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## Global Value Chains and Industry Architecture: an insight into the Bicycle Industry

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## **Abstract**

The aim of this dissertation is to describe the Industry Architecture and the Global Value Chain of the Bicycle Industry and to investigate the Italian Companies reaction to the evolution of them. Whether and how firms deal with this and how they could keep the leadership, in a sector that moved production off-shore, thanks to innovative strategies.

With this perspective, the purpose of this research is to verify whether and how Italian companies are dealing with localization shifting and globalization of the value chain.

The dissertation presents the relevant literature on GVCs and Industry Architecture; it describes the state of art of the research on this field through a quantitative analysis and qualitative description of its evolutions.

The thesis of the need of a pure global strategy in order to compete and to keep this industry in Italy is supported by sales figures of the last decade, and furthermore by the results of the companies we looked at.

The study is conducted through the qualitative analysis of case studies. Interviews with the managers of different companies were conducted in person and on the phone. They provided useful examples and deep insights on the industry. We identify two different approaches to competition based on four key elements and factors: corporate culture, approach to new market segment, internationalization of the strategy and production, the management of the distribution channel.

## Acknowledgements

This study is the perfect conclusion of my experience at Ca Foscari University. I researched on a field and over an industry I am very passionate about; I wrote it while I was working in London thanks to my second Erasmus scholarship, and many people supported me throughout this work.

Foremost, I am infinitely grateful to my parents and all my family who have been fundamental to me during all my studies, encouraging me every time I needed.

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I would like to thank many people, both for scientific reasons and for moral support. All the managers cited in this dissertation that have been helpful and that gave me important insights and valuable perspectives in order to understand the issues of this industry. Special mention of gratitude goes to the staff of the two companies: Fulcrum's managers I worked with when I was 21 and who still continue helping me in my career development; L'Occitane en Provence UK colleagues for having me there for eight months while I was writing this dissertation.

Finally, I am thankful to my colleagues at University for sharing this amazing experience and for helping reciprocally, to my friends for diverting me in these years, to Giulio and Anya for their support in the review of the present dissertation, but chiefly for being my best friends in London sharing great moments together while I was studying and writing for this work.

## Table of contents

Abstract	2
Acknowledgments	3
Table of content	4
Introduction	6
Chapter I	
1. Value Chain concept and its evolution in management literature	8
1.1. Michael Porter's Value Chain model	8
1.2. Value Chain: a terminology specification	10
1.3. Global Value Chain Concept	11
1.4. Evolution of Global Value Chain concept	22
1.5. Industry Architecture and Globalization	25
1.6. The role of innovation into Industry Architecture	31
1.7. The importance of the product line breadth to determine firm performance and industry architecture into Bicycle Industry	36
Chapter II	
2. Bicycle Industry	40
2.1. Introduction	40
2.2. Market size and figures	41
2.3. The history of the industry	54
2.4. The Distribution Channel and Industry Supply Chain	56
2.5. Case Study: Shimano	62
2.6. The power of industry architecture: Shimano went integrated from being modular	66
2.7. Case Study: Campagnolo	69
2.8. Innovation and EPS case in Campagnolo	72
2.9. Differences in the two case studies	76

Chapter III	
3. Bicycle Industry Case Studies	77
3.1. Introduction	77
3.2. Methods and Data	78
3.3. Bianchi	79
3.4. Campagnolo	82
3.5. Fulcrum Wheels	85
3.6. Selle Royal	87
3.7. Selle San Marco	90
3.8. Ciclo Promo Components	92
3.9. Cycle Lab Italy	93
Chapter IV	
4. Findings and conclusions	95
4.1. Introduction	95
4.2. Factors Reshaping the Bicycle Industry Architecture	97
4.3. Corporate Culture and management	98
4.4. Off-road bike and New Market segment development	100
4.5. Internationalization Process and Production off-shoring	102
4.6. Distribution Management	103
4.7. Italian industry perspective	104
Bibliography	108

## Introduction

The aim of this thesis is to investigate, describe and present an analysis of the Italian Bicycle Industry, focusing on the structure of its Global Value Chain and on elements leading the evolution of the Industry Architecture. We looked at different cases of companies located in the North East of Italy in order to identify common features of leading companies and key elements driving to market success.

In the first chapter we present existing theory concerning Value Chain concept in management literature. First of all a clarification concerning the terminology used in this paper is due. Throughout literature and different approaches, we present definitions and expressions that have different meaning according to different scholars, thus we need to identify a common technical jargon. We focus on Gereffi's work concerning Global Value Chain (1994, 1999) and Jacobides' contribution (2005) about Industry Architecture.

In the second chapter we describe the industry by analyzing figures and market data from Ancma - Associazione Nazionale Ciclo Motociclo Accessori - annual reports. After the first part that presents all the relevant figures; we summarize the history of this industry and new trends on the global market. We introduce Shimano's case in order to highlight the differences between the world market leader and Italian operators. We present Campagnolo's case and the innovation process of their last new product: EPS drive train that is the first entirely electronic shifting system.

The third chapter is dedicated to business cases and interviews we had with managers and industry experts. Thanks to this qualitatively information we are able to assess the situation and the strategy of Italian bicycle firms according to GVCs pattern of analysis from an Industry Architecture perspective. We report manager's thoughts about the industry and their companies and we present firms they work for.

The fourth chapter consists of the analysis of our findings and the critical comment looking at past strategic decisions and assessing the outlook for this industry according to the main

key factors of success we identified in our research. We present evidence of the shifting of the area of production and different approaches to this fact that have driven firms to different decisions and results. The aim is to understand reasons of this change in the Industry Architecture and to evaluate different patterns of organizations. From this point we describe two main strategies for competing and we comment on the economical results, the position and the importance in the supply chain. We complete our work with an analysis of the outlook of the Industry for Italy, highlighting the key factors of strategy that enabled some companies to keep or to get the leadership on the contrary of others that lost market shares.

# Chapter I

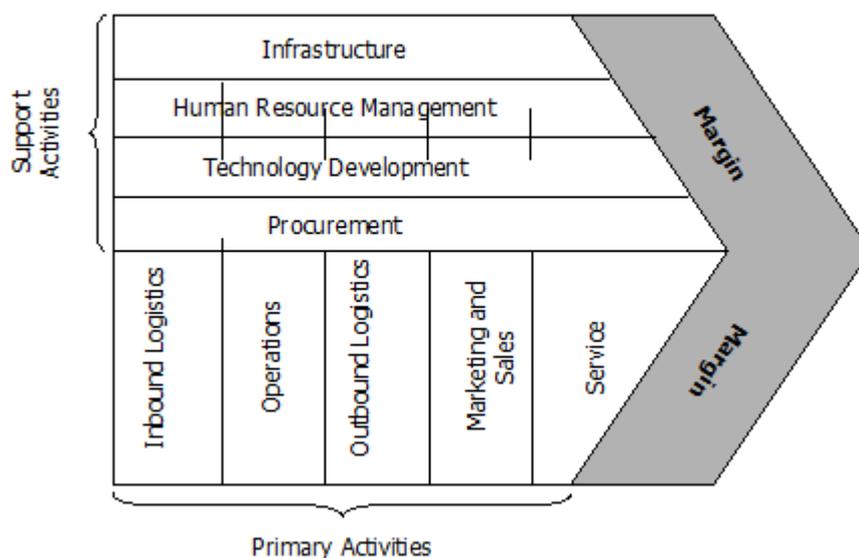
## Value Chain concept and its evolution in management literature

### 1.1 Michael Porter's Value Chain model

The research proposal of this dissertation rises up from studies on Global Value Chain. First of all, we have to clarify what Value Chain defines according to our thinking and the way we use it in the following pages. It is one of the most discussed and most misunderstood concepts in management studies. We go throughout the most important literature that is a matter of value chain concern.

At the beginning of our research, we have to cite Michael Porter's work (1985):

“Competitive advantage cannot be understood by looking at a firm as a whole. It stems from the many discrete activities a firm performs in designing, producing, marketing, delivering and supporting its product. Each of these activities can contribute to a firm's relative cost position and create a basis for differentiation”.



Value chain analysis describes the activities within an organization, and links them to the competitive strength of the organization. Therefore, this model evaluates which value each particular activity adds to the organizations products or services; each link in a value chain consists of a bundle of activities (value activities), and these bundles are performed by a firm to “design, produce, market, deliver and support its product (...) value activities are the discrete building blocks of competitive advantage” as we cited above.

According to Porter, the primary activities are:

1. Inbound Logistics;
2. Operations;
3. Outbound Logistics;
4. Marketing and Sales;
5. Service.

Secondary activities are:

1. Procurement
2. Human Resource;
3. Technological Development;
4. Infrastructure.

We have seen as this model considers the firm as an element itself and how it is important to understand dynamics and organization within the company in order to generate comparative advantage and to succeed in the market. These approach and perspective are still meaningful to us and stand as basis to let research go forward and keep pace to market evolution.

## 1.2 Value Chain: a terminology specification

After presenting Porter's fundamental position, which has influenced scholars for twenty years, we can define the firm as value chain made up by transformation and support activities. What is interesting to point out for our analysis is the Porter's *Value System* definition. It refers to the same concept of value chain as it is defined nowadays according to Gereffi's definition we are going to present in the following part of this chapter. Moreover, also in Womack and Jones' work (2003) we find a concept that fits with our value chain definition: they define it as *Value Stream*.

Furthermore some French scholars use the term *filiere* for describing the physical flow of inputs to obtain outputs. We can see as different words define the same concept: *filiere* is close to Porter's Value System and Womack and Jones' Value Stream. Nowadays, this *filiere* analysis is characterized by attention on economics and it is a theoretical tool to describe a punctual situation rather than a systemic analysis.

Gereffi's concept of global value chain, introduced in the mid-1990s, is interesting for our work because it provides us with a toolkit to describe the fragmentation of the value chain due to globalization. This enables researchers to have an understanding of value chains' dynamics on global scale and in dispersed settings. It started from the distinction of two kinds of chains: buyer-driven and producer-driven commodity chain. This definition identifies the whole bundle of activities required to deliver a product to the final consumer and its disposal.

### 1.3 Global Value Chain Concept

Nowadays globalization has forced companies to change and to upset their value chains and make them global. Strengthened strategies for value creation have proved to be not competitive anymore. Literature has also accordingly focused its research on new elements. Increasing of free markets, IT development at any level, plunge of transportation costs have determined the disintegration of the supply chain which went global.

According to [globalvaluechains.org](http://globalvaluechains.org) we can define value chain as a pattern that “describes the full range of activities that firms and workers do to bring a product from its conception to its end use and beyond. The activities that comprise a value chain can be contained within a single firm or divided among different firms. Value chain activities can produce goods or services, and can be contained within a single geographical location or spread over wider areas”. The key point of this definition I would like to emphasize is the step forward from Porter’s perspective: it is not a company-based analysis; it aims at a broader phenomenon. In literature we can see this new attention on networks and firm’s boundaries looking at GVC Initiative. It is particularly interested in understanding value chains that are divided among multiple firms and spread across wide swaths of geographic space, hence the term global value chain.

We can say that global value chains contain activities that are tightly integrated and often managed on a day-to-day basis by firms and workers in widely separated locations. Some relations are straightforward and their outcomes are easy to describe and to understand. Furthermore we can experience much more complexity: i.e. when a firm in one country deals with a partner firm in another country but the production and the shipment are going to be in and to a third country. Increasing complexity of problems and connectivity of markets has pushed scholars to make their analysis and models broader. Thus we have to move forward, from the single perspective of a firm as a whole, made up of activities, to a network of economic activities and links where firms are hubs of different importance. There is no generally accepted definition of the term *Supply Chain Management* and many

different definitions can be found in relevant literature. As an instance I quote the following ones:

“A concept whose primary objective is to integrate and manage the sourcing, flow and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers.” *La Londe and Masters (1994)*;

“The objective of managing the supply chain is to synchronise the requirements of the customer with the flow of materials from suppliers in order to affect a balance between what are often seen as conflicting goals of high customer service, low inventory management, and low unit cost.” *Stevens (1989)*;

“[...] an integrative philosophy to manage the flow of a distribution channel from supplier to the ultimate user.” *Cooper et al (1997)*.

According to these definitions, we can highlight common features of supply chain management:

- integrating and managing the sourcing, flow and control of goods;
- covering the flow of material suppliers through to customers;
- concept of networks of many clients and suppliers;
- scheduling of material movements and shrinkage of lead time;
- goal of effectiveness and efficiency.

Supply chains are often divided depending on the stage of the production process based on firm's position:

- *Upstream* – the flow of materials into the organisation;
- *Downstream* – the flow of materials from the organisation to the clients.

A further approach to supply chain management has been suggested by Meyr, Wagner and Rohde (2004):



We can easily see how this pattern does not follow Porter's approach. First of all, the above mentioned model, unlike Porter's, does consider upstream and downstream links as integrant steps/parts of the value chain. It means that value can be created in these stages throughout involvement of the whole value chain into operations. Elements of the model are more comprehensive and include different activities. For instance, procurement is a central part of the supply chain and not merely a support function. Sales define a wide range of marketing activities and services. Production is used instead of operations in Porter's value chain and it focuses more on the physical transformation.

In order to draw a more in depth analysis, here we introduce the concept of *Global Commodity Chains* and in the next part we are going to highlight differences with Global Value Chains.

A body of research on Global Commodity Chains developed a key distinction between global chains that are "driven" by two kinds of lead firms: buyers and producers (Gereffi, 1994). This structure enabled global buyers to use their market power to extract price concessions from their main suppliers. Supplying firms have responded by locating more of their factories in low-cost locations and working hard to extract price concessions from their own, upstream suppliers. The quality and the weight of a specific firm is related to its role and its power within the network – that we call Value Chain. The core element of this assessment is the commercial capital held by the company (i.e. large retailers and brand-name companies) and the grade of its exploitation. The revolution in transportation and communication, which

drove the growth of globalization, has enabled a new distribution of labour and we can distinguish two main categories of industrial players on strategy basis. Gereffi (1994) identifies two kind of industry's organization: *Producer-drive* and *Buyer-driven Commodity Chains*. First element of this pattern is the distinction between standard and strategic production. Second, he highlighted three main dimensions:

1. input-output structure;
2. territoriality;
3. governance structure.

In the first dimension we can find the legacy of Porter's work and the idea of operations within the firm structure to deliver outputs. Territoriality has two different aspects to be examined: one is the closeness to business partners, for example the importance of cluster phenomenon, while the second refers to cost efficiency only. Companies can easily decide to off-source production just taking into consideration good's cost, overcoming transportation and logistics expenses that become very little. Third, and it is the core of the idea, the definition of who is going to benefit from the industry is given by the capacity of leading firms to shape the structure of the chain in way of keeping high-value-added activities and outsourcing commodity production (Gereffi et al., 2005). For instance, Producer-driven commodity chains are capital and technology intensive and international subcontracting for labour-intensive activities. On the contrary, Buyer-driven commodity chains definition refers to industries in which the central role is played by the large retailers or brand-name companies. These industries are characterized by decentralized production under OEM arrangements. The debate concerns the mass production and flexible specialization patterns of organizations.

The all-comprehensive model keeps into account further external elements. For instance the role of state policies in global commodity chains is crucial to build the strategy. Different countries allow different models of development. Gereffi (1994) identifies two different strategies for developing countries.

- ISI : import-substituting industrialization (East-Europe);
- EOI: export-oriented industrialization (East-Asian countries).

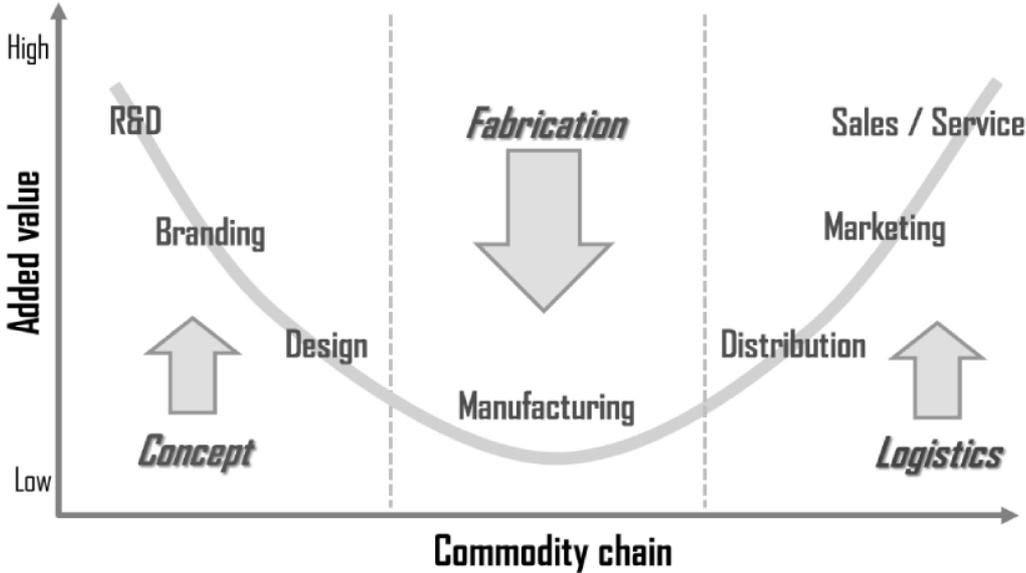
In the first case we have countries that wish to become more independent economically thanks to a growth of the capacity to sell on their internal market reducing importations. On the other side, economic growth could originate from an export-oriented strategy thanks to lower costs of production, especially due to labour cost. From companies' point of view, it is crucial to understand the impact of backward and forward linkages in controlling prices and value chains. These elements affect profitability significantly. Gereffi (1999) identified the *Triangle Manufacturing* as one of the most important mechanisms facilitating the shift to higher-value-added activities for mature export industries like apparel in East Asia. The essence of this scheme is the double transaction in the production mechanism: orders develop from industrialized countries to traditional export-country that have off-shored their facilities and then goods are shipped directly to clients. The geographical horizon of latest researches is global. This is a key statement for us because it defines the size of the phenomenon under analysis and witnesses, once again, the general degree of the globalization trend.

This dissertation does not purport to discuss the amplitude of globalization. Very notorious economists argued about the flatness of the world (Friedman, 2005), but not all scholars agree on the extent of this phenomenon (P. Ghemawat, 2007). Anyway, this cannot be a matter of numbers only. In our research we try to face this issue from a qualitative point of view. Perspective has to be global for an industry analysis, while a specific focus on a cluster, situation, geographical area or business model is required to deliver a consistent quality of research.

Internationalization of economy as spreading of activities all over the world is not a new issue. We are now experiencing a current trend of functional connection and integration between firms far away each other.

These reasoning made us persuaded that this is an effective toolbox to have a proper understanding of the industry. Gereffi's work (1999) provides us with a useful pattern to make a consistent analysis. Gereffi's aim is to define the structure of these sectors, which he defines as *Global Industries*. These networks can be divided in two macro sections as we have seen already in this chapter: "producer-driven" and "buyer-driven" global commodity

chains. For the research that this thesis is going to present it is interesting to see some outcomes of this framework for analysis. In fact, this phenomenon leads to fragmentation of production and reunification of not adjacent production phases, i.e. design and distribution. Again, we can observe “manufacturers without factories” that have optimized their internal organization selling facilities and keeping internally only high value creation activities. The core business is not to produce anymore, is to act as strategic broker within the industry, exploiting specific advantages of each elements embedded into the production process. This new positioning of firms is motivated by different degree of profitability along the chains. We can explain this concept graphically thanks to Stan Shih (1992), the founder of Acer, and his *Smiling Curve* concept. The chart below explains where the name of this concept comes from and helps us to understand which activities deliver better results in terms of returns on investments. In this perspective, firms should eliminate production – at the bottom in the chart: low level of marginality in order to have enough resources to invest in potential high profit segments of the industry. For instance, we can see how Research and Development at the beginning of the value chain, and on the other end Distribution and Service can generate more value added.



At this stage, we can assert that there is proven correlation and affinity between industry structure and strategy. Again, we highlight the importance of ISI (import-substituting industrialization) in East-Europe and EOI (export-oriented industrialization) in East-Asian countries to shape the industrial geography and development path for both: multinational companies and developing countries –that thanks to this have experienced a fast growth in term of jobs and production. Both categories, producer-driven and buyer-driven global value chains, are useful in order to address global industries. They go beyond the traditional perspective of goods' flow from production to distribution; key elements that qualify this pattern are:

1. the international dimension is explicit;
2. the importance of the role of leading firms and the power on different segments of the value chain;
3. competitive advantage is given by the coordination of the whole value chain and the use of networks as strategic asset;
4. each position among the chain is determined by the *organizational learning capacity* of the firm.

One of the key hypotheses of Gereffi's framework is the need to link up with the leading firm of the industry in order to be part of it. There is not a predefined model of firm, it can be located either upstream or downstream of the chain. Companies who provide critical components are in advantageous position as well. Vertical integration is not a strictly required feature to lead an industry. Indeed, for example, Chrysler in 1990s has been able to compete with Ford and GM thanks to its strategy aim to push subcontractors to develop subsystems more effectively. In this way Chrysler had the chance to focus on core business and it promoted a more horizontal architecture of the industry (Dyer, 1996). This example helps to understand the increasing importance of *First Tier Suppliers*. Not vertically integrated firms have to count on trustworthy suppliers and business partners. Further on, suppliers rely on other firms, *Second Tier Suppliers*, and so forth. These relations are enabled by a small number of system integrators that are able to deliver complete modules to assembly plants.

A further step on this path is the creation of foreign transplants. Building of facilities in a new market allowed firms to choose different kind of supply chains as reaction to external changes, i.e. currency exchange rate and excise duty. Moreover it helps to enter markets of the country the new plants are located in. For instance, in apparel commodity chain we experience three different types of leading firms. This verifies the statement of the absence of one best way to dominate an industry. In fact, we can identify retailers, marketers and brand manufacturers (Gereffi, 1997).

For each of them we can individuate common features: they have global sourcing capabilities thanks to a de-verticalization process enabling them to control high value-added phases and to eliminate less profitable and capital intensive activities. Furthermore, it is interesting to see how strategic choices are linked to profitability and not to a specific concept of organization. “De-verticalization” can be implemented for production, while, at the same time, “Re-verticalization” can operate for distribution and branding strategy.

In order to proceed into our review of well-established literature in GVCs and to set standards for our analysis is useful to introduce Kaplinsky and Morris’ scheme of research on this field. We quote Kaplinsky and Morris’ definition of GVCs (2001) to explain better this pattern:

“The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production, delivery to final consumer, and final disposal after use.”

They have introduced links of twofold nature instead of classic vertical chain and closed loop chain. This evolution is helpful to deal with complexity of studies and a new concept that arises: *the extended value chain*. It is not one value chain anymore, we have to figure out the structure of many value chains, not only manifold links but structured industries that overlap each other and melt together. We have to do it not only for scientific reasons, but to have a better understanding of the business. For instance, share of sales is not a reliable indicator to assess importance; it may obscure the existence of a supplier who plays a key role

because of technology or bottleneck input. Reasons of importance of value chain analysis are:

1. systemic competitiveness in scenarios characterized by growing division of labour and global dispersion of production;
2. efficiency is only a condition, is not the provider of competitive advantage for penetrating new markets;
3. understanding of dynamic factors within the whole value chain enables companies to enter into global market in order to increase incomes in a sustainable way.

Moreover, in their paper, Kaplinsky and Morris highlighted the importance of this analysis for its policy implications:

1. "It addresses the nature and determinants of competitiveness, and makes particular contribution in raising the sights from the individual firm to the group of interconnected firms;
2. by focusing on all links in the chain (not just on production) and on all activities in each link (for example, the physical transformation of materials in the production link), it helps to identify which activities are subject to increasing returns, and which are subject to declining returns;
3. as a result of being able to make these distinctions regarding the nature of returns throughout the various links in the chain, policy makers are hence assisted in formulating appropriate policies and making necessary choices. These may be to protect particularly threatened links (e.g. poor informal operators) and/or facilitate upgrading of other links in order to generate greater returns;
4. it shows that even though competitiveness may have been achieved, the mode of connectedness into the global economy may require a focus on macro policies and institutional linkages, and these require a different set of policy responses to those which deliver firm-level competitiveness;
5. participating in global markets, however competitive at a single point in time, may not provide for sustained income growth over time. By focusing on the trajectory

which participation in global markets involves, value chain analysis allows for an understanding of the dynamic determinants of income distribution;

6. value chain analysis need not be confined to assessing the extent to which participation in global markets determines the spreading of the gains from globalization. It can also be used to understand the dynamics of intra-country income distribution, particularly in large economies.”

As the world economy becomes more integrated, products become more globalized. Constituent parts of several products are made all over the world. Amdt and Kierzkowski (2001) present arguments and evidence showing that this process does not deliver positive results anytime, but, for instance: it rises competitiveness, creates jobs, and enhances economic welfare on the one hand; on the other, if a country's terms of trade, i.e., the relative price of its exports to its imports, fall sufficiently as a result of fragmentation, it will be worse off. The key element authors point out in their work is the increasing countries' specialization in particular stages of good production sequence due to internationalization of trade.

Jones and Kierzkowski also believe there is a role for scale economies in fragmentation, especially through the services that link the production fragments. Describing evolution of industries we can see as different scholars have focused their attention on different aspects and stages of this complex topic. Sturgeon (2002) has described a new model of industrial organization that he defined as the modular production network. According to the author's words:

“Lead firms in the modular production network concentrate on the creation, penetration and defence of markets for end products while manufacturing capacity is shifted out-of-house to globally operating turn-key suppliers. The modular production network relies on codified inter-firm links and the generic manufacturing capacity residing in turn-key suppliers to reduce transaction costs, build large external economies of scale and reduce risk for network actors.”

This approach is useful for our research because enables us to design the path of industry evolution due to globalization. Indeed the model, in the author's opinion, works properly especially in networks which are globally spread rather than socially embedded cluster.

First key element which created by this kind of networks is the decision to outsource commodities production and cease production in order to stop the flow of resources in this direction to invest money on activities considered more core as R&D and Sales. Second, this pattern enables companies to discharge part of volatility risk on contractors. Evidently suppliers gained some contract power from this situation. They shifted from assembly activity to turnkey solution which enlarged their margins on the products and related services as well. Moreover we have to consider the push on optimization derived from IT development and increasing competition. Frequency, uncertainty and asset specificity in the modular network provided Sturgeon with concrete reasoning to say that the transaction costs theory was not fitting with the pace of market.

The industrial system has become more interlinked as global-scale production networks have developed. Pressure on domestic system has increased and pushed firms to adopt new patterns of organization even though not completely implemented. National rooted organization will persist in the future but over time we might arrive to a dominant system with few isolated exceptions. National peculiarities will remain, but probably we will experience a merger of models and everyone will shift to a more interconnected and compatible system of production in order to be part of a further increasing global economic integration.

## 1.4 Evolution of Global Value Chain concept

Our aim is to understand how GVCs work and if and who they are “governed” by. What role do they play in labour division and margin appropriation? Research has also shown that GVCs have a variety of types with peculiar features and characteristics. Five different GVC governance patterns have been identified (Gereffi, Humphrey and Sturgeon, 2005):

1. *“Markets*. Market linkages do not have to be completely transitory, as it is typical of spot markets; they can persist over time, with repeated transactions. The essential point is that the costs of switching to new partners are low for both parties.
2. *Modular value chains*. Typically, suppliers in modular value chains make products tailored according to customers’ specifications, which may be more or less detailed. However, when providing ‘turn-key services’ suppliers take full responsibility for competencies surrounding process technology, use generic machinery that limits transaction-specific investments, and make capital outlays for components and materials on behalf of customers.
3. *Relational value chains*. In these networks we see complex interactions between buyers and sellers, which often create mutual dependence and high levels of asset specificity. This may be managed through reputation, or family and ethnic ties. Many authors have highlighted the role of spatial proximity in supporting relational value chain linkages, but trust and reputation might well function in spatially dispersed networks where relationships are built-up over time or are based on dispersed family and social groups (see for example, Menkhoff, 1992).
4. *Captive value chains*. In these networks, small suppliers are transactionally dependent on much larger buyers. Suppliers face significant switching costs and are, therefore, ‘captive’. Such networks are frequently characterized by a high degree of monitoring and control by leading firms.

5. *Hierarchy*. This governance form is characterized by vertical integration. The dominant form of governance is managerial control, flowing from managers to subordinates, or from headquarters to subsidiaries and affiliates”.

The authors have identified three important variables to check when studying GVCs in order to recognize the typology:

1. *The complexity of transactions* due to level of knowledge and quantity of information required to run a process involving many agents with a high grade of interaction among themselves. Thus, complex transactions will likely to be associated with one of the three network governance patterns (modular, relational, or captive) or integrated within a single firm (hierarchy).
2. *The codifiability of transactions*. This variable is related to the extent to which information are codified. In some cases schemes have been worked out to codify complex information in a manner in which data can be handed off between GVC partners with relative ease, often using advanced information technologies. In this case, if the codification schemes are widely known and widely used, then we would expect to see modular value chains emerge. If not, then lead firms might either keep the function in-house, leading to more vertical integration (hierarchy) or outsource it to a supplier that they tightly control and monitor (the captive network type) or have a dense, idiosyncratic relationship with suppliers (the relational governance type).
3. *The competence of suppliers*. This concept relates to capabilities of current and potential suppliers to receive and act upon complex information or instructions from leading firm require a high degree of competence on the part of suppliers. We can experience a modular networks or relational networks if the degree is high. Where competent suppliers are not available, leading firms either must internalize the function (hierarchy) or outsource it to suppliers that they tightly monitor and control (captive suppliers).

Since Gereffi's seminal book chapter was published, however, markets have changed quite dramatically due to globalization and IT evolution. They have become less vertically integrated and more network-oriented. Better diffusion of standards, management capacities and information technology in areas such as design, manufacturing, service provision, supply-chain coordination, and materials management, have enabled increased outsourcing in producer-driven chains and allowed firms to create modular linkages between buyers and suppliers in both producer- and buyer-driven chains. The result has been a broad and rapid shift in chain governance, where the two models have become closer to each other in order to be more rapid to respond to the market. The GVC framework, accordingly, specifies a more elaborate set of tools to analyze governance and structure of the network and provides a method to explain changes in governance patterns over time.

Global Value Chain model is useful and functional to our analysis to help predict how industries might change over time. GVCs are spatially extensive, often organizationally fragmented, and sometimes highly dynamic; it could result very difficult to determine one's position and prospects within GVCs. For example, a small firm in a developing country, an employee within that firm and local policy-makers focused on sustainable economic upgrading might all benefit from thinking about their competencies related to other actors in the chains they participate in, or hope to participate in.

## 1.5 Industry Architecture and Globalization

Most recent literature focuses on the whole structure of industries. It starts from globalization as issue; Value Commodity Chain as element and it addresses the overall organization of an industry. In this field very important relevance has the concept of *Industry Architecture* elaborated at London Business School by Michael Jacobides.

We cite authors' words to present the concept (Jacobides et al., 2006):

Industry architecture: "templates that emerge in a sector and circumscribe the division of labor among a set of co-specialized firms [and] it is an abstract description of the economic agents within an economic system (in terms of economic behavior and the capabilities that support the feasible range of behaviors) and the relationships among those agents in terms of a minimal set of rules governing their arrangement, interconnections and interdependence (the rules governing exchange among economic agents). [...] In most of the cases, it emerges in early life of a sector, due to balance of knowledge and strategic asset ownership."

Truly linked to this concept, Jacobides et Billinger (2006) provided a definition of *Vertical Architecture* as "the overall structure of a firm's value chain". First of all it is important to define the mission of a company and its strategy to pursuit it by its own structure. Once again, the topic of who comes first between strategy and structure has risen, but addressing it is not the aim of the present work. In our perspective, investigating networks' link is more interesting. Where do we set boundaries of firm? How does it affect effectiveness? How much companies should be open to final and intermediate markets? Consolidated literature (Williamson, 1985 et 1999) has been focusing on Transaction Cost Economies (TCE) concerning options: make, buy or ally. This approach suffers the narrow-mindedness of looking at "one transaction at a time". Over the last decade many scholars have been researching on this field and they have recognized the growing importance of understanding

the outcome of boundaries decisions in terms of profitability, strategy and dominance of one specific market.

We have to go beyond the theoretical contrast between firms and markets and “discrete structural alternatives”. In order to do so, authors mainly take into consideration linkages between firms and each level of market, each stage of production process. The Strategic Business Unit is the core element to assess these interconnections at intermediate markets in several different ways. This first evaluation allows researchers to describe vertical architecture. In details, we have to consider a set of choices: where does the firm want to participate in the value chain; how does it interface with internal and external suppliers and buyers at every stage of the value-added process; which kind of vertical and horizontal relations is the company willing to manage, for instance, transfer prices, resources allocation among SBUs and so forth.

Before Jacobides’ work, the well-recognized research has focus mainly on the reason why firms want to make or buy; this is because we are experiencing a fast development of global sourcing evolving in its features and getting more complex. Thus, we started from production decisions while nowadays we face firm’s architecture and boundaries decisions. Latest literature is focused on effectiveness of industry governance and how architectural decisions drive it, which is shifting from simpler contingencies to a deeper understanding of the complexity of internal dynamics of a whole industry. Disaggregation of the business unit we are experiencing helps us to understand patterns and dynamics as well as it helps managers to understand their own business and to measure their results. It is not a matter of vertical integration or not, it is about strategic decisions that require deep knowledge of how companies run business.

Latest literature shows how increasing permeability of a firm can help to push performance without changing scope. In this sense boundary decisions have a fundamental role to play. A traditional value chain approach cares whether a company has to undertake further stages on production process or not. New perspective suggests that we can have more options, for instance mixed models. We present here some possible activities.

- *Out-streaming*: selling to downstream units and to external buyers;
- *brokering* for companies and external buyers;
- *tapered integration*: using both internal and external supplier.

At this stage of reasoning, concept of permeability helps us to understand in depth how a business unit links to upstream and downstream stages of value chain. Mixed procurement delivered by this new pattern of relationships enables firms to manage effectively different capabilities in not consequential segments along the chain. The ability to leverage on its own excellence within the internal market and outside the company's boundaries is a determinant element to lead industry and to be successful in gaining profitability. An effective use of resources is becoming a key element to ensure high returns on investments. For example companies could match different capabilities inside and outside their boundaries to provide services and products to downstream units or external clients and gain more knowledge and expertise working with arm's length operators instead of internal clients only.

The organizational and strategic logic involved in boundary decisions affects vertical architecture clearly and the benefits are to be traced at corporation's level. It comes from the joint result of permeability and mechanism activated by management in order to deal with complexity of interdepartmental coordination.

We cite Jacobides' definition of the vertical architecture concept:

“Vertical architecture consists of choosing (1) where to be active in the value chain; (2) how to interface suppliers and buyers along the value-added process; and (3) vertical and horizontal relations, including transfer pricing, inter-SBU resource allocation, and managing divisional incentives. Vertical architecture, which defined the configuration of transactional choices, became away to improve the firm's efficiency and effectiveness, enhancing learning and monitoring (Sabel 1994), and allowing for superior resource and capital allocation (Burgelman 1991).”

The approach suggested by this definition positively influences the managing of the company. First it enables efficient and effective operations throughout the firm thanks to comparability, i.e. benchmarking activities. Second, it properly exploits innovation through a more opened up company. Third, it enables a better use of resource with a more profitable allocation to business unit.

This pattern describes internal dynamics concerning the company but it takes into consideration a higher level as well. The final aim of the company keeps driving strategy. There is a logic behind decisions which is over business units and regards firm's boundary. Ways to perform in efficiency and profitability are increasingly showing how mixed models of organization are possible and effective. Permeable structures give us a different and new point of view: from idiosyncrasy between integration and disintegration of the value chain to a broad range of possibilities enabled by permeability and modularization. Anyway, at the end of discussion we have to consider boundaries' definition as a tool to improve organization and to reach, or defend, a position of dominance on the global value chain. We have to take into consideration impacts of this kind of decisions strategically.

Following the track we just described above, it is interesting to investigate some features of firm and industry structures in order to assess the potential of internationalization of value chain. Jacobides and Kudina went beyond these perspectives to focus on *industry architecture* and the comparative structure of value chain in different countries (Jacobides and Kudina, 2008). Their research suggests that there are two separate variables affecting international expansion's success of firms:

1. degree of fit between industry architecture;
2. extent of modularity along the value chain.

Liabilities of foreignness are cultural, due to physical distance and differences of the business environment. The key trade-off is between firm's specific advantage and the challenge of going international. The driver of success is then the degree of exportability of the domestic advantage. We can say that a pivotal role is played by the value chain structure and by the

industry architecture. Following these assumptions we can easily understand that if the structure of the home-based business is similar to the foreign investment -concerning division of labour and the typology of suppliers' localization- it will have high possibility to success. Literature has gone beyond company and country perspectives to focus on industry architectures, or the comparative structures of value chains indifferent countries (Jacobides et Kudina, 2005). Many hypotheses have been formulated and the strongest which found empiric evidences are as follow:

- the more institutionally modular a sector in which a firm operates is, the more successful its international expansion will be;
- greater the similarity in the value chain structure between host and home country is, the more successful international expansion will be;
- greater the institutional modularity of a sector is, easier for a company to overcome differences in the value chain structure between host and home countries will be.

These results suggest that the degree of 'fit' between industry architectures is an important predictor of success in international expansion, as is the extent of modularity along the value chain. The aim of the authors is to investigate the role that the structure of GVC plays in the internationalization process and the role of *value chain structure* or *industry architecture* in the host country. The division of labour derives from the way of breaking up the activities along the value chain and all this is given by the degree of involvement of the firm in its own domestic supply market. We can see this phenomenon as "international integration of trade through the dis-integration of production" (Feenstra, 1998). The "fit" between industry architectures (i.e. the similarity between the value chains in home and host countries) and the institutional modularity (i.e. the separability between the stages in a value chain in a segment where firms are active) are two key success factors in international expansion.

The focus is on the importance of industry architectures in terms of their *similarity* and *institutional modularity* as these two shapes the ability to transfer an advantage to another country. Going more in details, we analyse the role of the comparative value chain structure.

Specifically, “institutional modularity” at the level of industry plays a central role, as does the extent of similarity in the value chain structure between different countries. “By *institutional modularity* we mean the degree of separability between parts of the value chain, which allows a firm to transplant easily if it focuses on one single part of the sector, without needing to re-create tight links to the existing (and potentially different) structure of the sector in the host country. By *similarity of industry architectures* we mean international compatibility in terms of the nature, structure and operation of the value chain (i.e. the vertical division of labour and the “rules and roles” that connect different industry participants (Jacobides, Knudsen and Augier, 2006). At this stage is easy to share the facts that similarity in value chain structures makes global expansion significantly easier, especially if it is modular.

In this perspective “*industry architecture*” concept plays a pivotal role. More home and foreign situation are similar, less time and resources are needed to adapt. For this reason sector modularity is very significant since it makes easier to overcome the difficulties. It is also noteworthy that similarity is partially given by modularity and helps firms to overcome difficulties they are prepared for.

Summing up, similarities between the firm’s sector in its home country and the same sector in the host country, and particularly the modularity in the sector, are good predictors of success through international expansion. Jacobides and Kudina have demonstrated that *comparative structure* of the value chain is a crucial determinant of success. In particular they looked at the similarity and modularity of industry architectures. On this basis they assert that worldwide economic development in the upcoming decades will be shaped by the global homogenization of value chain structures. Service globalization moreover, aided by the off shoring of service components to low-cost economies, is a long-term state of arts.

## 1.6 The role of innovation in Industry Architecture

Nowadays, the innovation issue is fundamental in order to understand evolutive dynamics within sectors. In well-affirmed firm literature, important contribution is due to David Teece and his paper *Profiting from Technological Innovation*. He started, theoretically, from transaction cost literature and enriched it with a new pattern based on complementary assets and appropriation of value created. The main point in that article was the ability to benefit from innovation. Often firms are unable to return on research. This unlucky condition derives, in most of cases, from a particular architecture advantage of leading firms that makes impossible for others to appropriate the value created through innovation. This position of advantage derives, in his model, from dynamic capabilities to adapt strategy and organization to the evolving business. Extending this idea, Jacobides (Jacobides and al., 2006) considered three elements: industry architecture, complementary and mobility. There is a strong linkage between transaction costs and dynamic capabilities that enable company to lead industry and value chains. The first indicator of industry architecture is the division of labor. It reveals who does what and therefore who gains increasing returns.

Teece's article focuses on the relationship between innovators and leading firm which are identified as the asset holders. Further literature goes more in details in analyzing this relation. Teece's original argument is co-specialization made by two different elements: complementarity and factor mobility. They are not in antithesis each other as it could seem. Complementary refers to level of factors to be combined, while mobility concerns the number of combinations made possible along value chain.

The pattern has been moving from bilateral dependence to asset combinations in industry architecture. The model keeps into consideration the complex nature of relationships; mutual dependencies are in fact not just bilateral but involve several players. For example the cluster phenomenon explains clearly that business environments and human relationships matter. Architecture offers a viable mode of production and when it becomes stable a set of interfaces arise. Interfaces are defined quite broadly as technological, institutional or social artifacts that drive labor division allocation. Architecture is created on the basis of the interface characteristics decided by the most able firm to take advantage

from its superior capabilities. Though, it is not only a matter of pure technical aspects as we said before. Laws and regulation play an important role as well. Furthermore we have to consider our condition of ignorance: verifying quality and reliability of suppliers cost as Akerlof (1970) has theorized. In young sectors we can experience different architecture which companies try to insert in. Once one of them has emerged and has become stable is pretty hard to move again. Reasons of this statement are linked to inter-operability standards and relative costs to change, regulation and expectation of the market.

After introducing the main topic of industry architecture we can present some research on innovation linked to value chain. Innovation and its generated value appropriation is one of the key elements that drive architecture modification. This comes from the need to return from heavy investments that would be impossible otherwise. From a company's point of view there is a second option as well. A particularly good possibility is to hold and control asset complements. This element might entail a loss of efficiency but it will pay back. At this point is not only a boundary issue in order to gain activities performing high returns, but it involves further possibilities of growth. Anyway cash position and trade-off between efficiency and control over complementary assets have to be kept into account.

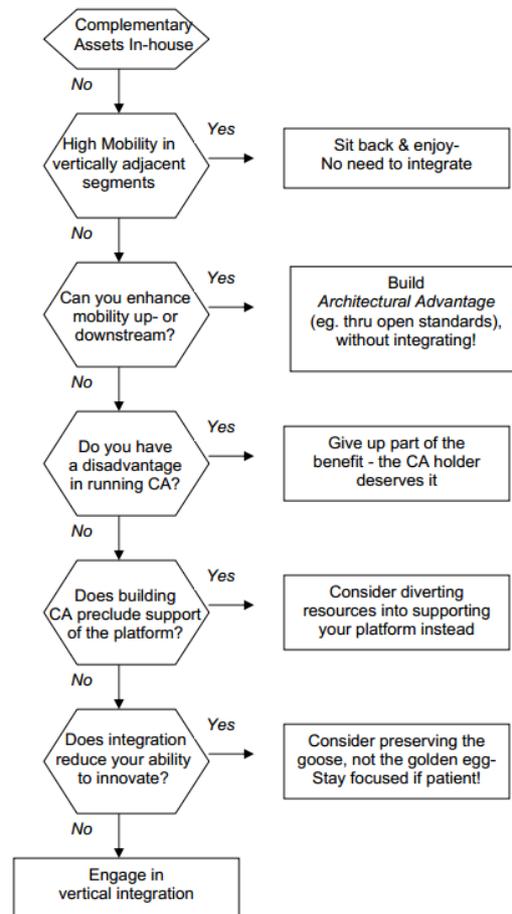
Concerning returns from innovation, literature identifies two distinct components of co-specialization which play at different levels. Complementary (1) can be described as bilateral dependence of two elements that over-perform together. It influences the size of the value bargained. Conversely, mobility (2) is bilateral dependence due to switching costs and refers to the numerical number of assets that can enter into the process at low costs. This influences the bargaining power of the asset holders and therefore the degree of value appropriation. As a consequence, mobility might be used as a powerful tool to determine dynamics of interdependent products in intermediate markets. A leading company has interest in allowing competition in commodity and component markets for two reasons. First of all it has a decreasing effect on prices, but more important, if competition affects that particular segment of the value chain, leading companies can gain a higher percentage of value created by the product.

To sum up it is mobility that decides who is going to earn on innovation. More competition on complementary assets generates higher returns upstream firms investing in innovation. It is quite intuitive that the perfect situation is the bottleneck. We can define it as architectural

advantage. It makes easy to gain bargaining power holding the distinctive component of a co-specialized group of firms. Moreover it is not only about returns, but there is a strategic implication: bottlenecks drive the technology innovation; that is a condition of strong advantage. A classic example is the computer industry where Microsoft and Intel enable hard competition with open source platforms on different other sections of the value chain, preserving in this way their positions. Interconnectivity and standard platforms are principal elements that make possible to enhance downstream demand and to shape the structure of the sector taking advantage on it.

A deeper understanding of dynamics we have described above can help management to maximize control on their value chain and to promote the most profitable architecture for themselves. The main limitation of the model just explained concerns the opposition of value creation to appropriation. It enables innovation imitation rather than to protect it. The solution prospected by Teece is to earn value from downstream assets (e.g. real estate). Besides, if the business model is attractive, company will be able to make profit from lease. The meaning of this example is that innovation creates opportunities to benefit from underlying asset's appreciation. The focus has been moved from profit to wealth creation.

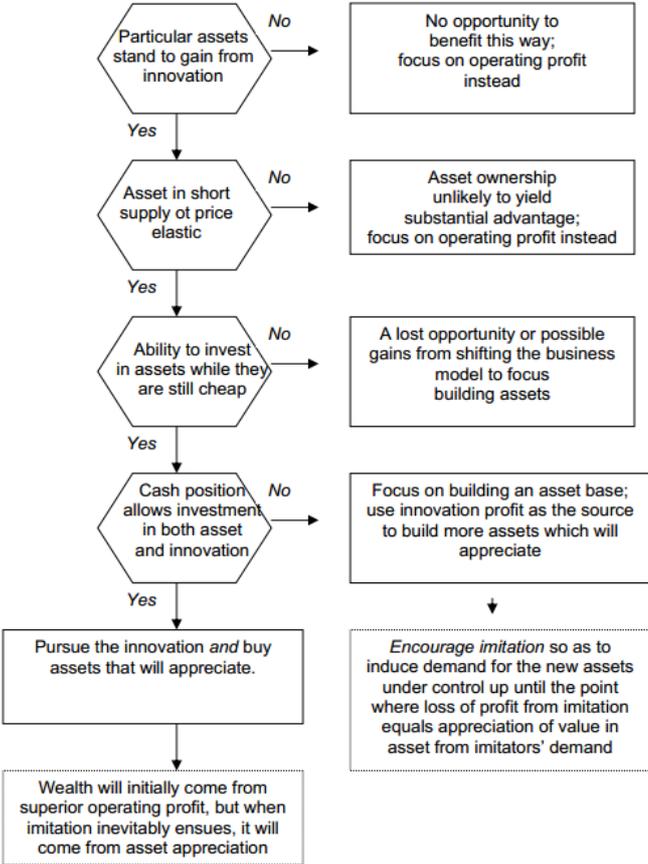
At this point a comprehensive framework has to be introduced in order to make everything clearer.



Choosing Scope to Maximize Profits: The Role of Architecture and Capabilities (Jacobides et al., 2006)

Authors have considered architectural advantage versus integration in relation with mobility and focusing on business model. Firms can benefit increasing mobility in vertically adjacent stages, without reducing complementarity. The focus has been shifted from the original business to a broader prospective which might enhance the level of control over the industry. In this decision process it is fundamental to take into consideration “costs needed to develop and to manage complementary asset positions” and the market trends. A broadening of focus is recommended when industry is expanding; on the contrary specification is required in a stable industry. The model asserts the preeminence of shaping the capability of future development to drive distribution of innovation over time throughout contracting or integrating. Long-term perspective has to balance vertical integration’s advantages and ability to innovate in the future. Same considerations are

applicable for operating profit versus asset appreciation. In this case marginal returns, level of demand and factor mobility influence choices. We quote here another significant table by Jacobides.



Profiting from Innovation: Wealth Creation through Appreciating (Jacobides et al., 2006)

The model shows as a firm may find convenient to invite imitation in the underlying innovation in order to raise demand for locked-in assets, albeit it diminishes profitability. Of course, in case of massive amounts of resources available, both strategies are to be implemented: (1) invest in innovation, (2) buy complementary assets. In this optimum case company would be able to profit from prices in the early phase of product life and afterwards from asset appreciation when return will start decreasing.

The bottom line of this model is how to profit from innovation. Protecting the innovation ability to keep high returns is not going to be effective on long term time. Value appropriation from innovation can be achieved more effectively by investing on both: returns from higher prices in the first phase of the life-cycle of the product and on complementary asset appreciation in the second period. The pattern identifies co-specialization as the key concept that comprises two distinctive components of complementary and factor mobility (Jacobides, 2006).

### **1.7 The importance of the product line breadth to determine firm performance and industry architecture into Bicycle Industry**

In previous chapter we saw how decision related to products affects industry architecture. In the same way we can state that similar effects derive from decision at the range level. A firm's degree of breadth within a market affects its performance and it is a key strategic decision (Dowell, 2006). In order to clarify the pros and cons of different decisions and how a firm can benefit from them, we have to examine the relationship between product line breadth and firm performance. Breadth impacts performance on three levels:

1. product line length;
2. product line complexity;
3. product line overlap with other firms.

Clearly trade-offs have to be addressed and shortcomings are present as well for each level of investments in each area of analysis. Broad product lines confer both benefits and costs on firms. Specific research separates breadth into two elements—length and complexity—and outlines the impact of product line overlap on survival of new ventures (Dowell, 2006). Broader product lines enable firms to reach finer-grained consumer preferences, to gain market shares and maybe to charge a premium price. In addition, firms can enjoy lower

costs with broad product lines if there are economies of scale and of scope. Besides this, breadth–performance relationship studies have found conflicting results. It has attempted to find an overall optimal degree of breadth in order to make companies better able to manage the costs associated with breadth. The problem with such a measure is twofold. First, how much of resources is required for a firm to manage its product line? Second, how viability is affected by the degree of product overlap with rivals? In order to sort out these experimental questions, we introduce three hypotheses by Glen Dowell (2006):

1. the higher the degree of product line length for a new firm, the lower its probability of failure;
2. the greater the complexity of the product line offered by a new firm, the higher its probability of failure;
3. new entrants' probability of failure first falls, then rises, with increasing degrees of product line overlap.

As a general rule, entering an established market for new entrants is more difficult to manage breadth through product line *complexity* than through *length*; to change product line length is relatively easier. Overlaps with competitors' offerings are other elements that significantly affect viability. A firm's product line defines the customers that it is attempting to attract, therefore the size of the market it could potentially enjoy. In general, overlap can be beneficial or detrimental. The benefits from overlap come when firms recognize the potential for mutual forbearance, and choose to limit competition on prices. The net effect of a particular product strategy for a young firm depends upon marketing strategic decision. We can state two different dimensions of product line breadth as *length* and *complexity*. Key element of distinction is the degree of *know-how* and technical knowledge required to implement them. The productive outcomes of these two ways are a range with variations on a relatively narrow set of core product attributes, or different products that have different core attributes and thus are likely to draw on different knowledge bases (Dowell, 2006).

At this point of our research we are interested in investigating the relationship between product line breadth and performance in the bicycle industry. The bicycle market is very differentiated by variety of designs and purposes; bikes can be used for different segments. Bicycles for the different segments are

produced using different frame architectures and subsystems; therefore we can observe a wide range of experience in order to make our data consistent within the industry. We define product line length by the count of products that the firm offers in a season (Dowell, 2006). This is positively related to viability but only for those firms that operate in the middle of the value chain. This is true because at this stage of the chain is much easier to benefit from slight variations on the product features. This enables the company to meet fine-grained consumer preferences (Lancaster, 1990).

The findings suggest that companies should focus on either a very simple or very complex product line, but avoid the middle, and if they enter in the middle, to move to a lower or higher degree of complexity quickly. Firms that offer very simple and very complex product lines have higher survival prospects than those that have intermediate levels of complexity (Dowell, 2006). Firms 'stuck in the middle' between the benefits of specialism and the benefits of breadth have the highest failure rates. In reality, however, reality is more complex than this suggestion. We can highlight two further complications. First, even if viability is higher for wider breadth of product line, investments required are higher and resource not always easily available. Second, for firms in the middle is not fast and cost free to change the core of the business. Moreover, changing in strategy half way through raises the rate of failure. With regard to the effects of overlap, the coefficients on the overlap variables indicate that firms entering with product lines that are very similar to their rivals are highly disadvantaged.

To sum up our analysis, we have separated product line length from product line complexity. Both elements impact the survival rate and viability. In addition, product-line length is an important element to keep into consideration, but a key role is played by the firm's product line overlaps with its rivals' offer (Dowell, 2006). Second, the question is not *whether* increased breadth is beneficial, but rather *under what conditions* broad firms outperform narrow ones (Hannan and Freeman, 1989; Sorenson, 2000). Breadth benefits are determined either at firm-level either at industry-level. Product dimension is important as well. Findings of research demonstrate as they influence each other and only a correct mix results beneficial for the firm. Moreover, impact of product line length differs between

different stage of value chain. A deep product-line is statistically more effective in established market, paying attention to the degree to which their product lines overlap with their rivals on key dimensions. Last but not least, we have to keep into consideration the strategic dimension of breadth product line decisions. If breadth is generally beneficial, but early on, firms should stake out narrow positions, then a strategy that enables firms to survive their early life can reduce their later chances of success (Dowell, 2006).

# Chapter II

## Bicycle Industry

### 2.1 Introduction

20,000,000 bicycles are annually sold across Europe. This number makes the bicycle the most used means of transport, more than cars. My dissertation, therefore, is not only focused on high-end product niche. The aim is to understand the importance of the whole industry and to see how different segments of the market are linked each other and how profitable niches can be defended by standing on the global market and by competing on international scale.

The second part of this dissertation presents a quantitative and qualitative description of the industry we are researching on. We present figures and data as well as qualitative information from specialized publications and market research. In the second part of the chapter, we tell the story of this sector and its evolution. We use Shimano and Campagnolo business cases in order to explain the importance of our research and motivations of it. This case helps us to demonstrate the link between innovation, strategy and industry architecture shaping. The way of competing can influence whole industry and can generate competitive advantage moving the leadership alongside the Value Chain, from a company to another one.

Nowadays, there is more awareness concerning sustainability on transportation. Market size is increasing, but for the most part of Italian firms this could turn into a threat. Companies operating on low-end segment are entering into higher ones thanks to the money made on massive quantity products and their size allows them to make heavy investments in R&D and in sponsorship activities that small firms cannot effort.

## 2.2 Market size and figures

In the first part of this chapter we present some figures from Ancma and Coliped market reports in order to describe the Bicycle Industry with a numerical approach. These figures enable us to address the size and trends of this industry concerning different countries and market segments with a special focus on Italy. All the figures presented in the following tables are at net value - excluding VAT.

**European Bicycle Production (EU 27)**

Year	Bicycle Production	Var %
2000	14,531	
2001	13,009	-10%
2002	12,272	-6%
2003	12,828	5%
2004	13,232	3%
2005	13,218	0%
2006	13,320	1%
2007	13,086	-2%
2008	13,246	1%
2009	12,178	-8%
2010	12,241	1%
2011	11,758	-4%
2012	11,537	-2%

(1,000 units) 2000 – 2012

We would like to start from a European perspective and from the first evidence we can address looking these data from Ancma annual reports. In a growing market, like the bicycle's one, European Union is losing positions at international level. The Total Production has been decreasing since 2000. This is not only due to economic crisis, but it is the consequence of a change of the geography of the industry. Of course we can observe differences within the Union, for instance, Italy lost its leadership and Germany gained a dominant position. Consequently, East European countries started being the location for

German factories. In the table below we divide and present the European Production by country, showing how it moved from Mediterranean Country – Italy, France – to Germany and East Europe.

### 2012 European Bicycle Production (EU 27)

Country	Bicycle Production	Country share %
Germany	2,211	19,2%
Italy	2,195	19,0%
Poland	1,076	9,3%
The Netherlands	900	7,8%
France	850	7,4%
Bulgaria	837	7,3%
Portugal	780	6,8%
Romania	450	3,9%
Hungary	391	3,4%
Spain	370	3,2%
Czech Republic	350	3,0%
Lithuania	340	2,9%
Slovakia	220	1,9%
Austria	142	1,2%
Greece	130	1,1%
Sweden	115	1,0%
Belgium	105	0,9%
Great Britain	40	0,3%
Finland	30	0,3%
Slovenia	5	0,0%
<b>EU 27</b>	<b>11,537</b>	<b>100%</b>

Bicycle Production (x 1,000)

As we described in the previous part of our thesis, the supply chain of this industry is complex. Production does not only refer to assembled bikes, but a really important role is played by components and accessories. Looking into more details to these elements of the industry, we can observe a different situation. Components, such as saddles, groupsets and wheels, have a tremendous importance for consumers. Marketing competition is tough on brands and sponsorships: competitors are medium or large size companies due to technical

complexity. It is much more difficult to engineer an efficient fork or pedals rather than to assemble a bike or to produce an aluminium or carbon frame. Italy can still rely on powerful brands like Campagnolo, Miche, Cinelli, DedaAcciai and Fulcrum Wheels for components, Sidi and Santini for shoes and clothes. France is leader for pedals – Look – and wheels – Mavic. Again we have to highlight the importance of Romania as production location.

### 2012 European Bicycle Parts & Accessories Production

Country	P & A Production (M€)	Country Share %
Italy	496	30,1%
Germany	260	15,8%
Romania	200	12,2%
France	180	10,9%
Portugal	120	7,3%
The Netherlands	90	5,5%
Czech Republic	80	4,9%
Poland	60	3,6%
Belgium	40	2,4%
Finland	34	2,1%
Great Britain	31	1,9%
Slovakia	20	1,2%
Bulgaria	10	0,6%
Hungary	10	0,6%
Slovenia	10	0,6%
Spain	5	0,3%
EU 27	1,646	100%

P & A Production (M€)

One of the main reasons why the bicycle industry has developed in Europe is the culture of cycling and bike racing. The possibility to be close to riders is one of the most important elements of the competitive advantage we experienced during the last century. The final market in home countries has been a decisive factor for the development of technology and firms. Even though the crisis caused shrinkage of consumption, the bike gained positions as

means of transport, especially in big cities. Especially in North-Europe the culture of cycling is developed not only as sport activity, but mainly as life-style. Touring by bicycle is a growing industry as well as bikes as means of transport instead of the car. Anyway, looking at sales figure in Europe, we cannot see any growth in comparison to ten years ago, but, at least, the market did not lose size in terms of quantity produced.

**European Bicycle Sales**

Year	Bicycle Sales (x 1,000)	% Var
2000	18,945	
2001	17,745	-6,3%
2002	17,840	0,5%
2003	20,206	13,3%
2004	20,322	0,6%
2005	20,912	2,9%
2006	21,033	0,6%
2007	21,344	1,5%
2008	20,206	-5,3%
2009	19,582	-3,1%
2010	20,461	4,5%
2011	20,039	-2,1%
2012	19,719	-1,6%

Bicycle Sales (x 1,000)

In the chart below we can see as the figures of sales are bigger than the ones of production comparing country by country, therefore our trade balance is negative: Europe it is not an exporting economic area for this industry. Again, culture plays a double role in this sector. Germany got leadership not only because of strategic approach and engineering capabilities, but also because of a growing domestic demand. On the contrary, Italy is still a net producer country; it produces more than what it sells on its internal market, but the trend of the trade balance is decreasing.

### 2012 European Bicycle Sales par Country (EU 27)

Country	Bicycle Sales (x 1,000) Sales to Consumers	Country Share %
Germany	3,966	20,1%
Great Britain	3,600	18,3%
France	2,835	14,4%
Italy	1,606	8,1%
Spain	780	4,0%
The Netherlands	1,035	5,2%
Poland	992	5,0%
Sweden	555	2,8%
Denmark	550	2,8%
Belgium	450	2,3%
Austria	410	2,1%
Romania	380	1,9%
Czech Republic	350	1,8%
Portugal	350	1,8%
Finland	330	1,7%
Greece	320	1,6%
Slovakia	300	1,5%
Slovenia	250	1,3%
Hungary	232	1,2%
Lithuania	115	0,6%
Ireland	95	0,5%
Estonia	65	0,3%
Bulgaria	62	0,3%
Cyprus	35	0,2%
Latvia	35	0,2%
Malta	12	0,1%
Luxembourg	10	0,1%
EU 27	19,719	100%

Bicycle Sales (x 1,000)

Europe is a key market not only in terms of size, but especially for the kind of products requested by consumers and relative prices. The average price for a bike in Germany is € 513 that enables firms to return investments and to deliver product and service at high level. The industry can rely on high margins and can invest in innovation and marketing activities and in sponsorships.

**2012 European Bicycle Sales (EU 27) average price/country**

<b>Country</b>	<b>AVERAGE PRICE/COUNTRY</b>
The Netherlands	€ 724,00
Germany	€ 513,00
Austria	€ 440,00
Denmark	€ 440,00
Belgium	€ 410,00
Luxembourg	€ 400,00
Sweden	€ 385,00
Finland	€ 310,00
Great Britain	€ 305,00
France	€ 278,00
Italy	€ 269,00
Spain	€ 260,00
Hungary	€ 257,00
Poland	€ 210,00
Ireland	€ 190,00
Czech Republic	€ 150,00
Portugal	€ 150,00
Greece	€ 125,00
Malta	€ 120,00
Romania	€ 120,00
Slovakia	€ 110,00
Slovenia	€ 110,00
Cyprus	€ 100,00
Estonia	€ 100,00
Latvia	€ 100,00
Lithuania	€ 100,00
Bulgaria	€ 83,00

Vat included

Our research looks at the industry as a whole and particularly on the medium high segment due to the focus on Italian firms. Anyway, we cannot forget about new trends, historically missed out by our country. A new product, named EPAC - Electric Power-Assisted Cycle, is gaining positions at consumer levels, especially in North-Europe, due to cost and the extensive use of bicycle in that area. The two following charts present figures for Sales from

2009 to 2012 and in Europe and Sales by country in 2012 in order to assess the growth and the potentiality of this product.

### European EPAC Sales (EU 27) 2009 – 2012

Year	EPAC Sales (x 1,000)	% Var
2006	98	
2007	173	76,5%
2008	279	61,3%
2009	422	51,3%
2010	588	39,3%
2011	716	21,8%
2012	854	19,3%

EPAC Sales (x 1,000) - EPAC = Electric Power-Assisted Cycle

### 2012 European EPAC Sales (EU 27)

Country	EPAC Sales (x 1,000)	Country share (%)
Germany	380	44,5%
The Netherlands	175	20,5%
France	46	5,4%
Italy	46	5,4%
Austria	45	5,3%
Denmark	30	3,5%
Great Britain	30	3,5%
Spain	30	3,5%
Belgium	25	2,9%
Sweden	11	1,3%
Portugal	10	1,2%
Czech Republic	5	0,6%
Finland	5	0,6%
Poland	5	0,6%
Ireland	2	0,2%
Lithuania	2	0,2%
Slovakia	2	0,2%
Slovenia	2	0,2%
Greece	1	0,1%
Luxembourg	1	0,1%
EU 27	854	

(1,000 units)

Cycling industry still requires specialised manual labour, but, from chart below, we can see that, even though production has been moved out from countries, satellite activities employ relevant number of people, i.e. The Netherlands. We could say that pure production and assembling are not the only elements that can foster employment, but research and development activities, headquarters staff, commercial branches and so on require medium and high level profiles. Germany is a paradigmatic example: it produces half quantity of components than Italy and it employs just 25% less people. There are similar evidences for France as well.

### 2012 Employment in Bicycle and Bicycle Parts & Accessories Industries (EU27)

Country	Bicycle Employment	Parts & Accessories Employment	Total	% of Total
Germany	2.600	1.300	3.900	19,0%
Italy	1.600	1.750	3.350	16,3%
The Netherlands	1.764	500	2.264	11,0%
France	1.000	900	1.900	9,3%
Poland	1.200	370	1.570	7,6%
Bulgaria	1.387	60	1.447	7,0%
Romania	400	800	1.200	5,8%
Portugal	690	500	1.190	5,8%
Czech Republic	460	480	940	4,6%
Hungary	500	80	580	2,8%
Belgium	258	182	440	2,1%
Slovakia	280	90	370	1,8%
Spain	300	10	310	1,5%
Austria	300	-	300	1,5%
Lithuania	250	-	250	1,2%
Greece	130	-	130	0,6%
Great Britain	50	70	120	0,6%
Finland	60	45	105	0,5%
Slovenia	10	70	80	0,4%
Sweden	80	-	80	0,4%
EU 27	13.319	7.207	20.526	

The Italian bicycle industry, that represents the focus of this dissertation, tells us a story of a country with competitive advantage that has been reduced by external competition and lack of innovation in terms of both product and strategy.

The following chart is straightforward. Production is dropping down without any interruption since 1990's. We can see clearly that is neither a matter of domestic market demand nor a global crisis. It comes from a loss of competitiveness of the country on this industry.

### 1992-2012 Italian production

Year	Italian Production	% Var	Export	Import	Supply on Italian market
1992	4.150.000		2.249.114	243,789	2.144.675
1993	5.200.000	25,3%	3.061.694	110,522	2.248.828
1994	5.800.000	11,5%	3.175.863	107,895	2.732.032
1995	5.300.000	-8,6%	2.703.638	145,263	2.741.625
1996	3.950.000	-25,5%	2.046.224	148,843	2.052.619
1997	3.950.000	0,0%	1.581.605	204,645	2.573.040
1998	3.000.000	-24,1%	1.667.275	179,812	1.512.537
1999	3.300.000	10,0%	2.086.087	223,988	1.437.901
2000	3.250.000	-1,5%	1.752.345	224,45	1.722.105
2001	2.650.000	-18,5%	1.411.791	445,819	1.684.028
2002	2.350.000	-11,3%	1.419.193	453,951	1.384.758
2003	2.550.000	8,5%	1.588.963	471,55	1.432.587
2004	2.600.000	2,0%	1.554.246	631,036	1.676.790
2005	2.400.000	-7,7%	1.343.268	820,736	1.877.468
2006	2.418.000	0,8%	1.238.810	764,119	1.943.309
2007	2.520.000	4,2%	1.357.991	827,08	1.989.089
2008	2.380.000	-5,6%	1.553.409	704,28	1.530.871
2009	2.585.000	8,6%	1.284.798	627,398	1.927.600
2010	2.489.000	-3,7%	1.354.320	636,112	1.770.792
2011	2.430.000	-2,4%	1.480.193	735,945	1.685.752
2012	2.190.075	-9,9%	1261705	677644	1.606.014

Italy has historically been the country of high-end road bike. This statement is based on common opinion, belief and market data as well. Whether we look into data, we can easily understand that we are talking about a small niche of market. We can always say that is the most profitable one, but it does not weight enough to pay off investments and to support business growth. Road bike represents the 4% of the whole bicycle market in Italy, in Europe the percentage is even smaller. Italy lost momentum to enter into Mtb market during the 80's and afterward a slow decline began. We can see from our charts that Mtb is the most popular product sold by Italian companies, and there is not an overflow of products from Chinese firms. It is clear evidence that the issue for our companies is on export and international competition rather than domestic market. Less than 3% of our production is exported out of EU.

**Italy 2012 Bicycles Production by type**

<b>Product</b>	<b>%</b>	<b>n° of bike</b>
MTB	29%	645,08
road bike	4%	96
city bike, sport	25%	550,25
Boys' Bicycles	41%	898,75
<b>Tot</b>	<b>100%</b>	<b>2.190,08</b>

(1,000 units)

In the following tables we can assess the trade balance of Italian bicycle industry. These figures make clear that the strategic decision to defend high-end market niche did not pay off in terms of market presence and shares. Moreover, profitability is also decreasing. The decision to do not design and produce medium value product is affecting the whole industry, including the possibility to defend the leading position on top of the range segment of the industry. These considerations are valid for both bikes and components, but we can see that where there is more technology – components, we import less; furthermore China does not have a strong position in this industry. These facts and figures support our thesis of the importance of a global strategy. It is not about economic crisis or Chinese competition; it is concerning the ability of competing at international scale and to foster our export based on

more production reliability and capacity, on more effective market strategies able to promote our products on this global market.

#### Italy 2012 Bicycles Import

Country	Units	%
UE	400,013	59,03%
Cina	8,811	1,30%
Malesia	5,873	0,87%
Indonesia	14,071	2,08%
Sri Lanka	41,634	6,14%
Tunisia	42,527	6,28%
Filippine	20,991	3,10%
Vietnam	154	0,02%
Taiwan	55,874	8,25%
Rest of the World	87,696	12,94%

(1,000 units)

#### 2012 Italy Bicycles Export

Area	Units	%
UE	1.228.058	97,33%
Europe not EU	19,99	1,58%
Rest of the World	13,657	1,08%

#### 2012 Italy Bicycles Component Parts Export

Area	Units	%
UE	1.200.734	85,76%
Europe not EU	65,559	4,68%
North America	47,273	3,38%
Rest of the World	86,618	6,19%
<b>Total</b>	<b>1.400.184</b>	

All the figures presented above make clear that our bicycle industry is oriented only towards Europe, small attention is for US market and there is not almost any presence on other markets. On the other side, the quote of import is increasing, due to the cost of product manufactured out of Europe and the absence of Italian brands on city and leisure bicycle segments.

#### Italy Bicycles Import/Export Trends since 1995

Year	Import	% Var	Export	% Var
1995	145.263		2.703.638	
1996	175.682	20,9%	2.046.224	-24,3%
1997	204.645	16,5%	1.581.605	-22,7%
1998	179.815	-12,1%	1.667.275	5,4%
1999	223.988	24,6%	2.086.087	25,1%
2000	224.450	0,2%	1.752.345	-16,0%
2001	445.819	98,6%	1.411.791	-19,4%
2002	453.951	1,8%	1.419.193	0,5%
2003	471.550	3,9%	1.588.963	12,0%
2004	631.036	33,8%	1.554.246	-2,2%
2005	820.736	30,1%	1.343.268	-13,6%
2006	764.119	-6,9%	1.238.810	-7,8%
2007	827.080	8,2%	1.357.991	9,6%
2008	704.280	-14,8%	1.553.409	14,4%
2009	627.398	-10,9%	1.284.798	-17,3%
2010	636.112	1,4%	1.354.320	5,4%
2011	767.626	20,7%	1.585.734	17,1%
2012	731.641	-4,7%	1.356.449	-14,5%

The components side of the industry does not differ from the frame's one. We can easily see how China is competitive from a quantitative point of view. Taiwan is certainly the country with competitive advantage for bicycle industry, but low cost Chinese manufacturing is supplying cheap components to all the entry level bicycle brands.

### Bicycles Component Parts Import

Area	€ 100 K	%
UE	587,774	4,69%
Europe not EU	15,092	0,12%
China	9.965.565	79,45%
Asia excl. China	1.951.926	15,56%
Rest of the World	22,616	0,18%
<b>Total</b>	<b>12.542.973</b>	

Italian cycling firms did not invest for innovating on the range of product and the latest example is EPAC bikes. All the technology is made in Germany and the production is split in two areas: East Europe and China. These two countries serve the two area of the World and enjoy increasing demand.

Export 2011-2012		2011		2012		Variation %	
		Quantity	Euro	Quantity	Euro	Quantity	Value
E-Bikes		nd	nd	1.514	677.187	-	-
Bikes	n	1.480.193	145.790.813	1.261.705	136.179.517	-14,76	-6,59
Other bikes (i.e. toys)	n	105.541	8.550.858	9.323	7.961.323	-11,66	-6,89
Bike components	kg	17.355.855	390.713.552	19.670.400	451.499.294	13,34	15,56

### **2.3 The history of the industry**

The modern idea of bike was born at the end of 19<sup>th</sup> century in the United Kingdom and in France. It derives from previous means of transport characterized as a two-wheeled man propelled machine that has been developed since 15<sup>th</sup> century. For about half a century the industry was characterized by continuous technological improvement, taking advantage of metallurgical developments and new mechanical manufacturing processes. The industry was highly integrated in order to reduce costs and provide resistant and comfortable mass-produced bikes at low price. In the aftermath of World War II, bicycle manufacturers did not invest much into the development of bicycles with the exception of racing bicycles. In this period, we experienced a decreasing of frame producer number due to a shift of the use of the product and the increase of the use of automobiles. In the late 50's and 60's only road bike segment was pulling the whole industry head. For instance, materials used for the aerospace industry like dura-aluminum were increasingly used to achieve weight reduction. Since its foundation in 1895, the American Schwinn has been being the leader of the industry, benefiting from this consumer behaviour as they offered reliable, standardized bicycles, which could be produced at a low cost. Due to the integration of the bicycle value chain, consumers identified the names of large integrated players such as Schwinn or Peugeot with quality bicycles. Barriers to entry were relatively high, because entrants needed high capital investments in machinery and in distribution channel management (Shimano inside, 2002).

The bicycle industry, in the late 60's and 70's, was characterized by capital intensity, poor attention to innovation and research, the presence of integrated companies and by the fact that the industry was dominated by frame producers. The Supplier Bargaining Power was low and they were not specialized. Among leading firms the rivalry rate was low due to the oligopoly situation in a market that was growing. The industry evolution was driven by producers rather than consumers, whose bargaining power and influence was small. In that period, the turning element of the market was the change in consumer needs. Consumer trends changed dramatically in the 1970s, when young Californians invented the idea of off-road bike (Shimano inside, 2002). The well-established companies, i.e. Schwinn, dismissed

this phenomenon as a fad; producers of bicycle components did not take the mountain bike seriously in its early days. This new trend of the market and the following change in consumer demand gave rise to the disintegration of the bicycle value chain. At the beginning of the mountain bike craze, users and producers of mountain bikes were identical. After 1976, some riders began to assemble and sell some of their bicycles. A crucial step in the development of a mountain bike industry was the manufacturing of frames and parts specifically designed for off-road use. As a consequence, the structure of the bicycle industry started changing dramatically; the market was requiring highly specialized components and this provided smaller companies with the opportunity to come up with innovative designs and specialized parts. This event is fundamental for our analysis because it demonstrates that a mature industry could go modular being already integrated. New structure and that firm strategy could influence and shape Industry Architecture. Afterwards, the bicycle value chain was characterized by more competition on the market, especially on R&D of components. Parts manufacturers were able to ride the innovation trend in the bicycle industry, while original manufacturers downgraded and became assemblers. Suppliers become specialized (parts manufacturers) and they built brand equity and capture an important part of the consumer WTP. Original manufacturers capture only the low end of the value chain. Industry Rivalry increased at the assembly level of the chain, few components producers took the leadership and they enjoyed the fast growing phase. The consumers who enabled the revolution did not get strong power due to the size of new leaders and the control they had on the distribution channel and dealers.

In the last 35 years the bicycle industry underwent dramatic changes due to a radical shift in customer preferences. The mature business of the late 70's was revolutionized by change into the industry architecture and the supply chain pattern. Main actors in this change have been Shimano and Merida. The first one took the leadership of the component sector, while the second turned upside down the frame producer supply chain: it was used to be an assembler and it became the leader. This revolution led to a change in the bicycle supply chain: vertically integrated manufacturers, which had been dominating the market before the consumers changed their preferences, lost their dominance due to a slow adoption rate of the new trends, lack of investments in research and development, plus a short-term strategy. They have been unable to figure out the evolution of the industry and they lost

their elements of competitive advantage that they were use to leverage. They downgraded themselves from industry leaders to scaled-down assemblers, capturing only the remaining low end surplus of the value chain. The most significant portion of the willingness to pay of the emerging high-end customers was captured by innovative companies such as Shimano.

Shimano, a former bicycle manufacturer of Japan, gained recognition for the quality and the innovation it brought to the market. In the early 70's they were the second components producer after the Italian company Campagnolo, but they have been able to gain the leadership thanks to an all-embracing strategy. First, its strong focus on R&D; second, a sophisticated marketing strategy, based on bundling products; third, the integration of systems incompatible with competitor products; fourth, continuously changing product specifications and finally a superior management of the dealer network (Shimano inside, 2002).

#### **2.4 The Distribution Channel and Industry Supply Chain**

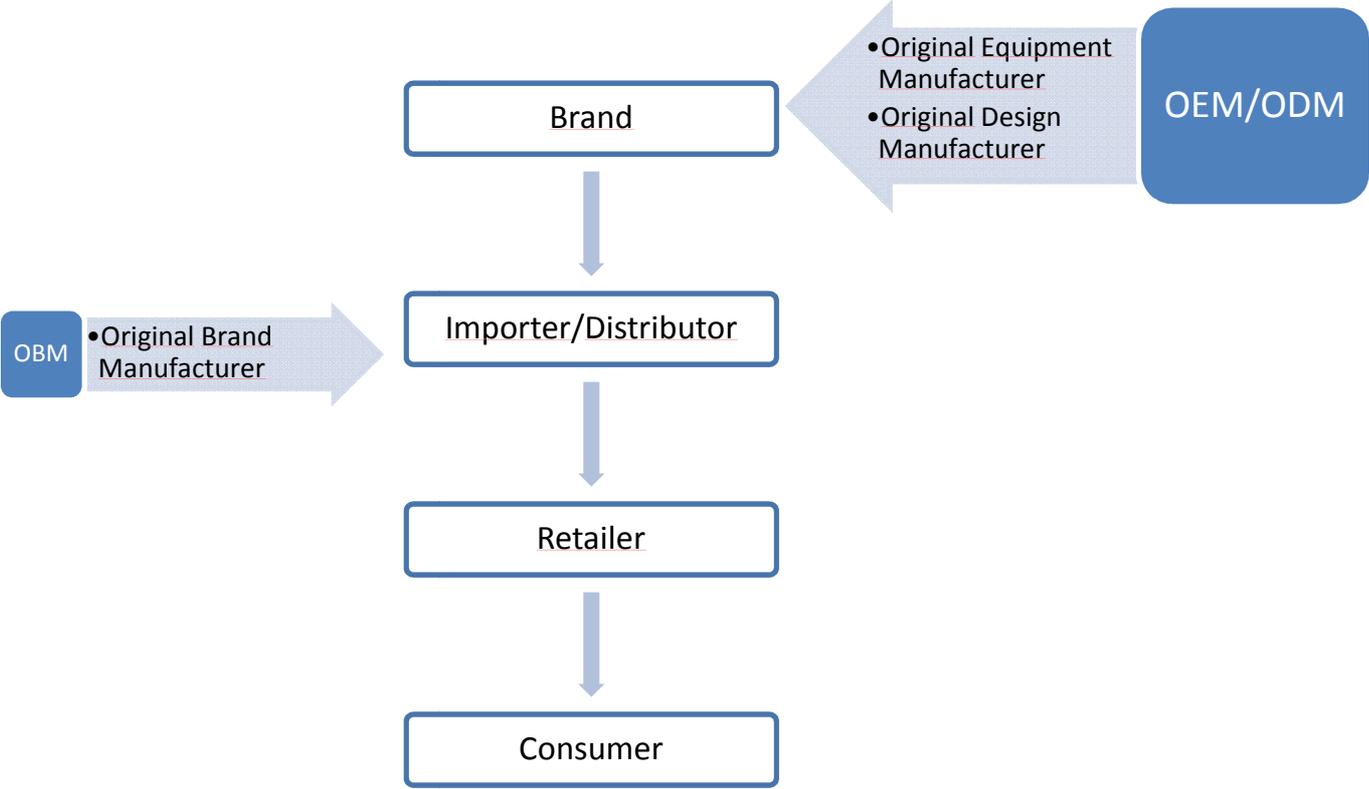
In the last decade the bicycle business has been under pressure. Multiple business models co-exist, creating plenty of operators and possibility to access. Every firm in the supply chain, from factories to bicycle retailers, must be profitable to survive the new paradigm. The industry has achieved significant international scale; it relies on a long supply chain to realize export market growth. At the beginning of the modern bicycle industry we experienced an undisputed leadership of European brands, in particular Italian ones. Then the 'Made in Taiwan' era began. Import from Taiwan steadily increased inverse to price from the mid-1990. At that point, the Italian business model went under crisis due to slumping prices boosted by internet and globalization. Prices decreased alongside all the value chain as well as the retail prices. This situation created tensions among business operators. Taiwanese arm's length supplier were the most ready to react to diminishing margins and they were able to challenge branded company on the final market (cyclingiq.com).

At the beginning of the 90's the industry experienced a new change. Cheaper products started coming from Far. Taiwan began a key location for the industry, not only for assembling activity. Giant Bicycles and Merida, Taiwan-based bicycle manufacturers, began OEM and not only contractors. New patterns of cooperation between producers and distributors enabled companies to gain position on new markets and consumer recognition.

Only few years later, Italian and European firms started marketing their products out of Europe but retail prices for these products were exorbitant. The long supply chain was too long, slow and inefficient, but it was still profitable. Globalization was fuelling sales and margins at the beginning, but the situation was going to turn upside down. These conditions enabled Taiwanese brand to enter the market at lower prices but still very profitable. They started to get recognition at consumer level. New Original Brand Manufacturers, like Giant, contributed to the structural supply chain changes that have shaped today's aggressive and more commercial bicycle market.

The 'Made in Taiwan' movement in bicycle manufacturing was viewed differently by the operators. Bicycle brands welcomed the opportunity to focus on research and design, off-shoring production to Far East locations. Reduced local input costs and strong Dollar and European currencies bought down production costs significantly. Well-known brands with strong country of origin's image such as Cannondale for the U.S.A. or many Italian firms tried to keep production at home but the market went to another direction. Cannondale moved its plants to Taiwan some years later due to tougher price competition. Distribution worldwide was optimized and generous margins largely over-rode any resistance to manufacturing origin. This is the key point for Italian firms. They completely lost momentum and they did not innovate on their business model. On the contrary, Giant developed its engineering competencies and understanding of global market trends. From the early 1980's, Giant began to methodically roll out brand operations infrastructure in key locations (Netherlands, USA, Japan, Australia). Bicycle supply chain evolved and we experienced the dominance of new players. Original Brand Manufacturer (OBM), bicycle companies that own production facilities and brand, took the leadership and shaped the industry thanks to their capacity to play on global scale. Others firms operate as Original Design Manufacturer (ODM): they design and produce original bicycles and accessories, but they do not to brand and market them. Instead, they sell these products to other brands companies. Most bicycle

brands today design their own product and they might create pilots; then engage a third-party manufacturer for serial production. We refer to them as Original Equipment Manufacturers (OEM). Examples of OEM clients are Scott, Felt and Cannondale (cyclingiq.com).



Typical supply chain of different bicycle manufacturing models

According to the scheme in the chart above, it is easy to understand how OBM are better positioned in comparison to other firm using different strategies. They are able to market easier and at lower price their products due to a shorter chain. In order to analyze in depth this new situation we would like to highlight 3 main trends. First of all we had a removal of

all competitive barriers. Globalization, reduction of transportation costs and e-commerce enable Original Brand Manufacturers (OBM's) like Giant Bicycles to equip their bikes with better specifications and lower pricing. The second emerging trend was the development of online sales. It is a phenomenon only for After Market (AM) business and is meant for upgrading bikes from the consumer point of view and to increase margins and sales by the components manufacturers. Moreover it gives them the possibility of approaching downstream customers in the After Market supply chain and to create brand awareness. With the world as marketplace, and with a short supply chain (direct to consumer), e-commerce started being a powerful tool for firm to get in touch with final consumers and to receive feedbacks. From the late 1990's, US-based and UK-based online bicycle retailers would enjoy years of dominance as they waited for other countries to play e-commerce catch-up. The third trend is link to the second one. More information about prices pushed operators to sell OE products on After Market, making the distribution less profitable and creating issue along the chain. OEM Resellers started increasing orders and selling in excess goods on AM at lower prices than recommended (cyclingiq.com).

New business models based on e-commerce platforms in the bicycle market was shocking for old leaders of an industry business model that had for years thrived on handshakes and high margin strategy. Though online stores had essentially evolved in full public view, a majority of the bicycle industry's distributors and retailers were blindsided. The statement "It's always been like that" is the first reason of the fall of many firms and retailers. The dichotomy of the choice between to react and to keep the old strategy set the difference between to lead the market and to downsize and maybe to close down (cyclingiq.com). This is essentially the situation faced by the bicycle industry only a few years ago, as the first wave of online retailers arrived. Retailers were at the end of a very long supply chain, they were powerless to act. Too small and capital-poor to demand better pricing terms, they could only hope their suppliers (distributors) would force online-exposed brands to close supply leaks. That never happened due to the blindness of firms that were focused more on sales budget rather than quality of distribution and brand image. The long supply chain, which was held together by multiple independent parties, was completely revolutionized.

Enormous amounts of OEM product were marketed and the goodwill and trust between operators and clients disappeared along the entire supply chain.

Bicycle brands, their distributors and retailers, demonstrated a remarkable endurance and capacity to sustain a profitable, trust-based supply chain model that ultimately could not resist to global market approach of multinational companies and global trade re-structuring and technological empowerment. Frame and components producers, as well as distributors and retailers have failed to adapt to a new reality; their passion and expertise are no longer enough to run successfully the business. Marketing and global distribution strategy are now the key elements to succeed. It is no longer enough to have good product knowledge and mechanical skills. Consumers are more informed and competitors are really close. Brands and country of origin are not enough to justify a premium price anymore (cyclingiq.com).

Original Brand Manufacturer with an OEM function has taken the leadership of the industry, this different business models re-structured, and compressed, the supply chains in order to position better for market share. The main elements which enabled companies such as Shimano and Giant to do so are (cyclingiq.com):

1. Lower manufacturing costs: purchasing raw materials directly from material suppliers, efficient production;
2. Knowledge/technology transfer: by working as a first-tier supplier they improved their manufacturing processes, competencies and knowledge;
3. Manufacturing for competitors: producing an OEM client's frames or components, an OBM therefore get full understanding of the client/competitor's costs, product direction, market capitalization and supplier relations;
4. Best lead times and dynamic response to market: thanks to internal capabilities and resources;
5. Geopolitical advantage for manufacturers in China thanks to currency policies and subsidization for Chinese export.

Giant and Shimano are the two most well known bicycle brands. This brand awareness materially affects bottom line profit floors. They have built their competitive advantage scaling up and investing on downstream global infrastructure (cyclingiq.com). They do not only deliver high-quality products with aggressive prices, but more important they manage the distribution channels that are integrated into their business model. Their strong investments in communication pay back not only in sales but also on market leadership and brand awareness.

Nowadays OEM brands have a big challenge to win; convincing consumers that their heritage, origin, authenticity and exclusivity are worth the premium price. Long supply chains are not necessarily the problem. It is all about quality of this chain and distribution. There will always some enthusiastic consumers willing to purchase a special product with a perfect service. However, OEM brands have to win back market shares from the less-expensive OBM and ODM brands. Consumer-focused communication and marketing strategy have to be implemented. Global market scale has to be the horizon. OEM brands need to explain their multiple supply channels and associated benefits to consumers, whilst giving all downstream stakeholders equal opportunity to deliver best value and service to the end consumer (cyclingiq.com).

The markets have reached maturity and all major manufacturers are focusing on their key skills, trying to increase their own strengths and to defend their competitive advantage. On the product side, main innovations have only been brought by improved manufacturing processes or technical refinements of established products. For instance, we saw introduction of new materials and designs for enhancing performances. This flatness on the product offer pushed competition on price, distribution and marketing activities. What the industry is eagerly awaiting is a new disruptive product, in a broad sense, to revitalize the market and to open it up (cyclingiq.com).

In order to provide evidences of the fitting of these theories with the real business we are going to describe two different approaches to industry architecture and governance of global supply chain. On one side Shimano with its global and wide range product strategy. On the other we have Campagnolo and its niche segment.

The two most important components company during the 80's made opposite decision and the outcome is a dramatic change of the architecture of the industry.

The two business cases are relevant to our work because show to opposite approaches to global value chain and industry architecture. Shimano has been proactive and thanks to its initiative it has changed the industry architecture. On the other hand we have Campagnolo and its reactive approach. This passive strategy brought the company to defend a profitable position but did not take into consideration further evolutions, both inside and outside the firm.

## **2.5 Case Study: Shimano**

Shimano established itself as a bicycle parts manufacturer throughout the 1960s, and strengthened its position during the 1970s through a constant focus on customer needs, a culture of product and technology innovation, a great attention to improve manufacturing processes. They were able to move forward from core competences to competitive advantage into this industry and to take the leadership of it. They were very good at spotting trends and early market such as off-road bike fad; moreover they developed a company culture of attention and responding to customers' emerging needs. Thanks to development and launch of new products Shimano outperformed others component producers like Campagnolo. In 1982 Shimano was the first company to introduce a complete group-set of components specially designed for off-road use. A culture of innovation through strong focus on research is one of the key factors of its success: in fact Shimano always invested massively in R&D: and its technology had been protected by almost 500 US patents since

1976. At the opposite, Campagnolo had less than 50 in the same year. Furthermore Shimano has been having a strong tradition of quality excellence at reduced costs: it has always had a focus on costs controlling; therefore Shimano manufactured its parts in South-East Asia, achieving labour cost advantages. A second key element of Shimano's cost management is the focus on process improvement. Faster production at lower costs has been a regular preoccupation since the 1950s (Shimano inside, 2002). This unique combination of Shimano's competences, mentioned above, and first mover advantage, have been rapidly translated into a competitive advantage that allowed Shimano to be perfectly positioned for the mountain-bike craze of the 1990s. We can schematize key elements of Shimano's success as below:

- bundling of products: Shimano managed to capture more of the consumers' surplus by offering its products in bundles;
- assembly: companies that wanted to use Shimano's thumb shift had to buy the freewheel at the same time as the gearshift, a new standard was set throughout the integration of systems and components;
- continuous change of products' specifications: thanks to this strategy, Shimano kept its competitors far from developing components compatible with its own ones and furthermore this marketing policy helped Shimano to sustain its cross-selling and lock-in capabilities;
- exclusivity discounts to dealers: Shimano further increased its market power by offering 10% exclusivity discounts to bicycle companies;
- advertising campaign: high investments in advertisement in order to build brand equity and to create awareness among customers regarding components they were using.

Looking at the costs side we can highlight how they did reduce costs through a combination of the marketing measures mentioned above and a set of cost reduction policies that helped them to be very aggressive on the market. The main attention was on the following three:

- logistics: reduction of transportation costs thanks to production location close to frame producers, i.e. Taiwan;
- economies of scale: they have been able to enjoy this cost driver thanks to an expansive marketing strategy that increased the market share;
- advanced cost controlling procedures: Japanese culture of lean production influenced the production process at the company.

Moreover, Shimano's strategy was characterized by a permanent attention to quality and innovation of production processes in order to lower costs. They managed to handle traditional problem of bicycle's market as fashion and exporting difficulties throughout diversification and going international. They were disadvantaged by the strength of their currency: the Yen. They sorted this problem out by off shoring production to China for the Asian market and to Czech Republic for the European one. Clearly, Shimano had to fight for gaining this dominant position. Competitors and other firms of the industry reacted to the changing business environment. We observed very different reaction strategies. In the following part we are going to present different kinds of reaction by players operating at different stages of the value chain.

Cannondale, an American frame producer leader in aluminium technology, that based its strategy on a strong brand name, selective distribution and Made in USA products, reacted by sourcing their components from SRAM, Shimano's relevant competitor; and by manufacturing their own components, with Coda and HeadShok brands. Although Cannondale's experience with its own brands cannot be regarded as a failure, the company still relies on Shimano that remains the main supplier of components for Cannondale (Shimano Inside, 2002). This comes from the strong Shimano's brand awareness among cyclists that keep asking for Shimano's products for higher-end bikes. Cannondale is able to ask higher prices thanks to Japanese components.

Schwinn case study is interesting for our research from a different perspective. This American company was used to be the leader of the industry since its foundation in 1895. From leading firm they downgrade to market follower. Schwinn never invested in R&D and

despite its great experience it lost its advantage because the management did not respond quickly enough to adapt to the new trends of consumers' preferences. This vertically integrated company was unable to compete either on quality with Shimano either on price with Taiwanese assemblers. As a result, Schwinn's share (by units) of the US bicycle market was eroded from over 25% in the 1960s to just 5% in 1992 (Shimano inside, 2002). Schwinn's reaction was based on the strategy of outsourcing: at the first stage they went to Japan but they did not enjoy the expected costs savings. After this first attempt they decide to source from the expanding Taiwanese bike industry. They started just importing Taiwanese-made Giant bikes. That was the biggest mistake. Schwinn transferred all the knowledge and technology without acquiring at least part of the Taiwanese company's equity. As part of its new partnership with Giant, Schwinn passed onto Giant its technology, engineering expertise and all its production. As counterpart the agreement set only commercial rules for importing in the United States under the Schwinn name. Giant levered its cost advantages and Schwinn's experience and demand for becoming a dominant player in the bicycle industry in the mid 80's (ibid). At that point Schwinn had no control over Giant's strategy that launched its own brand-name bicycles in the European market in 1986 and in the American one in 1987. Nowadays Giant is the biggest bike producer in the world.

The third business case we present, in this section of our research, is the most interesting from our perspective: the Italian company Campagnolo, founded in 1933 and that invented the drive train, it was the leader of high-end components until the end of the 80's. They did not recognize the importance of the mountain bike trend considering it as a fad. They invested a lot in sponsorship and marketing in order to catch up with Shimano, but first of all it was probably too late, secondly the brand image was too linked to road bike and bicycle tradition. After few years Campagnolo retracted from mountain bike market and put all its resources and effort on the road bicycles market where they were the best. Campagnolo reaction was then to focus on high-end road products. Today much of Campagnolo's business is on after-market distribution channel only for road bikes. They decided to focus on this more profitable niche and to do not fight for the market leadership. On the contrary, Shimano aim at medium/high end of market, therefore competing on a bigger market where can enjoy economies of scale and of scope, profiting from a larger many market segments.

## **2.6 The power of industry architecture: Shimano went integrated from being modular**

Many products are becoming more modular over time, and that this development is often associated with a change in industry structure towards higher degrees of specialization. We can find a strong connection between a new product introduction on the market and changes of industry structure. A fine analysis of the product architecture could prove the existence of multiple linkages between product architecture and industry structure. These considerations involve the firm boundaries decision and the investments on technology, research and development (Fixson, Park, 2008). Increasing modularity causes increasing vertical specialization in the associated industry. This case is the bicycle drivetrain component industry during the 80's. In the first part of this decade, the industry was fairly competitive and included both small and large firms. In total, well over 50 firms were active in the industry, and over half of those developed and manufactured only three or fewer of the components of a groupset. By the end of this decade, the industry structure had drastically changed. The total bicycle market had split into two major categories, one for road bicycles and one for mountain bicycles. Shimano had become by far the dominating firm for bicycle drivetrain components in both categories, with slightly less than 60% market share in the road bike category, and almost 80% market share in the MTB category. The rest of the market as occupied by two other firms, Suntour and Campagnolo, and some minor niche firms. Each of the three major firms offered integrated component sets, their components were no longer compatible across firms. Thus, between 1980 and 1990, the industry migrated not towards higher levels of disintegration but towards a much higher level of integration —both within and across the individual component segments. In the middle of the decade, one firm had introduced a new product design with an integral architecture including non-compatible components. Shimano came to dominate the industry by the end of the decade. This relatively is an unusual case of decreasing product modularity that is linked to substantial changes in industry structure. This is preparatory for our analysis and explores the linkages between product architecture, innovation, and industry architecture. At that point Shimano had the most advanced architecture; a second one was

still possible but far less effective and it was representative for the rest of the industry. Thus, multiple architectures are possible but one of them is leading the industry over the others. In order to understand this industry architecture we have to look into it and analyze the product itself. We can say that there is a product architecture that shapes industry architecture accordingly. Product architecture is “the scheme by which the function of a product is allocated to physical components” (Ulrich, 1995). We have to map functional elements and linked physical components with the specification of the interfaces. In theory we can divide the architecture in two big archetypes: modular or integral. Of course this strong distinction is powerful on a conceptual point of view, reality is more complex and we cannot set a straight border between these two different possibilities. In our research we have to keep into consideration the dimensions *function-component allocation* and *interfaces* that can vary independently from each other. While changes in two or more product architecture characteristics can occur simultaneously, they do not have to (Fixson and Park, 2007).

In the bicycle sector we have a clear evidence of industry shaping by the business case of Shimano. In 1989, the Japanese company took its product architecture integration one step further (Fixson and Park, 2007). In the MTB market segment it introduced its HyperGlide (HG) freewheel, which allowed bike riders to change gears under load while pedalling, even when shifting from a smaller to a larger sprocket (Bicycling, Sep 1988, Dec 1989). Shimano brought an additional component (the hub) into its already integral drivetrain system in order to introduce a new technical standard of interface. This strategy enabled the company to reduce the components’ compatibility with other products of other firms. Thanks to this innovation Shimano enjoyed a more standardized range of products; while on the contrary, competitors had to introduce more variants to their components in order to make them compatible. We cannot assert that there is a golden way between modularity and integration or one model is better than the other. For instance, systems can migrate towards and away from modularity (Schilling, 2000); product architectures can oscillate between integral and modular states as in the double-helix model (Fine, 1998). Looking at company level, we find evidence of this phenomenon on Jacobides research activity on potential gain from specialization and gains from trade as underlying forces that ultimately cause an industry’s disintegration (2005). As example, we could look at watch industry re-integrated

after the introduction of the quartz movement technology (Jacobides and Winter, 2005). For our thesis, it is important to notice that Shimano not only produced all the components since the beginning of its strategy, but, more importantly, it introduced an integrated design before it began its expansion of market share in the products segments (Fixson and Park, 2007).

According to many scholars, we can state that an industry could go through an industry architecture change towards higher degrees of integration (Christensen et al., 2002) (Jacobides and Winter, 2005). This strategy finds its reasons on the transaction costs reduction and on the value for a firm of maintaining an integrated knowledge perspective (Brusconi et al., 2001). A closer inspection of this business case can help us to understand the cause-effect relationships between Shimano Strategy and industry change. The industry was used to be modular and a firm introduced a modular product. We can look at this fact as a response to changes in either customer demand or technological environments to lower transaction costs. The result, showed by empirical outcomes, is the dominant position Shimano reached in this industry. Competitors were forced to adapt their offer to Shimano's one and to play as followers. Of course we are not saying this happens all the time, too many elements should be kept into consideration, but in this specific case a more integrated product strategy gained the market leadership. Due to the elimination of inter firm component compatibility, other firms lost the possibility to sell on Shimano's group-set that was not 'co-specialized' with their own components anymore. This fact provides evidence of linkages between individual product architecture dimensions and multiple strategic performance dimensions of a firm. This case, and its theoretical implications, are really important for our work and demonstrate the importance of this study. There is substantial value in understanding the potentially industry-changing power of product architecture innovation. Moreover, Industry Architecture can help us to understand Global Value Chain evolutions and geo-localization. It is not simply a matter of pure product performance and operational functionalities, but it has truly strategic value for the industry as a whole. Different strategies require different width and depth of knowledge; in fact, in modular sectors a deep knowledge base is necessary to compete effectively, while a broader range of knowledge is required in order to change the architecture of the industry. It is easy to understand that in the second scenario a higher amount of resources and investments are required. Starting from the product dimension is important to understand and design the paths through which

changes in individual product architecture dimensions propagate through the industry. Likely it will not be the same in any case. In bicycle sector decreasing modularity in a mature and modular industry has driven to an overwhelming dominance of the attacking firm.

## **2.7 Case Study: Campagnolo**

In the following paragraphs we present the first part of Campagnolo business case. It is interesting not only in contraposition to Shimano's one, but also because it is useful in order to understand to different ways of approach this industry. The second part of this section tells the story of EPS – Eletronic Power Shift -. It is a paradigmatic example of new product that could support the company in changing the industry architecture and might relocate part of the global value chain.

Tullio Campagnolo was a cyclist, an innovator and an entrepreneur. Tullio Campagnolo was born in Italy in 1901. He pedalled the best bike he could afford and was frustrated by the lack of practicality in its component. He was the son of a blacksmith who taught him basics of mechanics. He was uneducated and he started working when he was eleven years old in his father's shop. After the military service he took up a remarkable cycling career. These experiences provided him with the knowledge and the way of thinking to become a successful entrepreneur.

Everything started in 1927, when Tullio Campagnolo found himself alone ahead of his competitors; he prepared to climb the first steep slopes of the Croce d'Aune pass undauntedly and determined not to surrender. On that freezing morning of November, his hands were so numb from the cold that he could not loosen up the hub wing nuts to disengage the wheel and shift to an easier gear. Then and there, Tullio Campagnolo had a stroke of genius: he would redesign the nut's lever to make the release more straightforward. The Quick Release system was patented on February 8, 1930 and its

industrial production started in 1933. He had some money from his career as a cyclist and he used it for starting up the company. That year, Tullio Campagnolo founded Campagnolo Company, headquartered in the backroom of his father's hardware store in the city of Vicenza. Campagnolo spent much time following races and speaking with cyclists, taking notes of every input, suggestion, and recommendation. The information gathered on the field was then elaborated, translated through pencil and paper into sketches and perspective drawings. His solutions were then materialized by hand with a file in the back room of the hardware shop. This is the way how he made innovation. In 1949, in Milan, Campagnolo introduced a rear derailleur prototype equipped with an articulated parallelogram and a double pulley tensioner. This is an important fact, because it tells us how Tullio Campagnolo understood the importance of Milan's region, where now are located a lot of frame's producers. Campagnolo became a leader and global reality of its sector. The 60's were an amazing stepping-stone for Campagnolo, which soon became the benchmark in the field of bicycle parts manufacturing. 110 out of 130 cyclists participating in the 1963 Tour were equipped with a Campagnolo rear derailleur. The company started exporting worldwide, and opened a plant near the city of Bologna to start experimenting in new sectors. It created highly recognized motorcycle and car racing wheels, as well as lightweight magnesium parts for the aerospace industry (NASA).

Talent, attention to detail, and quality often spur from practical, yet complex needs. Campagnolo's brilliance was evident in his everyday life. When he hurt his hand one day while opening a bottle of wine, Tullio realized that traditional corkscrew could be improved. As if it were a malfunctioning rear derailleur in need of revision, he invented a corkscrew that could be removed effortlessly and with absolute precision, the Big Cavatappi – Italian word for corkscrew - immediately became a cult object.

Professional races are Campagnolo's all-time research and development laboratory. Tullio Campagnolo was always present; at every stop-over, at every race, with team leaders and followers alike. His mission was to listen, and to learn what to improve directly from cyclists. In 1983, the company crosses the half-century line. Tullio Campagnolo celebrates the event by leaving an indelible mark as his last signature. The event was commemorated with a limited edition of a special, gold-plated anniversary groupset, which outperformed the Super Record for quality of finish and attention to detail. Embodying the highest technology

possible, it was the old captain's final farewell to his company. Tullio Campagnolo died in Vicenza on February 1<sup>st</sup>, 1983.

It is the turn of Campagnolo's son, Valentino, to manage this big enterprise. Bicycles were undergoing transformation. Terms such as aerodynamics and lightness came into the play, as well as materials never seen before. Steel became lighter and aluminium alloys were introduced in the production of frame tubes. And Campagnolo, true to fashion, was at the head of this innovative revolution. Valentino Campagnolo followed the thoughts of his father as man and as entrepreneur concerning how to manage the company and how to innovate.

The early 80's represent a critical step for the Vicenza company: competition brought by the Japanese Shimano starts to get the first commercial results and sports. Shimano and SunTour entered in the mountain bike market with major investments and sponsorships. Afterward Campagnolo did the same, but the delay and the Campagnolo image, too tied to the history and racing bike, were obstacles too big to face. In 1995 the Italian company abandons the off-road market. In the late '80s Campagnolo chose to focus on more profitable niche market and that had always dominated: the high range. The Japanese competitors, however, engaged a long battle for supremacy in the market; Shimano won definitely on low-end product market and holds the leadership in that segments and sport city bike with a turnover of more than one billion Dollars: ten times Campagnolo's one.

Campagnolo consolidates its presence in the top of the range in the components of the world road, in cohabitation and constant challenge with Shimano, creating a real market niche for customers called "campagnolisti". They are loyal customers that mount only components from the Italian company and identify themselves in its values and its history.

Despite an evolving market, Campagnolo has chosen to remain faithful to its history, its customers and has never changed or distorted image of a myth. Preside though this market segment of cyclists high spending potential and high fidelity, however, has led the company to gradually reduce its market share, particularly on OEM market, in which manufacturers choose cheaper products.

## 2.8 Innovation and EPS case in Campagnolo

For Campagnolo, innovation is a key feature of the corporate vision. Campagnolo based his designs by observing cyclists and the types of bicycles they preferred to buy. Today the cycling market and technical evolution of materials drive the company's research and their launch of new products.

Campagnolo adopts an offensive strategy concerning its innovations. It was the first producer to make use of 11 speeds and the second in launching an electronic drivetrain system.

For Campagnolo, strategy follows innovation; this means that the company's aims are determined by the technological progress and innovations made by the R&D department. The launch of new products is dependent on the season; the preview for clients (B2B sales) is scheduled for September and the product presentation for the public occurs in March.

The R&D department, in which mechanical and aerospace engineers as well as experts in materials work, is central to the New Product Development. In particular, the contribution from the Faculty of Material Development at the University of Padua the company has been cooperating with for over twenty years is of utmost importance. The Composite Material Section is the most important production department in which technical innovations are applied in the manufacturing of products. The processing of carbon fibre requires significant experience and complex manufacturing procedures. Test and inspection laboratories where products are examined and data is collected provide valuable feedback of mechanical performances and of Campagnolo's products.

The role of the product manager is crucial to the Campagnolo system, since he is the one responsible for the product and also plays a fundamental role in connecting the marketing department, the sales office and the production area in order to offer the best possible results to the customer.

In preparation of the launch of new products the opinions of the different departments are presented and discussed at meetings. The participants of these committees include members of the R&D department who work closely together with the sales department to meet the demands of the market. These Product Committees are also attended by the leaders of the technical department, which is responsible for testing and quality control. Furthermore, representatives of the production, who are in charge of industrialization and making critical decisions such as “make or buy”, as well as representatives of the sales area, responsible for target price and quantity, participate in these meetings.

The final decision on the launch is made by the CEO on the basis of reports from the heads of the different departments. The most important element is quality. Even if the market requires the product, it is not launched if the technology is not fully developed and tested.

Our research show how Italian companies are embedded in a territory of great cycling races: the Giro, the one-day classics as the Milano-San Remo. The reason for this tradition is the use of bikes in Italy, whose mild climate compared to the rest of Europe has encouraged the spread of this form of transport and a number of mechanical workshops for its production.

To describe and analyze the process of innovation we opted for SCOT analysis on the model proposed by Wiebe E. Bijker, in order to understand how Italy became a good place to design and to product racing bikes. Our analysis of this case is based therefore on science, technology and society. In particular, following the work of Bijker, we use a descriptive framework SCOT, Social Construction of Technology. We have experienced that a linear approach to innovation is impossible, you can only draw *ex-post* as a line interpolating a set of points whose identification has been completely different.

In order to understand the process and the result of innovation we need to start from the assumption of the importance of people and of different social groups. Is the human ingenuity to discover and invent, not according to a fixed and stable path but following the inspiration and intuition. Innovation is developed by different social groups. In particular, in our case they are interested riders, engineers, and mechanics. Our analysis deals with the world of racing because it is from here that technology comes, which is then dissolved to the user's private bike, a bit as is the case for F1 and mass-produced cars.

These actors are members of different technological frameworks; therefore have different degrees of inclusion in their technological frameworks. The point of view of a mechanic will be very different than that of the runner, but more similar to that of the engineer who designed one of the components. The meeting of these experiences is essential to pursue incremental innovation, while large revolutions always start from an intuition, such as quick release by Tullio Campagnolo.

New technical applications and flexibility of interpretation derived from research on road bikes, their use and the sharing of technology with a wider audience with different needs. For example, new ways of processing of carbon, not used by professionals, have been highly appreciated in the market for comfort.

This example leads us to introduce the concept of tech framework: frame of mind compared to the technology. How people see the artefacts. This is very important to understand how the innovation of complex artefacts resulting from the meeting of different technical experiences that combine together and specific environmental factors can produce useful innovation.

Innovation is a composite path with pressures from private firms, market demand, public investment and drawings made from scaffolding structures that operate in relative sectors. In the field cycle there are different points of view and for each there is someone who cares to trace a path of innovation. For example, there is the UCI, Union Cycliste International, which sets the rules for the big stage races and for the construction of racing bike. For example, the minimum weight of 6.9 kg is stopped for a long time, so companies are focusing on aerodynamics rather than on weight, great importance is attached to the transmission and wheels.

Campagnolo EPS is a shifting system that works not mechanically thanks to steel cables that connect the control levers (Ergopower) to the front and rear derailleurs, but use electrical circuits managed by an electronic control unit. The implementation of electronics, also, is not a simple application to the mechanical system, but it is a completely electronic system to all effects, not electromechanical, because even adjustments are made electronically and are managed by the control unit Digital Tech Intelligence. There are no screws to be calibrated. This innovation could lead to further changes in the world of racing and cycling in

general. Electronics allows controlling the performance in a scientific way, knowing the pedalling frequency in real time, if the rider is tired or if the performance is constant, based on mathematical data and not on feelings. If the bicycle will become an integrated system managed by the electronics definitely change the way to run. We can imagine that in the future the change becomes more automatic, with the electronics that manages the group and suggests when to shift the rider. At this time EPS allows to face with less risk challenging climbs and treacherous terrain like the pavé in order to get more spectacle without danger. EPS Drivetrain allows to not worry about mechanics, the change before the climb as not to strain the chain, you always have the right gear-cog in relation to push on the pedals, to get the maximum performance from the propulsive effort as in sprints in order to have more speed and reactivity. There are significant advantages for the cyclist. The possibility of self-adjustment of the system allows having a drivetrain always aligned and sliding, making adjustments in an automatic way even in the running without stopping. The DTI (Digital Tech Intelligence) receives impulses from the controls through the interface that communicates with the sensor placed inside the derailleurs, which indicates its position at all times. Depending on the sprocket that has been selected with the controls, the EPS re-positions the derailleur to optimize its position with respect to the chain. This allows chain crossovers that are not optimal in traditional systems. It performs two corrections upward and downward. Thanks to the electronic evolution of the Multi-shifting technology which is already used in the mechanical units, it is possible to obtain multi shifting with 11 gear-cogs. Thanks to the use of a sophisticated electronic system, by keeping levers pressed down it is possible to continuously change gear upward or downward, by up to 11 sprockets with a single action of the levers. While the mechanical groupset are possible at the most five up-shift and three down-shift. The EPS system is capable of automatically detecting a whole range of malfunctions. If a malfunction is detected, the EPS system turns on an RGB led located on the power unit. Depending on the area where the malfunction has been detected the led takes on different colours. The uncoupling mechanism of the rear derailleur is useful if the battery runs out «on the road». If this happens, there is a procedure called “Ride Back Home” that allows you to manually «uncouple» the rear derailleur to position it on the required sprocket.

For Campagnolo, this has been a significant achievement and an extremely important project, while for the cyclist; it represents the zenith of cycling technology today. Campagnolo Super Record EPS is considered by pros the best drivetrain in the World. It represents a revolution in the cycling world, the technical evolution from a mechanic groupset to an electronic one. It works in a similar way to the traditional one, but inputs come from an electronic button and not from a lever connected to derailleurs with steel cables.

## **2.9 Differences in the two case studies**

The first and straightforward evidence from these two cases is the opposite role of innovation in the two corporate cultures. Shimano used its innovation to change the market and the industry. Campagnolo worked only on the product innovation and it was not able to shift this evolution at the industry level. Shimano relied on distributors and other firms to implement its strategy and achieved a central role on the industry thanks to its standards and its commercial strategy. EPS Campagnolo product, on the contrary, is the best drivetrain on the market, but marketing, distribution and strategy are working only for the high-end product niche. There is not any endeavour to broaden the potential market and to secure alliances and partnership at downstream stages of the Global Value Chain. This narrow approach to the industry architecture is stopping Campagnolo to enlarge its bargain power and influence on other firms.

## Chapter III

### Bicycle Industry Case Studies

#### 3.1 Introduction

In the third chapter we present some case studies which we analyzed. We have interviewed managers and leaders of Italian bicycle companies about two different topics. First, we have focused our attention on their firms and their specific position within the value chain. Secondly, we went through the main issues of the industry as a whole in order to compare different prospects on the sector and to assess the situation of the industry. The order in which we posed questions is both relevant and significant. We have followed the stream of production along the value chain: from frame producers to distributors. The North of Italy is the geographical area of our research: from Milan to Veneto Region. This area has been a broad unaware cluster for bicycle industry since the beginning of the last century. Nowadays some structured companies still located in this area are competing at international level on market niches and being successful; on the other hand family owned firms are struggling due to their size, lack of internationalization and short period strategy.

In this chapter we describe company profiles and management opinions. Specific relevance is given to interview results and company position on the value chain according to the analysis pattern presented in the first chapter. In the final chapter we state the pattern we identified in this industry and the bottom line of this analysis.

Overall, the Italian bicycle industry counts 220 companies, 12 000 employees, 2.5 million bikes produced and a turnover of 1.3 billion Euros. The macro sector is divided into city bikes, mountain bikes and racing bikes, that is the most important segment for our country and that represents excellence. Out of the 220 Italian bicycle companies, 150 deal with accessories and components for racing bikes, turnover is over 750 million euro, 70% of

export. The bike industry exports worth over 500 million euro, of which 400 million high-end bikes.

### **3.2 Methods and Data**

In order to support our thesis we have used both qualitative and quantitative sources of information and data. During our interviews we have commented on official figures presented on the second chapter and discussed about management opinion and point of view on the industry. This research involves case studies of bicycle industry with a geographical focus on North Italy; we analyzed balance sheets and market position as well as the strategic approach to competition.

The research starts from a review of the past structure and dynamics within this industry; it follows the evolution of bike sector in order to design the path and to propose an understanding of the actual situation where we stand.

We used multiple sources: archival data, industry publications and articles, companies' documentation and previous studies on the sector. Furthermore I have interviewed many managers for this research project specifically. To verify our archival findings, we also collected data through face-to-face, phone interviews and via e-mail. We checked data with company representatives, industry observers, technical journalists, and editors of bicycling-related magazines.

We shared our analysis and thesis with business operators and academic scholars we had the chance to interview. We found really useful Ancma publications for numerical data provided on them and also periodical magazines for consumers in order to have insights of what sector trends are.

### 3.3 Bianchi

The F.I.V. Edoardo Bianchi – that stands for Fabbrica Italiana Velocipedi, is one of the most important Italian bicycle manufacturer, founded in Milan in 1885 by Edoardo Bianchi.

Since May 1997, the Bianchi has joined the Swedish group Cycleurope AB, a leading global company in the bicycle industry. The brands of the Bianchi group were added to those of Cycleurope, creating a full range of products. Nowadays, in the Italian plant in Treviglio remains the design department and part of the production for the high-end frames, the so called "Reparto Corse". The production of the Bianchi is not limited to the creation of road bikes, but also Mtb, city bikes and BMX. It is among the most prestigious brands in the production of racing road bikes, which was used by the great champions of the past like Fausto Coppi, Felice Gimondi and Marco Pantani. The symbol of the company is the particular colour they use for their bikes: it is a special blue famous as Celeste Bianchi.

Thanks to our interview with the Head of Marketing, Mister Masnata, we can describe a modern firm open to international markets with a strong tie to its history and country. "Bianchi is not a niche brand. Bianchi is a global brand" the manager said, and it is distributed over all five continents and over more than 60 countries. Internationalization and distribution are key elements of their strategy. At the same time, Bianchi brand is synonymous of Italy. Domestic market still represents an important area of business both as product tester and for turnover, which is roughly 30% of the total revenue of the company. All the design, conception, engineering and prototyping activities are located in Treviglio – Bergamo, while the production and some assembling activities are carried out in the Southeast Asia by independent firms, but under the technical control of engineers from Bianchi. Assembling and testing for the top of the range – Bianchi Reparto Corse, are



performed in Italy. "For the final consumer assembled in Italy is still valuable and there is willingness to pay to this extra element. This is not just a matter of quality; Taiwanese production is even better for some kind of products in comparison to the Italian one, especially considering their capacity to produce massive quantities within reduced amount of time. It concerns more the idea of heritage and passion of Italian manufacturers in this industry that involves sentimental aspects and leisure for the final consumer" Masnata said. Bianchi defines itself as Performance Bicycle Company: not only from the technical point of view but also on the business side. Mister Masnata shows the pride of the company for its history and the will of fulfil the founder mission.

"We have a strong Italian identity but a wide mission: the aim of this company is to provide the right bike for anyone: from the children bicycle to road and off-road professional frame, from the classic looking model to the EPAC - electric pedal assisted cycle. Since the foundation of the company, Bianchi has been providing all kind of bicycles and the company wants to keep this strategy and identity: you can always have a Bianchi bike regardless what you intend to use it for".

Bianchi has suppliers from the Far East and their brand, and distribute not only frames, but also components with their brand. In the management opinion, the Made in Italy concept adds value for the high level products, not as manufacturing but as heritage that is preserved by the Italianity of the owner, Salvatore Grimaldi, even though the group is Swedish. The company has been bought by the Swedish Cycleurope AB of Mr Grimaldi in 1997 and nowadays represents ones of the biggest European Group for production and distribution of Bicycles.

Bianchi success, given by a constant positive trend in sales over the past years, is supported by investments in Research and Development, technology developed internally and externally as well, innovative materials and the capacity of forecast new trends. Archetypal example of this strategy is Countervail Vibration Cancelling Technology (used by the new Infinito CV model) that is an American Patent developed by a NASA supplier. Bianchi has an exclusive agreement for its use on the bicycle industry after two years of co-work with this company.

Bianchi management is very concerned about internationalization of the company. They understood that the market has evolved and therefore they need to be a global player

rather than just export oriented. Bianchi is a good example of successful strategy facing issues from globalization. After acquisition of the company by a European group they switched to a more international organization and production. They decided to invest on the Italian brand and heritage, not on hand-made production, in order to increase massively quantities and be able to supply every segment of the market at competitive price. The fact they do not produce anything in Italy, but they control from a technical point of view the outsourced production, is significant for our research. We can state that competitive firms have pursued the strategy of moving the production to cheaper location but keeping the headquarters in home countries such as US and Italy. They did so in order to guarantee shorter lead time, high quality on intensive production and increase the capability of reaction to market needs.

Bianchi is now able to lead its value chain; it keeps being an Italian company operating and making decisions in its home country, it is able to source from cheaper location with small investments but ensuring the quality, it manages the distribution channel and it can be considered a successful case for the Italian bicycle industry.

### 3.4 Campagnolo

Campagnolo is an Italian components manufacturer based in Vicenza, North-East of Italy. It is considered one of the top brands in the industry and from the 80's has narrowed down its focus on top of the range products. Nowadays it dominates the high-end road bike drivetrain niche of the market. In 2012 the public Profit and Loss Sheet reports 120 million Euros of revenue.



Campagnolo is the only leading firm in bicycle components that produces in Europe only. All Campagnolo components are designed, engineered and developed in Vicenza in the Department of Research and Development that is called Campy Tech Lab. As well as the development, the phases of testing takes place internally and with the use of both testing machine and on the road tests. A key part of the development process is carried out by professional teams sponsored by Campagnolo. They are the ideal people to test the quality, durability, effectiveness of all solutions brought forward by the R&D department. Only a small part of production and assembling is made in Romania, in two plants owned by Campagnolo.

Campagnolo exports more than 70% of its turnover, sells and distributes its products around the world. It supports its partners throughout the distribution channel managed by its local branches. Campagnolo coordinates all activities globally and operates in all five continents through a structured network consisting of 5 commercial branches (North America, Spain, France, Germany, Japan) and a logistics centre in Taiwan. In the case of Great Britain and Benelux they rely on independent importing firms, while the rest of the world Campagnolo works with more than 70 distributors in 32 countries.

A further project is undergoing. It is called Campy CODE and are selected stores within the network Pro-Shop. Each customer will find all the latest news on Campagnolo, a

comprehensive selection of products in the range and especially highly skilled staff who followed a training dedicated to them directly organized by Campagnolo.

Talking to Campagnolo management it is straightforward that they are very proud the company they work for. The first thing they state is that Campagnolo has never produced components for their own groups in Taiwan, only the low-end was brought to Romania since 2009 and only the production process. Campagnolo strategy is to stay and keep producing in Europe, as does the German company Cube, that is the leading firm for bicycles assembled in Europe.

Taiwan is becoming more expensive and the production began to be moved to China 6-7 years ago, but now the new producing locations are Cambodia, Vietnam and Bangladesh. This second relocation regards both the components and frames. The technology developed by Taiwan was higher than in the Italian and European in general, especially as regards the printed carbon and the production of large quantities with reduced lead time. The handmade culture was at the same time know-how and constraints of our firms. The premium frame brands have needs that only the Taiwanese organization and technology could guarantee. These costs and lead time are unsustainable for European firms.

In this scenario, Campagnolo has been pushed out from massive production; it has taken care of its niche as Italian top brand. Shortcomings of this strategy is that it only sells in After Market, and at the same time it is not powerful in marketing activities and it does not invest in a selected distribution channel that might help in order to create an image of exclusivity of the product. An example of this might be to follow Canyon, frame builder who sells online only managed to increase its profitability by 25%. The B2C is the new frontier for these brands.

The best way to get into the top specifications is sponsorships, but for corporate policies Campagnolo does manage to work with recognized premium brands like Trek or Specilized. It happens because they do not accept contractual obligations to purchase programmed quantities of products after the sponsorship of pros teams. In addition, in order to work with these companies, they would need to increase their work in terms of quality and lead time. Unfortunately, for the size of Campagnolo, only the first of the two elements is impeccable, and on-time delivery is difficult to ensure, especially for new products.

In addition to historical competitors Shimano and Sram, also FSA is growing very strongly, especially thanks to components with aggressive pricing on the OEM. They produce in China and store in Taiwan. In order to give an idea of the size of competitors, companies revenues are respectively: Sram: \$ 600 million Shimano: € 1,500 and € 120 Campagnolo - Data revenues in millions.

FSA has formed an alliance with Shimano in key non-competitive and is working to integrate their standards, eroding Campagnolo market shares. Sram brand is dedicated to drivetrain and the off-road market, whereas Vision is the brand they used to enter in carbon wheels market and now is entering in the aluminium one. FSA is an American company with a design office in Milan led by a former Campagnolo employee specialized on wheel product.

In a Global Value Chain perspective Campagnolo case is very interesting in order to understand the importance of size and industry architecture. Campagnolo kept the production on Italy counter trend, but this decision does not fit the industry architecture and only the strength of the brand and the medium size of the company allowed it to defend its position on the market. It is possible to innovate the structure of the industry, it is very difficult to defend an old and obsolete strategy. Campagnolo, therefore, moved some production to Romania in order to supply German market and it has set up a logistics centre for components and a firm for wheels production in Taiwan. Anyway this case demonstrates the importance of being a global player in order to be competitive. It is not only a matter of production but also a marketing issue. Consumer preferences in road bike segment are lead by the performance of the sponsored Pro Tour Team, and then it is easy to understand the importance of having high amount of money in order to sponsor teams and events. A small artisan bike boutique firm cannot have these financial resources. The importance of the quantity is not only from an economy of scale perspective but also because of the marketing investments required by the market.

## 1.1 Fulcrum Wheels

Fulcrum Wheels was founded in July 2004 and in a few years has become



one of the leading brands of high quality components for bike racing. The company has its headquarters in Arcugnano - Vicenza, where it produces the high-end aluminium and all carbon fibre products that are distributed in more than 30 countries through five subsidiaries abroad and 40 national distributors. Other production sites are located in Taiwan, the first country in the world for production of road bike frames, and in Romania in order to serve the European market and in particular the German one that moved the production to East Europe.

The history of the brand Fulcrum is linked inextricably with its owner, Campagnolo; that in fact designed and created the brand Fulcrum within a brand strategy portfolio management. All the staff are from Campagnolo and the production takes place entirely in the factories of the parent company. Fulcrum is just a distribution company, albeit with considerable influence on the design and manufacturing processes said Mr. Scalzotto, general manager of the company during our interview. The technologies applied are the same, but brand image and identity are completely different; Fulcrum is also present in the mountain bike segment unlike Campagnolo.

The core business is the wheel products and Fulcrum managers are focused on improving the distribution network. We interviewed Mr. Zanet, export area manager, and he explained their commercial organization and strategy. They produce only the rim and the hub because they are components with more technology and patents. The production of spokes is outsourced like for all the other companies, excluding DT. The world's largest producer of spokes is the Belgian Sapim, founded in 1918.

Fulcrum purchases all its wheels from Campagnolo: the carbon fibre and the high range aluminium production are entirely carried out in Italy. On the contrary entry level components are produced by Primatek, Campagnolo subsidiary based in Taiwan, established exclusively for the Fulcrum wheels project. Three years ago the aluminium production has

been moved from Campagnolo to a plant in Romania, while the carbon is still made internally in the site in Vicenza.

This new brand, in addition to an identity that is opposite to Campagnolo, has also a technical standard that Campagnolo adopted only last year: it was compatible with Shimano and Sram groupset. Indeed standards interfaced between gears and the wheels are different between Campagnolo and other manufacturers. Campagnolo wheels were used to be available only for Campagnolo standard. On one hand this allows maintaining the pure brand image of the Campagnolo, but on the other it precludes a massive market share, about 70% of groupsets use Shimano standard. The Fulcrum brand therefore allowed the Group from Vicenza to sell on all segments, using a high quality product that was previously reserved only for Campagnolo groupsets. This strategy allowed the company to regain market share, saturate the production facilities and to better spread costs of research and development. After first years of exponential growth where it went from one to ten million Euros turnover in three years, in 2007 Fulcrum entered into the off-road market. The new wheels for mountain bikes were immediately appreciated by the public and professionals, as Julien Absalon who won four World Cups and the Olympic Games in Beijing.

According to Mr Scalzotto: "Fulcrum is structured for market and sales the product, it is supplying goods from Campagnolo and Far East, it works on global scale on the most remunerative stage of the Value Chain. This very lean structure has permission to manage the growth phase and different needs of the company and clients".

Fulcrum has a very Global Value Chain and its managements look for opportunities to enlarge the range of products and partnership with OEMs.

### 3.6 Selle Royal

Selle Royal Spa is an Italian company located in Vicenza; founded in 1956 by Richard Bigolin, which produces bicycle saddles. In the 80's and 90's Selle Royal Spa has become a leading firm in the OEM market and AM as well.



The saddles produced by Selle Royal have won many awards for their design and are under examination in bioengineering research laboratories in many European universities. Present in over 70 countries around the world, with product lines designed for every type of riding, today Selle Royal Spa is the world's largest manufacturer of bicycle saddles. They registered 53.485.954 € of revenue in 2013.

The history of the company is a continuous of innovation built on research, technology, and advanced design. In 1970 Selle Royal developed a production technology based on a particular polyurethane foam and 20 years later a gel for the saddle for the recreational market, based on an exclusive polyurethane gel patented by Bayer. From mid 90's the company started its expansion on global scale throughout acquisitions of brands and plants. In 1996 Selle Royal set up a site for production in Brazil and one year later it launched Fizik brand. In 2002 they acquired Brooks England; the group now has three independent brands of saddles plus Crankbrothers brand for components. In 2010 the group acquired the 52% of Justek, a Chinese manufacturer.

Selle Royal is the largest saddle producer in the world and in the management's opinion this success is due to its international approach. The attention to the market led the company towards a growth in terms of quantities and market presence. In 2002 they acquired the historic brand Brooks – UK, in 2007 Crank Brothers – US, and in 2010 the Chinese Justek. All these acquisitions enabled Selle Royal, which owns also the brand Fizik, to improve its market leadership as a Brand able to add value and to enter into new segments. The strategy of this company is straightforward to understand, but complex and demanding to implement.

The SR brand manager, Mr. Federico Bucci, explained the strategy of the company showing an international horizon aimed to lead the market: “First of all, we have a big attention to OEM market. Tight relationships with frame producers enable us to deliver high quality products in reduced lead time and in massive quantities. In order to do that, we have set up two distribution sites: one for Europe and one for Far East. 70% of production is made in Italy: this is comprehensive of 100% made in Italy Fizik Brand which is the top of the range product for the company, entirely finished off by hand. 80% of production is branded, while remaining 20% is for private label. Each level of products requires technologies and staff dedicated, therefore a global market and different locations are needed”.

Key factor to work with OEM is the ability of Selle Royal to develop its own brand which adds value to bikes it is a component of. Research and Development plays a pivotal role in this strategy as well as important investments in plants and machinery. For example, this Italian company formed Technogel Srl, joint-venture with the German Bayer, to develop gel technology now used in the production of anti-decubitus cushions for long-stay patients and then imported into the saddle industry. Nowadays Selle Royal has an agreement of exclusive right to use this technology from polyurethane. Selle Royal doesn't work only on top of the range products but with all the big OEM firms in the market. Their competitive advantage comes from their ability to trade as a peer with their clients and not as a simply contractor. They worked a lot to set themselves on a comfortable position alongside the global value chain. They don't play as industry leader into bicycle industry but they dominate their stage of the value chain and are able to add value for the final consumer. This position of strength and power enables them to organize their activities and operations on global scale, the only way to be effective and competitive.

As we said before, acquisitions are really important to the company in order to get global. Brooks was the biggest producer during the 1960's and 70's. Afterwards, they focalized on high quality hand-crafted saddles of natural leather. This guaranteed high marginal margins but company size was not enough to cover all the overheads. In order to be competitive every company has to scale globally and rely on strong brands that are not enough anyway. In this sense, we have to look at Crank Brothers acquisition, even if it was useful also to enter into the off-road world and to enlarge products range. CB is a Californian components producer: pedals, crankset, wheelset and accessories. The productive sites are in US and

Taiwan plus China for simpler components and accessories. 2010 is the year of Justek, Chinese firm acquired by Selle Royal in order to secure their position on the Far-Eastern market. China has become a strategic country for bicycle industry because it is close to Taiwan and prices were really competitive. The aim of the acquisitions is to enter as a brand into target communities and to grow globally as producer as well.

For Selle Royal Italy is an important part of their story and heritage. Talking with their managers it is easy to understand that this is the only aspect they are really interested on Made in Italy concept. They are a global company and therefore they think globally. Italy is really important for the culture of cycle competition but the bicycle is not seen as a mean of transportation. The market size is too small to enable a company to rely only on it. The culture of cycling in Benelux or Germany is much more evolved, the possibility to market products and to sell massive quantities is incredibly bigger. Made in Italy does represents a good starting point for our companies in this industry, but it is not enough. Only for the top of the range Made in Italy brand adds some value and consumers are willing to pay for it. On the contrary, this niche is too small to guarantee prosperity and future to a company. Medium Size Company is the minimum pattern that could permit our firms to stay on the market, small firms can't rely on amazing margins anymore. Competition is getting tougher and the only weapons that can be used are cutting-edge technology, marketing investments and playing as global brands close to big OEMs. Selle Royal and Brooks are the empirical demonstration that it is not a matter of either country or competitive advantage. It is more about strategy and understanding of the direction the industry has undertaken.

### 3.7 Selle San Marco

Luigi Girardi founded the company in 1935.

Saddles made by San Marco had been quickly appreciated by professional racers.

Selle San Marco registered 4.875.308 € of revenues in 2013 and employed 21 people.



Selle San Marco produces and assembles its top of the range products in their plant in Rossano Veneto – Italy. They rely only on local supplier for two main reasons. First of all the complexity of the production of the saddle product, second of all the attention on quality and product development that a geographical closeness can boost. Selle San Marco managers are used to ride with managers from their supplier and this is considered very important for the day by day improvement.

Of course, the needs of the market have pushed Selle San Marco to supply from the Far East for the private label production and in order to be closer to the Taiwanese B2B market. At Taiwan Selle San Marco produces customized products for OEM with double brand that are down-specifications of the products manufactured in Italy. For the company the domestic market still represents the 35% of the turnover and the Made in Italy brand is worth the investment and the Italian production but only for high quality products for passionate customers willing to pay for the excellence of the Italian artisan. In saddle production the hand-made part is still massive and requires high level of proficiency. The remaining 65% of sales are driven by countries into high level bicycle products such as United Kingdom and Japan. We can see counter-correspondence between production and sales, Italy and abroad: 30% of production is off-shored and 35% of sales are in Italy and vice versa.

Selle San Marco strategy has been differentiated from its competitors as the Marketing manager Mr Federico Gardin said during our interview: “we are small size company looking at all the consumers. The range of products is very wide and consists of Bio-Aktive for urban cyclists, Vintage range and Urban Performance besides the classic road and off-road offer. Our strategy is aimed to individuate new market fast growing niches and to supply them”.

For them Taiwan represents an interesting market and model at the same time, but dimension and strategy of Italian companies are often an obstacle to set up and grow business there. Selle San Marco is developing its supply chain and business relationships over there and in the Far East in order to accomplish its mission of providing high quality standard products, having a competitive products mix and investing on its core business which is saddle production and distribution. Marketing activities are oriented to all the competition levels, not only World and Pro-Tour. Selle San Marco produces other components but everything is linked to the saddle; for instance the tap for the curve is often the same colour of the saddle, therefore to market them together makes commercial sense. Moreover the company is trying to exploit the brand with an enlargement distributing technical cloths with San Marco brand manufactured in Rossano Veneto as well.

In Selle San Marco business case we can easily see a different approach to the industry in comparison to Selle Royal. They focus on high-end products and they work on margins rather than quantities. They have their centre of business in Italy, they work internationally but they are Italian and do not exploit possibilities of global sourcing. On the contrary they rely on suppliers from the same cluster. This strategy works due to the small dimensions of the company but they are trying to enlarge their market presence by working on new product of growing market niches such as bike polo.

### 3.8 Ciclo Promo Components

Ciclo Promo Components is an Italian family owned distribution company located in North-East of Italy and its core



business is selection, import and distribution of high-end components for cycling in after Market. In 2013 the firm sold products for 9.734.382 € and employed 13 people. The firm distributes in Italy famous brands of leading companies in the cycling sector by a network of sales man. The philosophy of company is the same of distributed brands and it reflects the traditional heritage based on innovation, value, adaptability, reliability of service and quality assurance. Tireless dedication in meeting the demands of customers, ceaseless work of research and selection of the best products ensure the fulfilment of the mission.

In their management opinion the shift of the production and assembling from Europe and United States to Far East, especially Taiwan, does not matter too much at distribution stage of the global value chain. This statement comes true only if it is based on solid basis of internationalization of the supply chain and on a competitive business model where the firm is aware of the changing and challenging market.

Planning and organization capabilities are required to source globally and to distribute locally – Italian market in the specific case. The time perspective has to be on long term regarding the upstream phase of sourcing; on the contrary the rapidity of response to the market is a key success factor to operate at the bottom of the supply chain. Especially on a market such as the high level bicycle one, where customers are well informed, the capacity of following trends and emerging needs play a fundamental role. Nowadays retailers do not stock anymore, therefore for a distributors is important to cut delivery time and to guarantee immediate availability in order to provide a specific high quality service. Sourcing stock from Taiwan to Europe requires 90/120 days, taking into account production and shipment time; retailers ask for 48/62 hours. This entails more costs and stock management. During our interview to Mr Loris Campagnolo we understood how Ciclo Promo Components has reached the leadership of the Italian market. First element is their capacity of working on time and at competitive costs: they distribute all the most important brands in AM that have

not a local branch and a specific distribution. “Ciclo Promo does not only source from Far East, but we actively operate over that region in order to be closer to frame and components producers and to anticipate the markets trends. As distributor, CicloPromo plays a key role for spreading the new technologies and upgrades; the added value is on the idea and its implementation and the market timing. It is a complex combination of lead time, technology, design, functionality and distribution”.

All the big Italian names of this industry are facing the new challenges thanks to their technologies and heritages, but the common factor to succeed is to have moved production off-shore. China is competitive for entry level production, however this segment is already moving to cheaper places as Vietnam; Taiwan is the new country that can claim a business leadership in this sector. In CicloPromo managers’ opinion Taiwan represents a perfect location not only for the costs. Innovation and financial support are made possible by legislation and more remunerative market able to remunerate investments throughout large size. European and US markets do not have these features anymore.

### **3.9 Cycle Lab Italy**

Cycle Lab Italia is the Italian branch of a French firm specialized in bicycle product distribution. It has been launched in 2013 and they sold 132.161€ of services. Cyclelab Italia, under the leadership of Luca Brischetto who we have interviewed, aims to provide the same revenue of the French experience in terms of services to

the Italian market with retailer brand: Culture Bicycle, Bike and Bouticycle Station. The approach and strategy are the same of the transalpine distribution model.



The Chairman of the group Cyclelab, Denis Briscadieu and the Director of the Italian branch, have had confirmation that the technical competence and the experience are not more sufficient to manage successfully this business.

Many industry leaders, also in Italy, have decided to focus on this project qualification and strengthening of specialized distribution network. Managers from Cannondale / GT, X-Bionic, Gore Bike Wear, Scott, Victoria, Look, they invited their own dealers willing to learn more about the concept of Cyclelab, absolutely innovative for the Italian market, which will help them make the difference in the market today and, even more, tomorrow. The Italian bicycle market has, fortunately, been little affected by the economic crisis that has affected all sectors of commerce. Moreover the concept of "sustainable mobility" is becoming, finally, a more and more important topic, even in Italy.

Mr Brischetto highlighted with us the main reason of the success of Cyclelab in France and its potentiality in Italy: "The distribution of the bike in Italy is managed by specialist retailers for 65%. Despite a growing market, the specialized distribution is struggling and is the first cause is disorganization. In this contest Cycle Lab Italy is experiencing growing interest from independent retailers. The first two stores Culture Bike Italy respectively opened in early February and early March 2013".

In our analysis of this industry we understand the importance of managing the whole value chain. Distribution can create competitive advantage. Italian firms have probably suffered the absence of an organized distribution model. This situation has created a lack of connection between firms and consumers which enabled the loss of momentum into Mtb market. Italian distribution has always been characterized by strong presence of independent operators and these specialised dealers have not innovated their way of doing business. They are still working as thirty years ago, focused on mechanics service and road bike, while innovative and structured stores are enjoying a growing market thanks to their marketing abilities and broader product offer supported by a high standard level of service.

## Chapter IV

### Findings and conclusions

#### 4.1 Introduction

In the fourth chapter we present findings of our research and we sum up common features of the bicycle industry we noticed in our interviews with managers and by analysing data.

Within the same geographical area we discovered differences in company size, governance, market and awareness of the dynamics of their Global Value Chains. These differences bring gaps in growth, innovation and vitality of these companies. In the North of Italy we identified two opposite approaches to Global Value Chain challenge. The first approach is more proactive and open to adjust strategy to new scenarios. The second one is defensive and according to it some firms lost market share in order to defend their position on one market niche. As a result these companies are less global and they operate on market niches where competition is getting tough due to marketing investments and innovation technology.

The bicycle industry undertook an epochal change during the 80's. The bike evolved and Mtb appeared. In the Italian perspective, the bicycle was the road bike and none of our leading firms understood what was happening. Campagnolo's case is very significant. Drivetrain was a high-end product itself, but it became required on cheaper bikes and especially mountain bikes. The Italian company did not enter into this segment considering it as a fad and Shimano took over the leadership. The same happened for other companies such as Selle San Marco and frame producer like Pinarello, De Rosa and Colnago. All these big names of cycling did not realize that the market was growing and new opportunities were coming up.

They focused on their used markets, talking only to passionate cyclists and not to big firms producing thousands of bikes. This choice did not push them out of the market but cut them off from the growing segment. At that point for small companies became very hard to face the competition of big operators even if they had a strong brand. The importance of financial possibilities was becoming a key factor for supporting the business. Only a few forward-looking firms, i.e Selle Royal, were able to assess the change and to act accordingly in order to improve their competitiveness at international scale.

The competitive advantage of the Italian bicycle industry was on artisan knowhow but there was a lack of industrialization process and those companies, that did not moved their attention from Italy to the world, are now producing only small quantities for passionate customers willing to pay a premium price for heritage and brand. We lost the middle market production. This is not about relocation of plants as it has been said, but on the contrary, probably because we were not able to source from abroad at more competitive conditions, not only in terms of price, we lost many jobs and we did not creat big companies with their headquarters in Italy and a global sourcing and distribution strategy.

## 4.2 Factors Reshaping the Bicycle Industry Architecture

For our research we started from the Global Value Chain framework in order to understand dynamics, peculiarities and the complexity of the bicycle industry. First of all, we have to highlight a lack of awareness in the industry concerning these issues that we find during our interviews. The approach has remained stuck to the 80's, firms and many managers look at the value created internally in the company and there is no attention to external situation. The industry does fit the Global Value Chain Model but Italian companies did not understand the changing and enlargement of the market. They kept the same strategy even if the quantity requested and the features have changed. We can say that nowadays we experience a buyer-driven market (Gereffi, 1999) dominated by OEMs with strong brands and by Component producers that impose their standards thanks to the ability of understanding market evolution and customer preferences in order to supply the right component with perfect timing. Bicycle is one of the few industries that went more modular from being integrated and a key element to succeed in the new pattern was the management of the modular production network (Sturgeon, 2002). For instance, Shimano became leader working close to Mtb inventors and frame producers. They supported new trends and they gained a first moving position on these segments that became dominant. Thanks to this strategy they managed to boost their product on the road-bike segment.

The aim of our research is to highlight reasons why the Global Value Chain of Bicycle Industry has moved and accordingly to which elements it did so. The second purpose is to describe the pattern of the industry architecture and the key elements that shape it.

We identify **two main industry architectures**. The first structure is featured by large production and wide product line in the Far East and headquarters worldwide located investing massively on innovation and marketing activities. The second one, on the contrary, it is typical of the Italian bicycle cluster in the Northeast and is characterized by local assembling, hand-made production, narrow range of product only for passionate cyclists and family owned companies.

We highlighted four key factors in this industry shaping which we are going to present and analyze below. Our research shows that the first architecture is leading, the other is competitive as well. Therefore at the end of this dissertation we pose this question: is the Italian approach to Global Value Chain in Bicycle Industry still competitive? Which are the perspectives? After the analysis of our findings we present some issues arisen from interviews and research regarding further evolution of this industry in Italy.

### **4.3 Corporate Culture and management**

We define Corporate Culture the set of ideas and values that determines how a company management look at the business and what they value as important in order to support growth and vitality of the firm. Our industry analysis has shown that the first element is the strategic attention to innovation not only on products, but also on market, competitors and clients. The corporate culture plays a key role in shaping the kind of business the management wants to run. The strategy is affected, first of all, by the corporate governance and the education level of managers. The size and financial possibilities can determine some decisions rather than others as well. However, the approach to the market really matters and affects performance. The industry shifted from integrated to modular and many firms did not understand this change and its consequences. Jacobides and Kudina highlight the importance of the “fit” between the industry and the company organization (2002). Italian firms did not transform themselves and returns from investments started decreasing as soon as the market moved forward. Furthermore increasing costs for sponsorships and R&D required bigger quantities to be spread on.

In this research I found out that all the big OEMs have similar Global Value Chain. They have design and engineering phases in their home countries, limited local production and large supplier or owned plants in the Far East, even for high-end products. In Italy small businesses resist with local outlook but they are struggling. Taiwan is the best place for assembling; it is

financially competitive, reliable for quality and lead time for big commissions. Components could be produced almost everywhere, but low-value added activities have to be cheap. Anyway the key point we are trying to make does not concern only cost of production. It is more general and involves the mission of the company. Nowadays costs are increasing and therefore part of production is moving again from Taiwan. This is really important to understand the role of technology and R&D. Assembling and easy production can be moved quickly and everywhere, the important element for a company is the quality of the strategy at the headquarters. This involves the design and engineering of the product, the lead time and accountability of the production in terms of time and quality, the choice of the production location and the key markets for the brand.

Looking at the distribution side, we can say that the American model is the most successful: Concept-Stores of big brands and massive specialised retailers are the most profitable and they support brand growth and awareness. This fact is due to heavy investments in marketing and especially in range of product very wide broad - i.e. Trek, Specialized.

Industrials were not able to understand new customer needs and moreover the market was changing while the strategy was remaining the same. Italians are now no longer the only ones to do very high range of customized bicycle products: Trek is considered by operators the best bike, better than Specialized, and it produces one million bikes per year. Trek is focusing on brand made in Wisconsin. Likewise, Cannondale continues to represent the American excellence for aluminium produced in the USA. Italians are still the leaders on tube to tube technology both for the steel and carbon, but the problem of high costs and the impossibility of massive productions are key issues: paradoxically large orders are a problem. Tube to tube technology is a technique of manually welding tubes in order to produce the frame rather than printing on mould. To give an example, a De Rosa titanium bike has a lead time of 11 months. The Germans had never had strong cycling tradition, but, thanks to massive investments, with the help of financial operators and their excellence in mechanical engineering, they have become the first European manufacturer of bicycle frames. It is very interesting to notice how their different approach created a new competitive industry, while on the contrary we lost middle production due to the lack of scale economies. These two countries prove that competitive advantage is not stable if there is not innovation and awareness of business. For example, Campagnolo has always been in the bicycle industry at

global level, but with Italian mentality. They have had important market share in the United States and Japan since the 60's but always thinking as an Italian company. The location in Vicenza was important in the past, but today, it is not anymore in order to support the business. Campagnolo does not collaborate with universities or frame manufacturers from its region. The Italian brand is exploited only in marketing and heritage and not for the cluster. This involves a delay in understanding market trends: for example, Campagnolo has not launched yet components and wheels for disc-brake that is the new standard required by consumers. The same happens in the off-road world with Fulcrum Wheels brand: the market has moved from 26" to 29" and now it is moving again towards the 27.5" standard.

In the Bicycle industry, since the 80's, Shimano impose its standards. Now it is clear that it is necessary to locate the production in the Far East both for logistics reasons - for example 45 days from Taiwan to Italy- and for costs and technologies. Nevertheless, it is worth keeping the headquarters in Italy because of the culture regarding the bicycle and the engineering technology. The first to understand this was Pinarello that went to produce in Far East 15 years ago. It also managed to make the leap from being a local manufacturer to play in global niche thanks to a revolutionary product lines such as Dogma. Anyway, we must highlight that at that time they already had won 10 Tour de France. This means that they were able to evolve their strategy from a successful value proposition. The other Italian bicycle company that has managed to become a global company is Bianchi thanks to an international management: the Chief Executive Officer is American and the owner is half Italian half Swedish. Production has been moved to Taiwan while in Milan remains only the very high range assembling.

#### **4.4 Off-road bike and New Market segment development**

The invention of off-road bike by Gary Fisher was a key event for this industry. He was a former professional cyclist who developed a new prototype for riding down from hills in

California. Shimano was the only company that understood the potentiality of the product and it started producing specific components. Furthermore, at the beginning of the 80's drivetrain was still a high-end product itself only for racing bikes, but at that time also sport bikes started been equipped with it. These two facts opened new markets and enlarged the existing one. Italian companies reacted differently with tremendous results on their performance. For instance, Selle Royal started augmenting production and supplying saddles for new frame style, on the contrary, Campagnolo thought Mtb was just a fad and when the sales of mountain bikes boosted Shimano road components it was too late to react.

This fact is the key in order to understand Campagnolo evolution from market leader position to high-end niche manufacturer. When quantities required by the market increased, it was not ready and able to increase its production due to the artisanal mentality of the company. Shimano and its Far East located plants were able to supply massive quantities at Mtb demand and bundling the road components they succeeded in eroding Campagnolo market shares.

Those years were important not only for components manufactures but also for OEMs and frame producers. Italian companies did not follow Mtb innovation and they did not enter into this segment that now is the most important for product innovation and market size – see Sales Figures in Italy in the third chapter. The absence from the new segment caused a delay that became impossible to recover and furthermore it drove to the loss of competitive advantage coming from engineering knowhow and first mover advantage. Off-road bike is not only the most sold kind of bike, but it is also the more innovative segment of the market. Italian companies lost their strength because they lost the innovation leadership. Road bikes require less investments in R&D and the competition is more on price.

#### **4.5 Internationalization Process and Production off-shoring**

Nowadays the bicycle industry is international and globalized. We do not look at relocation of production as a negative thing. Italy is no longer a country of pure manufacturing due to poor industrial policy and management vision. Italy did not invest on industrial upgrade at the right time. The Italian frame builders were and still are dimensionally too small in order to be global players. They are not big enough and they have not got sufficient growth perspective in order to move the production to Taiwan or China.

Taiwanese production was competitive in terms of quality before 2000. In terms of production capacity, they have always been technologically ahead of Italians. They have been able to ensure quality production of large quantities that are not possible in Italy. Leading brands would have to keep their head quarters in home-countries, investing resources in R&D, prototyping and testing, managing large amounts of outsourced manufacturing in the Far East. Secondly, marketing and advertising investments were decisive factors. Instead of looking at the evolving market and new entrants and their evolution and growth, Italians have always thought they were untouchable. They have not been able to understand that for a global market a global product was needed: designed in Italy, tested on the pavè of the Belgian Ardennes Classics series in Central Europe and produced in Taiwan. The Made in Italy does not add great value anymore.

A very significant example is Selle Royal and its acquisitions and large production strategy. It is the only company among the ones we have interviewed that produces for private labelling. This fact enables SR to increase their production, to reduce cost per unit, to create economies of scale and as a consequence they have the financial strength to set firms abroad, to buy plants and brands, to sponsor Pro Tour team with their racing brand. Saddle production does not differ for road and off road products but there is big difference between commodity product and high-end one. In assembling there is more technology in comparison to other components or frames and for high-end products there is still an high percentage of manual labour. Anyway there are not only technical reasons why saddle production is still Italian. In the bicycle industry we lost middle market production because

of a lack of forward-looking strategy and production capacity that came from a poor industrial culture and management education.

#### **4.6 Distribution Management**

Down-stream stages of the Value Chain present different issues, but they are linked by the need of more specialization. Distributors and retailers have to be at their best in order to match customer expectations. Mechanical staff cannot be at the front of the store anymore. Sales assistants have to provide service and experience to clients, not only technical support. More efficient store organization is required and small family-owned stores are struggling due to this fact. Evolution in consumer preferences is moving sales from them to well-organized bigger retailers. Digital revolution is not seen as a threat even if this is a sensitive topic for independent retailers. In Italy the concept of bike is far from the North European one. The bicycle is seen as sport and leisure equipment rather than a means of transport. Italy has the highest ratio car/inhabitants in Europe and the lowest for bicycle, even if the situation is changing due to a new awareness about environment and health.

Italian distribution channel should change its approach. The Italian market is not different from many others: the customer has the same nature. In many industries we were used to be the leaders, but other operators have been able to understand consumer needs and to gain market share. Examples are furniture, fashion and clothing. The technical and artisan knowhow and experience are no longer enough, something more is required because the competition got tougher and hand-crafted products are only a small part of the market.

In the new distribution system the independent retailer is the weak point of the chain. In the sporting goods market, which the bicycle is part of, many stores have closed. Nowadays sales experience and service are more important than the product. The challenge is to raise the quality of service and management. The idea is to involve all of the operators: producers and retailers: a specialized distribution of higher quality is a benefit to all.

The pricing policy must be transparent in a way that ensures a fair return for the entire channel. The added value is not only on the product but also on the distribution management.

The Italian heritage and brand are not enough to stay on markets anymore. They can play a key role to succeed but they have to be within a richer value proposition. Being global is necessary, it is not a choice. Numerous firms are looking for partners, investors, funds of private equity. US firms have implemented massive investments years ago and they are paying off. For Instance we can look at cases like Dorel for Cannondale, Merida for Specialized. On the contrary we have Wilier that lost its Pro-Tour team because it was too expensive and there are plenty of small producers losing market shares and profitability. The sector is healthy but there is a challenge: decisions to make and actions to take.

#### **4.7 Italian industry perspective**

As we stated before, there are two main architectures within this industry but one is stronger than the other. Selle Royal, Bianchi, Pinarello play according to a Global Value Chain perspective, and they either outsourced or off-shored the production in Far East.

Nowadays Italian companies are famous for being bicycle boutiques and to dominate high-end market niche. Our dissertation has shown that they have been pushed to adopt that strategy rather than they have chosen to do it. Therefore an important question is raised. Is this strategy sustainable? We saw that many firms are competing and succeeding with only high-end products, but key elements to do so are quality of service and brand awareness. Small firms do not have resources to provide high standard service and assistance. Many Italian frame producers have wonderful products but they cannot support them with timing in delivery, after sale assistance and experience. In the global and competitive context this is a problem to be faced.

We can identify some issues by analyzing these two elements of strategy. First, a good service for bicycle product involves all the aspects of the distribution and corporate organization. The lead time for Italian firms has always been a problem: eleven months is way too much to wait for even if the product is considered the best for quality and heritage—i.e. De Rosa King 3 model in titanium. Then we have after sale assistance. How can this be effective if there is no control over the dealers? Spare parts are difficult to supply and costs are higher than average. Only structured company that market their product all over the world and that manage actively their distribution throughout reliable wholesalers or local branches can have the dimension and capability for ensuring efficiency of the final stage of the value chain.

Secondly, there is a dichotomy between the strategy and elements needed to implement it. In order to compete as a top brand massive financial resources are requested for sponsorship. How can small firms selling twenty or thirty thousand bikes per year have money to sponsor a Pro Tour Team? As an example, we can cite Wilier Triestina who lost Lampre Liquigas Pro Tour Team even though their sales are increasing. How can Colnago compete with Trek if the American company produces one million bikes more than the Italian one? Another example on components segment can be Campagnolo and Shimano or Sram. Scale of economies and R&D costs have different impact on 150 million dollars or on a billion dollars turnover.

In other words, the market is fully globalized and the artisanal production is losing competitiveness at every stage of the Value Chain. Customer preferences have changed and nowadays financial resources and operational effectiveness are key factors in order to compete. Heritage and 'Made in Italy' brand of Italian firms are no longer enough to sell high-end bikes but sponsorship and service are fundamental. Italy lost middle market production as a country. This is not due to relocation of production as proven by German experience. This fact makes the Italian situation even worse, because we had the possibility to keep this segment of the industry here but we let it go for the lack of will to face growing market and its challenges.

Nowadays the industry architecture is stable and Global Value Chain is moving only regarding assembling stage. The market has reached maturity and all major manufacturers are focusing on their key skills, trying to increase their own strengths and to defend their

competitive advantage. Main innovations have been brought only by improved manufacturing processes or technical refinements of established products. For instance, we have introduction of new materials and designs for enhancing performances, especially in Mtb segment. This flatness on the product offer pushed competition on price, distribution and marketing activities. What the industry is eagerly awaiting is a new disruptive product, in a broad sense, to revitalize the market and to open it up. Only new industry architecture could change dynamics and power relations well established over last decades.

Italian companies have to rethink their value proposition and try to grow in terms of quantities sold relying on their brand and expertise. This would be possible only abandoning old strategy of integration, on the contrary they should source assembling activities from arm's length plants in order to minimize the financial investments and focusing more on distribution and market requirements. As we stated in this dissertation the bicycle industry is global. This means that only global companies can succeed. This does not mean that small firms cannot operate, but they are condemned to play only on small niches threatened by big operators with aggressive price policy.

At this stage of evolution of the market and its Global Value Chain, the best strategy would be to keep focusing on high-end product, but to get rid of assembling and to exploit up and down-stream operators of the Value Chain Network. Especially big brands producing massive quantities would be the best partners in order to upgrade managerial and technical competencies. Italian firms have to increase their capacity of on time delivery, marketing effectiveness and production efficiency. They should have learnt the importance of playing on global scale and being aware of market and customer preference evolutions. Only keeping these companies competitive on global market throughout a more global strategy focused on marketing and R&D investments Italian bicycle industry will be able to keep its position on high-end product niche. In order to keep the niche they have to extend their market and increase financial resources available by increasing quantities and focusing on high value added activities. These findings and statements are supported by the evidence of the business cases we have analyzed, i.e. Selle Royal and Bianchi. As we saw it does not matter the stage of Value Chain the company operates in or the product. Corporate culture, ability to anticipate and understand market needs and global strategy are key elements of success in modern Bicycle Industry. Mergers and Acquisition strategy, different countries of

operations and production, global industrial groups gathering few firms and brands that can provide wide range of products are signs of a global and forward-looking strategy that marks successful companies in the modern bicycle industry.

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