Aalto University
School of Economics

Global Value Chain Analysis: Case of Metalli Inc. in Machinery Industry

International Business

Master's thesis

Eetu Koponen

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Department of Management and International Business
Aalto University
School of Economics

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Eetu Koponen
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AALTO SCHOOL OF ECONOMICS
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ABSTRACT
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GLOBAL VALUE CHAIN ANALYSIS: CASE OF METALLI INC. IN MACHINERY INDUSTRY

Objectives:
This study examines global value chains, and more precisely the creation and distribution of value in machinery industry in the level of an individual product. While the global economy and different webs and networks of companies are becoming more and more complex, this study is aiming at providing a workable example and model of a global value chain and defining both organizational as well as geographical distribution of value within that chain. Furthermore, the study is trying to position the case company Metalli Inc. in the larger economic environment also in terms of global value chain governance, quality standards, capital repatriation, offshoring and upgrading and reflect the strategic position of the company against the relevant academic literature available on the topic. The study is part of a larger research initiative of ETLA (the Research Institute of Finnish Economy).

Methodology:
Thorough qualitative research methods are used for the purposes of this research, but also some quantitative data is being utilized. Extensive in-depth personal interviews are used according to the framework provided by ETLA for obtaining qualitative data, and calculations are based on quantitative data gained from various public databases and company records and reports. The methodology aims at gathering data for accurate comparisons between different product "sizes", locations of production as well as regions of sales.

Findings:
The findings of this individual research project provide a great example of value distribution within a global value chain in the machinery industry, and provide a presentation of different roles and relationships within the chain. Findings also introduce different scenarios in terms of the product, production and sales and show the geographical as well as organizational distribution of value for each scenario. Furthermore, the results of this research are used later in a larger research ensemble organized by ETLA, in which these transparent and comparable results will be compared and analyzed together with other similar cases from other industries and fields of business.

Keywords:
Global value chain, value chain governance, value creation, quality standards, offshoring, upgrading, value distribution

AALTO YLIOPISTON KAUPPAKORKEAKOULU
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GLOBAALI ARVOKETJU-ANALYYSI: CASE METALLI OY KONEPAJATEOLLISUUDESSA

Tavoitteet:
Tämä tutkimus tarkastelee globaaleja arvoketjuja ja tarkemmin ottaen sekä arvon luontia että jakautumista konepajateollisuudessa yksittäisen tuotteen tasolla. Samalla kun globaali maailmantalous ja siihen sisältyvät erilaiset verkostot ja vaikutussuhteet yritysten ja organisaatioiden välillä muuttuvat jatkuvasti yhä monimutkaisemmiksi, tämä tutkimus pyrkii tarjoamaan toimivan esimerkin ja mallin globaalista arvoketjusta, ja samalla määrittelemään ko. ketjun arvon muodostumisen ja jakaantumisen sekä maantieteellisesti että eri organisaatioiden välillä. Tämän lisäksi tutkimus pyrkii sijoittamaan ja määrittelemään case yritys Metalli Oy:n aseman laajemmassa taloudellisessa ympäristössä ottaen huomioon arvoketjujen hallinnan ja johtamisen, vallitsevat laatustandardit, voittojen kotiutuksen, sekä tuotannon siirtämisen ja laajentamisen. Case yrityksen strategista asemaa peilataan myös tarjolla olevaan akateemiseen kirjallisuuteen edellä mainituiden konseptien ja aiheiden puitteissa.
Tutkimus on osa ETLA:n (Elinkeinoelämän Tutkimuslaitos) laajempaa projektia.

Tutkimusmenetelmät:
Tämän tutkimuksen toteutukseen käytetään lähinnä laadullisia tutkimusmenetelmiä, mutta myös kvantitatiivista dataa. Laajat ja perusteelliset henkilökohtaiset haastattelut ETLA:n tarjoaman viitekehyksen pohjalta mahdollistavat tarvittavan laadullisen tiedon hankkimisen, ja tutkimuksessa käytetyt laskelmat perustuvat kvantitatiiviseen tietoon joka on hankittu erinäisistä tietokannoista sekä yritysten raporteista ja arkistoista. Kaikki tutkimusmenetelmät tähtäävät tarkan vertailun niin eri tuotekokojen, valmistuspaikkojen kuin myyntialueidenkin välillä mahdollistavan tiedon hankintaan.

Tulokset:
Tutkimuksen tulokset antavat loistavan esimerkin arvon jakaantumisesta konepajateollisuuden globaalissa arvoketjussa, ja osoittavat hyvin eri roolit ja vaikutussuhteet ketjun sisällä. Myös tulokset eri skenaarioista tuotteen, tuotannon ja myynnin osalta niin maantieteellisen kuin organisaatioiden välisen arvon jakaantumisen osalta esitellään selkeästi. Tutkimustuloksia käytetään myöhemmin myös laajemmassa ETLA:n tutkimuksessa, jossa näitä vertailukelpoisia ja läpinäkyviä tuloksia verrataan ja analysoidaan yhdessä muiden vastaavien, muita teollisuudenaloja ja haaroja edustavien tulosten kanssa.

Avainsanat:
Globaali arvoketju, arvoketjun johtaminen, arvon luominen, laatustandardit, tuotannon siirtäminen, tuotannon laajentaminen, arvon jakaantuminen

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1. INTRODUCTION

1.1 Background

Due to the increased globalization and its effects throughout different organizations and industries, global value chains have become more important for understanding global economy from viewpoints of both business and academia. As barriers for international trade and transactions have fallen, communication technologies have advanced and transportation costs have declined, companies around the world are moving towards more task-oriented approach rather than traditional product-oriented approach. New Intra-sectorial linkages are constantly being formed between companies and other actors, reconfiguring and reorganizing the geographical and organizational construction of global production. Understanding these specialized and complex linkages i.e. global value chains, allow enterprises to gain a better understanding of their direct and indirect costs of production, locate their operations more efficiently, outsource various operations and focus on their core-competencies (Bair, Gibbon & Ponte, 2008).

The concept of Value Chain was first introduced in management literature already in the 1980's by Michael Porter (1985), who explained the basic steps and process of value creation in his book "Competitive Advantage: Creating and Sustaining Superior Performance". As mentioned, the sequence of transactions and transformations reaching from raw materials to the final product and customer has become very global in nature for most international companies. Value chain is a relatively simplified way of describing these productions systems, in which interdependence and interpenetration have achieved levels never experienced before. Ironically, even though maximization of value remains as the major objective for most enterprises, many of them are unaware of where in the chain the value is actually created (Dembinski, 2009).

While inter-firm relations extend exponentially and become hard to grasp, spatial dimensions and role of local governments and authorities in different parts of the world remain as an interesting factor influencing the global value chains. Value creation and

margins vary drastically between different regions, industries and value chains and companies (Dembinski, 2009). While various regional clusters are being formed and both large enterprises as well as SMEs play different roles in countless interrelated value chains, much remains to be studied in the level of individual products. Product level research can not only reveal wider consistencies within a certain industry, but can also explain how a product/service is or should be produced in terms of its value chain in order to maximize the value creation.

1.2. Research gap and problem

As global value chains (GVC) are becoming more complex, more outsourcing and offshoring take place and interrelationships are constantly evolving, it is difficult to locate where the value of a product is created, and furthermore how the value creation is divided between the different parties and regions involved in the value chain. What most current research and literature in the field lacks is the mapping of value creation process instead of plain analysis of the governance and management of the value created.

While there are some case studies made on the geographical distribution of value creation such as Linden et.al. (2009), most of them are quite heavily centered to US or other large economies and are not paying enough attention to other steps of the value chain besides production and sales. Furthermore, studies focusing on a single product rather than a whole industry or line of business are extremely rare at this point in time.

This research is aiming at providing information of a global value chain of an individual product of a relatively small company originating from a small and open economy of Finland. This project was initiated and designed by ETLA, the Research Institute of Finnish Economy, and is part of a bigger project analyzing multiple Finnish companies, their value chains and division of value creation. The focus of interest will be in revealing whether or not Finnish economy and the operations of the case company in Finland play a significant role in value creation, and are the profits and value created in Finland or abroad geographically flowing from their origin to other parts of the chain.

1.3 Research questions and objectives

Due to the objectives and requirements of the bigger value chain project this thesis is part of, the set of research questions is predetermined by ETLA and follows their guidelines. There are a few similar preceding projects done with largely similar research objectives, and perhaps the best one of them is the case study on Nokia N95 (Ali-Yrkkö, 2010).

In principle, this thesis is trying to answer the question where is value created within a global value chain? However, in order to fully appreciate the complexity and variability of the value chain, a more comprehensive set of questions is provided. Besides determining the position of the case company in its value chains, another objective for this research is to look at the development and progress of those chains. Furthermore, it is also within the scope of this research to determine differences between Finland and other geographical regions, as well as the case company and its subsidiaries in terms of the value added and created.

The set of research questions (1-3 provided by ETLA) is as follows:

1. What are the value networks and chains case company Metalli Inc. belongs to through the product under investigation?
2. How and by whom is the total value of the investigated product formed at different stages of the value chain, and what is the share of Metalli Inc.?
3. How is the value added geographically distributed between Finland and other countries?
4. How does the organizational and geographical value distribution differ for Metalli Inc. between their original production facilities in Finland and their offshored facilities in China?
5. How the value is finally distributed, considering the capital gains and surplus that are transferred back to the headquarters of Metalli Inc. from its subsidiaries?

By answering these questions, it will be possible to derive outcomes and illustrations on the different value chains case company is involved in, as well as on where and by whom the value is created in those particular value chains. The geographical and organizational distribution of value added will provide the case company valuable information to develop their operations in the future. In addition to the thorough analysis of value chain activities for the initial purposes of ETLA, one additional and differentiating objective of this thesis is to evaluate how extensively capital gains and profits made by subsidiaries are returned and transferred to the parent company and what are the possible causes of these patterns.

1.4 Definitions

There are some basic terms repeatedly used in this study. In order to fully enjoy and make use of this research and its results, it is important to be familiar with the terms and concepts defined below:

Value Chain: According to Porter (1985), Value chain is a system of interdependent activities that a company performs to design, produce, market, deliver and supports its products. Simply put, Value chain is a visualization that resembles production process of a product or a service all the way from raw materials through manufacturing, assembly, marketing & sales, retailers and distributors to the end customer. Additionally, value chain activities are also further divided into *primary* and *support* activities. While *primary* activities are involved in the physical creation of the product, *support* activities support the primary ones by providing various firm wide functions.

Global Value Chain (GVC): According to Bair et.al. (2008), GVC is "a set of intra-sectorial linkages between firms and other actors through which this geographical and organizational reconfiguration of global production is taking place". It could be stated that GVC is a modern version of Porter's original value chain, as Bair et.al. (2008) continue by describing the role of GVCs as "a critical infrastructure of economic globalization and the integrative counterpart to the current processes of geographical dispersion, economic specialization and differentiation and risk externalization".

Global Value Chain Governance: As one of the best of many definitions for GVC governance, Bair et.al. (2008) describe it as the concrete management practices and forms of organization through which the division of labor between the lead firms (buyers) and other economic agents (suppliers and sub-suppliers) is established and managed, leading to conceptualization, production and distribution of goods and services in global markets and industries. Another, relatively similar and straightforward definition is provided by Ponte & Gibbon (2005), who describe GVC governance as the process of organizing activities with the foremost purpose of building up a well-functioning division of labor along the chain, which is turn results in specific allocations of resources and distributions of gains.

Lead Firm: In this research lead firm refers to a company or a group of companies in a particular functional position that is/are able to define who does what in the value chain and also outline price levels, common standards, delivery times and other specifications for the whole chain (Ponte & Gibbon, 2005).

Upgrading: The most comprehensive definition of upgrading is provided by Humphrey & Schmitz (2000), who introduce three different kinds of upgrading within value chains, namely, process, product and functional upgrading. While process upgrading means more efficiency and re-organization in terms of the production system and transforming inputs into outputs, product upgrading refers to more sophisticated product lines and increased unit values. Finally, functional upgrading means acquiring new functions along the value chain, such as marketing or design.

Supply Chain: Simply put, Supply chain is a group of firms that passes materials forward. More specifically, it's a group of independent companies that are involved manufacturing a product and placing it in the hands of an end user, i.e. raw material and component producers, assemblers, wholesalers, retail merchants and transportation companies (La Londe & Masters, 1994).

Value Added: The total sum of value added in value chains equals the final price of the product. In other words, producers in the value chain purchase inputs, next add value

and lastly sell outputs forward (Linden et.al. 2009). In modern global value chains different activities and their value added are normally distributed between different companies in different regions and national economies (Ali-Yrkkö, 2010).

Value Creation: "Value creation depends on the relative amount of value that is subjectively realized by a target user (or buyer) who is in the focus of value creation" (Lepak et al. 2007). Naturally, the monetary value exchanged must exceed the producer's costs of creating the value in question in order for any value to be created.

Value Capture: The final distribution of value is not the same as initial value added by different parties in the value chain. Value capture, or gross profit, is not the full value added but the value that remains in the company (excluding direct labor) due to its role in the value chain, and can be used to practically command the company, pay dividends to shareholders, invest in growth and R&D, pay overheads and costs of capital depreciation (Linden et al. 2009).

Offshoring: Is the term referring to a phenomenon in which companies take advantage of international cost differences by fragmenting their production process across national borders. In other words, companies move some functions of their operations to foreign countries in order to gain cost savings (Harms et al. 2009)

1.5 Limitations

Before building the theoretical background for this study and looking at the results of the empirical research itself, it is worth considering some of the limitations that are explicit for this particular research.

Firstly, as this thesis project is part of a larger totality of studies conducted by ETLA, in order to ensure the comparability of the results the fixed guidelines and frameworks are also applied in this study. While this naturally creates the benefits of reliability of criteria and comparability of all the different aspects in the research, on the other hand it restricts the researcher from conducting investigation that could be relevant for achieving optimal results, but is simply outside the scope of the ETLA project.

Secondly, related to the fact that the project is pre-assigned for the researcher, there is a possibility for biased selection of companies and products under investigation in the project. Even though this seems highly unlikely, it could be possible to favor certain industries or specific products in order to gain desired results.

Furthermore, this thesis research project certainly has a certain emphasis on Finland before any other countries. The case company is Finnish, and even though the value chain contains parties from all over the globe, the whole process is considered mainly from the point of view of the Finnish economy. While this is natural and useful for the purposes of ETLA and this particular research, in order to gain a more comprehensive and international view on value chains the same issues should be considered also from perspectives of other nations. In other words, the results of this research, even though very suitable for the Finnish economy, may not be applicable for different countries with different economic and industrial settings.

Finally, as the research focuses on one single company from a relatively small industry with very few products, it is not very suitable by itself for drawing wider conclusions related to the industry or economy as a whole. Luckily, one of the purposes of the bigger value chain project of ETLA is to make comparisons and analysis between different industries and areas of business in relation to their value chains and value creation, and with few other examples from the same industry this individual study will serve the purposes of that wider project with flying colors.

Besides these overall limitations, challenges and obstacles related to research methodology will be discussed in more detail in the Methodology chapter.

1.6 Metalli Inc.

The case company of this research has requested to remain anonymous due to reasons related to sensitivity and significance of information shared and published through this report. That is why the case company is called Metalli Inc. and also some of the most important suppliers are given various aliases. A sufficient and suitable level of info

related to Metalli Inc. and the industry in focus are provided in later chapters in order to serve the readers of this paper well and simultaneously respect the wishes and needs of both Metalli Inc. and ETLA.

After this introductory chapter, a comprehensive literature review is provided in order to build a solid understanding of the subject area and provide a theoretical base for the forthcoming research and analysis through relevant academic literature. The viewpoint of Metalli Inc. is shared and discussed throughout the literature review in order to make the following analysis of the empirical findings more relevant an interesting also for the readers.

2. LITERATURE REVIEW

Purpose of this literature review is to provide a theoretical basis for the following empirical research and the analysis of the results of that research. Various sources in relevant academic literature are used to build an understanding of the topic and to justify the importance of the research in hand. Furthermore, through the literature review the significance and purpose of key concepts and the research problem of this thesis are thoroughly explained and justified. The position and status of Metalli Inc. in machinery industry and its value chain is later described through these key theories and concepts, and various cited authors assist in fully grasping the logic behind GVC in the level of individual products. The case of Metalli Inc. and its product serves as a real life example of the theoretical determination of value distribution throughout a value chain, all the way from initial suppliers to repatriation of profits.

2.1 Local Companies in Global Economy

A good starting point for the analysis of GVCs is to take a look at how the modern world economy functions and how local companies and other significant players function and interact in it. According to a distinct and practical framework provided by Messner (2004), the modern global economy is formed into a triangle, where local clusters, global lead firms and global standard setting policy networks represent the three interacting tips of the triangle. The triangle concept is highlighting the reality in which both local and global co-operation and interactions is needed in order to be succesful in global economy.

As the Triangle framework indicates, GVCs are nowadays often formed between global lead firms and local clusters of suppliers, and the governance of these chains can take many forms ranging from strict hierarchy to loose market relations. The efficiency of different regions depends not only on intra-cluster relationships, but first and foremost on transnational interactions and networks. Furthermore, global technical and quality standards are emerging both from the initatives of global lead firms reducing transaction costs and increasing stability, as well from local local clusters aiming at getting access

to and securing their position in the global markets and chains. The interplay between private and public actors from different regions and societies and their complex interactions shape the modern economy instead of any individual company, government or other entity (Messner, 2004).

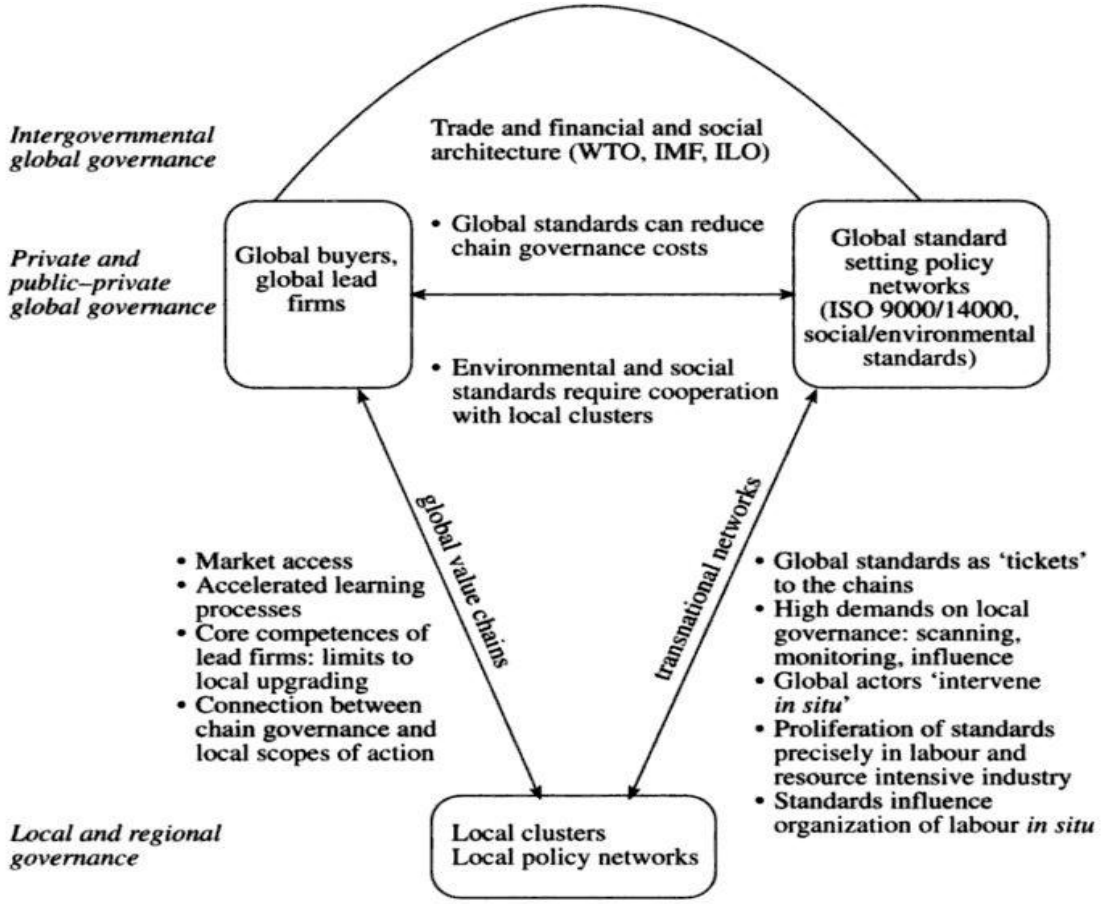


Figure 1: World Economic Triangle (Source: Messner 2004, p.23)

Different GVC governance types and the effects of quality and other standards will be further analyzed in the following chapters. The Triangle framework provided by Messner (2004) in figure 1 offers a great overview of the topic in hand highlights the most important actors and their interrelationships with one another. It can be stated that independent technical and organizational competencies are still valid for all local players also in the global economy, but in addition to these traditional guarantees of competitiveness they now also need to handle global structures and influences.

Depending on industry, governance type of a particular GVC and the competencies and desires of lead firms in that chain, suppliers and local clusters have various opportunities for upgrading and developing their operations in terms of new functions and production processes. Overall, roles of the different companies in GVC are quite straightforward, but there are many local and global factors, such as quality and technological standards, non-governmental and governmental organizations and other actors affecting the flow of business and processes within the GVCs.

2.2 Global Value Chain Governance

2.2.1 GVC Governance types

As previously discussed, the GVC governance refers to content and management of production, quality and distribution decisions across the whole value chain as well as the strategies behind these decisions, their implementation and monitoring (Bair et.al. 2008). There is a wide spectrum of research done on how GVCs are being governed and how they change over time. Naturally, the shifts in governance structures in companies and conglomerates of companies have created a totally new variety of network forms that demand different types of governing. How different actors in the value chain affect others and how their participation is determined and distributed is important also for Metalli Inc. as it pursues to determine and strengthen its status in this particular GVC in machinery industry.

Gereffi et al. (2005) offer a relatively comprehensive framework for different kinds of governance types in GVCs and also a theoretical reasoning behind each type of chain. In this research it is argued that there are three major variables affecting the GVC governance type, namely (1) Complexity of inter-firm transactions, (2) ability to codify transactions and (3) capabilities of the suppliers in relation to requirements of the buyers. Based on these variables, there are five different types of GVC governance on the spectrum from low levels of explicit coordination and power asymmetry between buyers and suppliers to high levels explicit coordination and power asymmetry between buyers and suppliers.

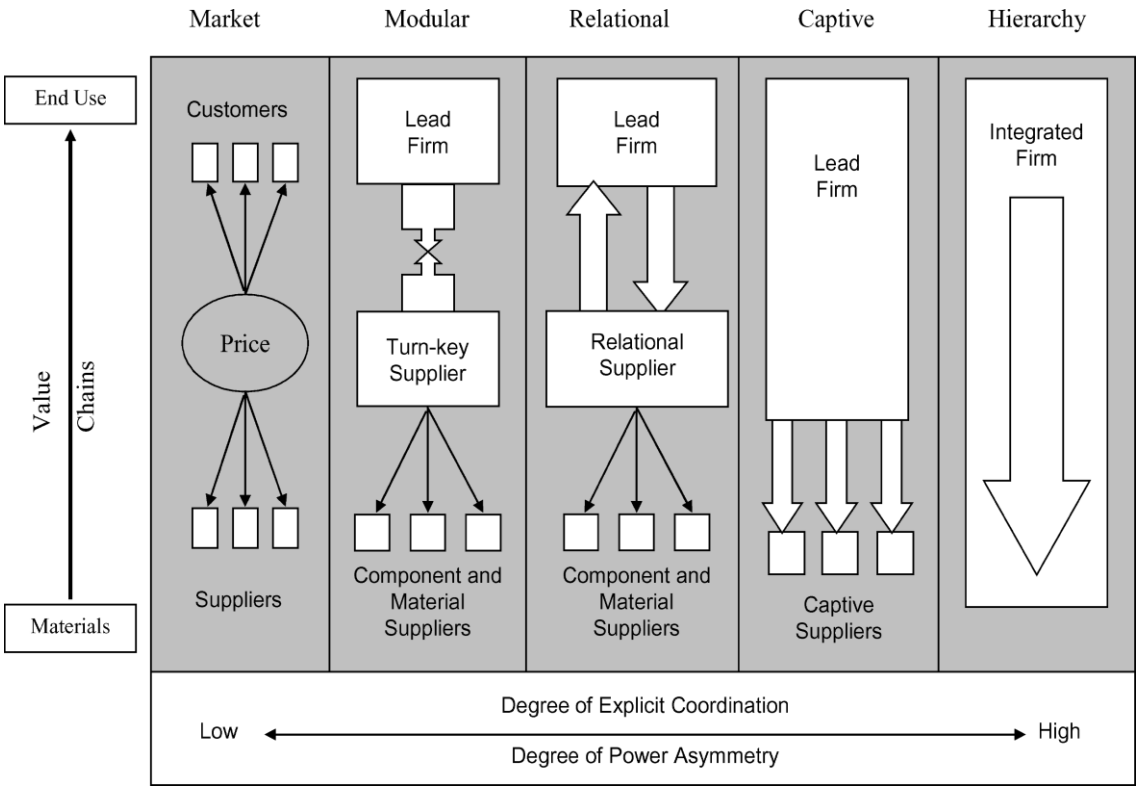


Figure 2: GVC Governance types (Source: Gereffi et.al. 2005, p.89)

These five types of GVC governance identified in the research are market, modular, relational, captive and hierarchy. According to the three variables introduced in the previous page, GVCs can be categorized to one of these five general types. Overall, the questions of asset specificity and transaction costs are well answered through these particular variables (Gereffi et.al. 2005).

While in market and modular governance models there less complexity in transactions and suppliers possess most of the requirements of the buyers, it is also relatively easy to switch both suppliers and customers compared to other types of governance structures. In the other end of the spectrum, in both captive and hierarchy GVC structures power is used directly by lead firms (buyers) on their suppliers and other subordinates, therefore signifying salient administrative control over the whole chain. In between and in the middle of the spectrum the relational GVC governance refers most to symmetric power balance, in which both buyers and suppliers contribute key competencies and

coordination is mainly achieved through close dialogue between different parties in the chain (Gereffi et.al. 2005).

All in all, Gereffi et al. (2005) offer a good starting point for evaluating the status and form of value chains and their governance structures. It should also be noted that certain governance structures introduced in this particular research are neither static nor associated with particular industries. Quite on the contrary, GVCs in different industries are constantly evolving and it is rather the three variables previously presented and initially based on technological characteristics on products and processes as well as effectiveness of industry actors and social processes, that further determine GVC governance structure in hand. For the purposes of Metalli Inc. the position of the company in terms of power and coordination compared to other members in their value chain is important, as it sets the basis for negotiations, enlargements and basically any type of inter-firm activity involving Metalli Inc. and other companies.

2.2.2 Global Standards, Quality and GVC Governance

Before investigating the linkage between quality and GVC governance, it is useful to briefly describe the ascending phenomena of quality and other standards in global business environment. Nadvi & Wältring (2004) claim that despite liberalization in business, global economy continues to be governed by rules, standards and regulations that come in numerous different forms and types. In fact, there is such a diverse group of different standards business professionals have to deal with, that acquiring a proper understanding of them requires dedication to the cause and interestingly enough can offer companies a competitive advantage in the intense global markets.

According to Nadvi & Wältring (2004) different global standards are meant to address various issues ranging from labor conditions, health and safety to quality management procedures and environmental and social issues. Simultaneously, are different motivations for promoting different standards and besides international and local companies also many other actors, such as non-governmental organizations, trade

unions, national governments and other international organizations have an influence on how widely and in what form the standards are being implemented.

Field of Application:	Form:	Coverage	Key Drivers	Certification Process	Regulatory Implication
• Quality Assurance • Environmental • Health • Labour • Social • Ethical	• Codes of conduct • Label • Standard	• Firm / Value-chain specific • Sector Specific • Generic	• International business • International NGOs • International Trade Unions • International Organisations	• First-party • Second party • Third party: • Private sector auditors • NGOs • Government	• Legally mandatory • Market Competition Requirement • Voluntary

Table 1: Typologies for Global Standards (Source: Nadvi & Wältring 2004, p.61)

As table 1 illustrates, global standards can and should be classified into different groups according to certain variables. Scope, geographical reach, field of application, key drivers, form, certification process, coverage and regulatory implications each describe certain characteristics of a standard that might be important for either local companies aiming at reaching global markets, global companies trying to reduce costs or both. A standard might also be a solution for non-commercial or non-profit party that is pursuing wider agendas, for example related to people and environment.

Most interesting single category of standards for the purposes of this research is definitely quality standards, as they affect the business of Metalli Inc. and are overall most influential standards affecting the core business functions in many firms. ISO, AS and QS standards are familiar to most companies and also to consumers through their wide spread across many different industries and products. While the importance of quality assurance through various standards for the end user is quite obvious, it plays a major role also for the producing companies and their suppliers. Issues such as traceability, documentation and stage-wise quality assurance are often solved through quality standards, and reduced transaction costs are generally a benefit for all parties

involved. Sanctions for non-compliance are often enforced by the unrelenting market itself, and there is little need for national or regional regulatory bodies in this sense.

In the research by Gereffi et.al (2005) described above, as well as in most other studies related to GVC governance, the basic distinction is made between buyer-driven and producer/supplier-driven value chains, that serve as the two opposite extremes on the spectrum of different types of GVCs. Ponte and Gibbon (2005) recognize the results of Gereffi et.al. (2005) and other studies related to the similar topic, but argue also that they have failed to distinguish immediate forms of coordination from the overall modes of governance. In other words, according to Ponte and Gibbon (2005) some of the GVC governance types introduced by Gereffi et al. (2005) may exist side by side in the same value chain, and do not describe the governance of overall chain. Rather than attempting to use the old spectrum and categories to define different value chains, Ponte & Gibbon (2005) look at GVC governance through convention theory, and place quality in the heart of it as the one most influential variable affecting the governance type.

As Ponte & Gibbon (2005) base their analysis of GVC governance on the convention theory, they define conventions as a broad group of mutual expectations that are both guides to action and collective systems to legitimize those particular actions, and provide a basis for judging actions of self and others. Through different types of quality conventions (industrial, market, civic &domestic) separated in table 2, i.e. industry wide standards and regulations, the authors are trying to explain the changes in coordination between lead firms and their suppliers and figure out whether or not the level of explicit coordination is actually changing. For the purposes of Metalli Inc., this coordination and co-operation means dealing with both suppliers and customers, i.e. both directions of the value chain they are involved in. Through the methodology and findings sections of this paper both the overall value chain model and the governance as well as other relations in it will become clearer.

(1) Convention theory: 'quality convention'	*(2) Convention theory: 'organizing principle'*	*(3) Global value chain analysis: quality-related mechanisms for exercising 'drivenness'*	*(4) Type of 'lead firms'*	*(5) Mode of governance (and degree of drivenness)*	*(6) Examples of specific global value chains*
Industrial Market	Productivity Competitiveness	Influence on setting 'content' of quality and standardization or codification; codification of production techniques and (branded) products into a few broad standards; alternatively, ability to convey 'mindset and operational culture'; ability to capture rents through management of information asymmetry on quality; minimizing cost of matching 'civic' quality content through external certification processes (or formulation of internal codes of conduct) and moving these costs upstream	Branded, manufacturers, Retailers, discounters	Buyer-driven (High)	Mainstream coffee Clothing
Civic	Welfare	Capacity to match 'civil society' demands in terms of minimum socio-economic and environmental standards; 'packaging' these achievements in terms of differentiated product and service offering	Marketers of 'ethical' products Civil society groups Certifiers, auditors	Moving towards buyer-driven (Medium)	Fair trade, organic and other 'sustainable' coffee
Domestic	Loyalty	Capacity to develop trust through repeated interactions and/or geographic indication; extract rents from the 'uniqueness' of products or production/trade relations	Producer groups under appellation systems International traders Niche/specialty marketers	Producer-driven, but often not driven at all (Low)	Specialty coffee Haute couture clothing

Table 2: Linking Convention Theory and GVC Analysis (Source: Ponte & Gibbon 2005, p.19)

Through the results of their research, Ponte & Gibbon (2005) argue that despite the ongoing trend of moving from hierarchical GVC governance structures to more networked and loosely controlled co-operation thanks to various standards and regulations, the power asymmetry does not disappear. Instead, moving from hands-on to hands-off coordination only changes the way power in exercised, not the magnitude and the exerciser of it. Nowadays in many industries it is standards and regulations rather than companies that take care of the quality control, and therefore also act as sources of power and governance in the value chains. In fact, on the contrary to most previous studies Ponte & Gibbon (2005) also conclude that value chains are becoming more and more buyer-driven in nature despite the changes in coordination forms.

All in all, as a producer of high quality and reliability products Metalli Inc. should also consider their position in their value chain from the quality convention point of view. How the different quality standards may have affected Metalli Inc. and/or different functional divisions within the chain is important not only for determining the current strengths and weaknesses of the company, but also for forecasting the future of the division of labor and possible entry barriers in the value chain Metalli Inc. is part of.

2.2.3 GVC governance and governmentality

In the previous sections we have examined two distinct approaches to GC governance in modern world. The 1st approach focuses mainly on coordination between barge buyers and their first-tier suppliers, and refers to complexity of transactions, codifying and transmitting information as well as capabilities of the suppliers as the determinants of the governance structure. The 2nd approach focuses on the proliferation of quality standards and requirements as the modern determinants of the GVC governance instead of neither buyer-driven nor supplier-driven standpoints. Taking the analysis further, Gibbon & Ponte (2008) approach the same issues of GVC governance from a governmental point of view, and compare the existing approaches to supply chain management practices of government programs especially in the US throughout the 20th century.

How Gibbon & Ponte (2008) criticize the previous research alignments is the argument that they ignore the programmatic formulation of buying objectives and practices common in purchasing trade. While in the existing GVC governance literature different types of coordination are results of different forms of transactions in terms of information content, technological resources and quality, for governmental programs the important factors include more traditional variables such as volume, unit cost, risk and profit impact.

On the other hand, there are also similarities between Governementality and traditional GVC governance approaches. "Relational" coordination and governance form introduced by Gereffi et.al. (2005), has an important role also in governmental program (Gibbon& Ponte, 2005). Also the "market" based governance is recognized by governmental program, as the main alternative the relational coordination.

The findings of this case study and the comparisons in it are not practically tested outside the case study in hand. Possibly the most important findings of this research are the questioning of the most influential research tendencies in the field of GVC governance, and comparing the existing ideologies to more governmental perspective.

For the purposes of Metalli Inc. the governmentality perspective may not bring directly any major insights, but it help to understand how value chain governance differs on the governmental side and possibly aids at co-operating with governmental authorities if needed.

2.2.4 GVC Governance and Risk

Interestingly, related to the determinants of a GVC governance type Humphrey & Schmitz (2000) offer a different and perhaps more simplistic suggestion. More precisely, their argument indicates that rather than intrinsic characteristics of the product, information and processes it is the level of risk faced by the buyer that determines the governance structure. The bigger the probability and consequences of poor performance, i.e. losses, the more hierarchical the governance structure in the whole chain.

Similarly to Gereffi et al. (2005) and their definition of GVC governance determinants, Humphrey and Schmitz (2000) also acknowledge product definition as other factor having an effect on the governance structure. As the supplier is troubled with meeting the product definition and the requirements of the buyer, and the buyer has to mutually ease the gap in knowledge and know-how by informing the suppliers about what is required in terms of technology, design etc. the tendency for more hierarchical governance structure increases significantly.

Chain Governance	Determinants
Arm's length market relations	Buyer and supplier do not need to collaborate in product definition. Either the product is standard, or the supplier defines it without reference to particular customers. Risks to buyer are low, either because requirements are easy to meet, or because supplier has a clear capability to meet them. The buyer's knowledge of this capability may arise from the reputation of a cluster, or from the reputation of a particular manufacturer.
Network	Co-operation between more or less 'equals'. Supplier and buyer jointly define the product, and combine complementary competences.[17] This is more common when both buyer and supplier are innovators, close to the technology or market frontiers. The risk to the buyer is minimised by the supplier's high level of competence. High and generalised competence favours networks and reciprocal inter-dependence.
Quasi-hierarchy	High degree of control of buyer over supplier; buyer defines the product. The buyer would incur losses from the suppliers' performance failures, and there are some doubts about the competence of the supplier. Where high supplier competence is not generalised, buyers invest in specific suppliers and seek to tie them to their chain.
Hierarchy	Buyer takes direct ownership of developing country operations. The buyer carries out product definition, which may involve proprietary technology. The risks of poor performance by independent suppliers increase if the buyer uses quality has a brand attribute. These factors favour direct control over the production process.

Table 3: Different GVC Governance types (Source: Humphrey & Schmitz 2000, p.16)

Despite the differences in variables and determinants, Humphrey & Schmitz (2000) have categorized the different GVC governance types relatively similarly to other researches introduced earlier in this paper. The four main categories, namely Arm's length market relations, network, quasi-hierarchy and their main determinants are listed in the table 3. The spectrum of categories ranges from little explicit coordination and power asymmetry in Arm's length market relations to total hierarchy where buyers (lead firms) use direct control and power over their suppliers.

Furthermore, in the same way as Ponte & Gibbon (2005) emphasize the importance of conventions and especially quality in determining the governance types, also Humphrey & Schmitz (2000) take this factor into account. According to them, in these types of value chains there is no direct contact between the producer and retailor or processor, and are more common to network and market relations types of governance structures. In addition, related to role of government and governmentality inspected by Gibbon & Ponte (2008), Humphrey & Schmitz (2000) recognize the importance of government regulations and standards as part of equation in determining the governance type GVCs.

Especially in the case of developing countries, the local government may have a significant role in satisfying and ensuring the requirements of foreign buyers by establishing quality standards to local producers and suppliers. While this is often times also a political issue, it creates a link between the construction of GVC governance type, upgrading and clusters that will be further discussed in the following chapter.

All in all, we can see that there are several different interpretations of the GVC governance and the different types that can be specified. However, most of the theories and frameworks are relatively similar, and the basic spectrum of governance types ranging from heavily coordinated and buyer-driven chains with high levels of power asymmetry to loosely coordinated supplier-driven chains with little power asymmetry is almost always the basis for investigation. Furthermore, other factors such as quality standards and regulations and governmental influences are also widely acknowledged. This thorough investigation of GVC governance will help to identify different roles of companies in different kinds of chains, and provide companies such as Metalli Inc. with theoretical justification of their network and value chain position.

2.3 Upgrading in Global Value Chains

Another concept or phenomena closely related to GVC governance is upgrading in the value chain. Depending on how and by whom the GVC is governed and what are the desires of lead firms in the chain, different types of upgrading offer suppliers possibilities to expand their production and improve their operations in general. Understandably, most of the previous literature and research related to upgrading is focused on developing countries and suppliers in various industries located there for lower costs of production. However, if SMEs such as Metalli Inc. from developed countries are considered, analysis of upgrading possibilities and trends offers insights for expanding in terms of new spheres of processes, production and /or products, and sectors.

Overall the process of upgrading can be evaluated from both the side of suppliers as well as from the side of buyers. Depending on the initiator, upgrading generally has

different types of objects and significance for the parties involved. In some instances upgrading may result in mutually beneficial results, while in others it may be more beneficial to only some of the companies involved. Several other factors, such as role of government, technological capabilities, moderation between risk and investment and transferability of knowledge may limit or promote upgrading, and there is no ultimate answer to where and when upgrading is appropriate.

As we consider upgrading from the point of view of suppliers, there are several different patterns how upgrading takes place. However, Humphrey (2004) offers a framework for a common sequence of stages that captures the advancement of strategies, acquisition of capabilities and technological learning for export marketing development.

Assembly ↓	The focus is on production alone, often following buyers' specifications and using materials supplied by the buyer. In the garments sector, this would be described as "cut-make-and-trim".
Original equipment manufacture **(OEM)** ↓	The supplier takes on a broader range of manufacturing functions, possibly including the sourcing of inputs and logistics functions. The buyer is still responsible for design and marketing. In the garments sector, this would be described as "full package" production.[4]
Original design manufacture **(ODM)** ↓	In addition to manufacturing, the supplier carries out parts of the design process, possibly in collaboration with the buyer. In the most advanced cases, the buyer merely attaches its own brand, or "badge" to a product designed and made by the supplier.
Original brand manufacture **(OBM)** ↓	The supplier designs, produces and markets its own products under its own brand. It no longer relies on a buyer for these functions.

Figure 3: Sequence of upgrading stages (Source: Humphrey 2004, p.8)

Framework by Humphrey (2004) in figure 3 describes an optimal situation and development for suppliers, and actually describes a pattern for a complete functional upgrading that in the end releases the supplier from being dependent on any individual or group of buyers. Naturally, instead of purely upgrading in the spheres of product or production, every supplier company aiming for higher level of autonomy and power

should try to expand their operations to as many functions as possible as the new information and technological know-how are being accumulated. However, this kind of development from pure assembling all the way to original brand manufacturer (OBM) is more of a model describing the objectives and ambitions of the suppliers rather than reality, and for example the GVC governance structure often poses limitation to suppliers' vertical endeavors in the value chain.

On the other hand, Humphrey (2004) points out that for buyers, upgrading in value chain often serves very different purposes than for suppliers. Simply put, global buyers are generally only interested in providing assistance and investing in their suppliers if the benefits of the integration more than offset the costs of the investment. For buyers there is always a risk in making an investment and sharing their knowledge and core information with suppliers, as there are is no guarantee that supplier will stay loyal to their buyer and their competitive advantage might be compromised. To avoid this misfortune, buyers can lock in suppliers by making them transactionally dependent either through contractual terms that directly forbid them from selling into the same market individually, or by providing them with enough incentives and benefits for maintaining the supply. All in all, upgrading by buyers often means increased amount of power and governance for them through the new arrangements.

Upgrading and Value Chain Governance

What comes to the relationship between upgrading and governance of GVCs, Humphrey and Schmitz (2000) make a clear and important distinction between global and local aspects of the both concepts. For instance, GVC governance and tight cooperation can block local upgrading, if the value chain is heavily buyer-driven. In many cases, while inter-firm governance within the value chain is emphasized the level of local governance is simultaneously minimized. On the other hand, inter-firm cooperation is also viewed as a great source of competitive advantage especially in developing countries and also as an important requirement for ability to do upgrading.

The role of local clusters in different industries also needs to be acknowledged, and will be further analyzed later in this paper.

Whether it is feasible and reasonable to upgrade in relation to processes, products or totally new functions, depends on the underlying governance structure of the value chain (Humphrey & Schmitz, 2000). In most value chains, the main motivator for upgrading is the need to sustain incomes and profits when facing increased global competition and markets. Naturally, upgrading often demands a considerable amount of investment, regardless of whether it is a joint action between larger group of firms and public sector or a project by an individual company.

Based on their four categories of GVC governance, Humphrey & Schmitz (2000) use different case studies to identify upgrading commonalities in each category. For example in hierarchical and Quasi-hierarchical value chains, where existing suppliers are always in the danger of being replaced by new ones due to buyers' constant global scout for new sources, the upgrading of suppliers constantly relies on products and production rather than new functions. The reason for this is that while suppliers need to perform extremely well and match the best of their industry in several production parameters (quality, punctuality, flexibility etc.), they avoid or are inhibited from expanding to new strategic functions, such as design, marketing or branding. This resembles to power and control that lead firms have and exercise in Quasi-hierarchical chains, leaving suppliers no choice but to accept their role and improve their production to meet the required demands.

At the opposite end of the GVC governance type spectrum, in market relations chains there is much more room also for functional upgrading of the suppliers. Even though there are no barriers to functional upgrading from the organization of value chain governance, upgrading is still not easy for relatively small suppliers. Accessing new markets, making heavy investments, acquiring information and meeting new requirements and standards without the help from more experienced lead firms is

difficult, and therefore functional upgrading and market diversification are not self-evident truths for most companies (Humphrey & Schmitz, 2000).

As an intermediary type of GVC governance on the spectrum ranging from strongly buyer-driven to strongly supplier-driven, Network type of governance structures also need to be taken into consideration. Even though there are few examples of upgrading in such network type of GVC structure and overall they tend to be relatively rare due to learning curve effects, competence differential between buyers and suppliers and fragility of these kinds of relationships, Network-based relationships are most common in linkages between machinery and component suppliers and buyers (Humphrey & Schmitz, 2000). For purposes of Metalli Inc. this is important, since company is indeed a supplier of high quality engine components. Value chain relationships based on mutual commitment and complementary competencies would primarily indicate to common upgrading of all products, processes and functions, but as always this is not necessarily the case.

2.4 Role of SMEs in global value chains

As Metalli Inc. is a relatively small firm compared to some multinational corporations operating in various GVCs, it is useful to consider the traditional role of SMEs in value chains and how that role may have an effect on the strategies and opportunities of SMEs in general.

While most of the research done on global value chains and supply chain management has focused on large multinational corporations, there is not much information concerning small and medium sized companies (SMEs) from developed countries that are both relocating sourcing their production to low-wage countries in Eastern Europe and Asia. Increasingly, SMEs are required to combine global business strategies across global production networks without the vast resources and abilities of large enterprises (Jorgensen & Knodsen, 2006).

Chiarvesio et al. (2010) continue by stating that it is often the role of only few firms in the value chain, whether it's a buyer-driven or supplier-driven chain, to govern and coordinate the inter-firm networks in a large scale. Traditionally the leading firms have been the key players for different industrial districts that serve as nodes in the global network. Each of these nodes possessed unique knowledge and competencies and promoted synergies with local assets, but due to the effects of globalization the organization of these networks is changing. While the leading firms are able to enlarge the boundaries of their supply chains and networks, other firms need a great deal of innovation efforts in all products, processes and technologies in order to remain competitive and guarantee the excellence of their products.

For the purposes of Metalli Inc. defining their role and position as a SME in their global value chains is important. Assessing the required strategic changes for sustainable competitiveness and taking full advantage of the opportunities offered by the global economy is of uppermost importance for the future success of the company. While the focus of this particular research is on Metalli Inc. which has also requested for relatively strict non-disclosure agreements, other companies within the same value chain are not thoroughly analyzed. However, it can be said that some of major suppliers as well as most important end customers of Metalli Inc. are very large corporations, which shows that Metalli Inc. is clearly taking advantage of their networks and connections with larger enterprises.

2.5 Gender Approach to GVCs

Quite differently from all the other approaches introduced previously, Barrientos (2001) explores GVCs from the interesting gender point-of view and argues that it does not only broaden the GVC analysis, but also enables to examine all the activities that are within the range of GVCs. In global economy, where both men and women are involved in activities along the value chain and the level of female employment is constantly rising, gender is definitely a factor that has an effect not only on the performance of different activities, but also on their inter-connections and alliances. Including the socio-

economic environment to the GVC analysis has a variety of significance for companies depending on the nature of their industry, and for example for Metalli Inc. it can offer different possibilities to understand and upgrade their human capital.

Through a study on global buyer driven value chains of fruits, Barrientos (2001) arrives in a conclusion that in many GVCs where global buyers have a lot of power over the weak producers, it is the flexibility of the workforce and supply as well as the gender distribution among the supplying companies that determines the productivity and efficiency of the production. The increased number of women in the workforce and their change of roles from pure domestic and childcare activities to important income earners has a great influence especially in industries where the demand and pressure on suppliers varies according to different seasons. While this change has an effect in the upstream companies of different value chains especially in emerging economies with lots of production, other socio-economic changes in developed countries are also affecting the GVCs. "Marketising" and increased overall convenience of household chores and activities has left women more opportunities to work and change the consumption patterns of products in the downstream end of GVCs. Therefore, it can be said that gender distribution has an effect on different nodes in the chain, as their functioning is constantly changing and evolving.

Overall, there is no question that gender distribution, flexibility and other socio-economic factors have some effect in GVCs and modern globalized economy as a whole. However, the significance of their role is definitely debatable and open to question in many industries and areas of business especially in more developed countries, where gender roles are nowadays overall less important. In the end, it is still weighty to recognize these aspects and consider their possible importance without bias, as something unexpected might always occur.

2.6 Alternative Approach to GVC analysis

Another interesting viewpoint to GVCs and their analysis is offered by Keane (2008), who claims to offer a new approach to the discussion instead of the traditional value

distribution and input-output ideologies that currently dominate the relevant literature. In an approach that is purely focused on value distribution, the final retail-price is used for division value added and the shares of economic surplus, but simultaneous overlooking of differences in production costs and margins added by retailers makes this approach not fully comprehensive. On the contrary, a traditional input-output approach looks at companies making changes in their operations in order to to increase the value of their products, but does not recognize the importance of external linkages and assumes that firms are operating in a vacuum, which in today's world is quite far from reality. What Keane (2008) suggests is that by combining these two dominating schools of thought, the "micro" input-output approach and "macro" value distribution approach, the new integrated frameworks can be used to better understand the growth opportunities and different roles of companies in trade and GVCs.

Firmly related to previous studies also discussed in this paper by Gereffi et.al. (2005) and Humphrey & Schmitz (2004), Keane (2008) argues that "learning by doing", innovation and spillover effects from one sector of the economy to another are essential in combining the more traditional approaches to GVC analysis and understanding the roles and growth opportunities of producers and companies especially in developing countries. GVC governance structures, both internal inter-relationships between different companies and external standards and quality regulations, have a major effect on what is feasible and probable for producers in terms of sphere of production and future upgrading opportunities. The unfortunate fact that lead-firms, retailers and other companies from developed countries generally reap most of the final retail price and value-added in most industries leaves "learning by doing", imitation of foreign technology and methods as well as scraping up all possible relevant technical information and knowledge the only possibilities for producers to grow and upgrade their operations.

Even though the study made by Keane (2008) is mainly concerned with status and abilities of companies from developing countries trying to enter GVCs in the industry of agricultural products, the results and conclusion can also be applied to wider

perspectives. While it is arguable whether or not this article indeed brought valuable new insights to the discussion, for internationally integrated companies such Metalli Inc. that is in the center of this research, information on relationships between firms from developed and developing is always valuable. In fact, the point made by Keane (2008) about spillover effects and offering technology to suppliers in developing countries is also relevant for Metalli Inc., as a large part of their production is already done in China and the proportion of this foreign production is constantly increasing. Finding the right balance in terms of governance for both standards and sharing of technology and information is important to both downstream and upstream connections in Metalli Inc.'s value chain. Just like in agricultural industry described by Keane (2008), metal and machinery industry Metalli Inc. operates in follows the same principles and trends as GVCs grow and develop around the world.

2.7 Offshoring in GVCs

Another interesting phenomenon that is very common for the modern global economy is offshoring. Decreases in transportation costs, liberalization of FDI policies and improvements in communication and information technologies have lowered the bar even for smaller companies to move some or all of the functions of their operations abroad in order to create savings and cut costs (Harms et.al 2009). Among many others the target company of this particular research, Metalli Inc., has outsourced a large proportion of their production to China. While offshoring has naturally increased the complexity and versatility of GVCs in many different industries, it has naturally also changed the geographic and functional division of value creation within those chains. Therefore, in order to understand how and where value is created in GVCs, it is also important to comprehend the offshoring trend and the consequences of it. Whether or not the relocation of various functions has really been successful, both in terms of value creations and cost savings, is not often clear even to the companies that are performing these changes.

What Harms et.al. (2009) emphasize is that while cost savings is the most common reason for offshoring, there are some functions duties that simply cannot individually be outsourced of offshored, because they depend on previous functions and have to be performed in certain order. If some of the steps along the production chain are cheaper to perform abroad and some others in between are not, a company cannot start sending components, intermediate goods and semi-finished products back and forth between different locations without losing the achieved savings immediately in increased transportation costs. It is often the technological constraints that that limit the variability in the sequence of production.

All in all, Harms et al. (2009) offer three different alternatives for companies in terms of offshoring; partial, full or no offshoring at all. The way company organizes their GVC and activities in it depends not only on the cost structure of different functions, but also on the nature of functions in terms of their togetherness and sequence. While Metalli Inc. has already moved a large proportion of their production in China, evaluating how and where value is created in their GVC may also have an effect on how they locate and structure their production differently in the future.

In the following two chapters the topic of offshoring is discussed both in terms of the value creation process (2.7.1) as well as in the light of possible outsourcing alterations (2.7.2). Offshoring is the most relevant theoretical entirety considering the practical applicability of different theories presented in the literature review to the current and future operations and business environment of Metalli Inc. Therefore, offshoring is thoroughly discussed here and its importance is also reflected in the following theoretical framework of the thesis.

2.7.1 Offshoring and Value Creation

Despite the fact that there is little research done on the effects of offshoring in value creation in the product level, it is also useful to investigate this relationship from a wider macroeconomic and socio-political perspective. Indeed, Levy (2005) argues that in modern offshoring companies have the opportunity to relocate almost any functions

from their operations, and even the highly demanding and complex tasks can now be performed in low-cost countries. Of course this requires that both the sequence and nature of different tasks is favorable for relocation efforts as described above by Harms et al. (2009), but in principal any node of the value chain can be relocated and the process of value creation changed. In fact Levy (2005) continues by saying that rather than affecting specific sectors or industries, modern offshoring where, how and by whom specific value chain tasks are being performed. Whether the offshoring is extensive or not, besides efficiency it has a lot to do with strategic improvements and power. Even for relatively small companies, such as Metalli Inc., tapping into new pool of workers and sharing some intellectual property with foreign subsidiaries is strategic move towards increased efficiency as well as the optimal lever of power and control in relationships with subsidiaries and partners in foreign countries.

Farrell (2005) has an even more positive viewpoint of the effects of offshoring, as she believes that it creates value and wealth for all parties involved both in developing and developed countries. In optimal situation, jobs that are relocated to developing countries allow workers in developed countries to be re-employed in more noteworthy jobs and the cost savings earned to be invested further in other operations of the company. However, it is very questionable if this happens in reality and how people and companies really react to changes in the construction of the value chain. For companies doing offshoring, besides the obvious cost reductions other benefits include increased flexibility in terms of labor and growth, ability to repatriate earnings "after" the value chain from subsidiaries and new revenue opportunities from the funds that are saved by relocating operations. The fifth research question in this research is particularly focusing on the actions of Metalli Inc. in terms of returning the earnings and profits back to their headquarters in Finland, and what are the possible obstacles and restrictions related to this behavior after the final sale of the product has been made and the value chain has technically ended.

All in all, as Farrell (2005) concludes offshoring is part of wider economic and social changes that are underway in the world, and just like Metalli Inc. in our case companies

are most of the time following the trend strongly. For individual workers under a threat of being discharged offshoring may not seem as a positive phenomenon, but in the big picture it is a major change that cannot be stopped and need to be understood. As companies are inevitably going to experience the effects of offshoring and changes in their value chains and value creation process, it is useful to realize the different aspects and underlying implications of the whole process. For the purposes of this research, both defining the value chain and the possible repatriation of funds and earnings from foreign subsidiaries and partners to the parent company in Finland are affected by offshoring. As the value chain and the production process define the core and soul of business also for Metalli Inc., large scale alterations in the global business environment, such as offshoring, serve as basis for the ground rules the company has to live with adapt their core business to.

2.7.2 Offshoring and Outsourcing

As we know, companies operating in the modern global economy are both geographically and organizationally dispersed. While term outsourcing refers to slicing the value chain of the company and sourcing some of the pieces to external vendors and contractors, offshoring entails also the geographical aspect of relocating operations abroad. This does not necessarily mean that foreign operations would be performed by external parties, as many multinational corporations have their own subsidiaries in various locations around the world (Contractor et al. 2010). While decentralization dispersion creates efficiency and savings as well as complexity and costs, it is important to try to evaluate an optimal level of disaggregation for each company in terms of their value chain activities. It should also be noted that similar offshoring and outsourcing strategies are not necessarily applicable to different companies even if their organizational structures, working cultures and industries would be close to one another. Even the timing of large strategic changes such as these may be a surprisingly important factor for the eventual success of the modifications.

Both offshoring and outsourcing can be seen as slightly different outcomes of same strategic changes that pushing companies towards changing the configuration of their activities. While the value chains of different companies are divided into even smaller pieces than whole basic functions and companies are increasingly moving also their core functions to new locations and organizations, it should be noted that these changes are always made to serve the efficiency and coherence of the whole network of actors both internal and external to the company, rather than any individual local market or organizational actor (Contractor et al. 2010).

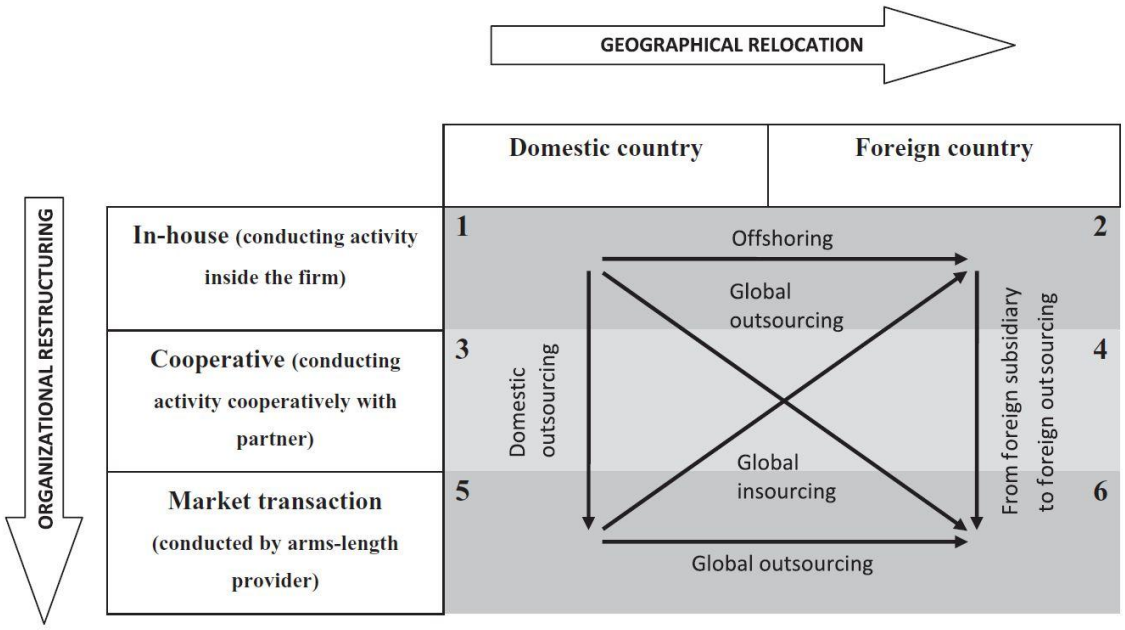


Figure 4: Allocation of Value Chain Activities (Source: Contractor et al. 2010, p.1420)

As figure 4 indicates, the path of a company from a purely domestic and organizationally disintegrated player to a true multinational corporation with global presence and numerous external partners requires careful consideration of each value chain activity and their optimal location, both geographically and organizationally. In other words, in order for a company to be globally successful it has to determine the optimal allocation of each value chain activity to one of the six cells in the figure above, and make sure that incremental search, coordination and transaction costs do not exceed the benefits gained through new arrangements (Contractor et al. 2010).

Besides the obvious benefits of gaining external expertise and know-how from the global networks, there are also other factors explaining the increase in dispersion of value chain activities. As identified earlier by Gereffi et al. (2005), the same factors affecting the GVC governance structure naturally also have an effect on the decision of either offshoring and/or outsourcing some of the activities in the chain. Easing the complexity of inter-firm transactions, increased ability to codify those transactions and the improved capabilities of various suppliers especially in developing countries have created more opportunities for companies in terms of the composition of their value chain. Co-operation that was earlier not feasible or advisable for one or both of parties involved can now be the optimal solution for everyone.

While the approach Contractor et al. (2010) is purely strategic and does not provide any numerical data to support the analysis, it offers a relatively practical viewpoint to the spreading of company over internal and external vendors, as well as spreading the activities over various nations. While the optimal level of dispersion and disaggregation is individual for each company, according to this article it truly exists for each of them. On the other hand, it also states that due to the accelerated outsourcing and offshoring, the percentage of value added internally as a fraction of output value has decreased significantly in most companies. While the offshored and outsourced segments of the value chain are also constantly finer and smaller than before, there would also be several arguments against the rationality and sustainability of this type of development. However, as always in business bottom line is all that matters and this is the reality we live in our global world.

What all this means for the Metalli Inc. and their product that are in investigated in this research is again dependent on the applicability of these wider concepts to the level of a single product in a relatively small company. As the GVC of this particular product and the flow of capital gains and profits back to the parent company from abroad as the final determinant of the value distribution are being considered, it is important to understand the outsourcing and offshoring decision Metalli Inc. has already made. As these decisions are completely unitary to the current GVC structure and the value creation

process, they cannot be ignored as the distribution of value within and outside the case Metalli Inc. and across different regions is being analyzed.

2.8 Summary of the Literature Review

Even though there is relatively narrow foundation of literature related to GVC analysis in the level of individual products, the abundance of literature on bigger concepts and totalities related to GVC are also helpful in creating an understanding of the topic in hand. As this literature review reveals, there are bigger underlying trends in the global economy that change the networks and inter-relationships of companies in a constant manner. Whether or not this development is preferable for different actors in GVCs is naturally arguable, similarly to the rationality of the fact that everything in global economy is dependent and reliant on everyone else. All in all, for fully understanding the GVC of a single product, it is important to see the wider picture around it as well.

GVC governance structures, upgrading, standards and quality, risk factors and offshoring & outsourcing decisions are all familiar to Metalli Inc., which is producing the investigated product as part of a truly global value chain. How the value is distributed both geographically and between different organizations is in the core of this research, and the different concepts described in this literature review define that distribution. Revealing the GVC structure for an individual product and including the flow of capital gains and profits back to the parent company may not alone describe the phenomena and changes in the larger context, but as this project is part of the larger research totality of ETLA, the results may also shed light to bigger occurrences in the global economy.

It is relatively hard to describe in theoretical terms the global value chain and the business environment Metalli Inc. is operating in. It seems to be a combination of the key concepts of this literature review, that is GVC governance structures, global quality standards, upgrading, outsourcing and offshoring of operations that reveal not only the nature of the industry in hand, but also the core business logic and mindset of Metalli Inc. However, theories regarding offshoring seem to best grasp the practical business

environment of Metalli Inc., and are without a doubt pondering with the same questions Metalli Inc. has, is, and will be pondering. Issues related to geographical and organizational locations of different operations are both in the heart of this value chain research as well as in the very core of Metalli Inc.'s business. Besides the obvious cost benefits sought through these discussed rearrangements, power, contacts and relationships also play an important role when these types of decisions are being made in business.

According to the underlying theories and literature, most GVC decisions are made on financial basis and in order to minimize costs and create profits. This is certainly true as it is the purpose and strategic starting point for most businesses, but quite few of the previous frameworks proceed to the level of practically explaining how the value is maximized in the GVC and how it is numerically and practically distributed across the different actors. The research questions of this particular study are trying to find answers to these problems in a product level, and then relate the findings to the wider concepts and ensembles, if possible.

All in all, defining the GVC of the investigated product is naturally the top priority of this project, but without a wider perspective the results may not be as useful as one might hope for. This literature review serves as a link between the study of the value chain of an individual product and the larger conceptual entireties related to the construction of that chain. It also builds the foundation for the analysis and discussion in the following chapters. For Metalli Inc. the combination of literature review theories, especially the ones related to offshoring, together with the empirical findings and their analysis form a comprehensive information package regarding the value creation and distribution of their product, which in turn assists the company in defining and improving their position within the value chain.

2.9 Theoretical Framework

As already mentioned, the uppermost objective of this research is to define the current distribution and division of value in the GVC of Metalli Inc. As this is in the core of the

research, there are a few surrounding phenomena that according to different theories together define the construction and distribution of value in GVCs. This setting is presented in the theoretical framework in Figure 5, which simultaneously represents the theoretical foundation of this study.

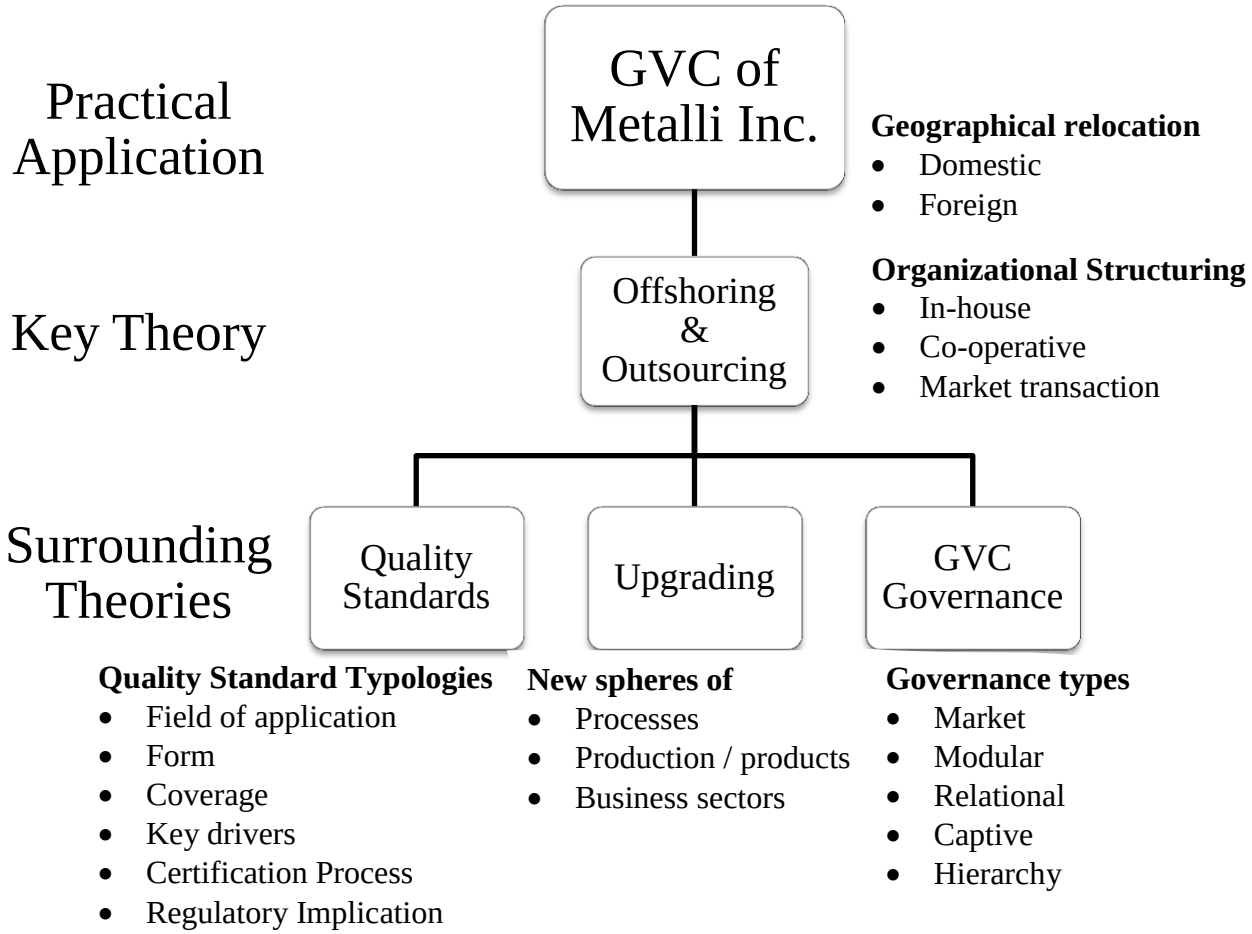


Figure 5: Theoretical Framework of the Study

All in all, themes of *Quality Standards*, *Upgrading*, and *GVC governance* together form a theoretical base surrounding the GVC of Metalli Inc. These topic areas are all one way or another connected to *Offshoring & Outsourcing*, which in turn rises as the key theoretical entirety for this investigation of global value chains. The surrounding theories are all concerned with different issues companies have to take into consideration when they are planning and performing arrangements related to

outsourcing and offshoring. In turn, outsourcing and offshoring decisions and agreements have a tremendous effect on the construction and shape of Metalli Inc.'s GVC both now and in the future.

While the core of this study together and the surrounding theoretical themes are presented through a relatively simple framework in Figure 5, the complexity and scale of the issues discussed cannot be excessively emphasized. As mentioned several times, evaluation of GVC of a company covers every possible aspect of doing business in an international setting.

The Literature review of this research project is concluded through this theoretical framework model, and focus of the paper is therefore changing from theory to practice. In the next section the research methodology of this project will be discussed in more detail as the background and methods used for the research are being thoroughly analyzed.

3. METHODOLOGY

Purpose of this section is to explain and expose the research methods used for the purposes of this project. The focus of this particular research is on distribution and creation of value in the Engine and machinery industry, and more specifically in both organizational and geographical aspects of the question. In order to fully understand the results and findings of this research, it is also important to clarify what are the methods and processes behind the results and the reasoning for choice of these particular methods. The initial purpose of the research methods is to provide the means for gathering and analyzing data and fulfill the expectations and criterion set for the case study project.

This thesis project was initiated and monitored by the Research Institute of the Finnish Economy (ETLA), and it is in fact part of a larger research project rather than just an individual case study alone. As part of this larger project that is initially funded and sponsored by TEKES, The Finnish Funding Agency for Technology and Innovation, the purpose of this particular study is to provide comparable, compatible and transparent information on this specific product and industry, which thereafter can be compared with other similar cases in other industries and domains. In order to fulfill these requirements, ETLA provided a conceptual framework and other analytical tools for the process of analyzing the results of the study. Close co-operation with Jyrki Ali-Yrkkö, a Research Manager at ETLA and a supervisor for this particular project, was conducted in order to ensure that results and findings of this project are acceptable by both ETLA and the case Metalli Inc. under investigation.

Before the majority of individual sub-projects such as this one have taken place, ETLA conducted a so called pilot study on the value chain of Nokia N95 cell phone, and due to the good results was encouraged to take the study further. Students of the Aalto University School of Economics had the opportunity to participate in this project by conducting their thesis as one of the case studies and part of the larger project. Companies and products for the project were preselected by ETLA through their

network of connections and partnerships, and then assigned to each student after a mutual discussion amongst the group of students and the ETLA representatives. The case company in this particular research requested to stay anonymous in order to retain and protect knowledge and core information that they possess both on their own products as well as the existing market conditions and competitive situation in the market.

3.1 Research Method

In order for both ETLA and the case company to gain the best possible insights and most reliable results from the study, a mainly qualitative method approach was chosen as the methodological starting point for the research project. Qualitative research methods and numerical/statistical calculations were used to create an understanding of the structure case company and its value chain, and to further analyze the numbers and data to gain more numerical picture of how and by whom the value is created and distributed.

Creswell (2003) defines *qualitative approach* to research as a method in which the researcher makes knowledge claims based on constructivist perspectives of past individual and social experiences and history, participatory perspectives of the issues, phenomena and changes in hand or both. The data collected is primarily open-ended, and the intention of the researcher is to gather predominant themes from this mass of data. This definition holds true also in this research, as six semi-structured interviews and discussion with various experts in the company were conducted so that a valid picture of the product in hand, the basic structure of its value chain and interrelationships in it could be formed.

On the other hand, Creswell (2003) defines *quantitative research* as an approach in which the researcher uses mainly post-positivist claims for developing knowledge, employs methods such as surveys, experiments and experiments as well as collects data on predetermined instruments that produce statistical data. Again, in terms of this research these conditions are met in the sense that numerical data is used to determine

the final value distribution between different organizations and geographical regions, and that ETLA has provided the researcher with various predetermined formulas and instruments for implementing the needed calculations. Although the statistical methods used in this research are rather empirical and numerical calculations than purely quantitative methods of research, the definition provided by Creswell (2003) describes the practical setting pretty well.

In the end, *mixed methods* approach combines the two previously mentioned approaches, and the researcher bases knowledge claims most importantly on pragmatic grounds. Both numeric and text information are being collected sequentially, and the diversity on the data provides a solid understanding of the research problem (Creswell, 2003). In this particular research, broad interviews and discussions are conducted first in order to gain general results and the big picture, and thereafter more precise numerical data is collected for deepening the understanding of the value chain and placing exact figures on the value generated and distributed along the chain. Again, even though the numerical calculations are more statistical rather than purely quantitative, the practical setting of the research has very much a *mixed method* approach.

3.1.1 Unit of Analysis

In this research the major unit of analysis is the GVC of the product that is being investigated. Yin (2009) defines unit of analysis as the major entity researched in the project, and in the case of this particular research the whole project is aimed at defining this chain of activities and their effect on value creation. Cassell and Symon (2004) continue by stating while collecting information especially in qualitative research, the researcher must constantly reflect the fundamental unit of analysis of the research. In this research the structure of value chain and the different roles of different actors in it are under constant evaluation during the research process.

Due to the role of ETLA as a major initiator and supervisor of the thesis project, the unit of analysis was also almost completely predetermined for the researcher. At this stage it should also be noted that while the unit of analysis is a GVC, the purpose of this study

alone is not to make generalizations concerning GVC structure across different industries and areas of business in international economy. Instead, the example this case study presents is about the machinery industry and serves as part of a larger research initiative of ETLA, and that totality will in turn be a better illustration of larger economic trends.

The investigated product of Metalli Inc. is another empirical unit of study and suits well for the purposes of the study due to the international and versatile nature of its value chain. Metalli Inc. aims at playing a major role in the market of this new product which is just emerging due to changes in international standards and regulations, and the data collected on the product serves a basis for analyzing the company as a whole as well.

3.1.2 Data Collection

As is typical for this study and all the other similar thesis projects under ETLA, the conceptual framework was assigned to the researcher beforehand. As this marching order is understood by both parties, the researcher and ETLA, it is mutually beneficial in the sense that it facilitates the research process by making it explicit and replicable and ensures the comparability of the results in larger contexts.

The purpose of data collection in this project was firstly to map and outline the global value chain Metalli Inc. is operating in and secondly define the value distribution of the value added in that chain both between different organizations and geographical regions. Thirdly, data was obtained in order to investigate the capital flows and repatriation of profits from foreign subsidiaries to parent company in Finland for final distribution of value. While collecting data, the initial research questions of this project have constantly guided the collections efforts and methods together with the conceptual framework provided by ETLA.

Interviews

Altogether six different semi-structured interviews/discussions were conducted with various experts in the company, including the CEO, Business Development Director,

R&D Manager, Sales Managers and a Controller. The interviews were conducted at the premises of the company in Finland during three different occasions. The first and foremost purpose of the interview was to allow the researcher to obtain information for accurately mapping the GVC of the investigated product and to gain a clear picture of the network company is part of and dealing with through their product. For the researcher, it was also crucial to increase overall knowledge of the product in hand and the whole business ideology Metalli Inc. is executing.

The interview followed a guideline created by ETLA (appendix 1), providing a structure for the interview and making the whole discussion coherent. Although the discussion in some cases drifted around various subjects not necessarily concerned with the product or even the project in hand, the meetings offered a great chance for both sides to clarify unclear information and follow-up certain interesting topics.

Numerical Data

In order to define the cost structure of the case product and the value added, each component, their suppliers, transportation costs and other middlemen needed to be clarified and separated for closer inspection. For this process, several different data sources were used and evaluated for gaining the best possible image of the value distribution. Sources such as bill of materials worksheets, order books and receipts were provided by the case Metalli Inc. to aid the investigation and to determine the value added by each individual component. For suppliers and other parties external to the case company Metalli Inc., general company level data such as EBIT, labor costs, amortization and profits were gathered from sources such as annual reports, Orbis database and the archives of the National Board of Patents and Registration of Finland. These numbers were used to calculate the value added of both 1st tier and 2nd tier suppliers involved in the value chain.

3.1.3 Data Management and Analysis

Quite similarly to the data collection process and actually the whole mixed-method approach, also the data analysis and can be divided between two main sections; *qualitative*, general and more strategic section and *quantitative*, more precise and numerical section. While these different sections of the process and the analysis aim at fulfilling different types of needs and revealing different kinds of information, they complement one another and together make the whole research process more comprehensive and coherent.

Firstly, the aim of general data analysis was to map the general structure of the value chain in hand and make geographical division between the main functions involved in the chain. Ultimately, both the general structure of the value chain as well as the geographical distribution of the functions are visually expressed in the findings section of the thesis. In other words, relevant information from the interviews and other company materials was extracted and used for picturing the journey of the product and its components from raw materials all the way to the end customer, and separating the different steps both geographically and between different actors and participants along the chain.

Secondly, the quantitative side of the research was mainly intended for determining the exact value distribution in percentages between different component producers and suppliers, Case Metalli Inc. and different agents/dealers involved in the value chain. After compiling various figures and numbers from previously named sources, the information was used in few basic calculations and ultimately expressed visually in the form of pie charts. These charts were a pre-assigned method of expression by ETLA, and they allow reader to simply and effectively form an understanding of the most important participants and organizations adding value in the chain. In addition, the data was also used to make a geographical differentiation between regions around the world.

The value added margins were determined separately for:

- Metalli Inc.
- Most important 1st tier suppliers
- Other 1st tier suppliers
- 2nd tier suppliers,
- Agents/Dealers involved in the chain and
- Transportation/cargo.

In terms of geographical distribution, the following division was used:

- Finland
- EU 27 (except for Finland)
- North America
- Asia
- Others

In order to complete this separation, few relatively simple calculations were used to determine the value added margins of each participant and their shares of the final value of the investigated product. Altogether 40 different components of the product in hand were identified and their suppliers' value added margins were calculated according to the following formulas:

$$\boldsymbol{Value\ Adding\ Margin} = \frac{\textbf{Labour costs+rents+Depreciations+EBIT}}{\textbf{Turnover}}$$

Through this formula, the value-adding margin of each supplier company was calculated. Furthermore, this company level figure was then later used in a product level to calculate the share of the company/component in the final value of the product under

investigation. The relatively standard financial indicators used in this formula (Labor costs, rents, depreciations and EBIT) were chosen for usage by ETLA because they provide an accurate reflection of the value creating potential of the supplying company. When this figure is divided by the overall turnover of the company, the marginal amount of value created by this company that also stays in the company is revealed. Other costs of the suppliers, such as material and service costs, operating costs and overheads are included in the calculation through the previously mentioned figures. All in all the formula serves as a great starting point for evaluating the external interactions and interrelationships of the value chain companies and their positions in the value chain and in the overall market environment.

Another, perhaps more simple way of expressing the same equation (the numerator in it) commonly used in various financial statements is as follows:

$$\boldsymbol{Value\ Adding\ Margin\ (VAM) = \frac{\mathbf{Turnover - Purchases}}{\mathbf{Turnover}}}$$

While the latter form of the equation is somewhat easier to understand, in the end both forms provide the same results. For the purposes of this thesis the previous one was used for all the different suppliers involved.

The value adding margin expresses the value added by 1st tier supplier in percentages. Naturally, the rest of the value of the component in hand belongs to the 2nd tier suppliers, i.e. suppliers of the suppliers of Metalli Inc. In other words, the value adding margins of the supplier of a component and the suppliers of this particular supplier together form the value added by individual components.

When the eventual shares of the final value of the investigated product were calculated, the following formula was used:

$$\boldsymbol{Share\ of\ Final\ Value = Suppliers'\ VAM * Suppliers\ cost\ for\ Company\ X}$$

This equation revealed the shares of both 1st tier and 2nd tier suppliers in the final sales price of the investigated product. After this, it was relatively easy to separate the shares of Metalli Inc., various middlemen and transportation according to the results of the calculations above and the other information gained through the interviews. Furthermore, as each stakeholder had also been assigned a country of origin and the distribution of their production and operations were estimated to have a certain geographical spread. Through these estimates and calculations also the geographical distribution of value in this particular chain was determined between the most significant regions of the world.

Thirdly, in addition to the initial research agenda laid out by ETLA for this particular project, the capital flows back to the parent Metalli Inc. in Finland from their foreign subsidiary and the repatriation of profits to same direction were also under investigation. For these purposes both qualitative information from the interviews and quantitative numerical data were used to determine what happens to profits after the value chains has "ended" and the product has reached its final customer/consumer.

3.2 Evaluation of the Study

3.2.1 Validity

Validity in empirical economics has a relatively simple definition, as Roe and Just (2009) point out that that in the end validity deals with whether or not conclusion or inference of a particular research is a good estimation of the true conclusion or inference in the subject matter. In other words, do the methods of research and subsequent observations provide an acceptable reflection of the truth and reality? While validity is easily defined, there are many different dimensions to it and Thanasegaran (2009) offers a great framework by dividing the concept between *content*, *construct*, *criterion* and *consequential* validity.

In terms of this particular research and the wider research project conducted by ETLA, both *content* and *construct* validity are achieved through multiple the use of multiple

sources of data and multiple interrelated research methods. For the most part the whole research process is predesigned and instructed by experienced professionals from ETLA, who have carefully considered and constructed the project and its content to fulfill the desired requirements and reach suitable outcome. Due to this favorable setting, also the *criterion* validity is attained as the results of the research are evaluated by not only the researcher but also ETLA and the case Metalli Inc. under investigation. This is done in order to ensure not only the validity, but also the general usefulness of the results later in the larger ETLA project as well as in other studies related to the subject area. Fourth dimension of validity, consequential validity is not valid in this research as this project in itself does not have any larger social or cultural effects in the surrounding communities as a whole (Thanasegaran, 2009).

Another concept related to validity is reliability, which is defined by Thanasegaran (2009) as the degree to which the measures of research are free from error and therefore yield reliable results. In other words, reliability means that the results of the study are also consistent and reproducible in other instances with similar methods. For this thesis project, this is actually one fundamental condition, as the results need to be compared with other similar studies also part of the larger research initiative by ETLA. This presumption together with other measures taken to ensure the good quality of the research and its results, it can be stated that validity of this research is decent.

3.2.2 Limitations

While this is a relatively narrow study as an individual thesis project, it is also part of a larger research totality organized by ETLA. Keeping these aspects in mind, there are some important limitations to this study that need to be recognized. Perhaps the biggest single limitation to the study, at least from the point of view of the researcher, is the fact that both the case Metalli Inc. and a particular product under investigation were pre-assigned to the project by ETLA. This could lead to biased results from the research, but thanks to the multiple different information and data sources used for the research this is hardly the case here. The same reasoning applies also to the pre-assigned research

framework also provided by ETLA, which could also lead to bias in case of narrower base of research sources. However, it has to be noted that these predetermined aspects of this research study were literally vital for the comparability and transparency of the results that are needed in the larger project, and the clarity and reliability they created for the whole research process were definitely positive and well justified.

Related to the actual data and information gathered, the biggest limitation to this particular study was the fact that the product under investigation was not at the time of the research yet in mass production. In other words, a few prototypes of the product had been made and initial sales offerings and bids had been sent to various new and existing customers, but no actual sales had yet taken place mainly due to renewed regulations and the need of certain standard approvals the product was still lacking. In addition to this limitation, the availability of information especially in the case of 1st tier suppliers and 2nd tier suppliers was a problem mainly due to the lack of resources. Instead of product specific figures, suppliers and their valued added was mainly calculated according to corporate level data, which was the best possible alternative considering the resource and time constraints as well as the overall scope of the whole project.

Furthermore, despite good communication and overall relationships between ETLA, the case Metalli Inc. and the researcher, strict non-disclosure agreements limited the specificity and applicability of the results in terms of company specific issues and managerial implications. Even though it is very understandable from the point of view of the case Metalli Inc. to protect their competitive advantages and core knowledge related to their products, but for the research itself this means that the published results are for the most part limited to a very general industry level.

All in all, these limitations are relatively common to thesis projects under the larger research initiative of ETLA, and they are both accepted and dealt with by all the parties involved. As discussed in the previous chapter, the results are by no means perfect in this research or even in the larger ETLA project, but considering the circumstances and

legitimate level of resources and effort put into this project, the results are best possible also in terms of validity and reliability.

4. EMPIRICAL FINDINGS

In this chapter the empirical findings of the research will be introduced in various visual forms of expression. As previously mentioned, while the final format of findings is visually relatively simple and includes pie charts, a chain model and geographic illustration, the raw quantitative data and calculations behind the results are far more complex and will not be explicitly described in this section. As the purpose of this thesis project is to define where value is created in the value chain of the investigated product produced by case Metalli Inc., the chosen style of illustration is considered to best describe the complexity and versatility of a global value chain in an understandable manner both by ETLA and the researcher.

Unfortunately for the researcher and the usability of results of this research, the case Metalli Inc. requested to stay anonymous and not specifically name the product under investigation due to obvious reasons related to sensitive information about the company, their products and the market they are operating in. However, despite this need of almost total anonymity enough relevant information is provided for the reader in order to grasp the setting of the research and the significance of its results. The role of Metalli Inc. in the value chain and the importance of other participants in the chain as well as their interrelationships between one another will be revealed by the results and also further discussed in the Discussion and Analysis section.

Before the initial research results requested by ETLA for the purposes of their larger research initiative are presented, a short description of the industrial setting of case Metalli Inc. and the product under investigation is provided. Even though also in this section the surrounding industrial environment has to be described in a relatively general level due to the reasons explained above, it is important to reveal the background behind the research project and the investigated product. Furthermore, after the initial results requested by ETLA, also some reference to how profits from the foreign subsidiary of the case Metalli Inc. are repatriated is provided. While this part of the research relied heavily on estimation and fragmental qualitative information, it gives

a decent estimation about what happens after the value chain ends and where the profits earned by companies like this actually end up.

4.1 Industrial Setting

Case company Metalli Inc. operates in the machinery industry, providing parts and units of whole engines for vehicles operating in the global freight traffic. This means that while Metalli Inc. is a relatively small company in terms of total turnover, number of employees and production facilities located only in two different countries, their market is truly global and their sales and service network expands to all the major continents around the world. While the industry itself the clientele in it are truly global, consistently with the predominant overall trend in the global economy the importance of China and other Asian markets has constantly been increasing also in this sector. In other words, more and more of the producers, their production and clients in this industry are nowadays located in Asia despite the location of their initial countries of origin. Also Metalli Inc. has their second production facility located in China due to not only lower production costs but also the proximity and closer connection to their customers.

While the company offers different product lines for varying needs of customers and has experience in the business since the 1970s, the product under investigation is still a relatively new to Metalli Inc. and the market overall. In fact, the market for this type of products has only existed for couple of years, and was created due to some changes and hardening of regulation and standards in the global freight traffic. Globally there are roughly 40-60 companies in the market depending on the definition of it, and they come with varying levels of standard and regulation certificates.

The biggest entry barrier to the market seems to be particularly the globally recognized standards that the products need to comply with in order to appear as a reliable, attractive and useful investment for the customers. However, for the companies passing theses regulatory tests and competence classification the market is very promising, and the predicted growth rate in terms of overall revenue is so high that there is plenty of

space for many different competing companies. In fact, towards the end of this decade the demand may actually surpass the supply and there may be a shortage of suppliers of this type of engine parts and units, if the predictions and projected regulatory changes become reality. Predictions of the future in this market can be seen in more detail from the figure below.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenues ($ Million)	18.5	37.1	297.3	995.3	1,336.0	2,106.5	3,201.8	4,974.3	7,150.7	6,129.3	5,903.7	1,960.4
Revenue Growth Rate (%)	---	100.0	702.3	234.8	34.2	57.7	52.0	55.4	43.8	(14.3)	(3.7)	(66.8)

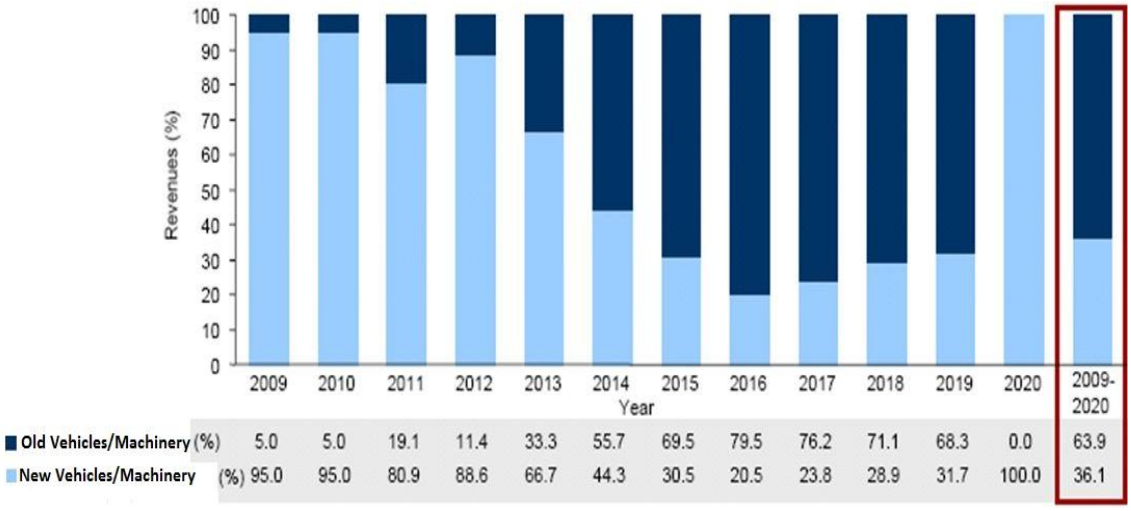
Compound Annual Growth Rate (CAGR) 2009-2020: 52.8%

Figure 6: Market Predictions for the Product under Investigation (Source: Metalli Inc.)

As we can see from the prediction above, the market for investigated product is expected to grow dramatically at the beginning of the decade and continue to grow all the way until year 2017. Naturally, the amount of total revenue follows the growth of the market with a little time lag, and experiences drastic increase between 2015 and 2017. At the highest point in 2017 the total revenue of the market is roughly 7,15$ billion US dollars. Again, such radical growth figures and total revenue increase are due to the changes in regulation and standards that force the customers of Metalli Inc. and its competitors to invest in this type of equipment. This is why the market is also expected to decrease relatively swiftly after the new standards have become concrete. Practically this means that there is no more need to install such equipment to old machinery and the only remaining customer group are the ones manufacturing new vehicles.

Due to the nature of their clientele, Metalli Inc. has made a natural division in their production and sales strategies between costumers with old machinery and vehicles and customers manufacturing new machinery. Practically this means that while the core components of the product are similar in both customer groups, the looks of the finalized and installed product may differ a lot based on the final customer. While the customers manufacturing new machinery usually buy the product in one piece and set of components, to customers with old machinery the product is often customized and sold in smaller kits of components. All in all, the difference in price between the products sold to different customer groups is small and quite insignificant, as the differences are only related to the final structure of the product and some minor components and not to any of the expensive major components.

The importance of these two different customer groups varies as the newly established market for the investigated product develops during this decade. Understandably, as the changes in the regulation and standards are very recent and there are no clear deadlines about when the changes need to be made exactly, the predictions may not be as accurate as one might hope for. However, the figure below shows the basic division between the two major customer groups in the market up until 2020.



		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2009-2020
Old Vehicles/Machinery	(%)	5.0	5.0	19.1	11.4	33.3	55.7	69.5	79.5	76.2	71.1	68.3	0.0	63.9
New Vehicles/Machinery	(%)	95.0	95.0	80.9	88.6	66.7	44.3	30.5	20.5	23.8	28.9	31.7	100.0	36.1

Figure 7: Division of the Market between Most Important Customer Groups (Source: Metalli Inc.)

As we can see from the prediction, the first couple of years the market is still mostly amongst the customers building new machinery and vehicles. However, as it is expected that around 2014 and 2015 all the owners of old equipment are going to be required to install the investigated product in their machinery, from there onwards the focus is mainly on the old machinery for the following five years. In this prediction, it is also expected that all the owners of old machinery have had their vehicles "updated" before 2020 as is required by the new standards, and thereafter there would only be one customer group of new builders.

On the whole, the industry and the markets Metalli Inc. is entering with the product that is under investigation in this research are extremely interesting. Changes in regulation have created a whole new playing filed for companies that are mainly experienced producers of various engine parts and units in machinery industry. Metalli Inc. is facing not only fierce competition but also the requirement to comply with all the globally recognized standards, as they are pursuing to become an important player in the newborn markets. Taking into consideration all R&D investments and other efforts put into the development of this new product, it is quite clear that for the future of a relatively small company such as Metalli Inc. this product is a very decisive factor. While it is always risky to make such large investments, this product offers a great opportunity to explore whole new markets and expand the operations of the company to a whole new level.

4.2 Value Chain model of Metalli Inc.

In order to formulate a realistic picture of the global value chain Metalli Inc. is involved in through their product, the qualitative information gained mainly through interviews with the company representatives was used extensively. Interviews were based on the interview guideline provided by ETLA and found in the Appendix 1.

Through the product under investigation Metalli Inc. is involved in a relatively complex value chain that expands into many different parts of the world. There are several different layers to it, and the different steps and functions in it are completed by several

different organizations in various locations. While especially at the beginning of the chain and in the sales and delivery phase of the value chain there are many different partners and suppliers of the Metalli Inc. that are performing partly overlapping functions, there are also two so called nodes in the chain that are clearly visible. Metalli Inc. and the end customers of their product can easily be separated from the chain thanks to their clear roles and places in the chain.

As the global value chain of Metalli Inc. is relatively typical for international companies operating in machinery industry and not very straightforward, it is useful to sketch a rough division of different actors and players involved before investigating the value chain in more detail. The combination of qualitative research data and author's own interpretation is summarized in the figure 8, which describes the value chain in hand in as simple manner as possible.

Figure 8 does not contain any indication to the locations of different functions and actors along the value chain. Neither does it highlight or understate the importance of any single actor or group of actors within the chain. At this point, it is important to lay out the flow of components and different parts from very beginning of the value chain all the way to the end customers without any additional references. As already mentioned, one purpose of Figure 8 is also to give advice to Metalli Inc. on their position in the value chain and aid their strategic decisions concerning both possible outsourcing as well as offshoring plans in the future.

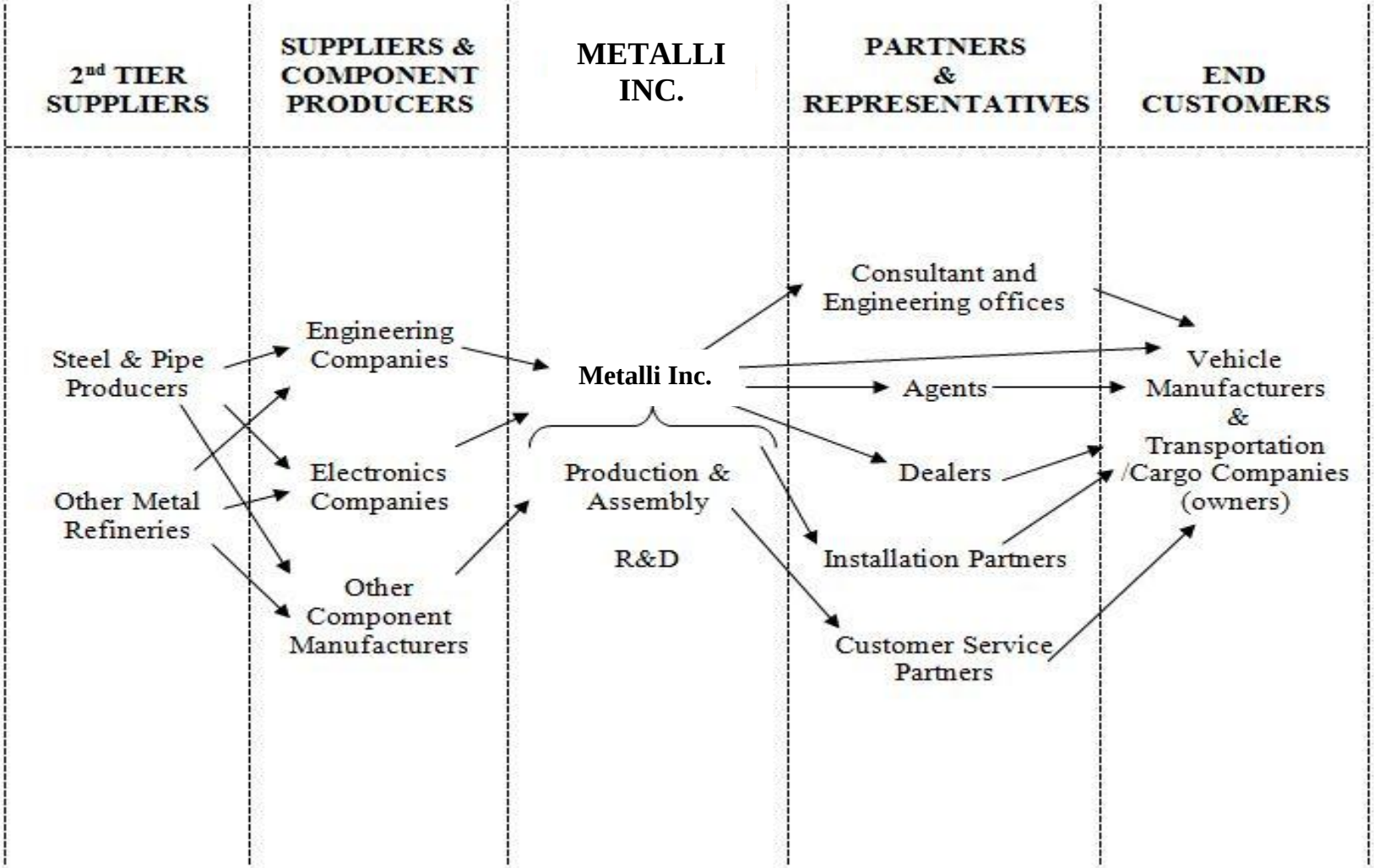


Figure 8: Value Chain of the Investigated Product of Metalli Inc. (Interpretation of the researcher)

The Value Chain Model presented in Figure 8 is divided into five different major stages according to the best judgment of the researcher derived from the data and information gained during the research process. The five main stages are as follows:

- 2nd Tier Suppliers
- Suppliers and Component Producers
- Metalli Inc.
- Partners and Representatives
- End Customers

In principle, Metalli Inc. does not produce any of the components in the product, but instead they purchase them through a large network of suppliers of different sizes and specialties. As the product of Metalli Inc. is not high-tech or especially complicated, already their 1st tier suppliers and component producers are operating with relatively basic materials and substances. 2nd tier suppliers, i.e. the suppliers of Metalli Inc.'s suppliers, are very much dealing with raw steel and other initial stage elements, and their role in this research and investigation is only described in a reasonably general level.

Metalli Inc. itself is mainly responsible for all R&D work on their product and the production as well as assembly of the product. While the components and exact compositions of the product are under constant valuation for improvement and intensification, Metalli Inc. has made a strategic decision to keep core business functions such as R&D and assembly in-house and not outsource them, at least not at this point. Naturally Metalli Inc. is also strongly involved in the sales process of their products, but as will be described in the following chapter there are many more actors involved at this stage as well.

As the readymade product is being sold to customers there are many different actors involved in the process, and every sales affair is somewhat unique. The number and form of actors in between Metalli Inc. and their end customers is largely determined by

whether the customer is improving old machinery or manufacturing new vehicles. When the product under investigation is sold to manufacturers of new vehicles, there is often just a sales agent or a dealer in between the selling and buying parties. This agent/dealer basically creates the contacts for Metalli Inc., finds new customers and gets a certain commission of the final sales price of the product. All in all, this process is relatively simple and common in many other industries as well. Of course there are exceptions to this rule, and sometimes also the sales to manufacturers of new vehicles may demand some of the additional middlemen described in the following chapter.

When the end customer is only upgrading old machinery and the product has to be installed to an existing system/vehicle, the sales process becomes a whole lot more complicated. Due to the confined size of its organization, Metalli Inc. uses different consultants, engineering offices and installation partners in the process of selling and implementing the introduction and installation of the product. These partners may have also been hired by the end customers searching for supplier such as Metalli Inc., so the initiative is not always coming from the provider of the product. Sometimes the partners may perform for example both consultancy and installation, and sometimes these services are provided by separate organizations. Also the agent/dealer can take care of the installation process and/or consulting in some instances. Furthermore, the service and maintenance of the product is also done through different customer service partners all over the world.

As we can see, the value chain of this particular product is extremely versatile especially in terms or different partners and representatives between the Metalli Inc. and their final customers. There are several variations to the chain, and even though the number and form of steps needed in the process varies largely according to the final customer, every sales occasion is at least slightly dissimilar to others. The final customers, i.e. the vehicle manufacturers and transportation companies are also often in very close co-operation with one another, and Metalli Inc. has to often deal with desires and requirements of more than just one customer organization. However, overall the

role of end customers in the chain is much clearer than the roles of middlemen acting as partners and representatives for Metalli Inc.

As already mentioned, there are two main nodes in the chain that are clearly visible and separable from others; Metalli Inc. and the end customers. Other than that, 1st tier and 2nd tier suppliers as well as different partners and representatives are big groups of different companies performing relatively similar functions and roles within their designated groups. If the value chain is analyzed from a more theoretical perspective, there is not much vertical integration between Metalli Inc. and other organizations, or between anyone in the chain for that matter. Metalli Inc. seems to be in a powerful position in terms of their suppliers, since even the few companies providing the big and important components for the product are under constant threat of being replaced by a cheaper and more efficient alternative. The role of different middlemen between Metalli Inc. and end customers does not play a major role in terms of exercising power, and same goes for the end customers of the value chain. As already mentioned, while there are several providers of similar type of product as the one under investigation in this project, there are plenty of customers in the market for all the different producers around the world.

Instead, in the end it seems that different standards and regulation are the biggest single source of quality control and power in this value chain and in the market for this particular product. Metalli Inc. and other similar companies have to comply with the regulations in order to be competitive and successful in the market. There is also a hint of politics in the creation of this market, is it came into reality mainly due to tightened environmental standards in the transportation/cargo business. All in all, the different interrelationships between organizations in the chain and their opportunities to improve their competitive and communal status are interesting. These features will be discussed against the theoretical background in more detail in the discussion and analysis section of this paper.

4.3 Distribution of Value Added in the Value Chain

For the purposes of both organizational as well as geographical distribution of value added, two different "sizes" or capacity levels of the same product were evaluated separately. In the context of this research the two versions of the product are simply referred to as P25 and P100 in order to protect the privacy of Metalli Inc. for the reasons explained earlier in the paper. This comparison was mainly done for identifying and comparing possible differences and similarities in the value construction of the different sizes of the same product. These two particular versions of the product were chosen out of a larger group of different "sizes" because they were considered to be the most common and popular ones amongst the customers, and therefore also most suitable for this project.

Furthermore, another comparison was made between production in Finland and production in China. In other words, production of both P25 and P100 were evaluated separately for both Finnish and Chinese factories of the company again with the intention of identifying differences between the values added by different organizations. At this point it has to be added that while the product itself is not in mass production just yet, and the existing prototypes are built only in Finland, relatively accurate estimations and calculations of the possible future production in China were conceivable due to adequate information on the other products of Metalli Inc. being currently produced at their factory in China. This comparison between different production facilities and locations was also considered important by Metalli Inc. in terms of their larger strategic decisions concerning production in the future.

4.3.1 Organizational Distribution

In terms of organizational distribution of value added, there are few clearly distinctive features for this particular value chain. First of all, there are two 1st tier suppliers that contribute significantly more value than all the other 1st tier suppliers combined, and their significance for the overall value creation is definitely noteworthy. For ensuring proper concealment of sensitive information, these two companies will be referred to as

Alumiini Inc. and Kupari Inc. in this paper. Secondly, the value contribution of Metalli Inc. is relatively similar in both "sizes" of the product, but simultaneously larger also for both products when the production takes palace in Finland compared to production in China. In other words, the role of Metalli Inc. seems to be more important in the Finnish production than in the Chinese production and is not so much dependent on the model or "size" of the product. Besides these two identifiable notions, other features of the organizational value distribution stay relatively similar across different production locations and "sizes".

Production in Finland

As both "sizes" are being produced in Finland, the value distribution in terms of organizations is as follows:

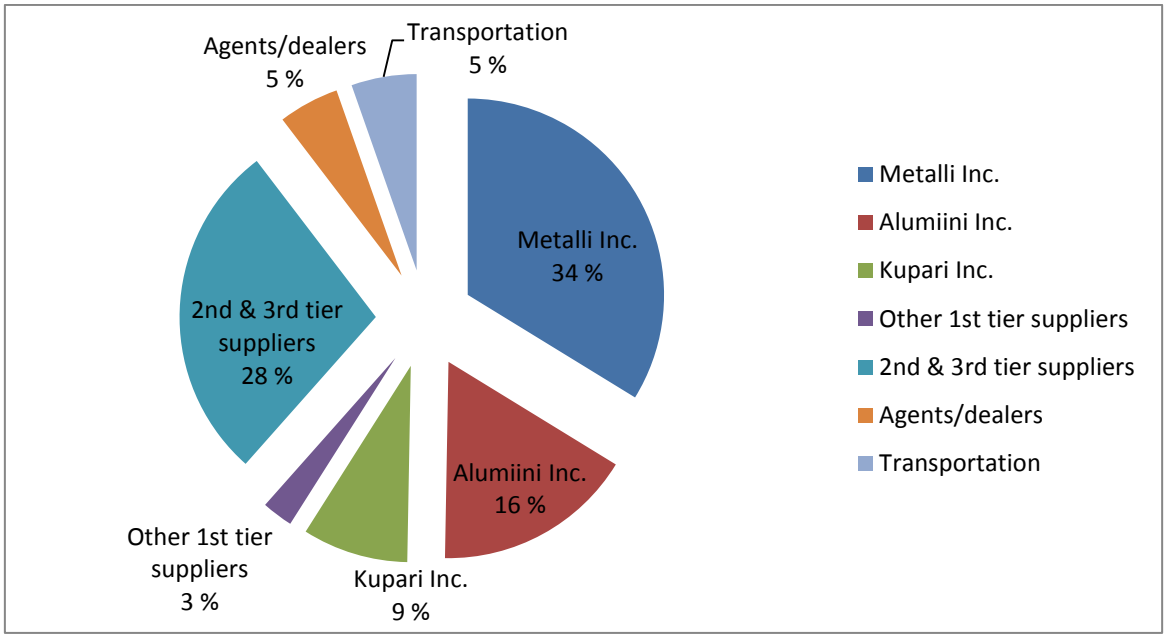


Figure 9: **P25** Organizational Value Distribution (Finland)

As the above figure indicates, the largest share of the overall value created for P25 is provided by Metalli Inc. itself. Alumiini Inc. and Kupari Inc. are other significant individual contributors, but other 1st tier suppliers do not play a weighty role in this value chain. Numerous 2nd and 3rd tier suppliers together account for roughly one

quarter of the total value created. In addition, Agents/Dealers and Transportation (including both inbound & outbound logistics) companies contribute to the value creation fairly evenly, and together form 10% of the final value created.

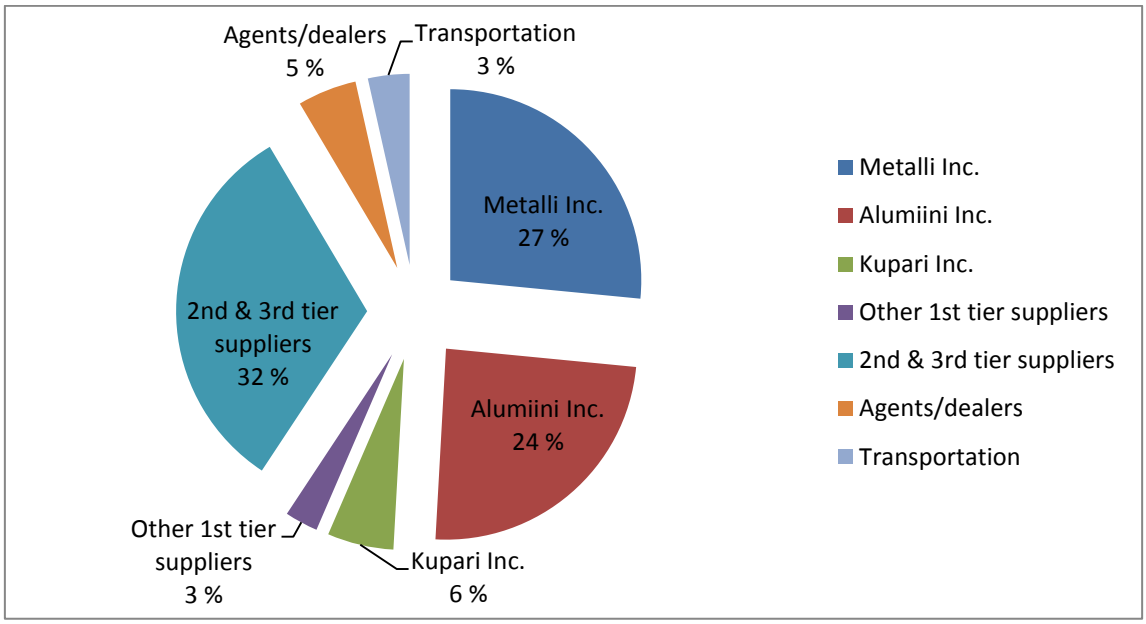


Figure 10: **P100** Organizational Value Distribution (Finland)

Overall, there are some differences to P25 when we look at the value distribution in the larger P100 size of the product. Contribution of Alumiini Inc. as well as contribution of the 2nd and 3rd tier suppliers is larger than in the smaller model. On the other hand, the roles of Kupari Inc. and Metalli Inc. are simultaneously smaller than before. The significance of Agents/Dealers and Transportation (both inbound & outbound) is understandably quite stable. Still, there is no denying that Metalli Inc. is the most influential single actor in the chain with irreplaceable tacit knowledge.

In the end, Metalli Inc.'s production in Finland lays on reasonably stable foundation, even though there are two 1st tier suppliers that contribute significantly to the overall value of the product. So do jointly all the 2nd and 3rd tier suppliers, but still Metalli Inc. is confident about their position as a buyer of the various components needed for P25 and P100. According to the Metalli Inc. representatives, there are several other suppliers/competitors also for Alumiini Inc. and Kupari Inc., and these competitors are

equally capable of fulfilling the strict requirements and standards needed in the business. Therefore, the significance of certain suppliers is not considered as a threat for Metalli Inc., and different alternatives for better price, quality and service are constantly being evaluated by Metalli Inc. employees. The shares of Agents/Dealers and transportation can be seen as relatively small but necessary value creators, and not the core functions in the chain. In terms of upgrading and vertical integration, there is no sense for Metalli Inc. to even think about internalizing these functions as they are not in the core of business for Metalli Inc. and do not bring much value for the company compared to the investments/efforts needed to make those changes.

Production in China

Due to the current status of the product under investigation, it is not really in mass production either in Finland or China. However, some prototypes have been produced in the Finnish factory, and as previously mentioned it is possible to make educated estimations of possible production in China according to data on other products being currently produced there.

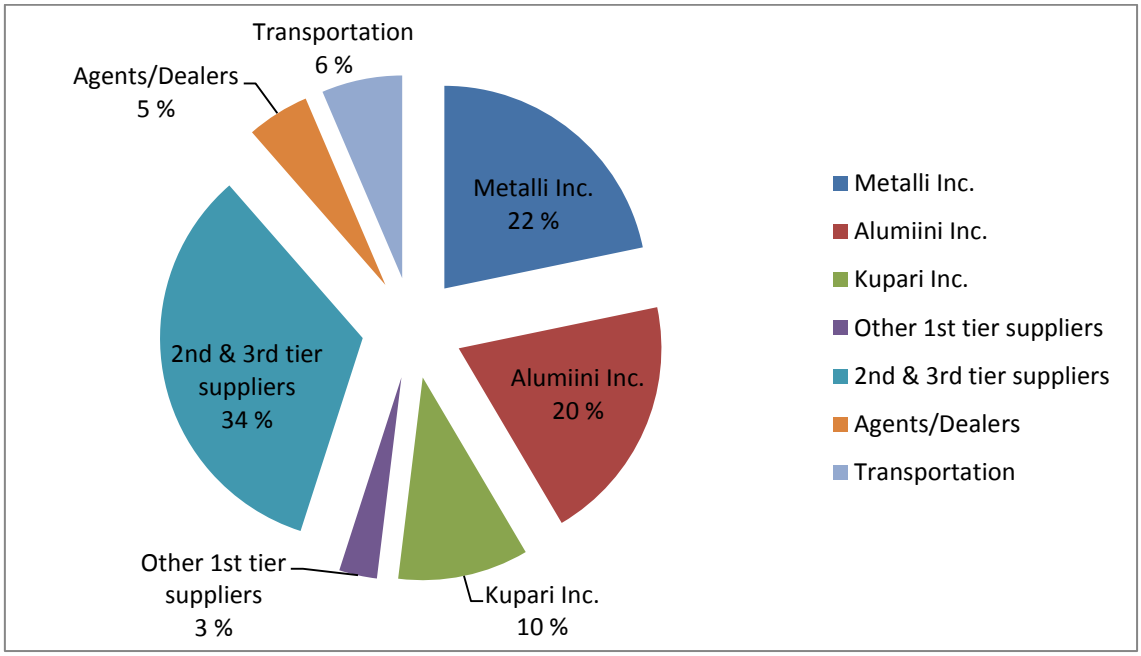


Figure 11: **P25** Organizational Value Distribution (China)

According to these estimations and both qualitative and quantitative data gained during the research process, the organizational value distribution for Chinese production of P25 is presented on the previous page. As already indicated, the value added by Metalli Inc. is significantly lower in the products produced in China mainly due to significantly lower labor and production costs. Alumiini Inc. is adding slightly more value than in Finnish production as do the 2nd & 3rd tier suppliers, but otherwise (other suppliers, agents/dealers, transportation including inbound & outbound logistics) the value distributions is relatively similar in both countries. All in all, there is little surprising in this value distribution after seeing the distribution in Finland.

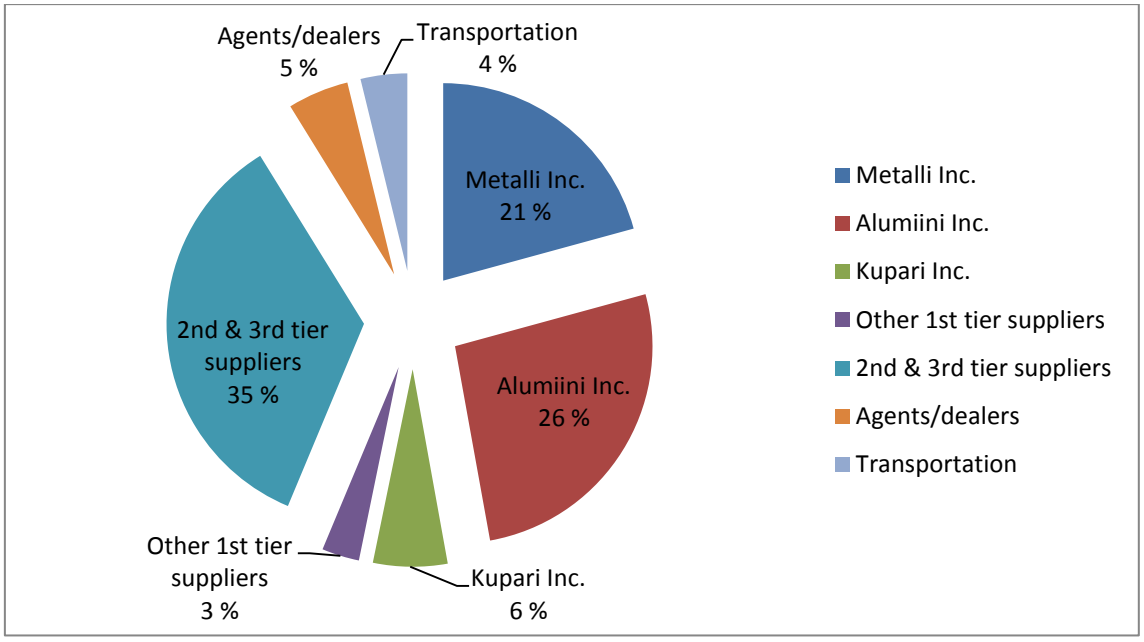


Figure 12: **P100** Organizational Value Distribution (China)

As we can see from the figure above, also for P100 the value added by Metalli Inc. is smaller in China than it is in Finland, which again is due to difference in production and labor costs. Otherwise there are no big differences to value distribution of P100 in Finland or P25 in China, as all the other actors in the chain are adding fairly similar amounts of value than before. Since both product sizes P25 and P100 are mainly composed of similar types of components from same suppliers their overall value distribution is also somewhat uniform.

All in all, organizational distribution of value in this particular chain is relatively typical for a product that is produced by a company that is focusing mainly on assembly, R&D and sales of the product, purchases readymade components from a pool of suppliers and uses various middlemen and partners in the sales process. The valued added by various suppliers is very significant, but still in terms of governance the producer/assembler (in this case Metalli Inc.) is controlling the value creation process by making sure that it does not become reliant on any particular supplier with unique skills and abilities not found elsewhere. Inbound as well as outbound transportation/cargo companies as well as Agents/Dealers create a relatively stable amount of value in the chain without surprises. The value added by Metalli Inc. comes mainly from their sales margin and the production/assembly and labor costs that differ depending on the location of production. One could speculate on whether or not it would be beneficial for Metalli Inc. to control more of the value created by manufacturing some of the components themselves, but this would not be in the core of Metalli Inc.'s business and not necessarily cost-effective. These types of questions related to upgrading, GVC governance and risks will be discussed in more detail later.

4.3.2 Geographical Distribution

For the purposes of evaluating geographical distribution of value, 3rd important comparison was made according to the location where the sales of the product take place. In other words, besides comparing different "sizes" of the product and different locations of production, also the process of selling the product was investigated in more detail. Overall, the value was distributed amongst five different geographical areas, namely **Finland, Other EU-27** (Excluding Finland)**, North-America, Asia** and **Others**. As the production facilities of Metalli Inc. are located in Finland and Asia (China), an assumption was made that if a product is produced in Finland, it can be sold in any of the geographical regions except for Asia. At the same time it was assumed that if a product is produced in Asia (China), it can be sold in all the other geographical regions except for Finland and Other EU-27. As the product is sold in different geographical

areas, the biggest changes in value distribution come from changes in the distribution of shares of outbound logistics and Agents/Dealers.

Production in Finland

In reality, due to the scale of required R&D as well as overall importance of the product for Metalli Inc. most of the production of both "sizes" will in the beginning be in Finland, where also all the existing prototypes have been assembled.

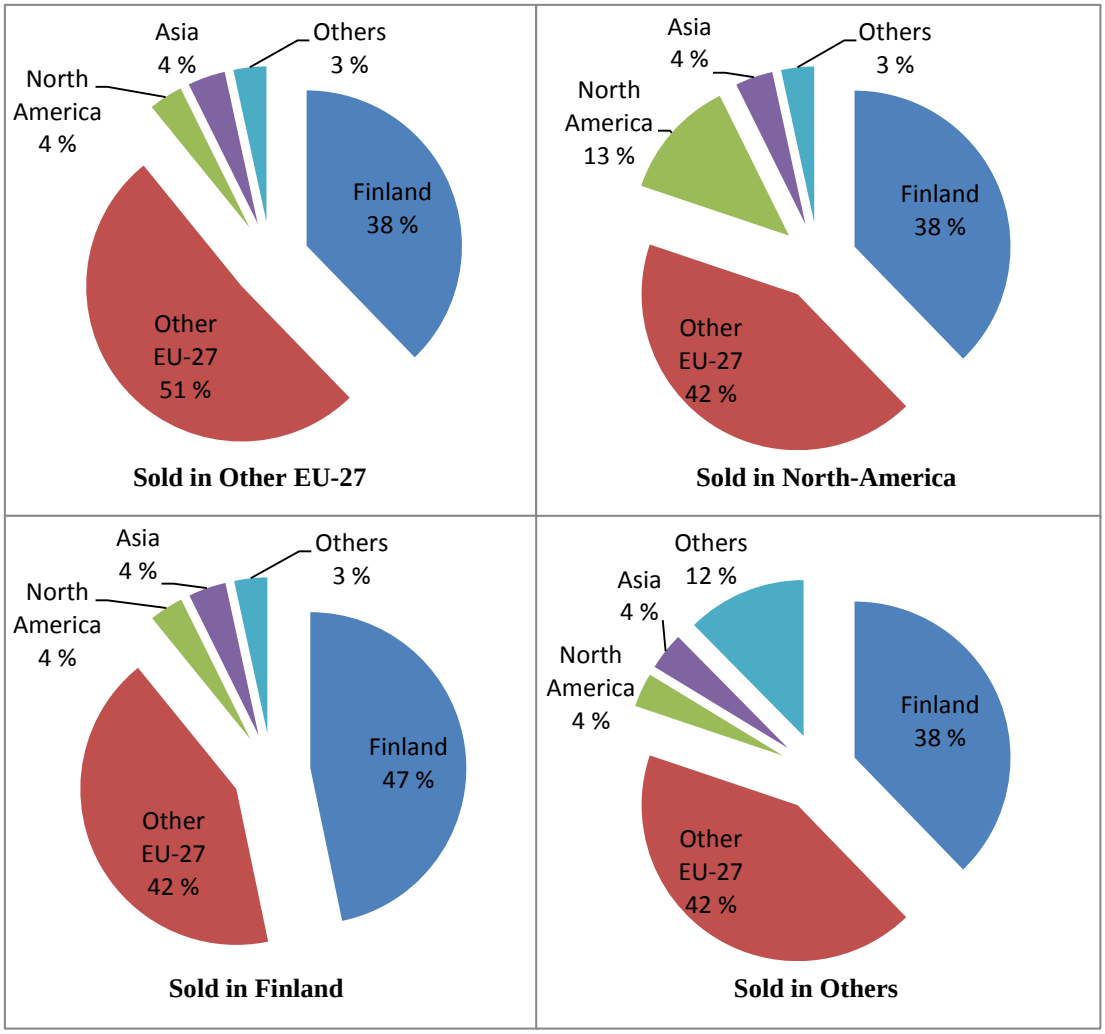


Figure 13: Geographical Value Distribution of **P25** & Region of Sales (Finland)

As the figures in the previous page indicate, most of the value for P25 is created in Other EU-27 area and Finland. The large proportion of Finland is natural due to the fact

that it's the country of origin for Metalli Inc. However, the largest share of value is distributed for Other EU-27 area, in every other case except when the product is sold in Finland. The significance of Other EU-27 is explained by the fact that the suppliers of most important and expensive components are mainly European. North-America, Asia and Others (rest of the world) contribute much less value but together still form a noticeable part of final value.

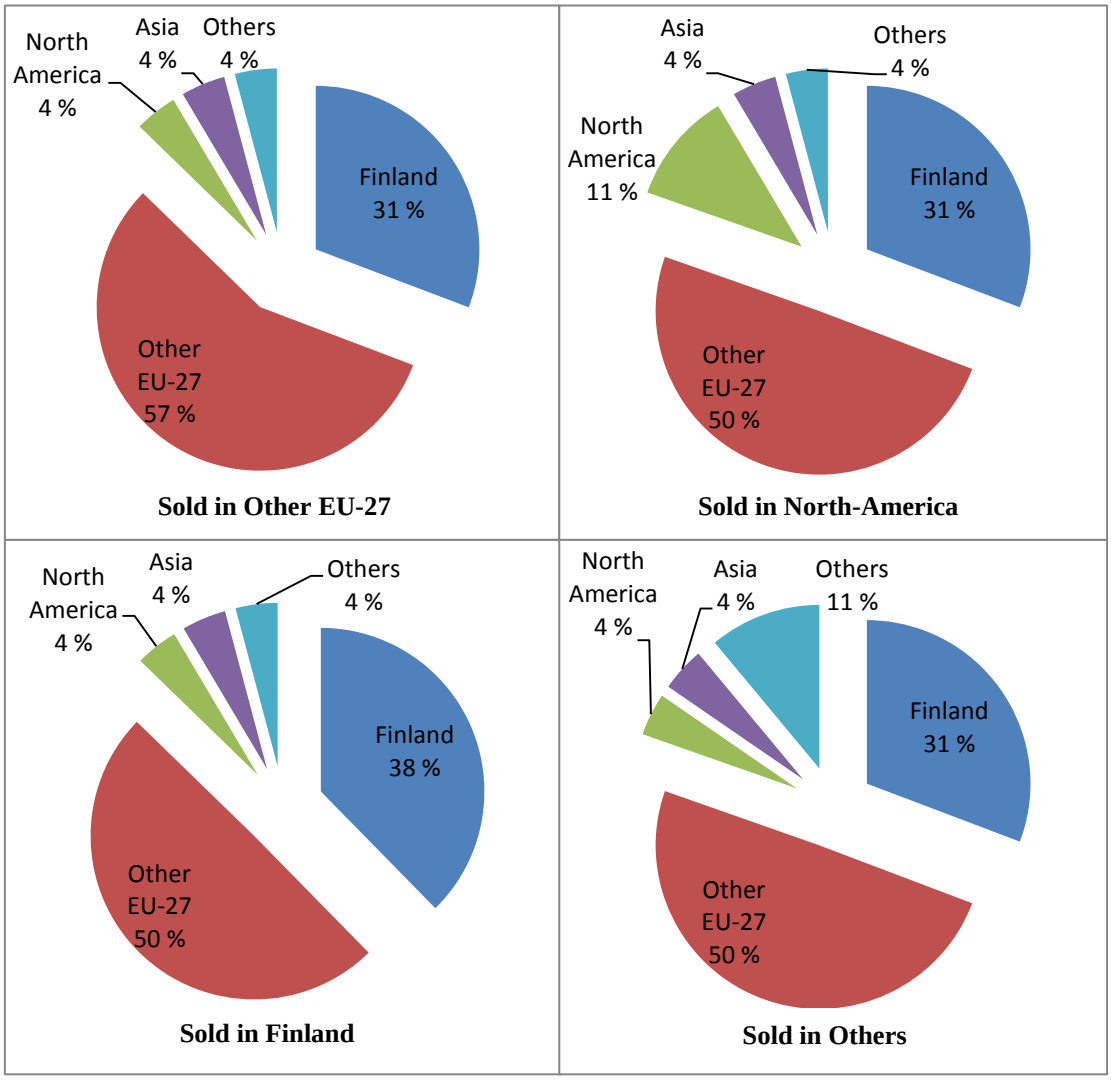


Figure 14: Geographical Value Distribution of **P100** & Region of Sales (Finland)

As we can see from the previous figures, the geographical value distribution of P100 is for the most part very similar to P25 value distribution. Possibly the biggest difference

between the different "sizes" of the product is related to the shares of Other EU-27 and Finland, as it seems that for P100 even a larger share of the total value is created in Other EU-27. As a matter of fact, regardless of the region of sales at least 50% of the final value of P100 is always created in Other EU-27. On the other hand this means that the significance of Finland in value creation is smaller than in P25. The shares of other regions vary naturally according to the sale, but still remain in almost equal level for both "sizes".

On the whole the value distribution of production in Finland offers little room for surprises. Finland and Other EU-27 contribute most to the total value, and other regions create smaller shares of value that vary little bit according to the sales process. Perhaps the fact that Other EU-27 contributes even more value than Finland may be little bit surprising, but again as Metalli Inc. is not making any of the major components itself and the most important suppliers are located relatively nearby in Europe the explanation for this division is quite obvious. It should be noted that the different value distribution scenarios presented in this chapter are just examples of sales taking place in different regions, and do not describe the frequency/volumes of sales in any of the regions. As described in the previous chapters, the emphasis and focus of the global markets in the industry of Metalli Inc. and their product is moving more and more towards Asia in terms of both customers and production facilities. While the figures in this chapter are extremely relevant now, the future production in China and the figures in the next chapter can possibly provide a better picture of what the situation in this as well as in many other industries will look like in near future.

Production in China

The geographical distribution of value was also calculated for the possible future production in China. This was done according to data on current production of other products in the Chinese facility, data on the production in Finland and some necessary estimation. As previously mentioned, the importance of the comparison between Finland and China in terms of production is likely to increase in the future, as the

significance of Asia as a market place and as a location of production in this industry rises and Metalli Inc. is faced with a need to make decisions concerning their overall strategy and manufacturing processes.

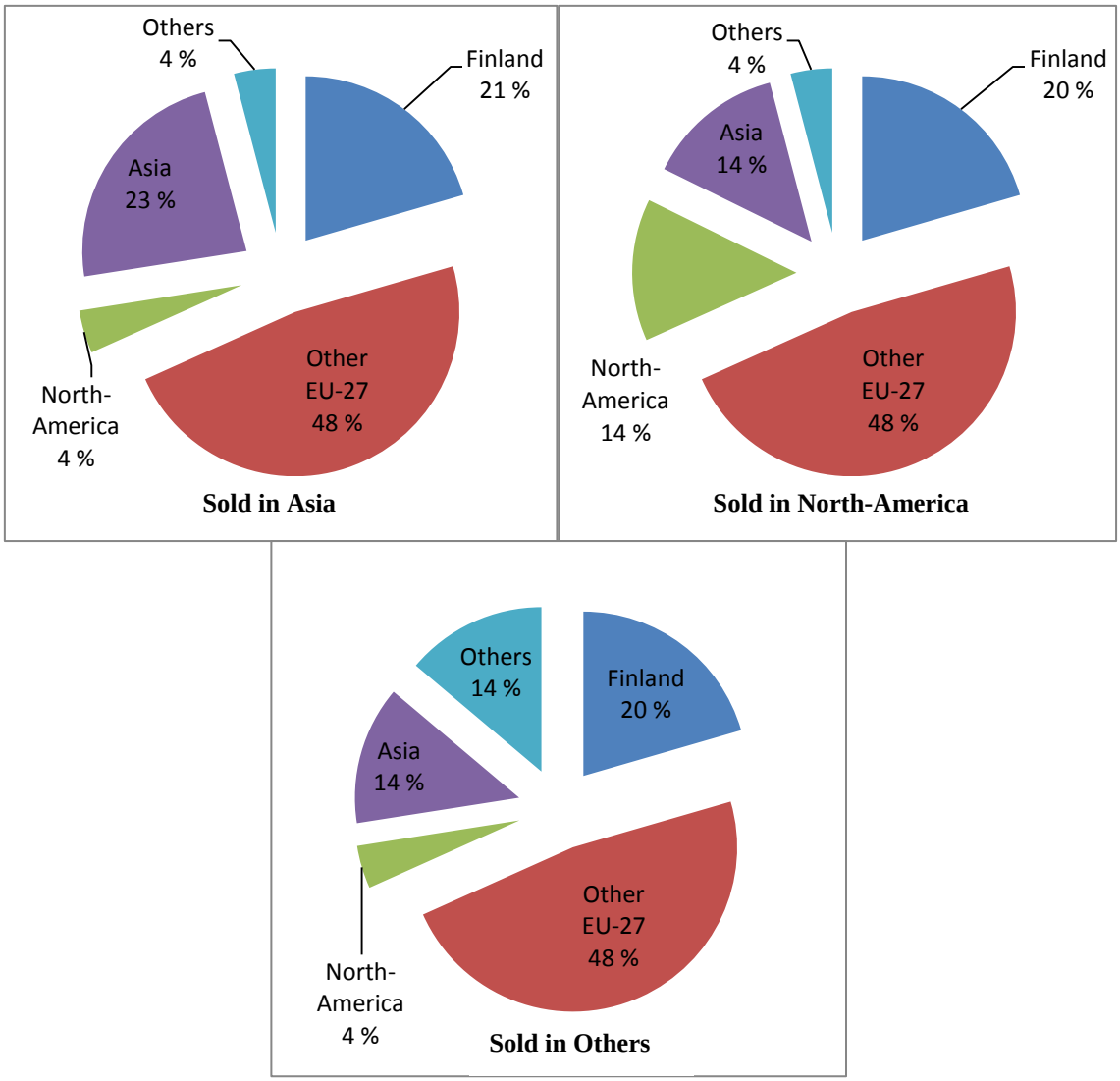


Figure 15: Geographical Value Distribution of **P25** & Region of Sales (China)

The biggest difference between production in Finland and production in China in terms of value creation is in the shares of Asia and Finland. Compared to figures in the previous chapter representing the value distribution of Finnish production, the role of Asia is evidently larger and role of Finland simultaneously smaller in the figures of

Chinese production. The dominance of Other EU-27 region in the value creation is still explicit, as its share is nearly half of the total value also in China. Again, the amount of value contributed by the less important regions varies slightly according to the location of sales and the placing of value created by logistics and dealers/agents.

This value distribution pattern is a consequence of couple of important overtones. First, it is obvious that if the product is produced in China instead of Finland, some of the component suppliers and operational functions will become "Chinese" together with the assembly process, which in turn changes the value distribution to emphasize Asia rather than Finland. Secondly, the dominant role of Other EU-27 is explained by the fact that even though the assembly/production process moves to China, the most important components of the product will still most likely be supplied by the same suppliers in and from Europe. Of course as time goes by and production in China becomes more stabilized, it could also be possible to find nearby suppliers with enough knowledge and reliability to match the current ones in Europe. This would certainly be in the interests of Chinese authorities and possibly also Metalli Inc. and many of the Chinese companies operating in the related industries, but so far best technology and know-how for the purposes of Metalli Inc. and the critical components they need for their products is still found in Europe.

Last but not least, the geographical value distribution of P100 being produced in China is very much similar to the value distributions presented before, and the patterns behind the division have not changed dramatically. The role of Other EU-27 regions as the most important value creator has not changed, and the same shift of focus from Finland to Asia already visible in P25 is still in place also in the larger model. Other less influential regions also contribute to the total value quite similarly as in other cases, and their role varies according to the sales process as usual.

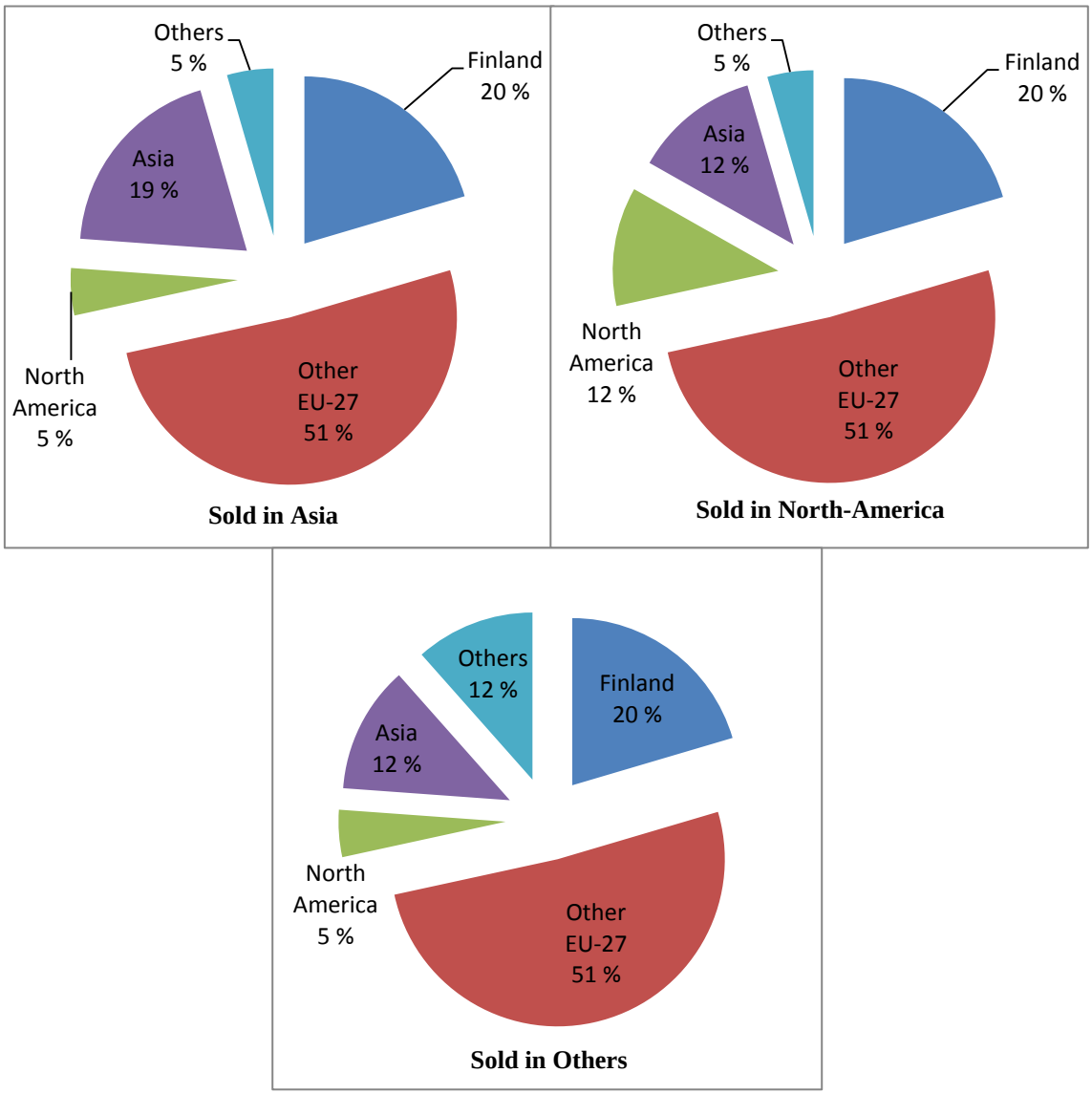


Figure 16: Geographical Value Distribution of **P100** & Region of Sales (China)

All in all, three main comparisons were made when the geographical value distribution was evaluated. Different locations of production, product "sizes" and regions of sales were checked against one another to form a more comprehensive picture of how and where the value is created and what are the underlying reasons behind this division. In the end the results were quite consistent with both each other and what was forecasted beforehand.

The findings show very explicitly that despite minor variations, Other EU-27 area is contributing roughly half of the total value in every scenario. Because of couple extremely important suppliers and their European origins the value distribution in this chain is very Europe-focused. The role of Finland varies depending on the location of production and regions of sales, and is naturally highest when both of them take place in Finland. Same rule applies also for the value contribution of Asia. North-America and Others (rest of the world) become significant value contributors only when they are the region of sales. Altogether there is very little difference between the different "sizes" of the product neither in Finnish nor Chinese production.

All in all, it has to be noted that the calculations in this research as assuming that Metalli Inc. has different final sales prices (higher in Finland than China) in both product sizes depending on the location of production. This difference is mainly caused by variation in labor costs, and it should be kept in mind while analyzing the results. However, it does not jeopardize the legitimacy of the results of value distribution as the different sizes are being evaluated separately. The higher sales price in Finland is also causing the share of value added/contributed by Metalli Inc. to be larger than what it is when to production takes place in China, as the share of value created by the sales department of Metalli Inc. is entirely allocated to Finland. This generalization was made because it best describes the current organizational structure and communication patterns within Metalli Inc. as most of the sales activity takes place or is at least managed from Finland.

4.4 Capital Flows and Repatriation of Profits

It was initially suggested by Metalli Inc. representatives that the value chain analysis could be taken one step further by investigating what happens to the profits/earnings of the Chinese subsidiary after sales deals have been completed and products delivered to the customers. In other words, how the value chain "continues" after the initial reach of investigation, how possible profits are repatriated and whether or not this is even close to being an optimal situation for Metalli Inc. This evaluation of Metalli Inc. and its

latter practices does not change the initial value creation process and its results defined in the previous chapters, but rather describe a separate phenomenon of handling the earnings/profits created by the value chain. While this is a separate issue, it can also be seen as a natural continuum for the value chain and as an extremely valuable addition to the study since at the end of the day final destination of profits is also the final destination of value created by Metalli Inc. in the value chain.

As it has been mentioned several times the product under investigation is not yet in mass production, and the only prototypes available are assembled in Finland and not in China. In addition, through interviews with Metalli Inc. representatives with expertise on Chinese markets and regulations it was discovered that in China regulations and laws for foreign international companies are under constant alteration and modification. Due to these reasons, the estimations presented in this chapter are heavily based on information/data about other products of Metalli Inc. being produced in its Chinese facility and the current status of the parts of Chinese legal and regulatory systems that are related to the operation of Metalli Inc. This means that these estimations are highly speculative and are intended to provide an educated approximation of how earnings/profits are being handled.

For the purposes of this research and in order to ensure at least a decent level of clarity, the author chose to use a fictitious example figure of profits that are being repatriated to Finland from China by Metalli Inc. The process of repatriating the profits includes several different steps, and at first sight seems quite complicated. However, ultimately the process consists of a few basic ways of transferring earnings that are being used by Metalli Inc., namely Dividends, Internal Service fees, Sales commissions and Brand/Trademark charges.

If the Chinese subsidiary had a turnover of 1 000 000€ and made a profit of 100 000€ at the end of the year, Metalli Inc. would most likely use transfer earnings back from China the following way:

Dividends

If profits of the Chinese subsidiary are 100 000€ Metalli Inc. will have to pay 25% tax in China, leaving 75000€ to be returned to Finland by dividends. However, according to Finnish-Chinese Tax Agreement, additional 5% tax have to be paid out of the 75 000€ when money is transferred between these countries. This leaves **71 250€** as the final sum of money that is possible to repatriate to Finland through dividends. Naturally in Finland taxes also have to be paid again by individuals/organization receiving the dividends according to the Finnish capital gain tax laws.

Internal Service Fee

As the turnover of Chinese subsidiary is 1 000 000€, Metalli Inc. charges 7% of that from China as Internal Service Fees. In other words, 70 000€ can be returned to Finland through this method. Metalli Inc. has to pay taxes for roughly 11% for this 70 000€, leaving the final repatriated sum as **62 300€.**

Sales Commission

Out of the 1 000 000€ turnover Metalli Inc. charges 5% as Sales Commission from the Chinese subsidiary. This way another 50 000€ is returned back to Finland. Again, Metalli Inc. has to pay a tax of approximately 6% for this sum, meaning that the final sum repatriated is **47 000€.**

Brand/Trademark Charge

As soon as all the patents required for the product under investigation are also approved in China by the local officials, Metalli Inc. can also charge their Chinese subsidiary roughly 2% of the turnover in Brand/Trademark royalties. This means that another 20 000€ can be returned to Finland, and after a tax of circa 16% the final sum is **16 800€.**

According to the Metalli Inc. representatives they are very likely to use Internal service fees, Sales commissions and Brand7Trademark charges also for P25 and P100 as they

have done with Metalli Inc.'s other products being currently produced in China. Also dividends will probably be used to some extent, but not quite as extensively as there are multiple layers of taxes that need to be paid with this method.

Referring back to the previous example, altogether after taxes Metalli Inc. will repatriate **126 100€ - 197 350€ (Internal service fee + Sales Commission + Brand/Trademark Charge + no/proportion/all dividends)** from China to Finland depending on the dividends and how widely they will be used in the process. In other words, this is roughly **12,6% -19,7%** of the total fictional turnover (1 000 000€) of the Chinese subsidiary. This can be considered to be a relatively high percentage, especially considering the level of profits (100 000€) made by the Chinese subsidiary. Of course also this figure is completely fictitious and created only for this example, but serves as a best possible estimation of the real life situation.

All in all, this example of capital flows and repatriation of profits is a simplified version of real life, and surely ignores some details that could be considered important in other occasions. However, this example and the calculations in it highlight the central path of events that take place when the parent Metalli Inc. is transferring earnings back to Finland. As there is a noticeable amount of value created in Asia in the value chain especially when the products are being produced in China, this movement of capital "after" the chain tells the story a little bit further. In the end, Metalli Inc. is still very much a Finnish company that is lead from the headquarters and sees the Chinese operations more as a way of saving money rather than an ultimate place to create value.

5. DISCUSSION AND ANALYSIS

As this project was predesigned and structured by ETLA, it was comparatively challenging to find relevant academic literature that would be both useful and interesting at the same time. However, there are some interesting viewpoints gathered in the literature review, and in this section they will be reflected with the findings of the research from previous chapter. Even though it may not seem so at first sight, all in all the concepts of GVC governance, quality standards, upgrading and offshoring are extremely relevant also for the purposes and results of this study.

The results of this research and especially the geographical distribution of value show that Metalli Inc. is operating in a truly global economy, where global players, local firms and standard setting policy networks are tangled up in international networks that are full of different value chains. In fact Metalli Inc. fits well into the World Economic Triangle introduced by Messner (2004), in which global standards are seen as "tickets" to global value chains and markets just like in the industry of global freight traffic engines. Messner (2004) also highlights the role of global buyers and interrelationship between lead firms and smaller local players and in this sense Metalli Inc. can be seen both as a small supplier for truly global vehicle producers as well as a leading firm in the newly established market with several different suppliers.

Considering the definition of GVC governance introduced by Bair et.al. (2008), Metalli Inc. is in a central governing position in the chain of their new products P25 and P100. They handle the production/assembly in-house, constantly monitor the quality of components provided by suppliers and monitor the distribution network as well as their own overall strategy. Despite the fact that a large proportion of value in organizational distribution is created by suppliers and, especially the few suppliers of the most important components, this does not mean that these suppliers would be in the position of governing or controlling Metalli Inc. Since their knowledge is not scarce and can be found from several other similar producers as well, Metalli Inc. is constantly evaluating the quality of the major components and is prepared to switch suppliers if it is necessary

and beneficial. On the other hand, the geographical distribution of value shows that the value chain of both product "sizes" and production locations is widely spread all over the globe, and therefore the central position of Metalli Inc. or any other organization is perhaps more distinct in theory than in real life.

As we look at the different basic GVC governance types provided by Gereffi et al. (2005), it is quite hard to decide which type would best describe the value chain if Metalli Inc. in this instance. Even though Metalli Inc. is able to change basically all of their suppliers if necessary, it is also in their best interest to form long lasting positive relations with partnering companies. They are also only one of the numerous machinery suppliers for their large vehicle producing customers, and these sales contacts and deals are very much based on previous relationships and contacts. These features would indicate the value chain to be relational, but as always price is an important factor for Metalli Inc. both in relation to suppliers as well as distributors/customers. This would indicate market-type of value chain, but many times the solutions provided by Metalli Inc. to their customers are also quite unique/turn-key projects, that in theory would best fit in modular chains. On the other hand, there are so clear characteristics of captive or hierarchical value chain that would have risen in this investigation. Therefore, it can be stated that governance in the value chain of Metalli Inc. is mainly relational, but includes features from market and modular types of governance that are quite important and cannot be neglected when the overall structure of the chain is being evaluated.

One feature of Metalli Inc. and the industry it is operating in that simply cannot be avoided is market wide standards and quality assurance that play a major role in setting the scene for the ability to sell and deliver the products in hand. In other words, it is mandatory for Metalli Inc. and its competitors to comply with certain international standards in terms of the reliability and effectiveness of the products in order to form customer relationships and catch any share of the market. In the different global standard categories described by Nadvi and Wältring (2004), Metalli Inc. and the industry it is operating in is most concerned with regulations related to quality assurance and environment. These standards are very generic, driven by international businesses,

NGOs and other organizations and are legally mandatory for everyone. The sanctions for breaking these binding regulations are still relatively unclear, as the whole industry and everything around are still very young.

The notion and use of standards and regulations as GVC governance-tools is very interesting, and the practical application of the theory in this particular industry also extremely vivid. The notion of Ponte and Gibbon (2005) of the fact that many value chains become more and more buyer-driven due to the increased standards and regulation holds true also in this case, as Metalli Inc. and other companies need to please their customers not only through good relations, but also through delivering products that live up the expectations set by various rules and regulations. This is a major reason also for Metalli Inc. to keep R&D and assembly work in-house, as they want to make sure there are no issues with the quality of their delivered products. Again, as Ponte & Gibbon (2005) describe though their theory, the level of explicit coordination does not necessarily change as the hands-off coordination increases like it has done in this particular industry. In the eyes of final customers, i.e. vehicle manufacturers and transportation companies, the one and only indicator of reliable quality is the compliance with international standards, and professional/personal relations in this sense are less important than before.

Despite the fact that all the concepts introduced in the literature review are important and have at least some practical application also for the results of this research, perhaps the most interesting one for Metalli Inc. is the concept of upgrading. According to Humphrey & Schmitz (2000) the ability to perform upgrading has often a lot to do with underlying GVC governance patterns and the position of each company in the chain. While different companies perform upgrading for different purposes, in the light of results of this research it is safe to assume that a major reason for Metalli Inc. to expand their operations to new products, processes and functions would be to catch a larger share of the total value created in the value chain. As the findings of this research indicate, Metalli Inc. generally only contributes roughly 20-30% of the total value created depending on the location of production and sales. This being said, the

previously mentioned GVC types introduced by Gereffi et al. (2005) would lead us to believe that while Metalli Inc. has positioned itself in its value chain network mainly through market-based and relational connections, it has good capability to do upgrading especially towards upstream and the suppliers and possibly also downstream towards the dealers/agents. On the other hand, this type of upgrading can only take place to a certain extent, and it is not feasible or reasonable for Metalli Inc. or any other company of similar type to expand throughout this type of value chain all the way from foundries to final vehicles and transportation.

All in all, even though the concept of upgrading is a tempting theme, and already through a rather brief review of the relevant literature it seems that it would be very useful area of investigation also for Metalli Inc., unfortunately it would require a lot more research and investigation that is simply outside the scope of this individual project. As said, Metalli Inc. is contributing relatively little to the overall value of their products, and upgrading can be seen as one of the most effective ways to increase this share and gain more leverage in the chain.

Besides GVC governance, quality standards and upgrading a fourth major topic in which theory and practical implications of this research are united is offshoring. While Levy (2005) argues that in modern global business companies can relocate almost any functions of their operations if they wish, and Harms et al. (2009) continue by identifying cost savings as the most common reason for offshoring, for Metalli Inc. the current situation seems much more stable. They have already offshored a large proportion of their assembly/production to China, and external parties perform most other functions. Since Metalli Inc. is basically only doing R&D, some sales and some assembly in Finland, there is not much left to offshore or outsource for that matter.

Besides offshoring it has to be noted that many of the different functions in the investigated value chain are performed by external parties and not by Metalli Inc. This does not necessarily mean that these functions are outsourced, but in every case Metalli Inc. has a strategy of performing only very few of all the different functions needed to

complete the chain. In this sense Metalli Inc. seems to follow quite well the model introduced by Contractor et al. (2010) about allocation of value chain activities. In the light of the results of this research this means that it is no surprise that Metalli Inc. is itself contributing only a certain share of the overall value and there are several other players contributing equal or even larger shares. While the different functions are dispersed in terms of organizations, also the value created is dispersed as well.

Furthermore, also geographically Contractor et al. (2010) manage to picture relatively well the current situation and development of Metalli Inc. operations. While the company moves their production/assembly operations to China, also the share of Asia of the total value created increases. Again, even though other companies than Metalli Inc. itself create a large proportion of the total value, their share remains relatively stable and is presented through the large share of Other EU-27 area in all the charts in the findings section. Both offshoring and use of other companies to perform significant functions, i.e. outsourcing are therefore affecting both organizational and geographical value distribution by increasing dispersion and versatility across the line. For Metalli Inc. the organizational distribution is much dispersed and especially different suppliers play a major role in the equation. In addition, three areas, namely Finland, Other EU-27 and Asia, heavily influence geographical distribution of value. Behind their large shares are the countries of origin of Metalli Inc., suppliers taking care of significant outsourced functions/components and offshoring to cheaper location accordingly. All in all, the current value distribution in this chain resembles larger strategic decisions made by Metalli Inc. and other related actors in the past.

Besides reflecting the results of this research with the theoretical background built in the literature review, it is also useful to consider the initial research questions of the study and link them to the results through theory and especially through the discussion related to offshoring and outsourcing. All in all Metalli Inc. is involved in a truly global value chain that concerns all continents around the globe. On the other hand, a distinct majority of the total value is created by Metalli Inc. and the few most important 1st tier suppliers, which together contribute more than 50% of the total value regardless of the

location of the production or the model of the product. Furthermore, as Metalli Inc. has a fair share of their operations still in Finland and the largest 1st tier suppliers are European, the geographical distribution of value is heavily centered on Finland and rest of EU-27 area.

As we consider the different outsourcing and/or offshoring options Metalli Inc. has regarding their current business operations and GVC, the results of this research indicate various phenomena. Obviously Metalli Inc. desires to generate as much of the total value of the product as possible, and in order to achieve this they need to evaluate the role of the few largest 1st tier suppliers. As the results indicate, while almost all other operations/functions are less significant for the value creation and can be outsourced, the share of those few most important components should conversely be brought inside the company in order to increase the value contribution. On the other hand, lover production costs indicate that outsourcing efforts should be continued and more focus should be given to low-cost countries in every possible function, particularly as a large proportion of key functions still lie in expensive Finland. Before committing itself into any large offshoring & outsourcing changes Metalli Inc. needs to take into account issues related to Quality standards, Upgrading and GVC Governance that underlie both geographical and organizational changes in business as well as GVC structures as a whole.

Coming back to the research questions, the first one (*What are the value networks and chains case company Metalli Inc. belongs to through the product under investigation?*) remained in a relatively general level revealing that Metalli Inc.'s value chain is truly global. Through questions two (*How and by whom is the total value of the investigated product formed at different stages of the value chain, and what is the share of Metalli Inc.?*) and three (*How is the value added geographically distributed between Finland and other countries?*) it was revealed that in order to make either geographical or organizational changes in its production and value chain, Metalli Inc. has to carefully consider the results of this research in the light of offshoring & outsourcing theory and also all the other related surrounding theories. Question four (*How does the*

organizational and geographical value distribution differ for Metalli Inc. between their original production facilities in Finland and their offshored facilities in China?) gave more insights for the current business environment and surroundings in which Metalli Inc. has to coordinate and improve their GVC structure and positioning. Question five (*How the value is finally distributed, considering the capital gains and surplus that are transferred back to the headquarters of Metalli Inc. from its subsidiaries?*) was intended for considering the value chain further and speculating with the possibilities of repatriating the profits/value created back to Finland, the home country of Metalli Inc. While this question and the calculations used for answering and clarifying it are highly speculative, it can be stated that if Metalli Inc. wishes to do so it can repatriate a large proportion of the value/profit created abroad back to Finland. In other words, in the end the importance of Finland in the value chain and profit creation is at least currently still very high for Metalli Inc. and perhaps even higher than what the initial results indicate.

All in all, this section has been emphasizing the linkage and interaction between the research questions, results of this research, relevant academic literature including key and surrounding theories as well as general discussion of the same subject matter. Even though there were a few more concepts introduced in the literature review, the surrounding theories of GVC governance, quality standards and upgrading as parts of offshoring and outsourcing decision-making in international business environment were considered to be most valuable in the light of the empirical findings and practical implications for Metalli Inc. The value chain model and value distribution both geographically and organizationally describe Metalli Inc. and its strategy well also in a larger picture, and illustrate the nature of the whole industry relatively accurately. As this discussion and analysis section is trying to signalize, empirical findings about value creation are a part of a larger environment Metalli Inc. is operating in, and should therefore be seen as one part of a larger economic ecosystem with several interrelated occurrences taking place all around.

6. CONCLUSION

This study has focused on defining the value creation process of products from a case company called Metalli Inc. and defining the value distribution both in terms of geography and organizations. In addition, some indication to how profits and capital flows are being moved and repatriated within the case company has also been given, together with a relatively comprehensive review at the relevant academic literature and how the findings of this particular research fit in to it. All in all, the besides the original research problem of defining where the value is created within a global value chain of an individual product, this research was aiming at clarifying the big picture and the environment Metalli Inc. is operating in and the value chain is part of. The importance of this research is therefore the fact that is helping the readers to grasp the complexity of modern global business environment through identifying an example of value creation process and chain in product level.

6.1 Main Findings and Theoretical Contribution

The findings of this research have been focused on defining the value construction of a product produced by Metalli Inc. and simultaneously making comparisons between different "sizes" of the product and different regions of both production and sales. As part of a larger research initiative of ETLA, the findings of this research will be used also as material and point of comparison against other products, industries and other comparable value chains. This larger project organized by ETLA is aiming at looking the world economy from the point of view of small and open economy such as Finland, and defining the importance of this type of countries and the industries/economies to the overall global business environment.

Generally the findings of this research indicate that in this particular value chain the role of Metalli Inc. is not as large as one might expect, and the company is contributing only roughly 20-30% of the final value of the product. The role of the most important suppliers is significant, as is the role of several 2nd and 3rd tier suppliers together. As we move downstream in the value chain, roles of different agents/dealers, transportation

and other middlemen between Metalli Inc. and their end customers are noticeable but not extremely significant in terms of the total value. Geographically, the value in this particular chain was heavily concentrated to Finland, Other EU-27 area and China, which is understandable considering the locations of Metalli Inc.'s production (Finland and China) and the locations of their biggest suppliers (Other EU-27).

As also mentioned before, there is not much previous research done of global value chains in the level of individual products. Studies by Ali-Yrkkö (2010) and Linden et al. (2009) are some of the few previously published examples of similar studies with consistent purpose. The biggest additions to current existing research through this study will become more concrete as the larger research entirety of ETLA is finished and fine-tuned. The new knowledge created in this research about this particular industry and product can and will be used as a reference and comparison point to other similar cases in various industries and fields of business. Alone the results of this project are an interesting example of value chain construction and value distribution, but together with other similar cases in ETLA's project they are an interesting package of data about the Finnish economy as a whole.

In terms of other relevant academic literature presented in the literature review, the findings of this study are rather examples of how those theories apply in real value chain model rather than an extension to the existing theoretical base. The key theoretical concepts are closely linked to the value chain model and value distribution, and together form the bigger picture of the business environment Metalli Inc. is operating in, as was the target of this research project right from the start. In the end, for the purposes of both businesses and academic professionals forming a picture of vast and global business environment through one single product seems like a difficult task, but a proper mapping of the value chain model and the distribution of value describes the case company and its environment extremely well. The web of different connections, interactions and partners build a decent picture of the different operations and actions case companies such as Metalli Inc. are performing and what they could possible do to improve their processes.

6.2 Managerial Implications

Even though one might think that every company has a clear and holistic picture of the value chains and value distribution of their products, this is not always the case. Companies generally roughly know their own position and status in the chain, but forming a comprehensive picture of global value chains is much more unusual. This is where the findings and results of this research come in handy for Metalli Inc. that can form a complete picture of the value creation and distribution of the product that is extremely important for the future of the whole company. Understanding the linkages and interactions between different companies and actors in the chain also helps managers at Metalli Inc. to make strategic decisions concerning their core and non-core activities and functions.

Organizationally, the findings of this research can guide Metalli Inc. in their outsourcing/insourcing decisions and help in pursuit of grapping a larger share of the total value of the product. Identifying other large value contributors besides Metalli Inc. is important also for defining the most important and influential relationships both towards suppliers as well as customers and agents/dealers. On the other hand, geographical findings allow Metalli Inc. to evaluate the value distribution of their product against the overall industry and the different markets around the world. Ensuring that the company is close to their important markets and customers also in terms of production is a priority for any company, and therefore Metalli Inc. can use the findings to guarantee a good balance between the versatility and concentration of their operations also geographically.

As the organizational distribution of value is reflected to the current situation of Metalli Inc. it might seem as if the most important 1st tier suppliers had a too important and dominant position in the chain. However, while the components they supply to Metalli Inc. are expensive and crucial for the product in hand, there are also other companies with similar capabilities with the current suppliers. This means that these 1st tier suppliers are facing strong competition and Metalli Inc. can and is constantly looking

for opportunities for better deals from other companies. As Metalli Inc. also possesses existing contacts and connections to customers and agents/dealers towards the other end of the value chain, the threat of suppliers becoming too important or replacing Metalli Inc. in the chain is very small. However, is should also be noted that while this particular value chain seems very beneficial and lucrative for Metalli Inc. it has several competitors that are operating through their own value chains and networks of connections. Management at Metalli Inc. has to ensure that the company stays competitive not only in the eyes of customers, but also in the eyes of suppliers and other partners with the ability to switch to a whole different chain of partners. In other words, the threat of competition and competitiveness is rather external than internal for Metalli when this particular value chain is considered.

In addition, different comparisons related to the product "size" and locations of production and sales provide Metalli Inc. with tools to evaluate and compare different scenarios related to their product, and adjust the production accordingly if needed. These variations are relatively small, but offer insights for Metalli Inc. on how the different functions being performed in different areas differ and affect the overall value. All in all, all the information gained about value distribution and creation through this research is helpful for Metalli Inc. in forming the big picture of different functions and organizations that are related to the production process of their products.

6.3 Suggestions for Further Research

As this research is part of a larger project of ETLA, the natural extension for this particular study is to compare it with other similar cases and make further conclusions and findings out of that larger body of data. This is exactly what ETLA is doing and that large project is notable for the whole Finnish economy. In terms of this individual research, the investigation of data could naturally be taken into more detail, and the calculation of value added by different organizations could be broken down further into smaller and more accurate pieces. Due to different constraints related mostly to time and data acquisition this study could not take the analysis any further, but fine-tuning the

calculations would provide results that are more accurate and therefore also more reliable.

One additional direction for further research could be to fully investigate the capital flows and repatriation of profits for Metalli Inc., and besides a hypothetical example truly extend the value chain analysis to include stages after the traditional value creation. However, this should be done after production of these products really takes place also in other locations besides Finland, and real figures and numbers are available and comparable.

Furthermore, as this study and also the larger ETLA project are focusing on Finland, an interesting comparison could be made if further research was focusing on another relatively similar small and open economy or perhaps on a totally different type of economy. Understandable this would require an extensive amount of resources from the researching party in order to create roughly equal amount of data and comparable results, but if this was achieved the findings could be extremely interesting and noteworthy. All in all, this project has given indication to how well value created in an internationally operating Finnish company actually stays in Finland and in the parent company, and how much of it is distributed across different regions geographically and how much across different co-operating organizations and companies. While the project serves as a workable example, much more research is needed for economy wide predictions and creating results that truly make a difference in a larger scale.

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APPENDICES

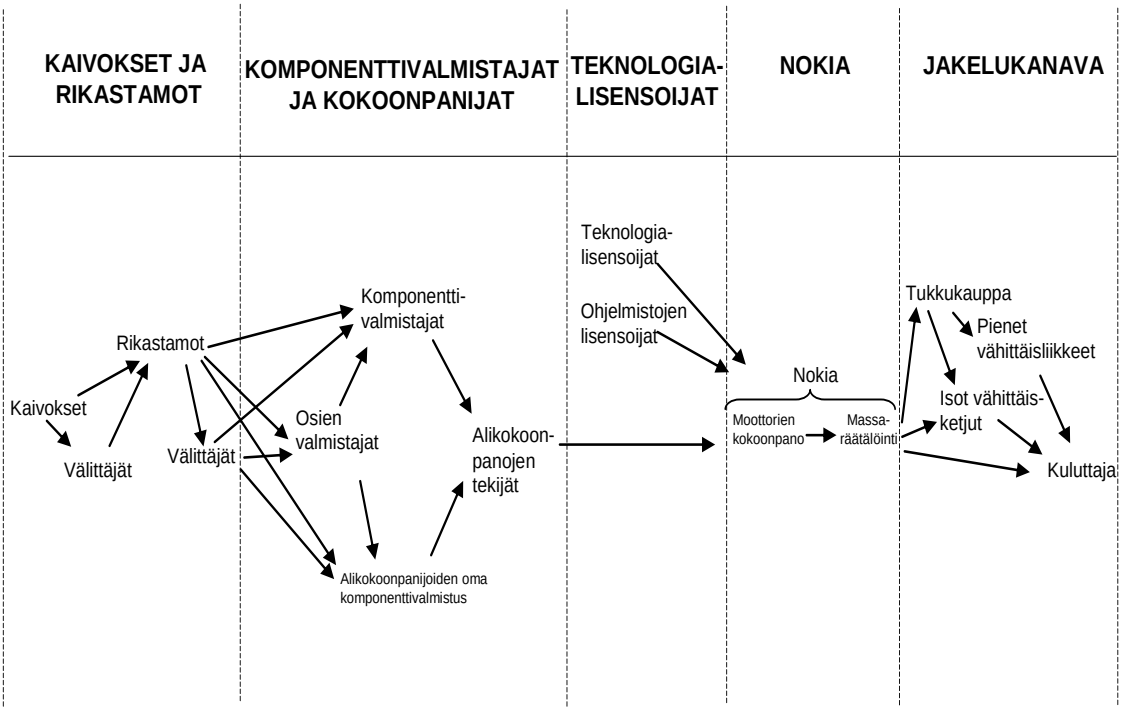
Appendix 1. Interview Structure provided by ETLA (Translated from Finnish to English)

1. THE STRUCTURE OF THE ORDER-DELIVERY- CHAIN AT THE MOMENT

The order-delivery chain describes the position of the organizations in the actor network, and the journey of the product or of the service from the raw material suppliers to the final consumer. All the firms that participate in the production of the product/service or in the delivery of the product to the client are part of the chain. The purpose of the order-delivery- chain analysis is to map the journey of an existing product or service from an organization to another one and finally to the consumer or the end user firm.

Through this group of questions we aim define the position of the case-company in the order delivery chain. At the same time we are tracking down the whole order-delivery chain of the case product or service. It may not be possible to track down the whole chain just by interviewing the case company and thus it may be necessary to also interview some strategic supplier companies and/or clients.

What is the structure of your product's order-delivery chain according to the guidelines of the following example (in Finnish)?



- Who are your direct clients or who do you sell your products to?
- Who are the clients of your clients and possibly their clients?
- Which are the central changes in the client group since the year 2000/in the 21st century?

2. THE PRODUCT STRUCTURE, THE SUPPLIERS AND THE GEOGRAPHY

Through these questions we aim to determine the product structure of the case product. Which parts the product or service consist of? Additionally, the price and origin of every component and the raw material is detected. An essential part of this theme is to find out how many inputs related to the product are bought from other companies. What is the component-specific BOM (Bill of Materials) of the case product, including a detailed list of all the components and raw materials used? If the assemblage of the product is done e.g. in two different countries, it would be advisable to have the BOM of each of these countries.

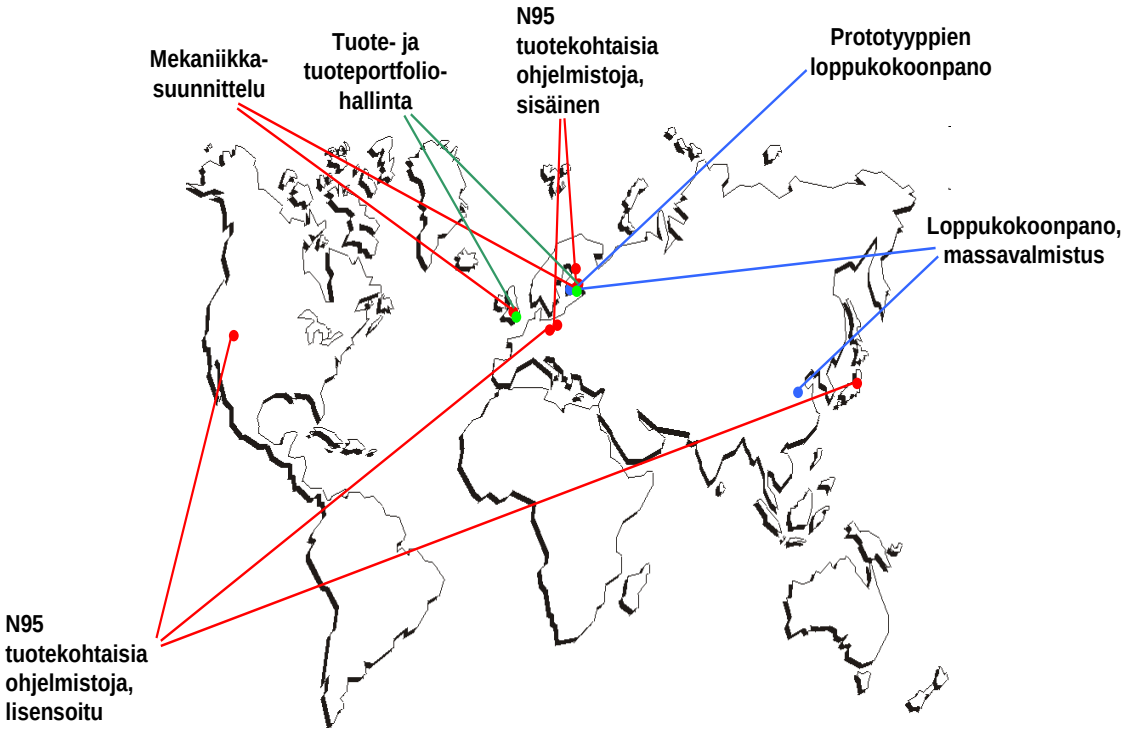
- The following information is needed of every component:

- The name of the component or of the raw material?
- The name of the supplying company?
- The price you pay?
- The country of manufacture: where was the component or raw material produced?
- The design or the R&D country of the component (naturally this does not apply to the raw material)?
- Who are the suppliers or subcontractors of the suppliers?
- The licenses and royalties paid?
- Which are the total costs of the product assemblage?
- The other costs (energy, logistics and overheads)?

In addition to the physical components, the possible licenses or other immaterial inputs that have been purchased will be included.

3. THE TASKS RELATED TO THE PRODUCT AND THEIR LOCATION

- Which are the central tasks related to the production, development and maintenance of the product/service?
- Based on the model below, where were/are the tasks performed?



Examples of the tasks:

Tasks related to the development of the product or service:

- The concept design/planning
- The industrial design
- The software development

The manufacturing of the product or the realization of the service:

- Prototype manufacturing or piloting of the service
- Mass manufacturing or production of the service

Others:

- The product management and the control of the product portfolio
- Sourcing
- Sales, marketing and branding

4. OTHER QUESTIONS

- What is the selling price of the product?
- Does the selling price vary according to the region (to different countries) or the client?
- What is the price paid by the consumer (if known)?
- Which are the terms of delivery when the product is sold?
- If "delivered free to customer", then what are the costs of delivery (freight, insurance etc.)?

5. CALCULATING THE DISTRIBUTION OF THE ADDED VALUE IN THE ORGANIZATIONS

Through these questions we aim to detect the origins of the added value in the order-delivery chain. The total added value of the product/service is the tax free price paid by the end consumer. This total added value can originate in dozens or hundreds of companies. Each part of the order-delivery-chain purchases raw materials, components or services, refines or processes them and sells them on to its own clients. The added value of each organization is calculated in the following way:

Value added = the selling price of the product or the service – all the purchases related to the production of the product/service

We can attain the same result by using the following formula:

Value added = Business profit + the labor costs related to the production of the product or service + the write-offs/depreciation related to the production of the product/service + the rents related to the production of the product/service