Trust and Trust Building: The Contexts and Strategies of Adaptive Learning in Acculturation*': Academy of Management

McKinsey: 2004: '*The Truth about Foreign Direct Investment in Emerging Markets*': The McKinsey Quarterly (no 1, pp 24-35)

Merck: 2007: (downloaded April 25th 2012)
http://www.merckmanuals.com/home/drugs/factors_affecting_response_to_drugs/genetic_makeup_and_response_to_drugs.html

Murray, Janet & Kotabe, Masaaki: 2005: '*Performance Implications of Strategic Fit Between Alliance Attributes and Alliance Forms*': Journal of Business Research (vol 58, pp 1525-1533)

Nielsen, Bo Bernhard: 2002: '*Synergies in Strategic Alliances: Motivation and Outcomes of Complementary and Synergistic Knowledge Networks*': Journal of Knowledge Management Practice (vol 3 / October)

Nielsen, Bo Bernhard: 2010: '*Multilevel Issues in Strategic Alliance Research*' (chapter 1 in '*Researching Strategic Alliances*' edited by T. K. Das): Information Age Publishing (pp 1-27)

Nielsen, Bo Bernhard & Gudergan, Siegfried: 2012: '*Exploration and Exploitation Fit and Performance in International Strategic Alliances*': International Business Review (vol 21, pp 558-574)

North, Douglass: 1990: '*Institutions, Institutional Change, and Economic Performance*': Cambridge University Press

Parvis, Ethan: 2002: '*The Pharmaceutical Industry: Access and Outlook*': Nova Science Publishers

Peng, Mike: 2009: '*Global Strategy*': Cengage Learning (second edition)

Peng, Mike & Meyer, Klaus: 2011: '*International Business*': Cengage Learning

Porter, Michael: 1980: '*Competitive Strategy: Techniques for Analyzing Industries and Competitors*': The Free Press (a division of Macmillan Publishing)

Porter, Michael: 1985: '*Competitive Advantage: Creating and Sustaining Superior Performance*': The Free Press (a division of Macmillan Publishing)

Porter, Michael: 1990: '*The Competitive Advantage of Nations*': The Macmillan Press LTD

Porter, Michael: 2000: '*Location, Clusters, and Company Strategy*' (chapter 13 in '*The Oxford Handbook of Economic Geography*'): Oxford University Press (pp 253-274)

Reuer, Jeffrey: 2004: '*Strategic Alliances: Theory and Evidence*': Oxford University Press

Reuer, Jeffrey & Ragozzino, Roberto: 2006: '*Agency Hazards and Alliance Portfolios*': Strategic Management Journal (vol 27, pp 27-43)

Reuters: 2002: '*Pharmaceutical Innovation: An Analysis of Leading Companies and Strategies*': Reuters Business Insights (healthcare)

Rodrik, Dani & Subramanian, Arvind: 2003: '*The Primacy of Institutions*': Finance & Development (June, pp 31-34)

Rugman, Alan: 2005: '*The Regional Multinationals: MNEs and 'Global' Strategic Management*': Cambridge University Press

Sarkar, MB; Preet, Aulakh & Madhok, Anoop: 2009: '*Process Capabilities and Value Generation in Alliance Portfolios*': Organization Science (vol 20, no 3, pp 583-600)

Saunders, Mark; Lewis, Philip & Thornhill, Adrian: 2007: '*Research Methods for Business Students*': Prentice Hall

Scott, William Richard: 2001: '*Institutions and Organizations*': Sage Publications Inc

Smith, Adam: 1776: '*The Wealth of Nations*'

The World Bank: 2012: (downloaded April 25th 2012)
http://data.worldbank.org/indicator/NY.GDP.PCAP.CD

Thuy, Lai Xuan & Quang, Truong: 2005: '*Relational Capital and Performance of International Joint Ventures in Vietnam*': Asia Pacific Business Review (vol 11, no 3, pp 389-410)

US Securities and Exchange Commission: 2012: (downloaded June 20th 2012)
http://www.sec.gov/info/edgar/siccodes.htm

Wassmer, Ulrich: 2010: '*Alliance Portfolios: A Review and Research Agenda*': Journal of Management (vol 36, no 1, pp 141-171)

Williamson, Oliver: 1991: '*Strategizing, Economizing, and Economic Organization*': Strategic Management Journal (vol 12, pp 75-94)

Williamson, Oliver: 1998: '*Transaction Cost Economics: How It Works; Where It is Headed*': DE Economist (vol 146, no 1, pp 23-58)

World Health Organization: 2002: '*Regulatory Framework*' (chapter 4 in '*Effective Drug Regulation: A Multicountry Study*'): WHO Library Cataloguing-in-Publication Data (pp 25-38)

World Health Organization: 2004: '*World Pharmaceutical Sales and Consumption*' (chapter 4 in '*The World Medicines Situation*': WHO Library Cataloguing-in-Publication Data (pp 31-40)

World Health Organization: 2012: (downloaded March 20th 2012)
http://www.who.int/trade/glossary/story034/en/index.html

World Intellectual Property Organization: 2012: (downloaded May 20th 2012)
http://www.wipo.int/sme/en/documents/pharma_licensing.html#P510_29610

Xu, Dean & Shenkar, Oded: 2002: '*Institutional Distance and the Multinational Enterprise*': The Academy of Management Review (vol 27, no 4, pp 608-618)

ix Appendix

ix.i Portfolio Function Diversity

Company name	# of research and development agreements	# of manufacturing agreements	# of marketing agreements	# of licensing agreements	Total # of alliance functions
AMERICAS					
Abbott Laboratories	55	24	62	58	**199**
American Home Products	31	10	19	21	**81**
Bristol-Myers Co	3	2	3	3	**11**
Eli Lilly & Co	8	2	6	4	**20**
Genetech Inc	1	0	1	1	**3**
Forest Laboratories Inc	6	1	14	8	**29**
Johnson & Johnson Inc	4	3	4	3	**14**
Merck & Co Inc	4	0	4	3	**11**
Pfizer Inc	78	17	39	43	**177**
Schering-Plough Corp	3	2	7	5	**17**
ASIA / PACIFIC					
Daiichi Pharmaceutical Co	4	1	1	3	**9**
Eisai Co Ltd	5	2	5	1	**13**
Kyowa Hakko Kogyo Co Ltd	1	1	1	1	**4**
Takeda Pharmaceutical Co	3	3	3	1	**10**
Yamanouchi Pharmaceuticals	6	1	1	3	**11**
EUROPE					
AstraZeneca PLC	2	0	2	1	**5**
Bayer AG	43	45	49	24	**161**
Boehringer Ingelheim KG	1	0	1	1	**3**
Ciba-Geigy AG	2	2	1	1	**6**
GlaxoSmithKline PLC	4	0	4	0	**8**
Merck KGaA	2	0	1	0	**3**
Novartis AG	43	7	20	32	**102**
Novo Nordisk A/S	26	7	21	21	**75**
Roche Holding Ltd	15	1	6	9	**31**
Sandoz AG	8	5	11	7	**31**
Sanofi-Aventis SA	10	7	5	4	**16**
MIDDLE EAST					
Teva Pharma Inds Ltd	8	2	15	4	**29**
Total	**376**	**145**	**306**	**262**	**1.089**

Figure x.i, Information source: Applied dataset (cf. Methodology)

ix.ii Portfolio Partner Diversity

Company name	# of partners from the same industry	# of partners from related industries	# of partners from unrelated industries	Total # of alliances
AMERICAS				
Abbott Laboratories	95	6	24	**125**
American Home Products	45	2	6	**53**
Bristol-Myers Co	6	0	1	**7**
Eli Lilly & Co	9	0	3	**12**
Genentech Inc	1	0	1	**2**
Forest Laboratories Inc	12	1	3	**16**
Johnson & Johnson Inc	3	1	6	**10**
Merck & Co Inc	5	2	0	**7**
Pfizer Inc	95	5	17	**117**
Schering-Plough Corp	13	1	1	**15**
ASIA / PACIFIC				
Daiichi Pharmaceutical Co	6	0	1	**7**
Eisai Co Ltd	9	0	0	**9**
Kyowa Hakko Kogyo Co Ltd	0	3	1	**4**
Takeda Pharmaceutical Co	5	3	1	**9**
Yamanouchi Pharmaceuticals	9	0	2	**11**
EUROPE				
AstraZeneca PLC	3	0	0	**3**
Bayer AG	52	20	40	**112**
Boehringer Ingelheim KG	2	0	0	**2**
Ciba-Geigy AG	2	1	1	**4**
GlaxoSmithKline PLC	5	1	1	**7**
Merck KGaA	1	0	2	**3**
Novartis AG	62	1	7	**70**
Novo Nordisk A/S	38	1	12	**51**
Roche Holding Ltd	16	1	3	**20**
Sandoz AG	15	1	2	**18**
Sanofi-Aventis SA	11	1	7	**19**
MIDDLE EAST				
Teva Pharma Inds Ltd	21	1	4	**26**
Total	**541**	**52**	**146**	**739**

Figure x.ii, Information source: Applied dataset (cf. Methodology)

ix.iii Portfolio Location Diversity

Company name	# of developed market, home region locations	# of developed market, host region locations	# of emerging market, either region locations	# of supranational locations	Total # of alliances
AMERICAS					
Abbott Laboratories	88	9	0	28	**125**
American Home Products	39	5	0	9	**53**
Bristol-Myers Co	3	1	0	3	**7**
Eli Lilly & Co	9	0	1	2	**12**
Genentech Inc	1	0	0	1	**2**
Forest Laboratories Inc	11	1	0	4	**16**
Johnson & Johnson Inc	9	0	0	1	**10**
Merck & Co Inc	6	0	0	1	**7**
Pfizer Inc	86	8	5	18	**117**
Schering-Plough Corp	7	3	0	5	**15**
ASIA / PACIFIC					
Daiichi Pharmaceutical Co	0	0	1	6	**7**
Eisai Co Ltd	7	1	0	1	**9**
Kyowa Hakko Kogyo Co Ltd	3	0	0	1	**4**
Takeda Pharmaceutical Co	3	1	1	4	**9**
Yamanouchi Pharmaceuticals	6	0	0	5	**11**
EUROPE					
AstraZeneca PLC	1	0	0	2	**3**
Bayer AG	33	39	21	19	**112**
Boehringer Ingelheim KG	0	1	0	1	**2**
Ciba-Geigy AG	1	2	0	1	**4**
GlaxoSmithKline PLC	1	2	0	4	**7**
Merck KGaA	1	0	0	2	**3**
Novartis AG	13	16	2	39	**70**
Novo Nordisk A/S	11	21	4	15	**51**
Roche Holding Ltd	3	13	0	4	**20**
Sandoz AG	5	7	1	5	**18**
Sanofi-Aventis SA	3	1	4	11	**19**
MIDDLE EAST					
Teva Pharma Inds Ltd	13	3	1	9	**26**
Total	**363**	**134**	**41**	**201**	**739**

Figure x.iii, Information source: Applied dataset (cf. Methodology)

ix.iv Portfolio Governance Diversity

Company name	# of equity-based agreements	# of non-equity-based agreements	Total # of alliances
AMERICAS			
Abbott Laboratories	5	120	**125**
American Home Products	2	51	**53**
Bristol-Myers Co	1	6	**7**
Eli Lilly & Co	1	11	**12**
Genentech Inc	0	2	**2**
Forest Laboratories Inc	0	16	**16**
Johnson & Johnson Inc	1	9	**10**
Merck & Co Inc	1	6	**7**
Pfizer Inc	7	110	**117**
Schering-Plough Corp	2	13	**15**
ASIA / PACIFIC			
Daiichi Pharmaceutical Co	1	6	**7**
Eisai Co Ltd	3	6	**9**
Kyowa Hakko Kogyo Co Ltd	2	2	**4**
Takeda Pharmaceutical Co	2	7	**9**
Yamanouchi Pharmaceuticals	1	10	**11**
EUROPE			
AstraZeneca PLC	0	3	**3**
Bayer AG	42	70	**112**
Boehringer Ingelheim KG	0	2	**2**
Ciba-Geigy AG	1	3	**4**
GlaxoSmithKline PLC	0	7	**7**
Merck KGaA	0	3	**3**
Novartis AG	5	65	**70**
Novo Nordisk A/S	7	44	**51**
Roche Holding Ltd	3	17	**20**
Sandoz AG	2	16	**18**
Sanofi-Aventis SA	5	14	**19**
MIDDLE EAST			
Teva Pharma Inds Ltd	5	21	**26**
Total	**99**	**640**	**739**

Figure x.iv, Information source: Applied dataset (cf. Methodology)

ix.v Market Type Specification

Developed Markets	Emerging Markets
AMERICAS	
United States of America	Brazil
Canada	Chile
	Columbia
	Mexico
	Peru
ASIA / PACIFIC	
Australia	China
Hong Kong	India
Japan	Indonesia
New Zealand	Malaysia
Singapore	Philippines
	South Korea
	Taiwan
	Thailand
EUROPE	
Austria	Czech Republic
Belgium	Hungary
Denmark	Poland
Finland	Russia
France	Turkey
Germany	
Greece	
Iceland	
Ireland	
Italy	
Netherlands	
Norway	
Portugal	
Slovenia	
Spain	
Sweden	
Switzerland	
United Kingdom	
MIDDLE EAST	
Israel	
AFRICA	
	Egypt
	Morocco
	South Africa

Figure x.vi, Information source: Dow Jones Total Stock Market Indexes (2011) p 2