The impact of regulation on innovation in the logistics sector

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1. INTRODUCTION

Innovation is the driving force for companies nowadays. The European Union is promoting both entrepreneurship and innovation in order to achieve both economic growth and progress on important social issues. Even though the European Union is encouraging innovation, European companies cannot compete with companies in other continents like Asia and North America (Nixon, 2015). A possible reason why the European Union is not able to compete with companies from other continents is regulation. Regulation can be a powerful stimulus in order to support innovation and entrepreneurship in companies (Pelkmans & Renda, 2014). Examples of regulation that might help innovators are patents and copyright. However, regulation can also have a negative impact on innovation. In this research, the impact of regulation on innovative activities carried out by SME's will be researched. General ideas exist about the impact of regulation on innovation, but the available literature shows that there is need for more specific studies. Since there has not been done a lot of research on the effect of regulation on innovation in the logistics sector yet, this research is focused on companies active in the logistics sector. The assumption that regulation can be a powerful stimulus to innovation will be tested.

The central research question in this paper is:

"In what ways do general regulations such as competition rules support or constrain small entrepreneurs from successfully launching innovations in the logistics sector?"

In order to answer this question, several sub-questions will be analyzed, which are:

• What types of laws and regulation matter most for the success for innovative entrepreneurs in the logistics sector?

• In what ways can law and regulation help small innovators access markets dominated by big companies in the logistics sector?

• In what way can law and regulations hinder small innovators in the logistics sector?

• What type of regulatory approach is the most suitable in the logistics sector?

1.1 Research project rationale

A lot of research has been done on the impact of regulation on innovation. As stated before, this research will focus on the logistics sector. Unfortunately, research on the impact of regulation on innovation in the logistics sector has been done little, especially in the Netherlands. Due to the lack of case studies in this field, I want to do research about the effect of a more specific kind of regulation in this sector. This paper will discuss the impact of competition law on the innovative activities of firms operating in the logistics sector. If competition regulation has a negative impact on innovation in this sector, this research can help the government to change the regulation. In this way, the governments can help new entrepreneurs in the logistics sector to invest a lot in innovation. Existing entrepreneurs can also profit from the improved law making, the incentives of innovation will stimulate their work effort. In this way, companies in Europe will be able to compete with companies from different continents. It will be of huge importance to know whether the competition rules have a constraining or stimulating impact on innovative activities. Besides the social relevance to research this subject, the scientific relevance of this research is also important. The demand for data in the logistics sector is higher than ever. We live in a knowledge based economy where firms with more knowledge systematically outperform firms with less knowledge (Oslo Manual, p.15). Transport companies take every effort in order to reduce the costs. Those companies choose to hire East-European employees, because they get paid less than West-European employees. This leads to many problems in several countries. By being innovative, those companies can find other ways in order to reduce the costs instead of hiring East-European employees. The transport process could be more efficient by retrieving data faster. The weight of trucks should be known fast, in order to save time and money. Innovation is important in order to develop fast weighing systems.

1.2 Research project objective

The objective of this research is to research whether competition regulation stimulates or constrains innovation in the logistics sector. This area of law matter for this research since there is a positive linear effect of competition on innovation according to Blundell, Griffith and Van Reenen, (1999). As stated before, there is a lack of case studies in the field of the impact of regulation on innovation in the logistics sector in the Netherlands. It is important that European companies can get a competitive advantage over companies in other continents. A country's economic performance can be improved by competition and it provides new business opportunities for citizens. (CAT, 2015 p.5) In this way it can reduces the costs of goods and services throughout the whole economy. In order to stimulate entrepreneurs in this sector, it is important to research this issue.

2. THEORETICAL FRAMEWORK

In this section, an overview of the main theories and concepts is given. Furthermore, the importance of these theories and concepts will be elaborated on. All theories and concepts will be elaborated on later in this section. Since this research is based on the impact of regulation on innovation, it is important to define both innovation and regulation. Also the importance of innovation for SME's must be analysed. Besides, there is a need for a standard in order to measure innovation. After defining the term regulation, the types of regulation are named, which are: public regulation and private regulation. Strategic behaviour and power can also occur in this sector. These factors can influence competition between companies in the logistics sector (Pelkmans & Renda, 2014 p.17). Competition law can be a powerful instrument in order to discourage unfair competition. Two types of regulatory approaches can be distinguished: prescriptive and flexible approach (Pelkmans & Renda, 2014 p.17). This research investigates which type of approach occurs in the logistics sector and whether this has a positive or negative effect on innovation. Finally, the link between regulation and innovation will be discussed. The effect of regulation on innovation depends on the type of regulation, which is present in this sector. There are five aspects of regulation that can enable or constrain innovation. These five aspects are: administrative burdens, compliance burdens, timing, flexibility and uncertainty (J. Pelkmans and A. Renda, 2014 p. 20-22). These aspects can have a direct impact on innovation. By investigating which aspects constrain innovation most, regulations can be adjusted in order to enable innovation.

2.1 Innovation

2.1.1 Definition of innovation

Innovation is a broad term with a lot of diversity in definitions. Because this research is based on organizations in the logistics sector, definitions of organizational innovation will be used. The most straightforward and early definition is: 'Innovation is the generation, acceptance and implementation of new ideas, processes products or services' (Thompson 1965, p.2). A more recent definition of innovation was proposed by West and

Anderson (1996): 'Innovation can be defined as the effective application of processes and products new to the organization and designed to benefit it and its stakeholders'. For this research, the most recent definition of innovation is the most applicable one to use, since this research is based on companies of MKB top 100 of innovations. Entrepreneurs which participated with the MKB top 100 of innovation, found that their revenue raised and more jobs were created (www.MKB.nl, 2017) (This means that the organization and the stakeholders benefit from the innovations. We can classify innovation into four categories based on the impact of innovation. It is relevant for us to distinguish these different types of innovation, because we need to identify which types of innovation are most common in the logistics sector. Some types of innovation can access the market faster than other types. When there are relatively small changes in technologies or products with little benefits for customers, we speak of incremental innovation (Chandy and Tellis, 1998). When an innovation provides higher customer benefits, we speak of a market breakthrough (Chandy and Tellis, 1998; McMillan, 2010). When an innovation is substantially different than an existing product, but it does not provide benefits for the customer, it is called a Technological breakthrough (Chandy and Tellis, 1998; McMillan, 2010). The last type of innovation is a radical innovation. A radical innovation is a disruptive innovation with first time features (Dibrell et al., 2008; Assink, 2006) that transform existing or creates new markets (Assink, 2006). Before investigating whether regulation has a positive or negative impact on innovation, it is recommended to identify whether we can speak of innovation. In order to do this research it is important to define and innovation, since innovation can have a different meaning for companies. It is important that the companies, which are chosen for this research, are equally innovative in order to avoid bias.

2.1.2 Measurement of innovation

Since this research is based on companies, I will focus on the measure of innovation at the organizational level. The measure of innovation can be done through internal benchmarking and surveys. There are several ways in order to measure innovation. According to Miller and Friesen, the performance of innovation can be measured by three factors. The first factor is the existence of a research and development department. The second factor is the launching of many new products in a given period of time. The third factor is the number of significant changes in products.

In order to measure performance well the balance scorecard is used frequently because it covers several aspects of innovation. The first generation of the balanced scorecard used four perspectives to measure performance (Kaplan, Robert S; Norton, D. P. 1992). The first perspective is the financial perspective. The second perspective to measure the performance is to look at the customers. The third perspective is the internal business process and the last perspective is the learning and growth perspective. There is no general method to measure innovation performance. The balanced scorecard is the most appropriate way to measure innovation, since the balance scorecard covers a lot of perspectives. There are also drawbacks when we will use the balance scorecard. Most companies use the balance scorecard as a management tool to measure their business performance, especially when compared against their strategy (Magalhães, 2004). The balanced scorecard cannot properly measure the value added by innovation. It is necessary to add some innovation metrics to the traditional metrics of the balanced scorecard. In this way we can measure the value added by innovation without forgetting the alignment with the organization strategic objectives (Nelson Gama, 2007). By measuring the innovations of the companies chosen, we will be able to identify the advantages and disadvantages of the innovations. We need to ensure that failure of an innovation cannot be attributed to regulation.

2.1.3 The importance of innovation for SME's

For most companies is innovation important in order to create and sustain a competitive advantage. Innovation is necessary in order to stay ahead in the market and to be successful (Johne, 1999). The higher the degree of innovation, the higher the financial return will be for companies (Roy&Riedel, 1997). According to Shepherd & Ahmed, 2000, organizations are experiencing shorter product life cycles, internalization of technology-driven competition, globalization of manufacturing and increasing customer needs. In order to deal with these challenges, organizations need to develop innovative products, strategies and processes. Since SME's do not have those resources available as some multinationals, the importance of innovation should be stressed more. As stated before, competition has a positive linear effect on innovation. So when competition increases, it will improve a country's economic performance. This will lead to new business opportunities for citizens in this country, so innovation is an issue we should care all about.

2.2 Regulation

The OECD defines regulation as 'the full range of legal instruments by which governing institutions, at all levels of government, impose obligations or constraints on private sector behaviour. Constitutions, parliamentary laws, subordinate legislation, decrees, orders, norms, licenses, plans, codes and even some forms of administrative guidance can all be considered as regulation'. According to Julia Black, the main textbooks on regulation identify three definitions. The first definition of regulation is 'the promulgation of rules by government accompanied by mechanisms for monitoring and enforcement, usually assumed to be performed through a specialist public agency. The second definition of regulation, is any form of direct state intervention in the economy, whatever form that intervention might take. The third definition of regulation, is all mechanisms of social control or influence affects all aspects of behaviour from whatever source, whether they are intentional or not.'

We can distinguish two types of regulatory approaches. The first perspective is a more prescriptive, regulatory approach. This approach can have a negative effect on innovation, since companies need to meet specific standards. In some cases it was a successful approach, so it depends per case. The second approach is a more flexible regulatory approach. The more regulation is flexible, the more positive is the impact on innovation.

Since this research is based on competition regulation, it is necessary to classify regulation into categories. By classifying regulation into categories, we will be able to identify which type of regulation is the most important in the logistics sector. We can distinguish regulation into: public regulation, private regulation. Besides these types of regulation, strategic behaviour and power can also occur in the logistics sector. The link between these types of regulation will be described in the following sector.

Public regulation refers to general rules applicable to different kind of sectors, such as competition rules, public procurement

rules, infrastructure policy, bankruptcy legislation (J. Pelkmans and A. Renda, 2014). Sector-specific regulations also belongs to public regulation, these are regulations, which are only applicable to one sector.

Private regulation in the world economy refers to the ability of private actors to establish rules and standards of behaviour across borders that end up as being recognized and implemented by agents who never formally delegated their sovereign rights to the bodies in charge of their definition and implementation (Jean-Christophe Graz, 2012). A code of conduct can also be a function of a regulatory tool in a sector.

Strategic behaviour is the general term for actions taken by firms, which are intended to influence the market environment in which they compete. Strategic behaviour includes actions to influence rivals to act cooperatively so as to raise joint profits, as well as non- cooperative actions to raise the firm's profits at the expense of rivals (OECD, 2015). Strategic behaviour can occur in industries with small numbers of buyers and sellers more likely.

In order to help us assess how free companies can work in the logistics sector, we perform an industry and market analysis using the Five Forces model by Porter. This model analyses five different forces, being supplier power, buyer power, competitive rivalry, threat of substitution, and threat of new entrants in order to determine whether a certain industry is attractive for a company to operate in. According to Porter, powerful suppliers capture more of the value for themselves by charging higher prices, limiting quality or services, or shifting costs to industry participants. This can be a big problem for SME's, whereas they are often unable to compete with large multinationals with more resources available. Because the costs are high, it will lead to fewer innovations or even no innovations. According to Porter bad inputs cause bad outputs, so the limitation of quality and services has a negative impact on innovation (Porter, 1979).

Powerful customers have more power and in this way they will be able to force and demand more in relation to not powerful customers. Powerful customers can capture more value by forcing down prices, demanding better quality or more service (thereby driving up costs) (Porter, 1979). In conclusion, power has a bad impact on innovative activities. Especially SME's are affected by powerful customers, because they have not the resources available.

In a market where power for suppliers and buyers is low, circumstances are more favourable for companies, especially for small SME's (Porter, 1979).

2.3 The link between regulation and innovation

The objective of this research is to research whether regulation stimulates or constrains innovation. There has been done little research on this topic. Recently Jacques Pelkmans and Andrea Renda researched how EU Legislation can enable and/or disable innovation. They came to the conclusion that 'regulation can be sometimes a powerful stimulus to innovation'. The type of regulation can have a great impact on innovation. The prescriptive regulation tends to constrain innovative activity. Contrary to prescriptive regulation, flexible regulation can stimulate innovative activity. Lower compliance and red-tape burdens have a positive effect on innovation (Pelkmans & Renda, 2014).

It is very difficult to draw conclusions whether regulation has a positive or negative effect on innovation, since it depends per case (Pelkmans & Renda, 2014 p.16). Public regulation usually affects both the expected costs and benefits of innovative activity, by affecting the general business environment and creating compliance and administrative burdens (Pelkmans & Renda, 2014 p.20-22). Sector-specific regulation is affecting innovation directly. The extent of such impact is a function of the timing, flexibility, stringency and uncertainty, which are generated by the rules at hand.

According to Pelkmans and Renda, 2014 there are several constraining factors to innovation. The availability of funding is one of these barriers to innovation. SME's in general have less financial resources available in comparison with larger organizations. A solution for this barrier is to make rules easier for entrepreneurs to secure funding from institutions in form of equity. Freel (2000) suggested the government to support agencies to help SME's with alternative sources of finance. Two of these sources are the Loan Guarantee Scheme and the venture capital.

In conclusion, it is very difficult to draw conclusions whether regulation has a positive or negative impact on innovation. The type of regulation is an important factor and it also depends on timing, flexibility, stringency and uncertainty of regulation. The existing knowledge provides general ideas about the impact of regulation on innovation. However, specific information is required to draw a link between these two variables in a given situation or industry. Furthermore, the output of my analysed data can be compared to the theories and ideas available in this research. The results can be explained by the theories presented in the theoretical framework.

3. RESEARCH DESIGN

In this paragraph, the basic set-up of this research will be explained. First of all, it is necessary to focus on a part of regulation, since it is a broad subject. Since the Competition Assessment Toolkit is an ideal tool to identify the impact of regulation in an industry, the focus will be on competition law. Second, it is important to find companies, which have been innovative in the last years in the logistics sector, since they have experience when entering the market. The selection of the companies will be explained in the next paragraph. The interview questions are devised based on the Competition Assessment Toolkit. These questions will be asked to the companies during the interviews. After all, the data of interviews should be analysed in order to draw a conclusion whether regulation has a positive or negative effect on innovation.

3.1 Criteria of companies

The objective for this research is to investigate whether competition law has a positive or negative impact on innovation in the logistics sector. In order to investigate this, we need companies, which were innovative in the last years. The chamber of commerce stimulates entrepreneurs to grow and innovation is a key factor of this. Innovation is a key factor of better achievements in companies. The turnover and profit can grow over time and innovation can create more employment (Tidd et al. 2005, p5). The Chamber of Commerce introduced the innovation top 100 of SME's since 2007 every year on. It is a unique opportunity to enlarge the visibility of the companies and their innovations. The MKB innovations top 100 gives new entrepreneurs the opportunity to find knowledge of existing innovations and to create new networks.

The chamber of commerce presents the top 100 most innovative companies every year in September. There are eight sectors where the innovations belong: Construction, Creative Industry, Food & Agriculture, ICT, Industry, Logistics, Human health and other. This research will be based on companies in the logistics sector. For every year, 2008 till 2015, I selected every innovation of companies in the logistics sector. In addition, I found out where the companies are based. Noord-Brabant was the most innovative province a couple of years during the period 2008 till 2015. I used three criteria to select the three companies form the logistics sector. The first criterion is whether the companies are listed more than once in the innovation top 100 of SME's. All three companies are listed twice in the innovation top 100 of SME's in the period 2008 till 2015 (MKB 2008-2015). This allows us to select companies with a track record of innovation. The second criterion is the type of transport of the particular companies. All three companies have innovations based on road transport. The third criterion is the type of innovation of the companies. All companies have innovations, which are related to software, in order to improve the efficiency of the transportation. According to these criteria three companies in the Southern part of the Netherlands are selected.

3.2 Competition criteria

In order to check whether regulation has a positive influence on innovation in the logistics sector, The Competition Assessment Toolkit (OECD list 2015, p.3). Since this Competition Assessment Toolkit is a tool for assessing the impact of regulation on competition in an industry, it is an excellent tool to apply for this research in the logistics sector. The list is developed by many members OECD, which were working for the Working Party No. 2 of the Competition Committee. In order the have fair competition between companies, the Competition Assessment Toolkit is an ideal tool to investigate it. The OECD is a unique forum where the governments of 34 countries work together to address the economic, social and environmental challenges of globalization. The OECD also helps governments to respond to new developments and concerns such as cooperate governance and information economy.

The Competition Assessment Toolkit consists out of 4 main effects and for every effect a couple of should be asked in order to check whether the effect occurs. The first effect (A) is the limitation of the number or range of suppliers. The second effect (B) is the limitation of the ability of suppliers to compete. The third effect (C) is reducing incentives of suppliers to compete. The fourth effect (D) is the limitation of choices and information available to customers (OECD list 2015). If in any case one of these four effects occurs; further competition assessment should be conducted.

4. RESEARCH METHODOLOGY

In order to answer the research questions well, different types of research methodology can be used. During this research I want to do both qualitative desk-based and empirical studies with actual companies. By combining these research designs, I want to explain the impact of competition regulation in the logistics sector. The objective of this research is to investigate whether regulation has a positive or negative impact on innovation in the logistics sector. In order to investigate this, it is necessary to interview companies, which have been innovative in the logistics sector. An interview is an example of a primary data collection method, which is verbal and obtrusive. On the basis of an ethical approval, managers of the companies can speak honestly about their experiences without any consequences. In order to conduct an efficient interview, it is necessary to use the inductive approach. By asking the sub-questions of the Competition Assessment Toolkit, it is possible to research whether an effect occurs or do not occur. Working from the specific questions to the general questions is the key characteristic of the inductive approach. As explained before, the companies are chosen based on a three criteria: listed more than once in the SME's top 100 of innovations, type of transport and type of innovation. This means that the companies are not chosen randomly, which means that the validity of this research is not in danger. The companies are chosen specific for the logistics sector. Also secondary data will be collected; data on the web about the companies, literature about innovation and regulation and the SME's top 100 innovations website in the Netherlands. For this case the unit of analysis are the chosen companies from the SME's top 100 of innovations list and the unit of observation are the individuals; managers being interviewed.

In order to measure the impact of regulation on innovation, several interview questions can be asked. The dependent variable in this research is innovation and the independent variable is regulation. A lot of questions are based on the Competition Assessment Toolkit, in order to test the four effects of the checklist. The table below gives a overview of the questions and the variables which will be tested.

Question	Variable
Which are the most important regulations in your field of business?' (Private regulations – sector specific regulations)	-
Does regulation limits the number or range of suppliers in the logistics sector? For example by giving exclusive rights to companies by the government – license or permit system as a requirement of operation- raises the costs of entry or exit – restricts the flow of goods services, capital and labour	The limitation of the number or range of suppliers.
Does regulation limits the ability of suppliers to compete? For example by controlling the pricing (maximum prizes leads to low quality products) – restricts advertising and marketing – Sets standards for product quality that provide an undue advantage to some suppliers – raises the costs of some suppliers relative to others	The limitation of the ability of suppliers to compete.
Does regulation reduces the incentive of suppliers to compete? For example by requirements to publish	The limitation of the ability of suppliers to compete.

information on supplier prices, outputs and sales	
Does regulation limits the choices and information available to customers? For example by limiting the ability of consumers to decide from whom they purchase	The limitation of the choices and information available to customers.
What limitations do you face when conducting your innovation activities?	Limitations in innovation activities.
Are there any licenses or permits you have to obtain in order to offer your products on the market?	The limitation of the number or range of suppliers
Do you think that strategic behaviour occurs by your competitors?	The limitation of the ability of suppliers to compete.
Do some regulations also support SME's to compete? if so in what way?	The reduction of the incentive of suppliers to compete.
Can you tell me how you measure innovation specifically?	Measurement of innovation
How important is innovation for your company? Why?	The importance of innovation.

4.1 Limitations

Limitations for this research could be that the managers do not want to inform us about important data, which could harm their company. The selection criteria used by the MKB in order to compose the list for the most innovative companies could be unrepresentative for this research. As this research tries to analyse the impact of competition regulation on innovation of SME's, the sample of MKB could represent different types of innovative companies. The MKB list could represent companies, which come with one-time innovations, and not companies that are impacted by the competition checklist. This could be a threat to the validity. The persons of the companies, which will be interviewed, are the commercial directors of the companies. They are high ranked people in the company, which means that they can provide a lot of information in order to do this research. The interview questions will be divided into three categories. The first part of the interview needs to give me information about the sector in which the company operates and about their innovations. The second part of the interview needs to provide me information about regulation in this sector. The last part of the interview should provide me information about the limitations, which the companies face in their innovation activities. The interview questions will be a mix of open and yes/no questions. The interviews will be recorded and the data will be analysed after the interviews. Two of the three interviews will be conducted face-to-face and one interview will be conducted via telephone. The interview questions are added into the appendix section. Another limitation of this research is the small sample size. Since this research is only based on three companies, it is obvious that is does not represent the whole logistics sector. The logistics sector is a very broad industry and consists of different type of organizations. All three companies in this research are data processing companies. A company like DHL has to deal with other regulations than the companies chosen in this research. This means that we cannot draw a conclusion whether regulation has a positive or negative effect on innovation based on the whole sector, since the data will be incomplete.

5. DATA

In this section the findings of the interviews will be presented. The questions will be shown followed by the answers from the three companies. The data will we presented into three sections. The first section will cover the subject innovation. The second section will cover the subject regulation. The third section will cover the subject limitations to innovation. On the basis of these data, an analysis can be conducted which will be presented in the next paragraph. As stated before, all companies have innovations, which are related to software, in order to improve the efficiency of the transportation. The first company made a very advanced universal data processing system, which can be used for logistics processes and transactions. Several devices can be connected with each other like weighbridges, barriers, cameras and traffic lights. The second company manufactures and distributes weighing systems integrated in hand pallet trucks, warehouse trucks and forklift trucks. The third company developed a system, were companies could use extern carriers in order to make the transport process more transparent, measurable and more efficient. Two companies make weigh systems and the most important regulation were they have to deal with is the 'ijkwet', which is a sector specific regulation.

5.1 Innovation

First of all, the companies are asked how important innovation is for them. The first company stated that is it very important for them. They still make enough revenue from their first innovation, which shows the importance of innovation. The second company find that innovation is essential in order to be a step ahead of competitors. They are market leader in their sector and in order to stay market leader, they have to continue with developing new products. The third company stated that a small company like them are dependent of innovation in order to continue to exist. Second, the companies are asked how they orientate their innovation process. The first company orientate their innovation process based on the wishes of their customers. They try to help every customer, but a lot of other customers should profit from a new function. The second company attaches great value to the feedback of their customers. They try to keep in contact direct and indirect with the end costumer. Based on a competition analysis, this company is able to identify were they have to focus on during the innovation process. The third company orientate their innovation process based on profit they think they will make with the innovation. At last, the companies are asked in what way they measure innovation. The first company stated that they is difficult to measure innovation. Their key performance indicator is the revenue they earned with the innovation; which means that the innovation activities are result-based. The second company also find it difficult to measure innovation. This company does not measure innovation. The third company measure innovation based on how many still uses their system and if it still a best seller on the market.

5.2 Regulation

First, the data of the most important regulations will be presented. Than according to the Competition Assessment Toolkit, the four effects, which are described above, will be tested.

All companies are asked which regulations are the most important in their sector. The first company stated that the 'ijkwet' is very important in their sector. If a company send a invoice to a customer with measurements, the customer wants to know the weight is right. In order to ensure this, companies should have a certification in order to be worthwhile. In order to keep functioning in this niche, a certificate from the 'Nederlands Meet Instituut' from Dordrecht is necessary. This certificate is valid in whole Europe. From the establishment of this company, the company had to revise the certificate four times, since the indicators continue to change. The governments in West-Europa control these systems regularly. This company is also in possession of a certificate ANTEP, which is valid in the U.S.A and Canada. They do not have a certificate for Russia. The second company stated that for them the machinery directives are the most important. It is not a regulation, but they are required to meet the conditions. Like the first company, they also have to deal with the 'ijkwet'. In order to be taken serious, they have to own a valid certificate. These are more sector-specific regulations. The third company does not face important regulations, since they integrated a lot of systems in one system.

5.2.1. The limitation of the number or range of suppliers

The first effect of the Competition Assessment Toolkit is the limitation of the number or range of suppliers In order to measure this variable, five questions were asked. The first question asked to the companies is: "Does a legalisation grants exclusive rights for a supplier?'. All three companies responded that this is not the case. The second question, which was asked to the companies, is: ' Does a legalisation establishes a license, permit or authorisation process as a requirement of operation?' All three companies responded the same that they do not need any license, permit or authorisation process any other than other firms in different sectors. The third question asked to the companies is: 'Does a legalisation limits the ability of some types of suppliers to provide a good or service?' Also this was not the case for all three companies. The fourth question asked to the companies is: 'Does a legalisation significantly raises cost of entry or exit by suppliers?' According to all companies, they were able to enter or exit the industry without any costs. The last question asked to the companies based on the Competition Assessment Toolkit is: ' Does a legalisation creates a geographical barrier to the ability of companies to supply goods services, or labour, or invest capital?' All companies responded in the same way that it was not the case.

5.2.2. The limitation of the ability of suppliers to compete

The second effect of the Competition Assessment Toolkit is the limitation of the ability of suppliers to compete. In order to test this variable four questions were asked to the companies. The first question asked to the company's is:' Does a legalisation limits seller's ability to set the prices for goods and services?' All companies can set their own prices without any constraints. The second question asked to the companies is: 'Does a legalisation limits freedom of suppliers to advertise or market their goods or services?' All three companies found that they can advertise in the way they wanted. Company two brought a file with random e-mail addresses, in order to reach a lot of people with their newsletter. This is forbidden and they got a warning from the government. It is only allowed to send e-mails to you own customers. The third question asked to the companies in order to test this variable is: 'Does a legalisation sets standards for product quality that provide an advantage to some suppliers over others or that are above the level that some well-informed customers would choose?' As stated before, in the data processing niche, it is necessary to have a valid certificate in order to be worthwhile. Due to this certificate, companies are able to sell more products and raise their revenue. Companies in countries like Russia were a certificate is not necessary, can offer their product for less money. This can influence the competition position of companies 1 and 2. Company 3 does not face any problem with this legalisation. The last question, which is asked to the companies, is: 'Does a legalisation significantly raises costs of production for some suppliers relative to others?' All three companies responded that this is not the case.

5.2.3. The reduction of the incentive of suppliers to compete

The third effect of the Competition Assessment Toolkit is the reduction of the incentive of suppliers to compete. In order to measure this variable, three questions are asked to the companies. The first question asked to the companies is: ' Does a legalisation creates a self-regulatory or co-regulatory regime?' All three companies did not face any problems with this legalisation. The second question asked to the companies is: ' Does a legalisation requires or encourages information on suppliers outputs, prices, sales or costs to be published?' All companies stated that that they are enrolled at the Chamber of Commerce. All information is public for the government, but competitors can only see the basic information of the company (number of employees and the financial statement). The last question, which is asked to the companies in order to test this variable, is: 'Does a legalisation exempts the activity of a particular industry or group of suppliers from the operation of general competition law?' This legalisation did not apply to any of the companies. Company 1 and company 2 stated that other competitors in other countries do not need a certificate in order to be worthwhile. However a certificate has a lot of advantages (credible), this legalisation has influence on the competition position of the companies. The third company did not face any problems with this legalisation.

5.2.4 The limitation of the choices and information available to customers

The last effect of the Competition Assessment Toolkit is the limitation of the choices and information available to customers. In order the test this variable, three questions are asked to the companies. The first question is: 'Does a legalisation limit the ability of consumers to decide from whom they purchase? 'This did not apply to any of the chosen companies. The second question asked to the companies is: 'Does a legalisation reduces mobility of customers between suppliers of goods or services by increasing the explicit and implicit costs of changing suppliers?' All three companies did not face this problem, but they admitted that strategic behaviour exists in their sector. The first company has one big reseller and

they could sell their product also to other customers. They do not sell their product to these customers, since they are the competitors of their big reseller. There is strategic behaviour, but the government does not impose it. The second company had a joint venture with a company in the U.S.A. Due to a disagreement with that company, this company quitted the collaboration. Know this company is afraid to lose a lot of clients in the U.S.A and they decided to develop a product faster than agreed. The third company also admits that strategic behaviour occurs in their sector. Since that this company only integrated several systems in one system, strategic behaviour applies to a less extent to them. The last question asked to the companies is: 'Does a legalisation fundamentally changes information required by buyers to shop effectively?' According to the companies this is not the case in their industry. Not one of the companies faced problems when they wanted to introduce their product on the market.

5.3 Limitations in innovation activities

During the interview, the question was asked whether the companies face problems when conducting their innovation activities. By having a overview of limitations, the government can change some regulations in order to support the companies. The first question, which is asked to the company in order to test this variable is:' Does the government support you with subsidy?' All three companies answered in the same way that they can get subsidy from the government if they apply for it. The first company stated that in order to get subsidy, they have to meet certain rules. There are a lot of companies in the Netherlands, which can help you with applying for subsidy. The problem here is that you face administrative burdens for applying for subsidy. It takes the company a lot of time and money in order to get subsidy. Every hour that you put in conducting innovation activities should be tracked. Since this company has enough capital in order to conduct the innovation activities, they did not use the subsidy. This company only made use of rules where they could pay fewer taxes, because they invested in innovative products. This company would prefer that the administrative burdens were less, when applying for subsidy. The second company uses a lot of subsidy schemes in order to help them with conducting the innovation activities. On an annual basis, they can save up to 200.000,- Euro, by paying less payroll tax and cooperation tax. This company also took part in collaboration with a Germen company, in order to get subsidy from the European Commission. Due to this amount of money, this company is able to have four fulltime employees working on the research and development department. A drawback for getting this subsidy is that it takes the company a lot of time due to the amount of paperwork. They solved this problem by outsourcing the administrative work to a extern company, which is specialized in applying for subsidy. Unfortunately, they have to hand in the half of the amount of money they receive. The last company does not apply for subsidy, since they want to avoid all paperwork.

5.3.1 Supporting of innovation activities

It is important to identify if there are any regulations, which stimulates the companies in conducting their innovation activities. The first and second companies are data processing companies. They stated that they do not know direct regulations, which helps them to conduct their innovation activities. They stated that there are some indirect regulations, which help them to be innovative. The first company stated that it is against the rules to send trucks on the road, which are overloaded. This means that companies are demanding good weigh systems, which warns them if the truck is overloaded. The second company stated that governments want to tackle the problem of overloaded containers on ships. During the past years, a lot of ships sunk due to overloaded containers on the deck. The weight on paper is different than the actual weight of the container. As a solution to this problem, the government introduced new regulations, which is called SOLAS (Safe Our Lives At Sea). This regulation means that every container, which will be shipped, should be weighted. It helped the company to develop a weigh system for ships. In this way they could enlarge their market share. As stated before, the demand for data in the logistics sector is higher than ever. Governments want that they can measure everything, in order to identify the responsible party when problems occur. This can help data processing companies in conducting their innovation activities.

6. ANALYSIS

In this paragraph the data will be analyzed in order to draw a conclusion about the impact of regulation on innovation. In order to do this, the sub-questions will be answered.

What types of laws and regulation matter most for the success for innovative entrepreneurs in the logistics sector?

The most important regulation in the logistics sector is the 'Ijkwet'. This is a sector specific regulation, which affects innovation directly (Pelkmans & Renda, 2014). Two of the three companies experience this law as the most important law in their field of business. This law makes sure that the weighing systems of companies work correctly. In order to operate in this field of business, having a certificate is necessary in West-Europe. Concurrent in other parts in the world do not always own this certificate. In order to receive this certificate, a relatively high sum of money is should be paid. This means that they can offer their product for less money than companies in West-Europe. The competition position of West-European companies is relatively worse than companies without a certificate. The 'Ijkwet' has besides this drawback also an advantage. Companies with this certificate are more reliable than companies without. A customer will tend to choose a company with a certificate, which will lead to higher revenue and so higher profits. The 'Ijkwet' is an example of a prescriptive law, which can hamper innovation activity (Pelkmans & Renda, 2014). In this case, it is contradictory since it can also have advantages like increasing a company's market share.

• In what ways can law and regulation help small innovators access markets dominated by big companies in the logistics sector?

Based on the data, we can conclude that none of the chosen companies had problems with accessing the market in the logistics sector. However some laws did help some companies to stay innovative. The WBSO law makes it possible that companies can retrieve a part of the money they invested in their research and development department in that year. According to Pelkmans & Renda, the ability of funding can constrain the companies in their innovation activities. It is important that the government keeps supporting the companies in order to stay innovative. In my opinion it is necessary that the government does not only support companies by reducing their taxes, but also offering help from extern companies like Freel

suggested. The SME's Loan Guarantee Scheme provides loan guarantee to small and medium enterprises to help them to secure loans from private lending institutions in order to finance their innovating activities. All three companies make use of this kind of subsidy. Besides this direct law there is also an indirect law that helped one company to stay innovative. The SOLAS law ensures that every container needs to weight before it goes on deck. In this way, transport companies need software in order to weigh the containers. This means that this company can innovate due to new regulations. They stated that the law is constantly changing, which means that they have to change their products according to the new prescriptions. Due the SOLAS law, the company earned a lot of revenue and they accessed a new market. The stringency of this law is positive, which is one of the five constraining or enabling factors of regulation. Stringency relates to how difficult and costly it is for firms to comply with new regulatory requirements (Pelkmans & Renda, 2014). Since it was easy for this company to cope with this law and it led to more revenue, the SOLAS is judged as not stringent. Also for the government this can law has an advantage. According to Tidd et al, a raise in turnover and profit can create more employment.

In what way can law and regulations hinder small innovators in the logistics sector?

Besides the regulations that support innovators, there are also regulations that can constrain innovators in the logistics sector. As Pelkmans & Renda described, there are five major aspects that can constrain innovation as a result of regulation. These five factors are: administrative burdens, compliance burdens, timing, flexibility and uncertainty. As described in the previous paragraph, all companies make use of the WBSO law. Besides the advantage of paying fewer taxes, all companies face problems regarding the administrative work that needs to be done in order to pay fewer taxes. The companies admit that they can better use time for more productive activities. One company stated that they want to quit with this subsidy since it takes too much time to do the administrative work. Another company stated that they receive 200.000, - euro, but they outsourced the administrative part to another company. This company receives half of the money, which the company can receive, which is too much. In my opinion, the government should reduce the administrative burdens for the companies. In this way, the money can stay in the company itself and time can be devoted to innovative activities. Fortunately, the Dutch government developed a measurement system to record the administrative burdens for companies, which is called Mistral (Pelkmans & Renda, 2014). This can be a solution for this problem. One company has a research and development department with four fulltime employees. The other two companies do not have a research and development department. It could be possible for those companies to open a research and development department, if they would not have to spend a lot of time to the administrative burdens. The existence of a research and development department can raise the success of innovations according to Miller and Friesen.

What type of regulatory approach is the most suitable in the logistics sector?

As described in the theoretical framework, we can distinguish two regulatory approaches: the flexible and prescriptive approach. Both approaches can have different impact on innovation. According to Pelkmans & Renda the flexible regulation stimulates innovation more than purely prescriptive regulation. Flexibility is one of the five major aspects that can enable innovation. The use of functional or performance-based technical specifications from standard offers more room to innovative bidders to purpose new products than detailed standards. All companies do not have to meet any standards in their innovation activities. They need to keep in mind that the innovations should not be against the law and meet the safety standards. They assume this as normal conditions and not as constraining conditions. The companies feel that they can do what they want to do, which is positive for their innovations. In this research the laws that came across were the 'Ijkwet', the WBSO law and the SOLAS law. These laws are mostly prescriptive laws. Although that these laws are prescriptive, the companies found out that there are advantages. The advantage of the 'Ijkwet' is that higher quality leads to higher revenues. The advantage of the SOLAS law is that this law can lead to a higher market share as stated before. The WBSO law is an example of a too prescriptive law, which can lead to negative impacts on innovation. In my opinion, a more flexible approach is most favourable regarding the WBSO law.

7. CONCLUSION

In order to formulate a conclusion, the central research question should be answered. The central research question in this paper is: "In what ways do general regulations such as competition rules support or constrain small entrepreneurs from successfully launching innovations in the logistics sector?"

As Pelkmans & Renda stated, the impact of regulation on innovation depends per case. In my opinion, it is difficult to draw a conclusion with the limitations of this research in mind. All companies are data processing organizations, which deliver products to companies in the logistics sector. Based on the data of these companies, some findings can be presented. The most important laws in this sector are the 'Ijkwet', WBSO law and the SOLAS law. The 'Ijkwet' can have a positive and negative impact. The needed certificate costs money, competitors without this certificate can offer their products for less money. The demand of products with this certificate is high, which can lead to higher prices and more revenue. The WBSO law has a positive impact on innovation. The subsidy that companies receive can help them in their innovative activities. However, the administrative burdens should be reduced in order to maximize the support. This is important since the administrative burdens are one of five major aspects that can constrain innovation (Pelkmans & Renda, 2014). In addition to this subsidy, the government can support with the SME's Loan Guarantee Scheme in order to finance their innovation activities like Freel suggested. The SOLAS law has also a positive impact on innovation. This law provided a chance for a company to enter a new market and have more revenue. All laws are examples of prescriptive laws. According to Pelkmans & Renda, the prescriptive approach can hamper innovative activities. The 'Ijkwet' and the SOLAS law proved that it is contradictory, since these can have advantages. The WBSO should be more flexible. In this way companies can spend less time on administrative burdens and devote it to innovative activities. In conclusion, the regulations in this sector can both have a positive and a negative impact on innovation.

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