European Commission

Business Innovation Observatory

Regulatory barriers and firm innovation performance

Internal Market,
Industry,
Entrepreneurship
and SMEs

Business Innovation Observatory

Regulatory barriers and firm innovation performance

Authors

Nikos Maroulis, Paresa Markianidou, Carolina Spaini, Eleonora Zoboli (Technopolis Group)

Yannis Basiakos (National and Kapodistrian University of Athens)

March 2018

LEGAL NOTICE

Table of contents

List of tables

List of figures

Executive summary

Objectives

Although the effects of regulatory barriers on the economy through the generation of incentives have been widely discussed, the impact of complying with regulations and the effects on innovation are less well documented. Due to the lack of statistical data on regulatory costs across the EU and sectors, the present study uses company perceptions of regulatory costs to identify the impact on a broader scale than has been done in the past. It achieves this through analysis of the Community Innovation Survey (CIS) microdata which contains responses from more than 70 000 companies across Europe. The focus of the approach centres on the quantification, to the extent possible, of perceived regulatory costs on company innovation, competitive performance and market strategies.

Empirical evidence suggests that companies' perception of regulatory cost as an obstacle is context-specific. Factors such as competitive conditions or resource constraints can influence the perception of regulatory costs on performance. Building on these findings, the study addresses the following elements:

• the conditions under which regulatory cost is perceived as an obstacle by European companies;
• the connection between regulatory cost and companies' goals, and how strategic goals are more likely to be affected;
• whether regulatory costs hinder European market operations or create barriers to the expansion of company activities in Europe;
• the differences between innovative and non-innovative companies, and the degree to which the effects are seen in different sectors or influenced by size- or country-specific considerations.

Methodology

To address these questions, three logit regression models have been developed in relation to the question of the perceived importance of the cost of meeting government regulations or legal requirements. The first model addresses whether business goals are affected by regulatory costs and under what conditions. The second model explores the conditions under which companies perceive regulatory costs as an obstacle. Finally, the third model tests whether regulatory cost is an obstacle to the internationalisation of European companies.

Descriptive statistics provide an overview of the size and other firm characteristics of companies that consider regulatory costs as a significant obstacle to achieving their goals. In addition, the descriptive statistics highlight the models' results with regard to differences in the behaviour of innovative and non-innovative companies, size groups and country of operation. The sectoral differences are also examined in the light of existing studies assessing the cost of legislation in specific sectors.

Key findings

Approximately 29 % of European companies perceive regulatory costs as a highly important obstacle to achieving their goals. The effects of regulatory costs in relation to company performance, for example regarding their goals to increase turnover, improve profitability or expand their market share, are less clear.

When addressing the impact of regulation on business activity, previous empirical studies indicate that distinction should be made between the incentive effect and the cost of complying with the regulations. Both aspects affect companies' decisions regarding future investment, although the mechanisms through which they affect companies and the scale of the effect differ.

Companies that face strong price competition and rely more on cost-cutting strategies appear to be most affected by regulatory costs. In particular, firms operating in mature markets appear to be most vulnerable to regulatory costs. Although innovative companies in such markets tend to rely

on process innovations to increase productivity and reduce costs, or try to focus on introducing new products, regulatory costs are still seen as a significant obstacle.

Regulatory costs are perceived as being more significant for companies looking to enter new markets outside the EU rather than within Europe, confirming the benefits of the Single Market are being experienced by European firms. The advantages within the EU may stem from the positive effects of European legislation or prohibitive legislation in third countries.

There are notable differences in the impact of regulatory costs across sectors. The effect of such costs on companies' competitive position depends not only on the sectors' specific cost structure but also on the conditions affecting competition and the competitive position of companies and products on European and international markets. Within manufacturing, the pharmaceuticals sector has the largest percentage of companies reporting high regulatory costs being particularly important (39 % of EU manufacturing companies), which coincides with a strict regulatory framework in this sector, including for example new drug production and legislation on clinical trials.

SMEs are more affected than large companies by regulatory costs as the latter can often take advantage of economies of scale and scope associated with the administration of regulatory obligations and the investment required for compliance with these obligations. For SMEs, there is little difference in the perception of regulatory barriers between innovative and non-innovative smaller firms, with around 85 percent of all SMEs viewing such costs as medium to high. For larger companies, however, regulatory barriers are seen as less significant than their SME counterparts, with more innovative large firms viewing such barriers as unimportant.

Companies with a higher percentage of better-educated personnel consider regulatory costs to be less of an obstacle. This is more pronounced for SMEs than larger firms. This may be due to the ability of well-educated personnel to deal with administrative obligations and their associated cost in a more efficient way and the improved productivity of these companies.

1 Introduction

The effect of regulations on countries' economic performance has attracted the attention of both policy-makers and researchers. An increasing number of studies investigate the macroeconomic effects of regulations and their impact on specific sectors, especially those affected by environmental regulations. The Organisation for Economic Co-operation and Development (OECD) has contributed extensively to the debate by publishing several studies and developing the Compliance Cost Assessment Guidelines (OECD, 2014) for estimating the overall cost of regulation and several indicators, including the integrated product market regulation indicator. At the policy level, the European Commission has created the Regulatory Fitness and Performance (REFIT) programme under its better regulation agenda, which aims to improve the efficiency of EU legislation by removing unnecessary burdens and lowering costs without compromising on policy objectives. Among the better regulation agenda's objectives is keeping the regulatory burdens on business, among other stakeholders, to a minimum by promoting evidence-based policymaking and improving the understanding of the impact of regulations.

This study aims to contribute to the agenda's objectives by enhancing the understanding of how the regulatory cost impacts companies' efforts to achieve their goals, and to quantify the impact of such costs, as far as possible. Empirical evidence suggests that companies' perception of regulatory cost as an obstacle is context-specific. Factors such as competitive conditions and resource constraints could influence their perception of the impact of regulatory cost on their performance (Carter et al., 2009). The study aims to addresses the following issues:

- the conditions under which regulatory cost is perceived as an obstacle by European companies;
- the connection between regulatory cost and companies' goals, and how strategic goals are more likely to be affected;
- whether regulatory costs hinder European market operations or create barriers to the expansion of company activities in Europe;
- the differences of such effects between innovative and non-innovative companies and whether the degree to which the effects are influenced by sectoral, size- or country-specific considerations.

To achieve these objectives, the study has relied on the Community Innovation Survey (CIS) microdata which covers the behaviour of more than 70 000 companies across Europe. Therefore, the selected research questions and their formulation are limited by the CIS questionnaires and the specific information they collect.

Chapter 2 presents an overview of the current discussion about the impact of regulation on the economy and industry, and discusses some methodological challenges which justify the methodological approach presented in chapter 3.

The main analysis is presented in chapter 4 where the main questions are addressed by using three econometric models adapted to the questions in the CIS 2012 questionnaire. The first model addresses the question what business goals are affected by regulatory cost and under what conditions. The second model explores the conditions under which the regulatory cost is perceived by companies as an obstacle. Finally, the third model tests whether the regulatory cost is an obstacle to the internationalisation of European companies. Descriptive statistics provide an overview of the size and characteristics of those companies which consider regulatory costs to be a significant obstacle to achieving their goals.

In addition, the descriptive statistics illuminate and exemplify the results of the models with regard to differences in behaviour between innovative and non-innovative companies, company size, and country of operation. The sectoral differences are also examined in the light of existing studies assessing the cumulative cost of legislation on specific sectors.

Chapter 5 summarises the main conclusions, stressing that sector-specific factors, differences in the mix of regulations, the price competition and the effects on cost reduction strategies, the size of companies and the quality of human resources are all affecting the impact of regulatory costs on companies.

2 Regulatory barriers and innovation performance: literature review

2.1 Overview of the impact of regulatory barriers on companies and the economy

A growing number of theoretical and empirical studies are exploring the effect of regulation on innovation. However, the discussion is far from conclusive, and studies often contradict one another on their findings. Blind (2012) identifies that both the overall compliance[1] cost of regulation and the incentive effect affect the level of investment in innovation. A positive impact on innovation is observed if the compliance costs are low or even zero and the incentives are positive. A negative impact occurs when the compliance cost is high and the innovation incentives are low or even negative. The effects differ according to the various types of regulation.

A major contribution to the discussion on the effect of product market regulations (competition enhancing regulation, price regulation, market entry regulations) on innovation comes from Aghion and the "distance to frontier" literature (Aghion et al., 2005, Aghion 2006,) which emphasise the incentive effect and argue that the relationship between competition and innovation follows an inverted-U pattern that is much steeper for industries and countries close to the technological frontier than those farther away. Thus, competition has an increasingly positive impact on innovation as the distance to the technological frontier decreases up to a 'pick point' where the trend is reversed. Based on that finding, it is often argued that increasing product market competition by following deregulation policies fosters innovation, especially for companies and economies close to their technological frontier. Although empirical studies support the conclusions regarding the relation between competition and investments in R&D and innovation, the prediction about the negative effect of product market regulation on innovation is not adequately supported. Amable, Demmou and Ledezma (2009) tested the "distance to frontier" argument on a panel of industries for OECD countries and, contrary to expectations, found a positive or null impact of product market regulation on innovation for those industries close to the technological frontier.

Social regulations (environmental, labour safety and product regulations) also generate incentive effects that are added to the regulatory cost effects. In the short term, regulations can restrict innovation and create costs resulting in an ambivalent net effect (Blind, 2012). In the long term, the net effect depends on the incentive introduced by each type of regulation. The net result of *environmental* regulations is positive as the temporary market entry barriers introduced by the regulations create incentives for the development of eco-innovations. *Labour force protection* regulations introduce temporary entry barriers and monopoly gains generating incentives for the development of processes offering greater labour safety. The net effect could be slightly negative. The net effect of *product and consumer safety* regulations could be slightly positive as they increase the acceptance of new products and promote their dissemination.

The effect on innovation of institutional regulations (product liability and intellectual property rights) is mainly the result of the incentives, and tends to be positive (Blind, 2012). The net effect of *product liability* regulations is ambivalent but slightly positive. In the short term, a high liability risk can reduce the incentives for innovation. However, in the long run, regulations increase the acceptance of new products and promote their dissemination, thereby creating incentives for innovation. *Intellectual property rights* regulations mainly generate positive effects from a combination of costs and incentives. In the short term, the regulations restrict the development and dissemination of innovations via patenting. In the long term, they create strong incentives to invest in R&D and thus the net effect is positive (Blind, 2012). However, in contrast to Blind's prediction, the overall regulatory costs could be high for companies addressing the EU market,

---

[1] According to the European Commission (2017) definition, 'compliance costs' include charges, administration cost, implementation cost, direct labour and capital cost for investments necessary for the compliance to the regulation. However indirect costs are excluded.

prohibiting some of them from filing patents in all Member States and thus eliminating the incentive effects (van Pottelsberghe and François, 2009; Reinstaller et al., 2010, p. 86).

In a recent study, Ravet (2017) corroborated Blind's argument that regulations could be both a stimulus and a barrier to innovation. The study also confirmed the existence of the two different effects mentioned above and associated them with specific types of regulations and sectors. According to this study, two main groups of regulations generate barriers, namely product market regulations and social regulations. Sectoral characteristics were among the most important determinants of the type and significance of the impact. In the professional and scientific services, ICT and primary sector, product market regulations (incentive effect) had the main impact. However, the manufacture of pharmaceuticals, chemicals, food and metal, as well as the health and construction sectors, were more affected by barriers related to product safety regulation, environmental protection and labelling (cost effect). By combining survey data and statistics from Eurostat (CIS), companies' results show that regulation has a net positive impact on innovation investments. Findings on the differences among sectors fill a gap in the literature regarding comparative studies and support the findings of this report on sectoral differentiations. Furthermore, one of the main points of the study – that regulations could both hinder and stimulate innovation – could explain the weak relationship between innovation activity and companies' perception of regulatory cost as an obstacle.

The OECD has studied the effect of regulations on companies extensively, in particular the incentive effects generated by entry barriers and competition. As the OECD points out (2011), there is growing evidence that regulatory reforms promoting the liberalisation and opening up of product markets, alongside relaxing or lifting restrictions in the business environment, could contribute significantly to economic development and growth.

As suggested by economic theory and microeconomic research (see, among others, Geroski, 1995; Nickell, 1996; Griffith et al., 2002; Nicoletti and Scarpetta, 2003; Conway et al., 2007), competition in product markets contributes to higher productivity by reallocating market shares to the most efficient companies. Therefore, the restriction on competition by product market regulations is expected to be negatively associated with productivity. Papaioannou (2017) found that lower product market regulation is associated with a long-term increase in total factor productivity. Other studies associate the growth in productivity with improvements in the allocation of skills resulting from intensified competition (OECD, 2016).

The effects on productivity are not constrained within the sectors directly affected by the regulation, but can spill across the supply chain. Cette et al. (2017) found that anti-competitive regulation protecting rents in upstream industries (energy, transport, communication, retail, banking and professional services) creates disincentives which affect productivity negatively in those downstream industries which use intermediates' inputs from these upstream industries.

Although custom and tariff barriers have been eliminated within the European single market, non-tariff barriers still exist for companies trying to open new geographical markets within the EU. This results in incentives or disincentives generated by product market regulations in the target countries and to regulatory costs. Differences in national legislation, in the absence of EU directives or regulations, differences in transposing EU directives into the national legislation, or even the absence of regulations are among the factors which increase costs when products and services are traded between Member States (for example, Reinstaller et al., 2010). A non-exhaustive list of differences in legislation between the country of origin and the host country, which generate additional costs for companies selling their products to the host country, includes the following cases (Maroulis et al., 2017):

• New licence/permit is required to sell the product in the host country.

• Compliance with technical standards in the host country requires additional investment for adaptation of the product.

• Compliance with provisions of environmental and consumer or product safety regulations in the destination country requires additional investment for adjusting the product/service.

• Changes in the product labelling and packaging are necessary to comply with regulations in the destination country.

- Filing a patent application at the destination country's patent office and bearing additional costs for the protection of IPRs are required.

In the same study it was also found that the compliance cost was not the most important barrier to the commercialisation of innovative products. Gaps on ambiguities in the legislation, differences in the interpretation of EU regulations or in the transposition of EU directives to the national legislation often prevented companies to sell their products in other EU markets even if the products were already successful in some EU countries.

Recent studies measuring the cumulative cost of the EU regulations on specific sectors (CEPS et al., 2017a; 2017b, Maroulis et al., 2016 and León et al., 2016) found significant differences in the regulatory burden between SMEs and Large companies. For example, the cost for SMEs in the chemical sector for complying with the regulations as a share of turnover is approximately 35% higher on average compared to the large companies. According to the SME Performance Review (European Commission 2017a), regulation was among the most pressing issues for 12% of the SMEs in 2016 down from 16% in 2014. The same years 'finding customers' was the issue with the higher share of SMEs (25% and 20% respectively), followed by 'availability of skilled staff or experienced managers' and 'competition'.

2.2 Estimating the impact of regulatory cost

Contrary to the discussion on the impact of regulation on the economy and companies through the generation of incentives, the impact of regulatory costs on company performance is less well researched and documented. Crafts (2008), in a study focusing on measuring regulatory barriers in the UK, raises the issue of **distinguishing the impact of compliance costs from the incentive effect of regulation** when measuring the impact of regulations on industry. He also questions the feasibility of using econometric models similar to those developed to estimate the impact of compliance costs on US industry (for example, Gray, 1987) due to the lack of sufficient statistical data for UK industry. The argument concerning the feasibility of the measurement also applies at the EU level since the scarcity of data at the European level is even more evident.

Although there are estimations of the compliance cost of single EU regulations, to date, *ex-post* cumulative cost assessments of the regulatory cost generated by all (at least major) regulations affecting EU industry have only been performed for six sectors: steel (CEPS, 2013a), aluminium (CEPS, 2013b), chemicals (Maroulis et al., 2016), forest-based industries (León et al., 2016), ceramics (CEPS, 2017) and glass (CEPS, 2017). However, none of the studies have attempted to associate the regulatory costs borne by European companies in specific sectors or group of sectors with company performance. Due to the lack of systematic measurement of the compliance costs, existing studies rely on companies' **perception of both the regulatory burden and the compliance cost**. For instance, Athayde et al. (2008) conclude that the actual impact of regulatory costs on firm performance is minimal. On the other hand, Carter et al. (2006) report evidence of negative effects. Jong (2015) arrived at a similar conclusion by finding a negative and statistically significant effect of compliance costs on sales turnover and a negative but non-significant effect on market competition.

Due to the lack of statistical data on regulatory costs across the EU and sectors, the present study aims to explore further the possibility of using companies' perception regarding regulatory costs to identify the impact on a much wider scale compared to previous studies, by using the CIS.

Quantification of the regulation burden borne by companies is a complex task that must consider the cumulative effect of all regulations affecting a company or sector. The experience gained from four cumulative cost-assessment (CCA) exercises (CEPS, 2013a; CEPS, 2013b; Maroulis et al., 2016 and León et al., 2016) shows that companies do not keep systematic records on the cost and effort expended on complying with regulations. The retrieval of cost information and its attribution to regulations demands systematic and time-consuming fieldwork. Thus, companies' responses in surveys such as the CIS, concerning the importance of regulatory costs and their impact on performance and goals is based on their perception rather than on cost data and performance indicators. As argued by the OECD (2012) and European Commission (2009), factors such as "irritation" or "hassle" could influence the individuals' perception of the regulatory burden more than the measurable and actual cost. Often, regulatory language or an individual's negative experience concerning the behaviour of front-desk staff and the low quality of services related to implementing the regulation influence their perception and increase their dissatisfaction.

Furthermore, differences in companies' perception of the regulatory cost could be context specific and influenced by factors such as competition, or the firm's strategy, or even the length of time the respondent has been in business (Carter, Mason, & Tagg, 2009).

Although companies' perception of the significance of the regulatory burden might not be accurate, reliance on such perceptions for studying the regulatory burden remains valid, as the **perceptions of management shape the strategy and affect the decisions** on how the company operates (Moynihan et al., 2012). However, different policy conclusions might be drawn on the necessary actions if the perception is driven by the irritation of an individual or by a realistic estimation of the regulatory cost. Therefore, as argued by the OECD (2012), knowledge of the real drivers of responders is necessary, along with use of a comprehensive evaluation system that combines different approaches and types of indicators.

2.3 Regulatory cost and product life cycle

As argued in section 2.1, regulations creating high regulatory costs result in resources being removed from companies which otherwise would have been directed towards **investments for product innovations, improving productivity or expanding a company's markets geographically**. According to Utterback and Abernathy (1975), a company's strategy and its decisions regarding investments in innovation, productivity or market expansion change according to the life cycle of its products and changes with the level of competition.

According to Utterback and Abernathy, a product's life cycle can be divided into three stages. In *stage I,* the product is in the early phases of its life cycle. The company adopts a *performance maximising strategy* aiming at producing an innovative product(s) with a unique performance. The industry segment will probably be made up of relatively few firms – mainly new or older firms entering an entirely new market – based on their existing technological strengths. At this stage, the production process has yet to be standardised (uncoordinated stage).

In *stage II,* the company adopts a *sales-maximising strategy*. Market uncertainty is reduced, and the competition is growing according to product differentiation, while some product designs are beginning to dominate. As the rate of performance improvements declines, price competition, brand name and customers' loyalty become increasingly important. Emphasis on marketing, advertising, distribution and after-sales services increases. The development of the production process is still asymmetrical and not standardised, characterised by segmented quality (segmental stage).

Stage III is characterised by *cost-minimising characteristics*. The product becomes standardised with few opportunities for performance differentiation. The competition shifts to product price, profit margins are reduced, and the emphasis is on cost cutting by increasing production efficiency and economies of scale. Although process innovations dominate, incremental product innovations are still highly dependent on changes in the process. As the scale of production grows and the processes become highly developed and integrated, changes in the processes become costly. Process redesign can be triggered by developing new technology.

Therefore, as the strategy and investment needs change and are adapted to the maturity of the product and the characteristics of the competition, **the impact of regulatory costs should also vary across the different stages of a product's life cycle in conjunction with changes in the company's needs and priorities**. Although the product life-cycle approach has been criticised as simplifying companies' innovation patterns (for example, Adner and Levinthal, 2001 and Lambertini, L., and Mantovani, A. 2010), it nevertheless provides useful insight into the links between a company's strategies, its innovation activity and the competitive environment in which it operates.

3 Methodological approach

3.1 Overview of the methodology — challenges and limitations

The adopted approach combines questions from the CIS at the company level to model the relationship between different elements of the questionnaire based on a multivariate regression analysis. This approach is also used by Reinstaller et al., (2010), but for different research questions and model specification, and in Jong (2015).

The data comes from the CIS 2012 survey[2]. The question used as a proxy for regulatory burden is the sub-question of Q11.3: "During 2010 to 2012, how important were the … high cost of meeting government regulations or legal requirements … as an obstacle to meeting your enterprise's goals?"

To answer the main research questions, three standard binary response models (logit model[3]) have been developed which associate the question on the **importance of the regulatory cost as an obstacle** (11.3. OBSREG) with the questions concerning:

- The goals of the company Q11.1: "During the three years 2010-2012, how important were each of the following goals for your enterprise?"

- The strategies of the company Q11.2: "During 2012 to 2012, how important was each of the following strategies for reaching your enterprise's goals?"

- The obstacles Q11.3: "During 2012 to 2012, how important were the following factors as obstacles to meeting your enterprise's goals?"

In order to take into account other factors that are expected to affect the company's perception of the regulatory barriers, control variables (sourced from other CIS questions) have been added to the models: size (based on the number of employees), type of innovator, sector and country. The questions used in the analysis and the names of the corresponding variables are presented in Annex I.

The specific formulation of the sub-question "high cost of meeting government regulations or legal requirements" refers largely to compliance costs and not to other types of costs or burden, such as opportunity cost. However, as mentioned in section 2, hard data on the compliance cost and its impact are not readily available within companies. Therefore, it is plausible to assume that companies' replies to this question were based on their perception of the cost and its effects on the company. Consequently, the outcome should be interpreted by taking into consideration all the caveats associated with using perception-related questions, as discussed in section 2.

A second consideration related to this specific question is the lack of clarity on the origin of the regulations generating the cost. As the question does not distinguish between EU and national regulations, both alternatives are assumed to elements of the responses by companies.

The endogeneity[4] of variables might affect the quality of the model as there can be a significant correlation between the unobserved factors contributing to both the endogenous independent variable and the dependent variable, resulting in biased estimators. However, it is difficult to address the problem empirically as the methods used — for example, the instrumental variables

---

[2] The 2012 Community Innovations Survey is the most recent year containing the formulation of the question on the perceived cost of meeting government regulations or legal requirements.

[3] The logit model is appropriate when the dependent variable is a binary variable.

[4] An independent variable is endogenous when its value is dependent on the value of other predictor variables.

approach — are not suitable for our study, given the limited number of variables we can use from the questionnaire. Moreover, in-depth research is required in cases where this method is relevant.

It should also be stressed that regression analysis does not indicate causal relationships among the variables. While a variable may predict a change in another variable, it cannot be claimed that the former causes the change in the latter.

The last caveat is that the analysis is subject to the limitations inherent in the CIS. The most important of these is that several questions, including those related to the obstacles, are not compulsory so some Members States either decided not to include them in the questionnaire or not to report the result to Eurostat. Thus, data from the following countries are missing: France, Spain, Denmark, Finland, Czech Republic, Luxembourg and the UK.

3.2 Regulatory cost and goals

The CIS 2012 addresses the issue of regulatory cost by asking companies whether the cost of meeting government regulations or legal requirements is an important obstacle to meeting their goals. Therefore, by testing the relationship between the goals and the obstacle of regulatory cost, while controlling other factors, the analysis focuses on **which company goals are affected by the regulatory cost and what other factors might influence the relation between these goals and the perceived importance of regulatory costs as an obstacle.**

According to the discussion in section 2.2, the company's strategy (or 'goal' using the terminology adopted by the CIS 2012 questionnaire) and its investments in innovation (product or process innovations) change along the stages of the product life cycle and are adapted to the changes in competition and product maturity (Utterback and Abernathy, 1975). Therefore, apart from the regulatory costs, other variables related to innovation investment patterns and characteristics of the competition also affect a company's goals and should be taken into consideration. In addition, the availability of resources, such as qualified personnel and access to finance, the size of the company, and the sector and country of operation, also affect a company's goals.

Before developing the econometric model, which describes the relationship between a company's goals and the perception of cumulative cost as an obstacle, the relation between each of the four goals in the questionnaire and the high cost of meeting government regulations or legal requirements (OBSREG[5]) was tested in four stepwise logit models.

Each of the stepwise logit models has as a dependent variable one of the goals in Q11.1[6]:

- Increase turnover (GOTURN)

- Increase market share (GOMKT)

- Decrease costs (GOCOS)

- Increase profit margins (GOPRF)

Since by design all obstacles in Q11.3 are linked with the goals, all obstacles including the regulatory costs are included in the stepwise models as independent variables.

As can be seen in Table 1, since the p-value for the variable OBSREG is higher than 0.05, it was removed in all stepwise regressions except the one with dependent variable "decrease cost" (GOCOS), indicating that the **perception that regulatory cost is an obstacle is correlated only with the "decrease cost" goal**. The existence of a correlation between the two variables does not establish any causal relation but only indicates that companies reporting regulatory cost as an obstacle are more likely to be aiming to decrease costs.

---

[5] The names of the variables used for the coding of the questions are presented in parenthesis.

[6] Q11.1: During the three years 2010 to 2012, how important were each of the following goals for your enterprise? — The names of the corresponding variables are in parenthesis.

Table 1: P-value results of four stepwise logit models having as dependent variables the goals of the question Q11.1 of CIS 2012 questionnaire

Goals	OBSREG p-value
GOCOS	0.043
GOTURN	0.165
GOMKT	0.328
GOPRF	0.536

Following the exclusion of the three goals — 'increase turnover', 'increase market share' and 'increase profit margins' — a model has been developed to measure whether the independent variables affect the probability of a company having a goal to **decrease costs**. The logit model is represented by the following formula:

$$P(Y_i = 1 | x) = \Phi\left(\alpha + \sum_k \beta_k Barrier\ k_i + z_i \gamma\right) = \Phi(x\beta)$$

where Φ is a function with values between 0 and 1[7]; and Y is the dependent variable GOCOS which is equal to 1 if the firm has to "decrease costs" as an important goal, or 0 if otherwise;

Barrier k is a dummy explanatory variable of factors affecting the goal:

- Obstacles from Q11.3 are used as proxies for conditions of demand and competition:[8]
    - Strong price competition (OBSPR)
    - Strong competition on product quality, reputation or brand (OBSQL)
    - Lack of demand (OBSLDE)
    - Innovations by competitors (OBSCP)
    - Dominant market share held by competitors (OBSDMK)
- Availability of resources (Q11.3):
    - Lack of adequate financing (OBSFIN)
    - Lack of qualified personnel (OBSPRS)
- Other market barriers (Q11.3)
    - The costs of entering new markets (OBSAMK)
- The company's innovation behaviour by discriminating between product and process innovators
    - Product innovators: firms identified based on INPDGD = 1
    - Process innovators: firms identified based on INPSPD or INPSLG or INPSSU = 1

---

[7] For a probit model, $\Phi(x\beta) = \int_{-\infty}^{x\beta} \frac{1}{\sqrt{2\Pi}} \exp\left(-\frac{v^2}{2}\right) dv$, while for a logit model, $\Phi(x\beta) = \exp(x\beta)/(1 + \exp(x\beta))$. Only the logit model was estimated for this round of results. Probit estimates are expected to provide similar conclusions.

[8] The names of the variables are in parentheses.

- *z* is a vector of control variables which describe the company, including size, country and sector.

3.3 Analysis of factors shaping the perception of high regulatory cost

The *second* logit model measures how the independent variables affect the probability of a company that considers the high cost of regulations as a significant obstacle to meeting its goals. It also tests the hypothesis that regulatory cost is an important obstacle in situations concerning price competition and cost-cutting strategies.

To test the hypothesis, the sub-question Q11.3 "High cost of meeting government regulations or legal requirements" (OBSREG) is used as a dependent variable in the following logit model:

$$P(Y_i = 1|x) = \Phi\left(\alpha + \sum_k \beta_k\, k_i\, + z_i\gamma\right) = \Phi(x\beta)$$

where Φ is a function with values between 0 and 1; and *Y* is the dependent variable OBSREG which is equal to 1 if the company considers the high cost of meeting government regulations or legal requirements is a very important barrier to meeting its goals, or 0 if otherwise;

k is a dummy explanatory variable for the company's goals and strategies and for competition and market-entry-related obstacles it considers highly important;[9]

- The following goals are used:
    - o   Decrease costs (GOCOS)
    - o   Increase profit margins (GOPRF)
- Strategies:
    - o   Developing new markets outside Europe (STMKOTH)
    - o   Developing new markets within Europe (STMKEUR)
    - o   Reducing in-house cost of operation (STIHCOS)
    - o   Reducing cost of purchased materials, components or services (STEXCOS)
    - o   Strategy to introduce product innovations (STINNPD)

z is a vector of control variables which describe the company, including size, country, sector and innovator.

- For the size variable, companies were grouped as small, medium or large to determine which group size is more likely to regard regulatory cost as an obstacle.

- To reduce the number of dummy variables, the sectors were grouped into five categories: manufacturing, transport, construction, services and other.

- Similarly, to reduce the number of dummy variables, the countries were grouped in four categories according to the OECD index of restrictiveness of economy-wide product market regulation.

---

[9] The names of the variables are in parentheses.

3.4 Regulatory cost and internationalisation

The *third* logit model measures how regulatory cost affects the probability of a company having a strategy to develop new markets within Europe. The sub-question Q11.2 "Developing new markets within Europe" (STMKEUR) is used as a dependent variable in the following logit model:

$$P(Y_i = 1|x) = \Phi \left(\alpha + \sum_k \beta_k Barrier\ k_i + z_i \gamma \right) = \Phi(x\beta)$$

where Φ is a function with values between 0 and 1; and *Y* is the dependent variable STMKEUR which is equal to 1 if the firm has a strategy to develop new markets within Europe, or 0 if otherwise;

Barrier k is a dummy explanatory variable of the company's goals and the regulatory and non-regulatory barriers preventing it from achieving those goals;

- The main variable of interest is a dummy variable equal to 1 if the company considers that the high cost of meeting government regulations or legal requirements is very important, or 0 if otherwise (OBSREG*)*.

- The company's goals are used as proxies of its drivers to open new markets abroad:[10]

  o Decrease costs (GOCOS)

  o Increase profit margins (GOPRF)

  o Increase market share (GOMKT)

  o Increase turnover (GOTURN)

- The non-regulatory obstacles describe the company's competitive environment, possible entry barriers and the availability of resources:[11]

  o Strong price competition (OBSPR)

  o Strong competition on product quality, reputation and brand (OBSQL)

  o Lack of demand (OBSLDE)

  o Dominant market share held by competitors (OBSDMK)

  o Lack of adequate finance (OBSFIN)

  o Educational level of employees – share of employees with university degree (EMPUD)

  o High cost of access to new markets (OBSAMK)

z is a vector of control variables describing the company and its goals. The variables describing the characteristics of a company include size, type of innovator, sector and country.

- Firm size: number of employees (in three groups: small, medium, large companies).

- Innovators: firms identified based on INPSPD or INPSLG or INPSSU or INPDGD or INABA or INONG = 1.

- Sector: dummy variables based on five categories: manufacturing, transport, construction, services and other.

- Country: dummy variables based on four groups according to the OECD index of the restrictiveness of economy-wide product market regulation.

[10] The names of the variables are in parentheses.

[11] Ibid

4 The impact of regulatory cost on companies

4.1 Characteristics of companies perceiving high regulatory cost as an obstacle

4.1.1 The importance of regulatory cost

According to the CIS 2012, among various obstacles preventing companies from achieving their goals, regulatory cost is among the most important, coming second together with the lack of demand, representing 29 % of companies, totalling 472 000 firms (Figure 1).

Figure 1: Share of companies reporting obstacles as highly important — by type of obstacle
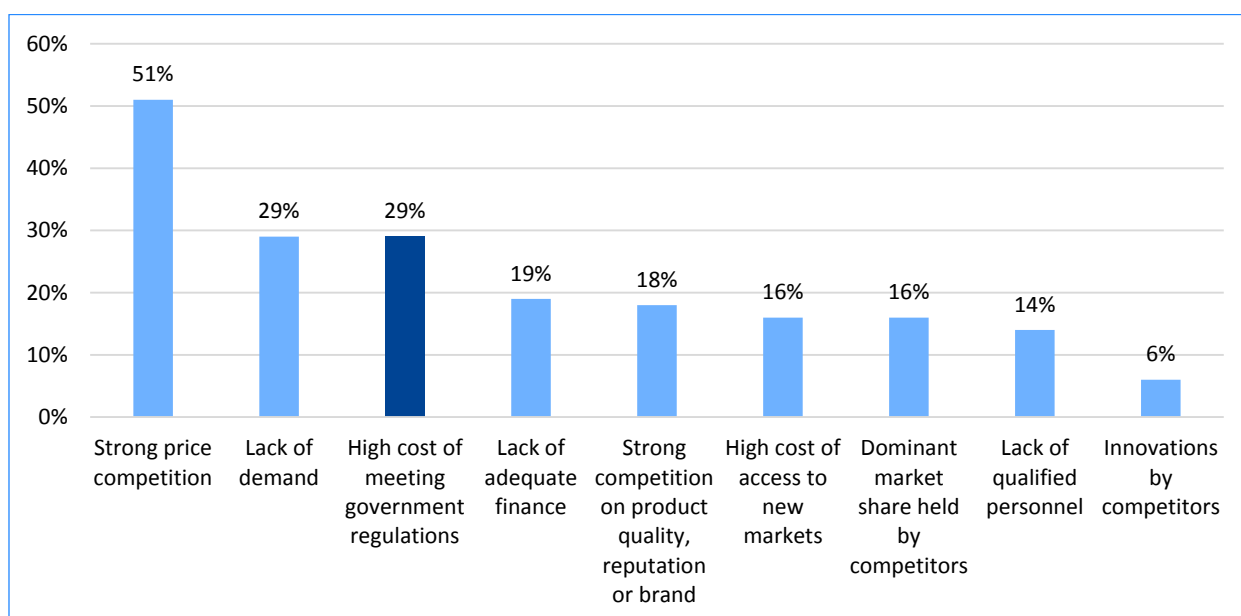
Source: CIS 2012 microdata (based on 75,720 observations)

In the following sections, the characteristics of the companies perceiving regulatory cost as an important goal to achieve their goals are examined.

4.1.2 Overview and results of the model

In this section the analysis aims to test the assumption that companies aiming to restrict costs are more likely to consider regulatory cost as an obstacle. Furthermore, if regulatory cost is not perceived in the same way by all companies, are there characteristics other their goals that influence their perception? Do differences in size, sector or country affect their perception of regulatory cost? Are innovators more likely to consider regulatory cost as an obstacle or not?

The second model, which is presented in this section, links a company's perception of regulatory cost (dependent variable) with its goals to 'reduce cost'. Non-regulatory obstacles are also taken into consideration as they affect a company's allocation of resources and provide a framework of challenges that the firm needs to overcome. The sector in which the company operates and its location (country) are also included in the model as, to a large extent, legislation is sector and country specific. Finally, other company-specific characteristics are also included, such as its size and the education level of the personnel. To capture the differences in the behaviour of innovators and non-innovators, a dummy variable was also included.

Table 2 presents the results of the logit regression with the regression coefficients (both in log odds and in odd ratios), the standard errors and the level of significance.

Table 2: Logit model — dependent variable: high regulatory cost as an obstacle

	Variables	High regulatory cost is a significant obstacle (log odds)	Odd ratios
Internationalisation	High cost of accessing new markets	1.901*** (0.022)	6.696***
	Developing new markets outside Europe	0.083** (0.032)	1.087***
	Developing new markets in Europe	-0.092*** (0.03)	0.912***
Cost-based competition and strategies	Obstacle: strong price competition	0.556*** (0.02)	1.744***
	Goal to reduce costs	0.215*** (0.027)	1.241***
	Strategy to reduce in-house operation costs	0.225*** (0.028)	1.252***
	Strategy to reduce input costs	0.177*** (0.025)	1.194***
Innovation	Strategy to introduce product innovations	0.159*** (0.025)	1.173***
	Innovators	0.185*** (0.021)	1.204***
Quality of HR	Education level of employees (share with university degree)	-0.006*** (0.0004)	0.994***
Sector variable	Construction	0.573*** (0.088)	1.774***
	Manufacturing	-0.419*** (0.084)	0.658***
	Services	-0.303*** (0.088)	0.739***
	Transport	-0.062 (0.084)	0.940
Size variable	Small companies	-0.141 (0.121)	0.869
	Medium companies	-0.418*** (0.122)	0.658***
	Large companies	-0.560*** (0.126)	0.571***
	Constant	-1.506*** (0.147)	0.222***
	Country groups	YES	
	N observations LR chi2(20) Prob > chi2 Pseudo R-squared	70075 13975.83 0.000 0.1727	
	Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		

The results presented in the table are discussed in more detail below. The relations identified should not be interpreted as an indication of the existence of causality between the variables. This also applies to the other models' results presented below.

4.1.3   Regulatory cost and internationalisation

The variable with the highest relevance to the dependent variable is the 'high cost of accessing new markets' (odds ratio 6.696). Since the regulatory cost is negatively related to 'developing new markets in Europe', but positively related to 'developing new markets outside Europe', the following conclusions can be made concerning the internationalisation of European companies:

- Companies regarding as significant the cost of accessing new geographical markets inside or outside Europe are more likely to consider regulatory cost as an obstacle.

- Companies opening new markets outside Europe are more likely to consider regulatory cost as a significant obstacle. Conversely, **companies developing new markets within Europe are less likely to consider regulatory cost as an obstacle** although they also bear the high cost of going abroad.

The relevance of regulatory cost to internationalisation will be further examined in section 4.3.

4.1.4   Regulatory cost and company strategies

The second group of variables with the highest relevance to regulatory cost is related to the competitive environment and companies' cost strategies. Price competition is closely related to regulatory cost competition (odds ratio 1.744) which means that **companies facing strong price competition are more likely to regard regulatory cost as an important obstacle**. In addition, companies facing strong price competition are more likely to compete in relatively mature markets adopting low-cost strategies (Utterback and Abernathy, 1975). This is consistent with the results of the model (see Table 2) that show that regulatory cost is strongly related to the goal of reducing costs and strategies to cut the cost of in-house operations and inputs. Therefore, it could be concluded that **the perception that a high regulatory cost is an important obstacle is driven mainly by strong pressures from competition to reduce costs, which is more likely to be observed in companies with mature products.**

Combining this finding with the previous one – that regulatory cost is an important obstacle for companies penetrating new markets outside Europe – it could be argued that **regulatory cost might be among the factors hindering a company's competitive position in low-cost international markets featuring intense price competition.**

Although the model in the previous section links low-cost goals with regulatory cost and process innovations, which improve productivity and reduce production costs, the current model links regulatory cost with both low-cost goals and the strategy to compete through product innovations (to introduce new or significantly improved products). Price competition and low-cost strategies apply to mature products at the latest stages of their life cycle, while the introduction of new products indicates the beginning of a new product life cycle. Coexistence of the two strategies could be explained, on the one hand, as an effort by companies to compete effectively with 'neck-and-neck' rivals in mature product markets by adopting low-cost strategies for their more mature products, and, on the other hand, to escape competition by introducing new products (Aghion, Harris, Howitt, and Vickers, 2001) thereby initiating a new product life cycle.

In the next section, the innovation activities of those companies reporting regulatory cost as a significant obstacle will be further examined with the support of descriptive statistics.

4.1.5   Regulatory cost and innovation

As is evident in Table 2, innovative companies (odds ratio 1.204) and companies with a strategy to introduce new products (odds ratio 1.173) are **more likely to consider regulatory cost as a significant obstacle**. This finding, in combination with the finding that companies in mature markets (with fewer innovation activities) are more likely to consider regulatory cost as an obstacle, raises the question whether non-innovative companies are less affected by regulatory cost and whether there are differences between innovators and non-innovators.

By using CIS microdata, a comparison between innovators and non-innovators shows little difference between the two groups regarding their perception of regulatory cost as a very important barrier, with more visible differences in the group of large companies (Figure 2). Specifically, the difference in the share of innovating and non-innovating SMEs is very small and

the statistical test shows non-significant differences between the two. The picture is **different in large companies where the share of innovators is higher**, amounting to 17.3 % compared to 14.9 % while the *z* test rejects the null hypothesis of the two proportions being the same[12]. Innovative SMEs are more affected than large companies by regulatory costs as the latter can often take advantage of economies of scale and scope associated with the implementation of regulatory obligations and the investment required for compliance. 36% of innovative large firms view such regulatory barriers as unimportant, while only 15% of innovative SMEs considered this to be the case.

Figure 2: Share of innovative and non-innovative companies reporting regulatory costs as a low, medium or highly important obstacle — large companies and SMEs
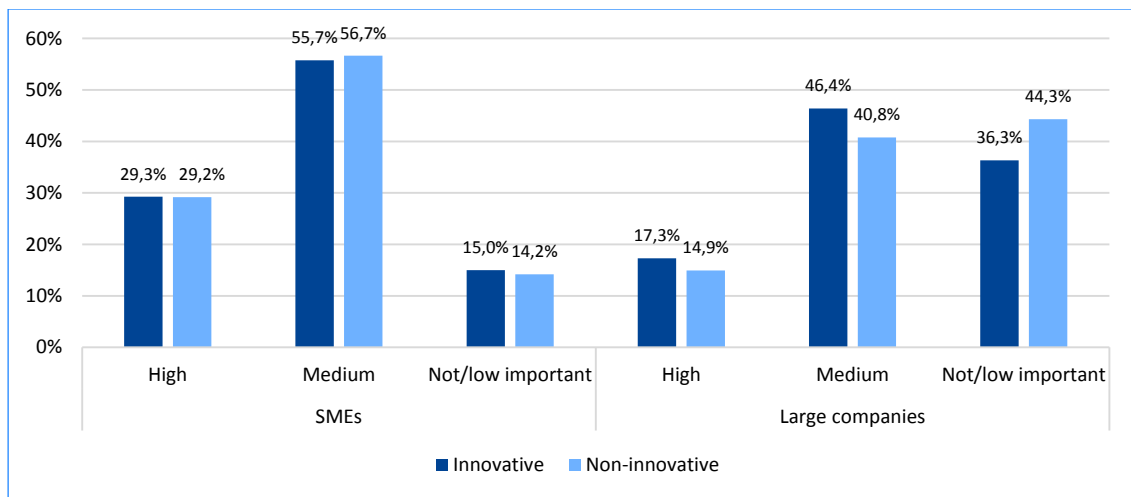
Source: CIS 2012 microdata (based on 75,605 observations)

The small difference in favour of large innovative companies reflects differences across the sectors. As Figure 3 shows, the difference between innovative and non-innovative firms is small in manufacturing, which represents 54 % of the companies, with the share of non-innovative companies being slightly higher.

Figure 3: Share of large innovative and non-innovative companies reporting regulatory cost as an important obstacle — by sector
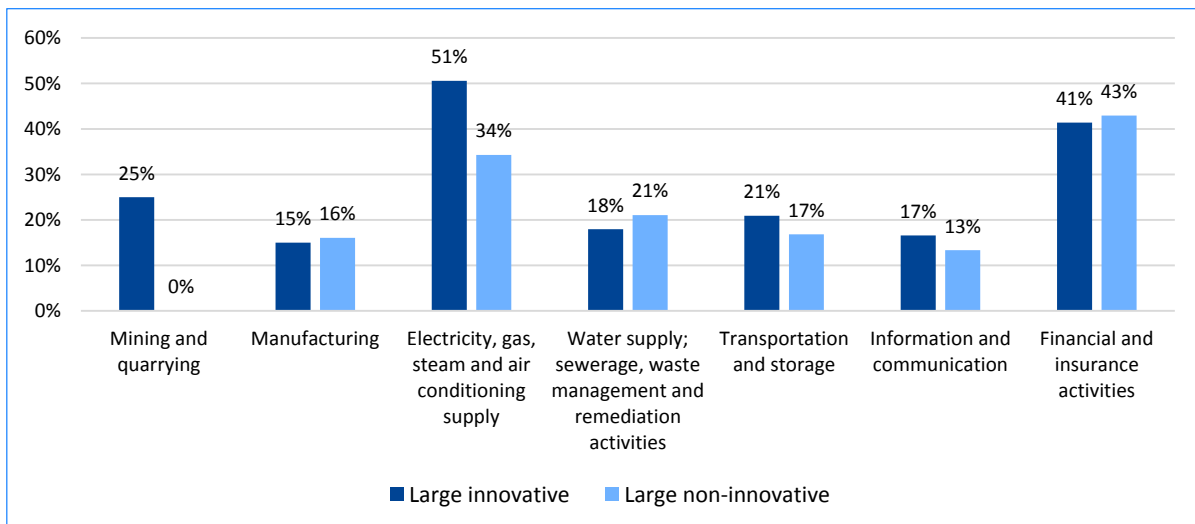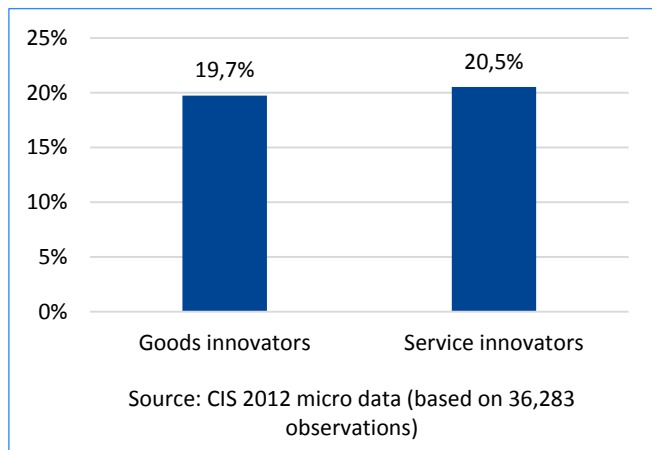

Source: Eurostat CIS 2012 (based on 95,390 observations)

---

[12] The result is significant at p <0.05.

The sectors influencing the overall result are mining and quarrying, electricity and gas, transport and storage, and information and communication. As the specific dataset used for the comparison does not provide data for construction, it is not known how it might affect the comparison between innovators and non-innovators.

Differences between innovative and non-innovative companies, either within a sector or across sectors, could be attributed to, among other things, **differences in the regulatory cost for new products compared to those already on the market**. Registration and permit fees and the cost of producing and reporting the information required for registration, or permits for products new to the market, tend to be higher than for products already on the market. For the latter, procedures are often simpler and companies can use the existing information. Therefore, the higher administrative costs and monetary obligations borne by innovative companies could create differences in the perception between innovative and non-innovative companies regarding the significance of regulatory costs. In addition, companies which invested in new, more efficient and environmentally friendly or safer machinery and equipment in order to comply with the legislation are counted as

Figure 4: Share of innovative companies perceiving compliance costs as a very important barrier — by type of innovator

Source: CIS 2012 micro data (based on 36,283 observations)

process innovators in the CIS survey – and process innovators might tend to experience higher regulatory costs than other companies. However, the perception is not influenced by the absolute value of the cost but rather by its impact on the company which means that a higher cost is not automatically perceived as an obstacle. Some CCA studies found that in some cases the strict requirements (e.g. health and safety) imposed by regulations had gradually become industry standards and although additional investments were required, they were not regarded by industry as a regulatory cost or an obstacle (for example, Maroulis et al., 2016).

The perception of innovators in manufactured goods and service innovators does not seem to differ, with 19.7 % of the former and 20.5 % of the latter perceiving regulatory costs as a very important barrier (Figure 4). In fact, as the z test gives a non-significant p-value, we cannot reject the null hypothesis of the two proportions being the same. The category service innovators in the CIS includes companies in the service sector as well as service activities in the manufacturing sector. Thus, further investigation is necessary at the sector level to explain the differences between goods innovators and service innovators.

As differences in perception between innovative and non-innovative companies regarding the importance of the high regulatory cost as an obstacle is small, yet statistically significant for large companies, it could be argued that being an innovator is an additional factor which when added to others – not related to innovation activity – are already influencing a company's perception. Thus, the explanation of the overall negative perception should be sought **mainly for reasons not related to companies' innovation activities**.

4.1.6 Quality of human resources and regulatory cost

Employees' education levels also affect companies' perception of the regulatory cost. The negative sign of the coefficient indicates that **the higher the educational level the less the regulatory cost is seen as an obstacle**. Figure 5 corroborates this finding by illustrating how the share of companies regarding regulatory cost as an obstacle falls as the percentage of employees with tertiary degrees increases. Approximately 17 % of companies with 75 % or more of their personnel qualified at the tertiary education level regard regulatory cost as a significant obstacle compared to 29 % overall. However, when looking at the behaviour of the two size groups, the trend for SMEs is clear while for large companies notable differences can be observed with more than 75 % of its personnel having had tertiary education.

Figure 5: Share of companies regarding regulatory costs as highly important — by size of the company and percentage of employees with a tertiary degree
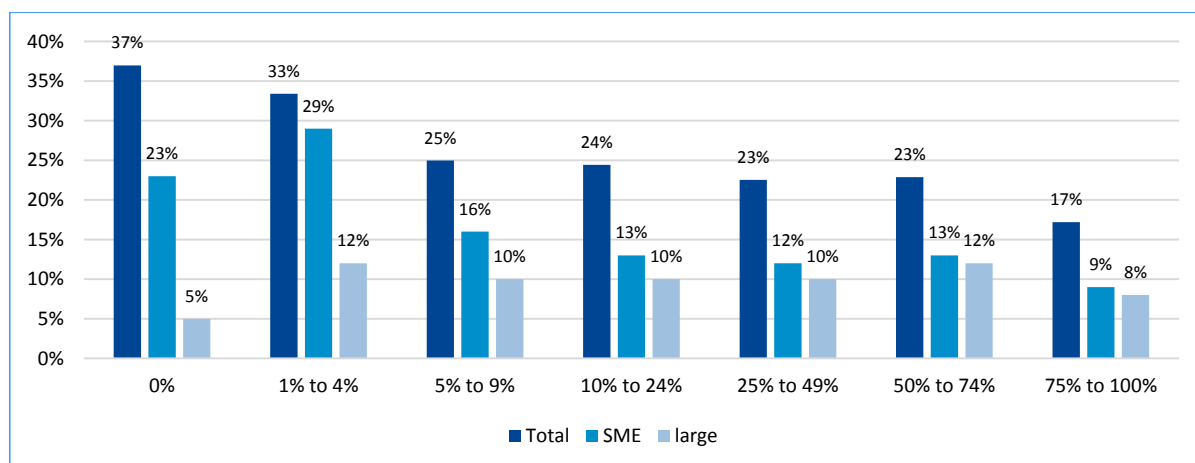
Source: CIS 2012 microdata (based on 75,605 observations)

4.1.7 The size of companies and their perception of regulatory cost

As regards size, medium and large companies are negatively related to regulatory cost while there is no relation between the regulatory cost and small companies (Table 2). Since the three company sizes are expressions of the same variable, the negative coefficients mean that **medium and large companies are less likely than small companies to perceive regulatory cost as an obstacle.**

Variations between the size groups is better illustrated in Figure 6 which shows a clear and statistically significant[13] difference between SMEs and large companies. The figures confirm that the share (17 %) of large companies reporting regulatory cost as an obstacle is lower than that of SMEs (29 %). The finding of empirical sectoral studies that the compliance cost is substantially higher for SMEs than for large companies could explain the difference between the two. As has been estimated in a cumulative cost assessment for the chemicals sector (Maroulis et al., 2016)[14], the overall

Figure 6: Share of companies regarding regulatory costs as very important — by size
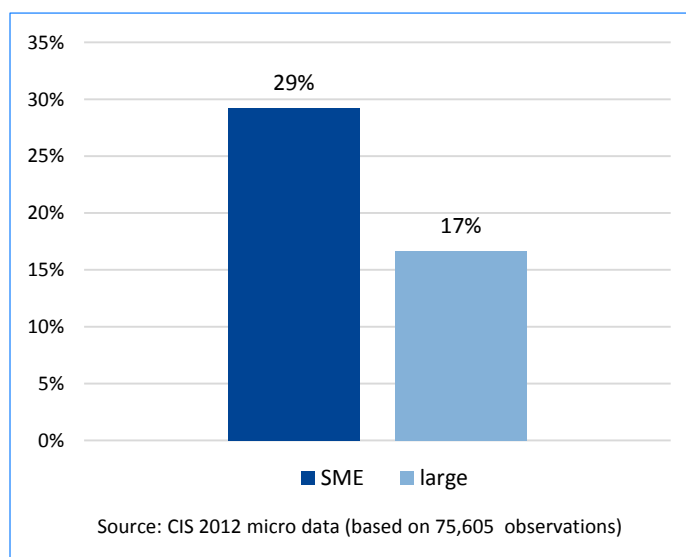
Source: CIS 2012 micro data (based on 75,605 observations)

average annual compliance cost for SMEs as a share of turnover across all legislation is around 35 % higher on average compared to large companies. However, it should be noted that differences between SMEs and large companies vary substantially between pieces of legislation. Similar conclusions are supported by a cumulative cost assessment for forest-based industries (Leon et al., 2016)[15] where, in general, SMEs incur higher costs when compared to large firms because the cost of complying with legislation is not linear and cannot be amortised by SMEs on a large volume of products. Economies of scale and scope in big business associated with the

---

[13] The *z* score falls into the rejection region, hence confirming our findings in rejecting the null hypothesis that the two proportions are the same.

[14] Available at: http://ec.europa.eu/growth/sectors/chemicals/ec-support_en

[15] Available at: http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=9000

administration of regulatory obligations and investments necessary for compliance are responsible for the difference in the regulatory burden when compared to SMEs.

4.1.8 Sectoral differences

Companies are grouped into four broad sectors as part of one of the model's variables. According to Table 2, 'construction' is related positively to the dependent variable, indicating that construction companies are more likely than those in other sectors to regard regulatory cost as an obstacle. Since the four sectors are part of the same variable, each of their coefficients compare with the others. Therefore, the negative coefficients of 'manufacturing', 'services' and 'transport' mean that companies in those sectors are less likely to see regulatory cost as an obstacle than those in the 'construction' sector.

Differences between the sectors are better illustrated in Figure 7. The share of companies in the 'construction sector' reporting that regulatory cost is an obstacle is the highest at 47 %, while the share of 'administrative and support services' (11 %) and 'information and communication' (13 %) are the lowest. Significant variability in the perception of different sectors is not surprising given the differences in volume and the implied cost of regulation borne by different sectors.

Figure 7: Share of companies reporting regulatory costs very important — by sector NACE-1 digit
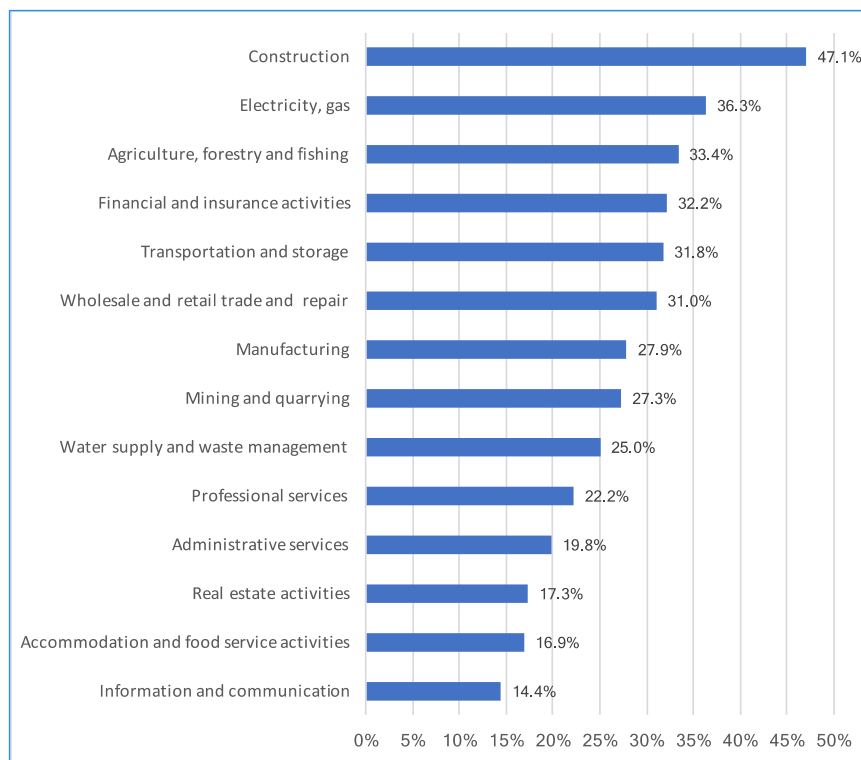
Source: Eurostat CIS 2012 (based on 507,608 observations)

As is evident from the cumulative cost-assessment exercises, environment (including climate and energy) and safety-related regulations usually generate the highest regulatory cost. Therefore, companies in sectors with environmental and safety concerns are expected to be among those that regard regulatory cost as a significant barrier. This applies to the construction sector (Testa et al., 2011), energy production, manufacturing, agriculture, forestry and fisheries, as well as transportation and storage. Labour legislation also directly affects cost, having a greater impact on labour-intensive sectors (e.g. construction, agriculture, retail).

In addition, sector- and product-specific regulations could generate additional direct or indirect costs. The financial sector is highly regulated, especially since the recent financial crisis (Quaglia, 2013). The retail sector is subject to entry regulations which impose registration and licensing costs in addition to restrictions on the range of products and services and the establishment of

large outlets. There are also restrictions on inputs, pricing and hours of operation which generate indirect costs such as an opportunity cost.

Sectors such as professional and administrative services and ICT, which have a relatively low share of companies reporting regulatory cost as a significant obstacle (Figure 7), are mainly affected by product market regulations (Ravet, 2017) that do not inflict regulatory cost but rather create incentives or disincentives for companies.

In addition to differences in the 'regulation mixes' affecting different sectors, other factors are also important for shaping companies' perception, and should also be taken into consideration when interpreting the results. As argued in chapter 5, a company's strategy, the competition, and its position in relation to its product life cycle are also relevant in this respect.

Looking at the sectoral differences at the 2-digit level for the manufacturing sector (Figure 8), 'manufacture of pharmaceutical products' stands out as the sector with the highest percentage of companies reporting high regulatory costs (39 %). The result is not surprising given the existing strict regulatory framework covering areas for new drug production (e.g. legislation on clinical trials or patenting to production, distribution and pricing). As pointed out by Ravet (2017), the main types of regulation affecting pharmaceuticals are product safety, environmental protection and labelling regulations.

The second highest percentage of companies (34 %) reporting regulatory costs as a very important barrier is observed for the 'manufacture of basic metals'. According to CEPS and Economisti Associati, (2013b), 2012 was a bad year for the steel industry with low profit margins, intense competition, and overcapacity. While the cost of regulation varied in 2012 between 1.6 % to 2.9 % of production costs, depending on the product, the share of the regulatory cost over EBITDA[16] ranged from 15 % to 33 %, which significantly squeezed profitability. In 2006, which was the most profitable year, the regulatory cost represented 9.4 % of EBITA. For the aluminium industry, which is heavily affected by energy-related regulations, regulatory costs varied from 16 % of EBITA in 2006 (the most profitable year) to 93 % in 2012 (CEPS and Economisti Associati, 2013b).

For the chemical industry, 27.9 % of the companies reported that regulatory cost was a significant obstacle. According to a recent cumulative cost-assessment study (Maroulis et al., 2016), the average annual regulatory cost during the period 2004-2014 represented 2 % of turnover and 30 % of the gross operating surplus (GOS).

Following close behind the 'chemicals' sector, 27.1 % of companies in the 'non-metallic products' sector reported that regulatory cost is a significant obstacle. The regulatory cost for the ceramic subsectors varied from 10 % to 42.5 % of EBITDA (depending on the product) in 2015, which was a typical year for the sector. For the same year, the cost for the glass subsectors varied from 14.7 % to 31.1 % of EBITDA (CEPS, Economisti Associati, and Ecorys, 2017a, 2017b).

In the 'manufacture of paper and paper products' sector, 22.7 % of companies reported regulatory cost as a significant obstacle. Over the period 2005-2014, the average annual cumulative regulatory cost amounted to 0.9 % of turnover, 10.8 % of gross operating surplus and 7.6 % of EBITDA (León et al., 2016). The sector reporting the least concern for high regulatory costs is in 'beverages' (15% of EU manufacturing companies) which is typified by fast-moving consumer goods and a focus on international markets.

---

[16] EBITDA is a company's earnings before interest, taxes, depreciation and amortisation and is used as a proxy for a company's current operating profitability.

Figure 8: Share of manufacturing companies reporting high regulatory costs as very important — NACE-2 digit

Pharmaceutical products — 38,5%
Basic metals — 34,1%
Repair and installation of machinery and equipment — 33,3%
Leather and related products — 30,0%
Other manufacturing — 30,0%
Textiles — 29,1%
Food products — 28,9%
Chemicals — 27,9%
Fabricated metal products — 27,6%
Other non-metallic mineral products — 27,1%
Furniture — 26,9%
Wearing apparel — 26,3%
Wood and of products of wood — 25,6%
Coke and refined petroleum products — 24,8%
Other transport equipment — 24,8%
Rubber and plastic products — 23,2%
Printing and reproduction of recorded media — 22,9%
Paper and paper products — 22,7%
Machinery and equipment n.e.c. — 22,7%
Electrical equipment — 22,3%
Tobacco products — 17,2%
Computer and electronics — 16,6%
Motor vehicles — 16,2%
Beverages — 14,8%

Source: Eurostat CIS 2012 (based on 248,163 observations)

Although not all cost metrics are compatible across the various studies, the ranking resulting from the CIS survey seems to be consistent with the actual cost data reported by existing cumulative cost assessments, in the sense that **sectors with relatively higher regulatory cost tend to present higher rates of companies reporting regulatory cost as a barrier**.

4.1.9 Country differences

Despite increasing regulatory harmonisation within EU, differences among countries remain because of differences in transposing EU directives and national legislation. Therefore, differences are to be expected in companies' perception of regulatory cost across the countries.

When comparing countries, Italy ranks first as the country with the highest percentage share of companies reporting regulatory costs as very important (43 %). As can be seen in Table 3, Italy is within the highest 80 % percentile for almost all sectors except electricity and financial services where it is around the 50 % percentile. At the other end of the scale, Sweden and Netherlands have the lowest shares, 7 % and 12 % respectively, of companies reporting high regulatory costs as an obstacle (Figure 9). There is insufficient information at the sector level, while in the Netherlands all sectors, except financial services and water supply, fall within the lowest 20 % percentile.

As mentioned in the methodology, France, Spain, Denmark, Finland, Czech Republic, Luxembourg and the UK did not provide data on the specific section regarding the obstacles and are thus excluded from Figure 9.

Figure 9: Share of all companies reporting high regulatory costs as a significant obstacle, by country
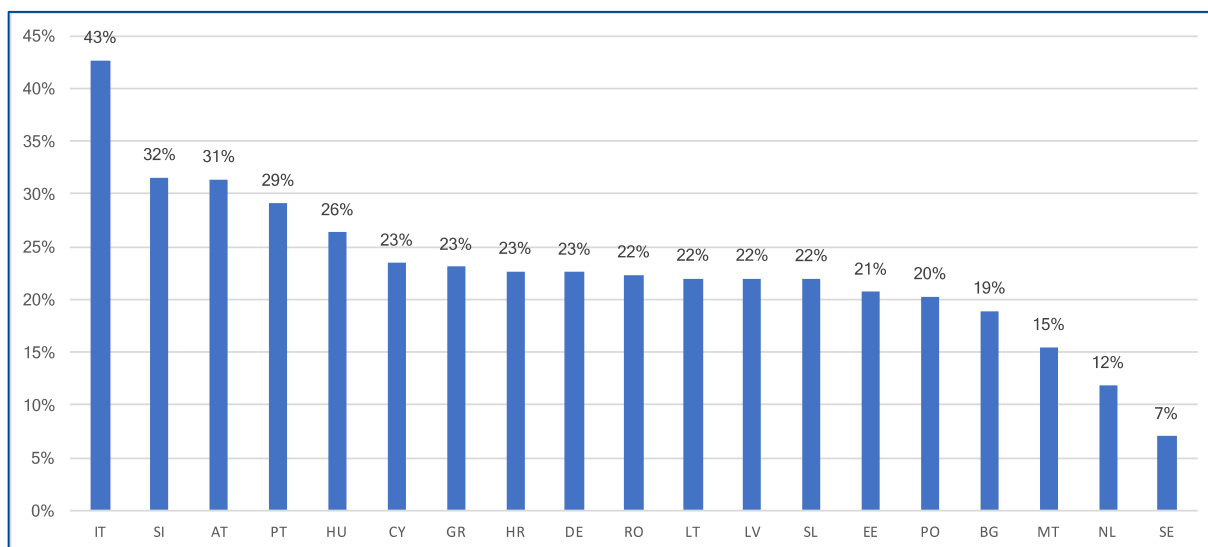
Source: Eurostat CIS 2012 (based on 507,608 observations) — source for data for LV and SE is CIS 2012 microdata

The differences across countries could be attributed to several factors, such as the different sectoral mixes or differences in national legislation, including differences in transposing EU directives.

Table 3: Share of companies reporting high regulatory costs as a significant obstacle, by country and sector

	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Electricity and gas	Water supply and waste managem.	Construction	Wholesale and retail trade	Transport. and storage	Tourism related activities	Information and comm.	Financial and insurance activities	Real estate	Professional, scientific activities	Administrative and support services
Bulgaria		22.5%	19.9%	22.4%	24.9%		19.1%	18.6%		12.7%	8.4%		18.3%	
Germany		22.2%	19.4%	63.2%	19.9%			34.7%		6.6%	52.3%			
Estonia		30.2%	21.1%	22.6%	36.4%			21.8%		8.5%	18.1%			
Greece		18.9%	26.6%	23.9%	21.9%			13.6%		15.4%	9.4%			
Croatia		14.3%	25.5%	13.7%	17.2%	27.2%	23.8%	20.8%	16.4%	13.6%	19.9%	16.2%	18.9%	
Italy		40.8%	42.8%	23.1%	32.9%	51.5%	41.0%	45.0%		31.3%	20.7%		34.7%	
Cyprus		66.7%	24.2%		41.0%		20.0%	21.3%		17.5%	33.8%		19.7%	
Lithuania		23.4%	21.0%	12.4%	29.0%	26.0%		22.1%		12.0%	13.9%			
Hungary		22.9%	26.2%	40.3%	36.0%		25.0%	29.8%		17.4%	35.6%		24.0%	
Malta	33.3%	25.0%	16.2%			9.6%	13.4%	15.1%	20.3%		13.5%	37.5%	14.6%	19.8%
Netherlands			13.4%		21.4%		7.7%	18.7%		7.3%	28.5%		5.7%	
Austria		20.2%	30.5%	39.8%	26.4%			34.4%		10.7%	58.2%			
Poland		20.7%	19.8%	20.1%	22.0%		20.5%	24.2%		16.2%	17.9%		18.4%	
Portugal		51.4%	29.1%	36.2%	25.1%	32.6%	33.3%	28.2%		22.8%	14.8%		24.5%	
Romania		18.4%	21.1%	19.4%	24.7%		30.4%	20.1%		17.9%	16.9%		13.4%	
Slovenia			33.8%					31.7%	31.9%				31.1%	
Slovakia		12.7%	23.5%	17.4%	11.6%	27.5%	18.1%	21.1%		14.6%	15.9%		24.0%	

Percentile 20%
Percentile 50%
Percentile 80%

Source: Authors' elaboration based on Eurostat CIS 2012 database

Country-level differences between innovative and non-innovative companies perceiving high regulatory costs as very important are also indicated. However, the results should be interpreted with caution as the difference in some of the countries might be attributed to small samples, among other reasons. Comparing innovators and non-innovators per country (Figure 10), it can be observed that the share of companies reporting regulatory cost as an obstacle tends to be higher among innovators than non-innovators in countries with a lower innovation capacity[17]. Innovators

---

[17] The European Innovation Scoreboard has been used to group countries according to their innovation capacity http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en

in 'innovation leaders' and 'strong innovators' countries are less inclined to regard regulatory cost as an obstacle than non-innovators. The opposite is true for 'modest innovators' and most of the 'moderate innovators' countries, with the exception of Italy, Lithuania, Poland and Slovakia where the share of non-innovators reporting that regulatory cost is an obstacle are more than the innovators.

Figure 10: Share of innovative and non-innovative companies reporting high regulatory costs, by country and innovation capacity — 2012[18]
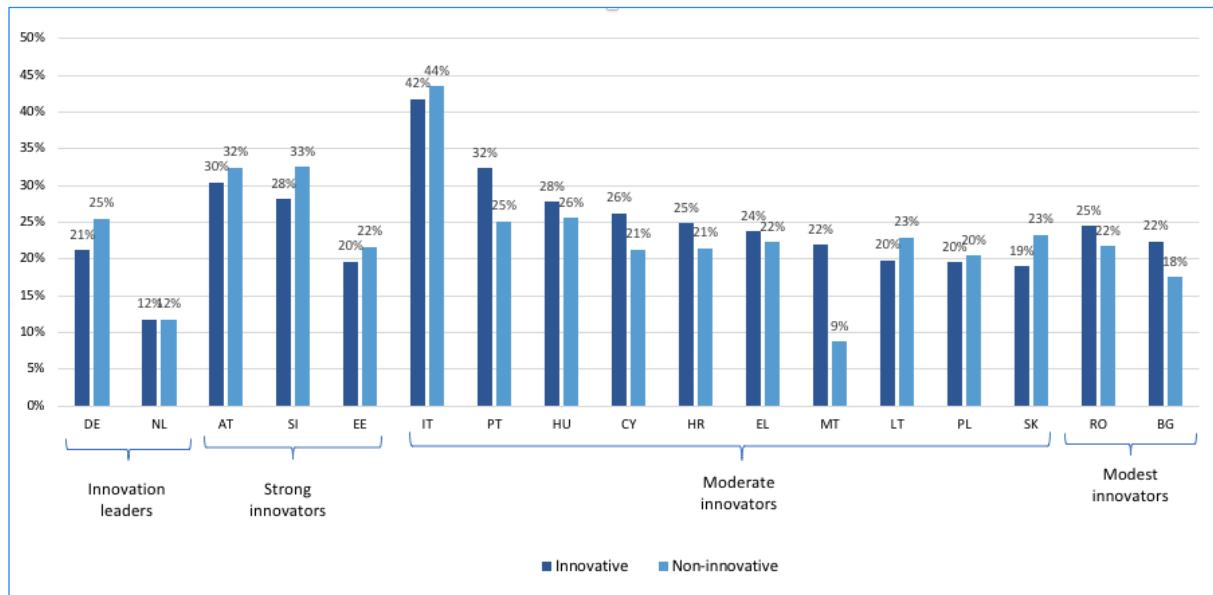
Source: Eurostat CIS 2012 and European Innovation Scoreboard 2012

The differences illustrated might imply that innovative **companies are already struggling to cope with the less innovation-friendly environment in countries with weaker innovation systems**. Any additional regulatory costs increase their burden and the obstacles they have to overcome.

It can also be observed that the share of companies reporting high regulatory barriers in some of the countries in the most innovation-advanced groups (Germany, Austria and Slovenia) are either above or close to the EU average (29 %), while several countries in the less-advanced groups are below that level. Therefore, it could be argued that **regulatory barriers do not impede a country's innovation capacity**.

4.2 Regulatory cost and companies' goals

The results of the first logit regression model, which is described in chapter 3 and presented in Table 4, provide more inside information on other factors that are also related to the goal "reduce cost".

The model confirms the results of the stepwise regression presented in chapter 3 – i.e. **companies reporting the high regulatory cost as an important obstacle are more likely to have a goal to reduce costs**.

Looking at the variables describing the competitive environment, **strong price competition and lack of demand** are among the predictors with the highest influence[19]. The importance of factors such as product quality, reputation or brand competition indicates that **companies competing in**

---

[18] Although there are more recent EIS data, the 2012 results are used for compatibility with the CIS results which refer to the period 2010-2012.

[19] Highest odd ratios.

markets with established products and rivals are also more likely to be aiming to reduce costs.

Table 4: Logit model — dependent variable: goal to decrease costs

	Variables	Goal to decrease costs (log odds)	Odd ratios
Main variable	**High regulatory cost is a significant obstacle**	0.370*** (0.021)	1.447***
Conditions of competition and entry barriers	Strong price competition	0.859*** (0.017)	2.363***
	Lack of demand	0.636*** (0.019)	1.890***
	Strong product quality, reputation or brand competition	0.257*** (0.023)	1.293***
	Competitors' dominant market position	0.053** (0.025)	1.054**
	High cost of accessing new markets	0.047* (0.024)	1.048*
	Innovation by competitors	-0.584*** (0.026)	0.557***
Available resources	Lack of funding	0.436*** (0.023)	1.546***
	Qualified personnel	-0.346*** (0.026)	0.707***
Type of innovator	Process innovators	0.297*** (0.024)	1.346***
	Product innovators	0.027 (0.024)	1.027
Size of company	Small companies	-0.504 *** (0.112)	0.604***
	Medium companies	-0.259** (0.112)	0.772**
	Large companies	0.094 (0.115)	1.099
	Constant	-0.315** (0.133)	0.642**
	Sectors	Yes	
	Country groups	Yes	
	N observations LR chi2(17) Prob > chi2= Pseudo R-squared	77090 12890.41 0.000 0.12	
	Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		

Competitors' innovations are related negatively to the dependent variable, indicating that pressure from innovations from rival companies is less likely to influence companies to adopt a low-cost goal. This is consistent with the finding that product innovations are not significantly related to the low-cost goal.

The positive sign of the coefficient for process innovations indicates an emphasis on improving productivity which contributes to reducing production costs.

Combining the findings, there is strong evidence that **companies reporting high regulatory cost as an important obstacle are more likely to operate in a highly competitive environment dominated by low-cost strategies, and that their products are probably relatively mature and at the later stages of their life cycle**.

4.3 Regulatory cost and internationalisation

The negative relation between the opening of new markets within Europe and the perception of regulatory cost as a barrier – which was discussed in section 4.2 – is also confirmed by a logit model that relates a company's strategy to open up new markets in Europe (dependent variable) with its goals, main obstacles and available resources. Similar to the other models, the specific characteristics of the company, such as size, sector, country of operation and innovation activity, are also included.

A similar model developed for the opening up of new markets outside Europe did not confirm any link with the regulatory cost.

As shown in Table 5, the connection between the regulatory cost as an obstacle and the strategy to open new markets in Europe is significant. The negative sign of the coefficient means that **companies with a strategy to open new markets in Europe are less likely to regard regulatory cost as an obstacle**, despite the high cost of assessing new markets.

Drivers for companies to seek new markets in Europe are expressed by their goals to increase market share (odds ratio 2.268), profit margin (odds ratio 2.268) and turnover (odds ratio 1.809), plus the pressure from strong competition on product quality and brand name (odd ratio 1.277), the dominant position of competitors (odds ratio 1.171) and unsatisfactory demand in the local market (odds ratio 1.06). Price competition and cost reduction are not among the driving forces since their relation to the dependent variable is not statistically important. Also, innovative companies are more inclined than non-innovative ones to open new markets in Europe (odds ratio 1.426).

A negative trend is observed when looking at the relationship between regulatory cost and opening new markets in Europe for innovative companies by sector (Figure 11). The sectors with a higher share of companies reporting regulatory cost as an obstacle reveal a lower share of companies opening up new markets in Europe. However, this observation does not imply that there is a causal relation between regulatory cost and internationalisation. For network sectors such as electricity and gas, transport (only rail transport) and water, regulation tends to restrict competition and the entry of newcomers (Koske, I. et al., 2015). Therefore, in these sectors, the entry barriers related to product market regulation restrict internationalisation rather than the regulatory cost. Near the other end of the graph, in the telecoms sector, where product market regulations are more conducive to competition, the share of companies with an internationalisation strategy are among the largest. Manufacturing, which represents more than half of the companies' population, is located in the middle with 28 % of all manufacturing companies considering regulatory cost to be an obstacle and 27% having a strategy to open up new markets in Europe.

CIS data provide information only for the country of operation of the companies replying to the questionnaire. Thus, the question regarding regulatory cost cannot be associated with regulations in the destination country but only in the country of origin where the company operates.

Table 5: Logit model — dependent variable: strategy to develop new markets in Europe

	Variables	Strategy to develop new markets in Europe (log odds)	Odd ratios
Cost barriers	High regulatory cost is a significant obstacle	-0.061** (0.027)	0.941**
	High cost of accessing new markets	0.394*** (0.029)	1.483***
Goals	Decrease cost	-0.013 (0.027)	0.987
	Increase market share	0.819*** (0.026)	2.268***
	Increase profit margin	0.308*** (0.026)	2.268***
	Increase turnover	0.593*** (0.030)	1.809***
Competition	Strong price competition	0.028 (0.024)	1.028
	Strong competition on product quality, reputation or brand	0.205*** (0.026)	1.227***
	Lack of demand	0.058** (0.024)	1.060**
	Dominant market share held by competitors	0.158*** (0.029)	1.171***
	Innovators	0.355*** (0.022)	1.426***
Resources	Lack of adequate finance	0.234*** (0.028)	1.264***
	Education level of employees	0.004*** (0.000)	1.004***
Size	Small companies	0.090 (0.121)	1.094
	Medium companies	0.597*** (0.122)	1.182***
	Large companies	0.434*** (0.125)	1.543***
	Constant	-4.307*** (0.128)	0.013***
	Sector	Yes	
	Country	Yes	
	N observations LR chi2(20) Prob > chi2 Pseudo R-squared	70206 10983.99 0.000 0.162	
	Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		

When comparing the share of companies which regard regulatory cost as high and those with a strategy to open new markets in EU, no clear relation is observed[20] when the countries are considered (Figure 1). The distribution of countries in the two size groups – all companies and SMEs – present significant differences without following a particular pattern. The largest differences are observed for Italy, Netherlands, Hungary, Lithuania and Romania. No significant changes are observed among the two groups – all companies and SMEs – in Germany, Bulgaria, Malta and Greece.

---

[20] However, the absence of an observable correlation does not preclude its existence. The analysis of microdata presented previously provides a more conclusive view on the subject.

Figure 121: Share of innovative companies per sector with a strategy to open new EU markets which regard regulatory cost as a significant obstacle
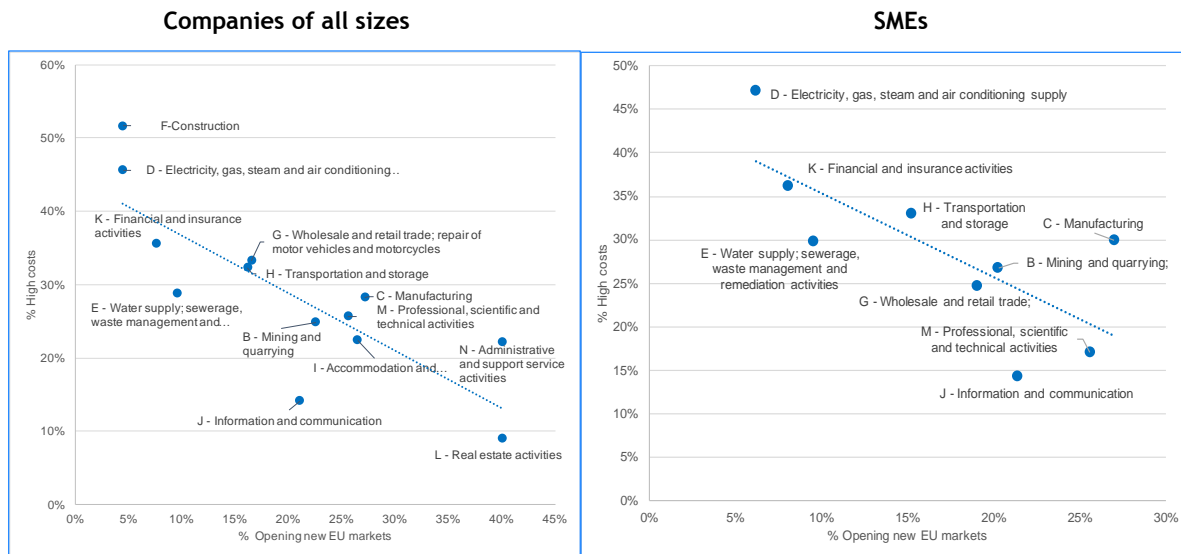
Source: Eurostat CIS 2012

Figure 112: Share of innovative companies per country with a strategy to open new markets in EU which regard regulatory cost as a significant obstacle
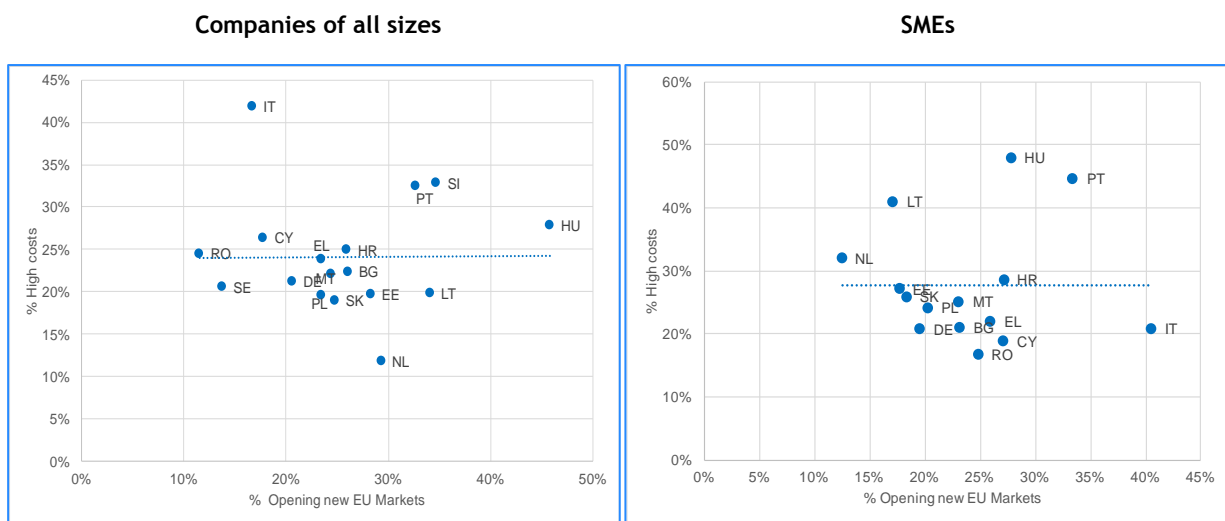
Source: Eurostat CIS 2012.

Countries with a higher share of SMEs that regard the regulatory cost as high are Hungary, Portugal, Lithuania and the Netherlands. When all the companies are considered, Italy moves to the first place with Slovenia, Italy and Hungary following from a distance.

5 Conclusions

Empirical sectoral studies have demonstrated that the effect of regulations on companies is differentiated according to the type of legislation, and that legislation does not only impose costs but also creates incentives or disincentives for companies to invest or innovate. Evidence of these **differences can be seen across sectors** as companies are subjected to different regulation mixes. The findings of this study, which are based on CIS data, support these conclusions while offering additional explanations.

Approximately 29 % of European companies perceive regulatory costs as a highly important obstacle to achieving their goals. The **impact of regulatory cost on company performance often depends on contextual factors** such as the level and type of competition and the strategies companies adopt to respond to challenges. Companies that are affected more are those facing intense price competition and rely on cost-cutting strategies to improve their competitive position. Among these, firms operating in mature markets with established products in final stages of their life cycles are most vulnerable to cost constraints and thus to regulatory costs. Although innovative companies among them tend to rely on process innovations to increase productivity and reduce costs, or to trying to escape competition by introducing new products, several still regard regulatory cost as an important obstacle.

Due to the influence of factors such as a company's competitive position and the characteristics of its product portfolio, simple estimations of regulatory costs are not sufficient to draw conclusions about the impact of regulation on companies. Furthermore, **sector-specific characteristics are also important**. On the one hand, product and sector-specific regulations add additional costs to those generated by horizontal regulations. On the other hand, the impact of such costs on companies' cost structure and on their competitive position can also depend on sectoral characteristics. Therefore, efforts to measure the cost and impact of regulations **s**hould take into consideration the sectoral characteristics and structure of the competition.

Other company characteristics, such as its **size and the educational level of its employees, can also be influential**. In general, the higher the educational level of employees the lower the possibility that the company will be negatively affected by its regulatory obligations. Well-educated personnel improve a firm's productivity and its ability to deal with administrative obligations and their associated cost. Considering their size, SMEs are affected more than large companies since the latter can take advantage of the economies of scale and scope associated with administering the regulatory obligations and the investments necessary for compliance. Large companies can also take advantage of a relatively larger pool of highly educated employees. Thus, **efforts to reduce regulatory cost for SMEs should be encouraged** without hindering the effectiveness of regulations.

Findings in the present study support the well-documented veiw that the cost of internationalisation can be high. The results of this study suggest, however, that regulatory costs are perceived to be less of an obstacle when entering new markets within Europe than in third countries outside the EU, suggesting that s**ome Single Market benefits are being experienced by European firms**. Some sectoral differences can however be observed, and these are likely to be associated with product market regulations affecting competition rules in specific sectors related to energy, water and transport networks.

Regulatory costs are perceived as more of an obstacle for companies opening up new markets outside Europe, which suggests that tangible benefits of the Single Market are being experienced by European firms. The advantages within the EU may stem from the positive effects of European legislation or prohibitive legislation in third countries. Companies that face **strong price competition and rely more on cost-cutting strategies** appear to be most affected by regulatory costs. Among these, firms operating in mature markets appear to be particularly vulnerable to such costs. Although innovative companies in such competitive markets tend to rely on process innovations to increase productivity, or to focus on new product development, regulatory costs are often still perceived as an obstacle in such instances.

6 References

Adner, R. & Levinthal, D. (2001). Demand heterogeneity and technology evolution: implications for product and process innovation. *Management Science*. Retrieved from http://pubsonline.informs.org/doi/abs/10.1287/mnsc.47.5.611.10482

Aghion, Philippe (2003). Empirical estimates of the relationship between product market competition and innovation, in J. P. Touffut (ed.), *Institutions, Innovation and Growth, Selected Economic Papers*. Edward Elgar: Cheltenham, pp. 142-169.

Aghion, Philippe (2006). A primer on innovation and growth. Bruegel Policy Brief (2006/06).

Aghion, P., Bloom, N., Blundell, R., Griffith, R. and Peter Howitt, "Competition and Innovation: An Inverted-U Relationship", *Quarterly Journal of Economics*, Vol. 120, No. 2, pp. 701-728, 2005.

Blind, K. (2012). The influence of regulations on innovation: A quantitative assessment for OECD countries. Research Policy, 41(2), 391-400. doi:10.1016/j.respol.2011.08.008

Carter, S., Mason, C. and Tagg, S. (2009). Perceptions and Experience of Employment Regulation in UK Small Firms. *Environment and Planning C: Government and Policy*, *27*(2), 263-278. doi:10.1068/c07106b

CEPS, Economisti Associati, and Ecorys (2017a). Cumulative Cost Assessment (CCA) of the EU Ceramics Industry, European Commission

CEPS, Economisti Associati, and Ecorys (2017b). Cumulative Cost Assessment (CCA) of the EU Glass Industry, European Commission.

CEPS, and Economisti Associati (2013a). Assessment of Cumulative Cost Impact for the Steel Industry: Final Report. Retrieved from http://ec.europa.eu/enterprise/sectors/metals-minerals/files/steel-cumcost-imp_en.pdf

CEPS, and Economisti Associati (2013b). Assessment of Cumulative Cost Impact for the Steel and the Aluminium Industry: Final Report Aluminium. Retrieved from http://www.ceps.eu/system/files/final-report-aluminium_en.pdf

Conway, P., Rosa, D., Nicoletti, G. and Steiner, F. (2007). Product market regulation and productivity convergence. OECD Economic Studies, 2006(2), 9. doi:10.1787/eco_studies-v2006-art9-en

Crafts, N. (2006). Regulation and Productivity Performance. Oxford Review of Economic Policy, 22(2), 186-202. doi:10.1093/oxrep/grj012

European Commission (2017a). Annual report on European SMEs 2016/2017, SME Performance Review 2016/2017, doi: 10.2873/742338

European Commission (2017b). Better Regulation "Toolbox". https://ec.europa.eu/info/law/law-making-process/better-regulation- why-and-how_en

European Commission (2009). Action Programme for Reducing Administrative Burdens in EU, Communication from the Commission to the Council and the European Parliament, (COM (2009), 544 final, European Commission, Brussels.

Geroski, P. (1995). What do we know about entry?, *International Journal of Industrial Organization*, 13, 421-40.

Gray, W. B. (1987). The cost of regulation: OSHA, EPA and the productivity slowdown. *The American Economic Review*, 77(5), 998-1006. doi:10.2307/1810223

Griffith, R., Redding, S. and Simpson, H. (2002). Productivity Convergence and Foreign Ownership at the Establishment level, CEPR Discussion Paper 3765.

Haskel, J., Pereira, S. and Slaughter, M. (2007). Does Inward Foreign Direct Investment Boost the Productivity of Domestic Firms?, *Review of Economics and Statistics*, 89, 482-96.

Jong, G. and Witteloostuijn, A. (2015). Regulatory red tape and private firm performance. Public Administration, 93(1), 34-51. doi:10.1111/padm.12098

Koske, I., Wanner, I., Bitetti, R. and Barbiero, O. (2015). "The 2013 update of the OECD's database on product market regulation: Policy insights for OECD and non-OECD countries", OECD Economics Department Working Papers, No. 1200, OECD Publishing, Paris. http://dx.doi.org/10.1787/5js3f5d3n2vl-en

Lambertini, L. and Mantovani, A. (2010). Process and product innovation: A differential game approach to product life cycle. *International Journal of Economic Theory*, 6(2), 227-252. doi:10.1111/j.1742-7363.2010.00132.x p 250

León, L., Bougas, K., Zoboli, E., Ravet, J., Griniece, E., Vermeer, J., and Hurmekoski, E. (2016). An assessment of the cumulative cost impact of specified EU legislation and policies on the EU forest-based industries, European Commission.

Maroulis, N., de Kettenis, P., Bougas, K., Ravet, J. and Reid, A. (2016). Cumulative Cost Assessment for the EU Chemical Industry, European Commission. Retrieved from http://ec.europa.eu/growth/sectors/chemicals/ec-support_en

Moynihan, D.P., Wright, B.E. and Pandey, S.K. (2012). Working Within Constraints: Can Transformational Leaders Alter the Experience of Red Tape?, *International Public Management Journal*, 15, 3, 315-36.

Nickell, St. (1996). "Competition and Corporate Performance," *Journal of Political Economy*, 104, 724-46.

OECD (2016). Economic Policy Reforms 2016. doi:10.1787/growth-2016-en

OECD (2014). OECD Regulatory Compliance Cost Assessment Guidance, OECD Publishing, Paris.

OECD (2012), Measuring Regulatory Performance: A Practitioner's Guide to Perception Surveys, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264167179-en

OECD (2011). Regulatory Policy and Governance: Supporting Economic Growth and Serving the Public Interest, OECD Publishing.

Papaioannou, S. (2017). Regulations and productivity: Long-run effects and nonlinear influences. Economic Modelling, 60, 244-252. doi:10.1016/j.econmod.2016.09.018

Quaglia, L. (2013). Financial regulation and supervision in the European Union after the crisis. *Journal of Economic Policy Reform*, 16(1), 17-30. https://doi.org/10.1080/17487870.2012.755790

Ravet, J. (2017). Assessing the Impacts of EU Regulatory Barriers on Innovation: Task 1 Development of the Economic Analysis, European Commission, in progress.

Reinstaller, A. (coord.), Hölzl, W., Janger, J., Stadler, I., Unterlass, F., Daimer, S., and Stehnken, T. (2010). Barriers to internationalisation and growth of EU's innovative companies. PRO INNO Europe: INNO-Grips II report, Brussels: European Commission, DG Enterprise and Industry.

Testa, F., Iraldo, F. and Frey, M. (2011). Environmental regulation and competitive performance: new evidence from a sectoral study. *International Journal of Sustainable Development & World Ecology*, 18(5), 424-433. doi:10.1080/13504509.2011.578678

Utterback, J. and Abernathy, W. (1975). A dynamic model of process and product innovation. *Omega*, *3*(6), 639-656. https://doi.org/10.1016/0305-0483(75)90068-7

van Pottelsberghe, B. and François, D. (2009). The Cost Factor in Patent Systems. *Journal of Industry, Competition and Trade*, 9(4), 329-355. doi:10.1007/s10842-008-0033-2.

Annex: Questions and variables of CIS 2012 questionnaire

Code from CIS survey	Description of the variables
FWTURN	**2.5**: What percent of your total turnover in 2012 was from world first product innovations introduced between 2010 and 2012?
TURN10 – TURN12	**12.1**: What was your enterprise's total turnover for 2010 and 2012?
EMP10 – EMP12	**12.2**: What was your enterprise's average number of employees in 2010 and 2012?
EMPUD	**12.3**: Approximately what percent of your enterprise's employees in 2012 had a tertiary degree?
2.3: Were any of your product innovations (goods or services) during the three years 2010 to 2012?	
NEWMKT	New to your market. Your enterprise introduced a new or significantly improved product on to your market before your competitors
NEWFRM	New to your firm. Your enterprise introduced a new or significantly improved product that was already available from your competitors in your market
3.1: During the three years 2010 to 2012, did your enterprise introduce?	
INPSD	New or significantly improved methods of manufacturing or producing goods or services
INPSLG	New or significantly improved logistics, delivery or distribution methods for your inputs, goods or services
INPSSU	New or significantly improved supporting activities for your processes, such as maintenance systems or operations for purchasing, accounting, or computing
4.1: During the three years 2010 to 2012, did your enterprise have any innovation activities that did not result in a product or process innovation because the activities were?	
INABA	Abandoned or suspended before completion
INONG	Still ongoing at the end of the 2012
5.1: During the three years 2010 to 2012, did your enterprise engage in the following innovation activities?	
RRDEX	R&D that your enterprise has contracted out to other enterprises (including other enterprises in your group) or to a public or private research organisation
RDENG	Did your enterprise perform R&D during the three years 2010 to 2012?
11.1: During the three years 2010 to 2012, how important were each of the following goals for your enterprise?	
GOCOS	Decrease costs
GOMKT	Increase market share
GOPRF	Increase profit margins
GOTURN	Increase turnover
11.2: During 2010 to 2012, how important were each of the following strategies for reaching your enterprise's goals?	
STMKEUR	Developing new markets within Europe

Code from CIS survey	Description of the variables
STMKOTH	Developing new markets outside Europe
STINNPD	Introducing new or significantly improved goods or services
STIHCOS	Reducing in-house costs of operation
STEXCOS	Reducing costs of purchased materials, components or services
STMKT	Intensifying or improving the marketing of goods or services
STFLEX	Increasing flexibility/responsiveness of your organisation
STALL	Building alliances with other enterprises or institutions
11.3: During 2010 to 2012, how important were the following factors as obstacles to meeting your enterprise's goals?	
OBSREG	High cost of meeting government regulations or legal requirements
OBSAMK	High cost of access to new markets
OBSPR	Strong price competition
OBSQL	Strong competition on product quality, reputation or brand
OBSLDE	Lack of demand
OBSCP	Innovations by competitors
OBSDMK	Dominant market share held by competitors
OBSPRS	Lack of qualified personnel
OBSFIN	Lack of adequate finance