The Economic **Effects** of the Regulatory Burden

Swedish Agency for Growth Policy Analysis had the assignment during 2010 of carrying out a study of the impact of regulation on companies. This final report, The Economic Effects of The Regulatory Burden – a Theoretical and Empirical Analysis, is based on research carried out by Ratio, an independent research institute.

growth analysis

Foreword

In 2010 the Swedish Agency for Growth Policy Analysis (Growth Analysis) carried out a survey of the impact of regulation on companies. This final report, *The Economic Effects of The Regulatory Burden – a Theoretical and Empirical Analysis*, is based on research carried out by Ratio, an independent research institute.

This study mainly covers the indirect economic effects of the regulatory burden on companies and analyses how regulations can create barriers to entry and market rigidities, which lead to reduced competition pressure, reduced entrepreneurship and reduced production dynamic. One of the main results from the report is that the indirect economic costs ensuing from a heavy regulatory burden borne by the business enterprises in a country are considerable and are much larger than the immediate, direct costs. The advantages and disadvantages of specific regulations have not been analysed.

Johan Eklund PhD at Ratio led a research project, to which research assistant Tarshini Thangalevu contributed valuable work. In addition, associate professor Nils Karlson, managing director of Ratio, and associate professor Kristina Nyström have made independent contributions. The person responsible for the assignment at Growth Analysis was Björn Falkenhall.

Support for the work was secured through dialogue and meetings with the project's reference group that contained representatives of the Board of Swedish Industry and Commerce for Better Regulation, the Swedish Better Regulation Council, the Swedish Agency for Economic and Regional Growth and the Ministry for Enterprise, Energy and Communications. The members of the reference group, Growth Analysis and Ratio have also studied the regulatory process in Canada and the USA at federal level.

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Summary and comments on Ratio's report

Background and implementation

Simplifying everyday life for Sweden's entrepreneurs, businessmen and businesswomen has been a priority area for the Swedish Government in recent years. It has been one of the Swedish Government's most important efforts for creating more jobs, employment and prosperity. The core of the project has been to design rules, processes and procedures better suited to the companies' conditions and the world in which they operate. This was done by measuring and monitoring companies' administrative costs, establishing a council for regulatory improvement, highlighting the effects on companies in impact analyses and through consultation with enterprise.

The Swedish Agency for Growth Policy Analysis (Growth Analysis) was commissioned by the Government to conduct studies of the effects of rules on enterprise. In brief, the assignment meant that Growth Analysis should:

1 Compile the latest research findings on regulatory burden, regulatory simplification and regulatory impact on business (research overview).

2 Examine what effects direct and indirect costs have on businesses and the economy.

3 Conduct an analysis of other regulatory effects, excluding financial costs, on companies and how they affect the companies' behaviour as regards investments and efficiency improvement.

4 Analyse what effect the structure of rules has on companies' productivity.

The objective of the project was to compile a knowledge database that could enable more effective regulatory simplification efforts with a greater impact for the companies. The interim report *Regelbörda och ekonomisk utveckling – en forskningsöversikt* [Regulatory burden and economic development – a research overview] was submitted to the Government at the end of May 2010.[1] (Item 1 above.)

The report in hand is a continuation and further development of the theoretical frame of reference established in the interim report. This final report focuses on how the regulatory burden affects business and enterprise dynamics, as well as the importance of how rules are designed. The objective is to scientifically investigate the indirect economic effects of the regulatory burden on businesses. The analyses are the results of further in-depth investigation of theoretical questions and international empirical comparisons. (items 2-4 above.)

Growth Analysis judges the report to be important in the continuing work on regulatory simplification and a better regulatory process. It aligns well with the needs and requirements that follow from the assignment. One significant contribution is that it provides evidence that the indirect economic effects are considerable. It also contributes new theoretical tools for evaluating and analysing the impact of indirect effects on business dynamics and growth. The survey provides further information on relevant prioritisation areas and where Sweden stands relative to other comparable countries. It thus constitutes a valuable basis for future political prioritisations. Lastly, the survey discusses the reasoning around the origins of rules and possibilities for designing effective rules, and also makes proposals for how the regulation process can be improved and developed in Sweden.

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[1] *Growth Analysis report 2010:07*

Main results

It is important to emphasize that certain types of rules are crucial to the enterprise's ability to develop, and that well-functioning institutions of this kind play a crucial role in creating economic growth. Rules are needed to create stability and give the market rules to play by, of which ownership rights are perhaps the most central. Furthermore, rules are needed to reduce companies' transaction costs. Ultimately, public intervention can be justified in order to ensure that goods or services with large positive externalities are provided, such as education, basic research and healthcare. Similarly, intervention can be justified in order to prevent large negative externalities such as environmental pollution.

At the same time, over-regulation, ineffective and poorly designed rules exist that are negative to enterprise and society's efficiency. The OECD[2] distinguishes between four different kinds of costs associated with regulatory failures:

1   Regulations that protect companies from competition.

2   Regulations that prevent companies from growing and exploiting new markets.

3   Regulations that generate excessively high compliance costs for both companies and governmental actors.

4   Regulations that contribute to companies becoming less capable of adapting to technological change or consumers' needs.

Items 1, 2 and 4 give rise to indirect dynamic effects that negatively affect companies' entrance, investments and production dynamics, which leads to poorer economic growth. This report analyses all of these specific aspects, as well as the regulatory burden's impact on economic growth. The overall conclusion from the theoretical and empirical analysis is that the indirect economic costs that ensue from a heavy regulatory burden on a country's enterprises are considerable and probably more important than the direct costs related to complying with the rules (item 3).

There is strong evidence that a heavy regulatory burden negatively impacts new companies' into the market and thereby contributes to reduced competitive pressure and less entrepreneurship. Furthermore, significant negative effects on production dynamics probably arise in connection with the regulations affecting the businesses' ability to adapt. This causes friction that reduces the enterprises' ability to adjust to external changes, which in turn leads to substantial allocation losses. A regulatory burden that impedes progress and increases the risks in investment decisions contributes to higher yield requirements. This means that the yield requirements probably increase as the regulatory burden increases, which has negative repercussions on investments. Altogether, these negative, indirect effects result in lower economic growth.

We find support for many of these effects in the empirical analysis. We also find that production dynamics are lower and yield requirements higher in countries that have a relatively heavy regulatory burden. The negative effects on production dynamics manifest themselves in the form of enterprises being less able to quickly adapt to external changes. Higher yield requirements lead to lower investment. The effects on entrepreneurship were also investigated. The results indicate negative effects, but these results are not as unambiguous, probably due to substantial measurement difficulties. Lastly, the study

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[2] *OECD, Regulatory Reform and Competiveness in Europe (2000).*

shows that countries with a light regulatory burden show more rapid economic growth in GDP per capita.

These indirect economic effects are thus significant, which means that it is important that rules are effective and appropriate. This is not, however, always the case, one reason being that the costs are largely not as visible as in financial policy area. There are though several reasons why ineffective rules are introduced. According to the so-called "public choice" theory, the political process is extensively influenced by special interests and short-sightedness, which leads to ineffective rules and over-regulation. Similarly, these well-organised groups block changes in the rules that disadvantage them, often in alliance with the public officials who administer the rules. Another reason may be that each regulation is well-intended and motivated, but that the intervention in the market creates distortions, which in turn motivates new intervention.

Policy implications

Consequently, it is important that ineffective regulations with high indirect costs can be prevented *ex ante*. Once regulations are in place, they have proven to be difficult to change or abolish, among other things for the reasons described above. To accomplish this, an institutional framework or process is needed that prevent regulations that are costly to society from being introduced.

Such a process consists of several steps in a logical, structured progression. First, a regulation must be well-justified and based on an in-depth problem analysis. Second, the regulation/intervention chosen must be able to rectify the problem. As points out in the analysis, it is not sufficient that these two conditions are met for a regulation to be considered effective. In an impact assessment, more consideration must be given to the indirect effects or costs that arise when the regulation is introduced and how they affect business and market dynamics. There are usually several solutions to a specific problem that may resolve the problem to varying degrees but may also cause undesirable side-effects and costs.

A rule that is effective as regards the economy is thus a rule that generates the greatest economic benefit to society. Cost-benefit analyses are necessary to assess this and these must be compared for several different alternatives (cost-efficiency analyses). Although they are sensitive to assumptions, systematic use combined with a transparent process can provide a better basis for decisions. This is also the essence of laws such as the *Regulatory Flexibility Act of 1980* in the USA. Under it, federal authorities shall choose the *least* invasive proposal for small and medium-sized enterprises for a given purpose.

Growth Analysis shares Ratio's opinion that the mandate should be strengthened for the function that the Swedish Better Regulation Council has. How and in what way is open to discussion, but its current role is solely advisory and it functions as one referral body among many that come in in the same phase as the other referral bodies. This is a clear disadvantage since there is a risk that greater importance will be attached to the comments of weighty referral bodies, without these and other referral bodies having had access to an appraisal of the impact analyses that have been made.

An improved regulatory process, which would strengthen the Swedish Better Regulation Council's role and increase transparency, would mean that commissions, committees and authorities must follow clearer guidelines for the way in which structured impact analyses are carried out. In such a process, the Swedish Better Regulation Council would also come

in at an earlier stage and its statements would be appended to the proposal or report when it is circulated for comment. Other referral bodies and, in a later phase, political decision-makers can thereby be made aware of weaknesses or deficiencies in the impact analyses that have been made and the economic benefit to society of the proposed regulations.

Lastly, there is continued need for further research concerning the indirect economic effects of the regulatory burden and the underlying mechanisms. It is also necessary to study the details of how the institutional framework should be designed in order to promote the creation of rules that are effective for the economy in the best way possible.

1   Introduction and Background

## *1.1   The economic importance of regulatory burden*

Realisation is growing around the world that various forms of regulation lead to considerable economic costs. As distinct from public expenditure, which is directly visible though the national budget for example, the costs that ensue from official regulations are generally concealed and indirect. A further important insight is that public taxpayer-financed expenditure is only one form of public policy tool. Regulations are equally important, if not more important, control instruments. An importance difference between taxpayer-financed expenditure and regulations, however, is that the costs that ensue from regulations are not visible in any budget. Nor are regulations subject to the same scrutiny and control as government spending, in the form of budget ceilings etc. Visible and direct costs, such as companies' administrative costs for regulatory compliance, are only a very small portion of the total cost of regulations. One result of most regulation costs being hidden and indirect is that the majority of the costs are passed on to companies, consumers and citizens without being made visible. Insight is growing that regulations and their design are of crucial importance as regards enterprise growth and the economy in general. The objective of this report is to scientifically investigate in detail the indirect economic effects of companies' regulatory burden.

For a few years now, the Swedish Government has been working on regulatory simplification in order to improve conditions for companies and facilitate growth. Between 2006 and 2010 the Swedish Government has had regulatory simplification as a stated and prioritised goal. The Government has also declared its ambition to continue this work over the 2011-2014 period to create better regulation and focus on developing an institutional framework for more efficient regulations. (Please refer to Ministry of Enterprise, Energy and Communications, 2010). The work of measuring the administrative costs associated with companies' compliance with regulations has been in progress since 2004[3] but focuses on direct administrative costs. Swedish efforts focus on regulatory simplification and improved regulatory design reflect a broader international drive. The World Bank has been running a project called *Ease of Doing Business* for several decades which maps regulations and regulatory burden world-wide. The World Bank's survey currently comprises 183 countries (from Afghanistan to Zimbabwe). Sweden holds a relatively high position in this international ranking. Sweden was ranked 18th in the 2010 edition of the *Doing Business* report, and climbed to 14th place in the 2011 edition[4]. Figure 1 shows Sweden's ranking in relation to the OECD, EU and Denmark. However, the radar chart below clearly shows that there is a considerable difference in the magnitude of the regulatory burden in parameters that the World Bank uses to measure regulatory burden. In this context, it should be mentioned that the World Banks states that Sweden has improved its regulatory framework and made things easier for companies (World Bank 2010a).

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[3] *Please refer to the Ministry of Enterprise, Energy and Communications (2010) for a description of regulatory simplification. Please refer to Skr 2008/09:206 for a description of the so-called Standard Cost Model, which is the method used to measure the regulatory burden.*
[4] *Sweden's improved ranking is driven by the reduction in the minimum share capital required in new limited companies, improved routines for registration of ownership, increased protection of investors through more stringent transparency requirements and through regulation of transactions between different stakeholders in the company. (Please refer to the World Bank 2010a, for details).*

Figure 1. Regulatory burden in Sweden, EU, OECD and Denmark
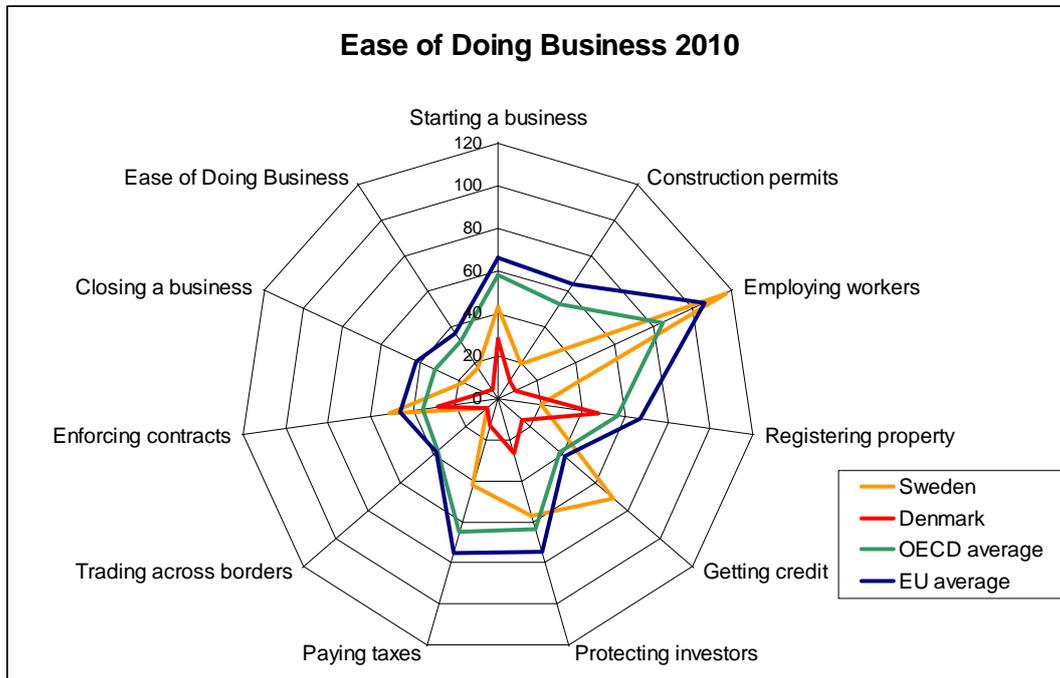
The chart shows the regulatory burden ("cost"), broken down into various dimensions. A low value indicates a light regulatory burden (or low transaction costs). The EU average has been calculated for all EU countries, except for Malta and Slovenia for which no data is available.

Source: World Bank 2010b. Own processing.

Extensive research is carried out on the economic effects of regulation. This research has engendered a field of research in its own right in economics: *Regulatory Economics*. Despite this extensive research, the concepts of both regulation and regulatory burden lack distinct definitions. Posner (1974) stated that economic regulation "(…) refers to taxes and subsidies of all sorts as well as to explicit legislative and administrative controls over rates, entry, and other facets of economic activity". Priest et al (1980) define regulation as "(…) the imposition of rules by government, backed by the use of penalties, that are intended specifically to modify the economic behaviour of individuals and firms in the private sector".

Despite the great amount of interest and work that has gone into reducing the regulatory burden for companies both in Sweden and abroad, there is thus no unambiguous definition of what is meant by regulatory burden (sometimes referred to as regulatory cost or regulation compliance costs). The explanation for this is probably the fact that regulatory burden, or regulatory cost if preferred, can be broken down into several different components.

The most common implicit definition of regulatory burden is the direct administrative cost incurred by the company when it complies with a regulation. This type of direct cost comprises only a fraction of the total regulatory burden for a company, however. This definition is thus unsatisfactory from an economic perspective. The highest costs are probably indirect costs, since the regulatory burden has a negative effect on investment behaviour, market dynamics, resource allocation and ultimately, on economic growth.

These indirect economic costs occur as a result of the regulations generating costs and market frictions that have a negative impact on companies and resource allocation.

In other words, a broad definition of regulatory burden and regulation costs includes the total economic costs to society generated by the regulations. For this reason, we have chosen to *define the concept of regulatory burden as being the total economic cost to society generated by a regulation*.

This is a broader definition of regulatory burden, as it includes more than the direct administrative costs that follow from regulations. This is further complicated by the total regulatory burden not being merely a simple summation of the costs that arise as a result of every individual regulation. So far, much of the discussion and work on regulation simplification work has focused on a relatively narrow definition of the concept of regulatory burden. The aim of this report is to shed light on the wider economic impact of the regulatory burden on companies and the economy. The survey is both theoretical and empirical.

1.2   Conceptualization, delimitation and structure

The purpose of this report is thus to scientifically investigate the indirect economic effects of the regulatory burden on companies and give a picture of where Sweden stands in relation to the regulatory burden, in an international perspective. This can then serve as a guide in continued work on regulation simplification and the ambition to reduce the regulatory burden.

As mentioned earlier, the literature on the economics of regulation is very extensive. This report focuses on the economic consequences of the regulatory burden that economic regulations entail for companies. In addition, the main focus is on the indirect economic effects on investment, market efficiency, resource allocation and economic growth of a heavy regulatory burden. The report does not set out to analyse the pros and cons of specific regulations. The empirical analysis necessary focuses on international comparison.

There is hardly any doubt that some regulations confer considerable added value on companies and ultimately consumers and citizens. These regulations can be referred to as market-support rules. Market-support rules are regulations that reduce transaction costs, making it easier for individuals and companies to carry out market transactions. One example is contract legislation and protection of ownership. Rules must naturally also be evaluated on the basis of the economic added value that they create, i.e. the economic costs that the rules (regulatory burden) entail should be weighed against the added value created. Analysing the added value (economic value) created by this type of regulation is mainly outside the scope of this report. The intention is instead to provide a better understanding of the costs that regulations entail in order to create increased awareness of the hidden and indirect costs generated by regulations.

This report is structured in eight sections. Section 2 contains a discussion of the concepts of regulations and regulatory burden and various types of regulation costs. Section 2 also contains a review of various measures of regulatory burden that are used internationally. Section 3 contains the theoretical framework used to analyse the effects of regulatory burden on business and company dynamics. Section 4 contains an empirical analysis of the economic effects of the regulatory burden. A discussion follows in Section 5 of the politico-economic literature related to regulatory design, i.e. the factors and interests that affect the creation and design of regulations. Section 6 contains a discussion on the way

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that regulations and legislation can be designed effectively. There is also a discussion about what Sweden could do to improve regulatory design, based on the research presented in sections 3-5. A proposal for institutional changes is included, aimed at ensuring that regulatory design is more efficient in future. Conclusions are presented in Section 7.

2 The concept of regulations – definitions and delimitations

2.1 Rules, regulations and regulatory burden

A rule is sometimes defined as an instruction, standard or custom. Issuing regulations is the act of *providing* rules for the way that individuals, companies or organisations should behave. Regulations could possibly be regarded as being a sub-set of rules, but the demarcation of these two concepts is difficult to define.

One generally characterises regulations as being economic regulations, social regulations, administrative regulations or industry-specific regulations in order to distinguish between different types of regulations. Economic regulations are regulations which directly intervene in the market and have effects on prices, the competitive situation, etc. Examples of economic regulations are taxes, quotas, tariffs, subsidies and barriers to market entry. Social regulations are regulations intended to protect the interests of the general public with regard for example to health, safety and the environment. Examples of social regulations are labour legislation, consumer protection and environmental protection. Administrative regulations refer to requirements to comply with specific administrative formalities, in order to collect information or influence individual economic decisions. Examples of administrative regulations are the administrative procedures required to start a company. This type of regulation is sometimes referred to as process regulations (Chittenden etc. 2002). Regulations which strongly affect companies in a specific industry are referred to as industry-specific regulations. It is not entirely easy to make clear distinctions between these types of regulation. A price regulation, for example, should mainly be regarded as being an economic regulation, but if it is intended to protect consumers, it should at the same time be regarded as a social regulation.5

Regulations can be either market-based (private regulation), national or publicly initiated (government regulation). Examples of private regulation mechanisms are voluntary standardisation and quality and certification organisations. It is most relevant to restrict the concept to meaning government regulation, for the matters referred to in this report. According to the OECD (1997), regulations can be defined as:

> *"the diverse set of instruments that governments use to impose requirements on enterprises and citizens. Regulations include laws, formal and informal orders and subordinate rules issued by all levels of government, and rules issued by non-governmental or self-regulatory bodies to which government have delegated regulatory power" (OECD 1997 s. 196).*

The concept of "red tape" is frequently used in international literature, to refer to the administrative burden associated with regulations. The concept of "red tape" has its origin in British tradition from the 19th century, when official regulation documents were bound together by a red tape. Pandey och Scott (2002) summarise how various researchers have defined the concept of "red tape". "Red tape" is associated with attributes such as excessive and meaningless paperwork, formalisation, unnecessary rules, un-justified delays

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[5] *A further distinction is the OECD distinction between product market regulations and labour market regulations. Product market regulations are formal regulations that improve or prevent competition in different markets. Labour market regulation refers for example to labour law. (OECD 2007).*

in processes and inefficiency. A definition of "red tape" that reflects the definition of "red tape" as a bad rule for *one* organisation is:

> *"A rule that remains in force and entails a compliance burden for the organization but makes no contribution to achieving the rule's functional object." (Bozeman, 2000 p. 82)*

"Red tape" is thus "bad" rules that do not contribute to achieving the original objective of the rule. That which is considered to be "red tape" for some individuals or organisations may be a good rule for others, however. Kaufman stated in 1977 that:

> *"One man's red tape is another's treasured procedural safeguard" (Kaufman, 1977).*

2.2   Definition of different types of regulation costs

Concepts need to be clarified as regards the costs that occur in conjunction with regulations. We have chosen to distinguish between three different types of cost that are generally included in an assessment of the costs that ensue from a regulation:

• Public administrative costs

• Direct costs for compliance

• Indirect costs

Public administrative costs refer to the cost of management and maintenance of regulatory authorities. This means costs associated with the regulatory framework at national, county and municipal level. They can be measured with dimensions such as budget costs for these activities, number of staff involved or the extent of the regulatory framework, measured for example in number of pages.

These are referred to in English language literature as Direct costs of regulatory compliance, or Compliance Costs. These direct costs are the costs sustained by companies, individuals and even the state itself in order to comply with the regulations. These include administrative costs, action costs and financial costs. Administrative costs refer to the time and the work that has to be expended on the administration generated by the regulations. Typical examples of activities that create administrative regulation costs are supplying statistics or registration information and applying for various kinds of permits. Action costs refer to such things as investments in personnel, equipment or material required to comply with the regulations6. Financial costs refer to financial requirements that may a arise out of the company's obligation to pay taxes, charges, etc. Direct costs can be one-off costs or recurrent costs. In addition to these costs, some researchers would also like to add psychological costs, which can occur for example in the form of stress when apparently incomprehensible regulations must be complied with. These are referred to in English language literature as the "perceived burden" and are very difficult to quantify. (Chittenden et al, 2002)

Indirect costs are the costs that occur when companies, public authorities and private individuals are forced to spend time on regulatory compliance instead of devoting their time and economic resources to other activities. From the government's point of view, this is a loss of money that could have been used to provide more resources for school, medical care, etc. From a company's point of view, it is a loss that could have been used for investment, innovation or new jobs. This then has repercussions at the level of society in

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6 *The Swedish Better Regulation Council(NNR) uses the term material cost for regulation compliance.*

general. If companies abstain from investment and pursuing innovations or creating new jobs, this affects the company's investment behaviour, production dynamics and profit dynamics. These effects at company level have repercussions at the level of society in general, in the form of less willingness to start companies, less employment growth and lower economic growth. Table 1 below gives some concrete examples of direct and indirect costs associated with regulations. In the remainder of this report we will focus on indirect costs. These regulations in all probability comprise most of the total economic cost entailed by the regulations.

Table 1. Examples of direct and indirect regulation costs

Direct costs			Indirect costs	
Administrative costs	*Action costs*	*Financial costs*	*Company level/ industry level*	*Societal level*
Application for permits	Protection of health	Income taxes	Investment activities	Productivity
Reports	Protection of the environment	Payroll tax	Profit dynamics	Entrepreneurship
Statistics	Production	Value Added Tax	Production dynamics	Growth
Registration tasks	IT solutions	Taxes	Jobs	Employment
	Transport			

2.3 How can the regulatory burden be measured?

There are, as was discussed above, considerable problems regarding measurement, which are naturally intimately associated with the problem of unambiguously defining the regulatory burden. Some of the measures of regulatory burden that are available internationally are presented in this section. The emphasis is primarily on two international measures: the World Bank's *Doing Business* index and the Fraser Institute's *Economic Freedom Index*, which constitute systematic attempts to measure regulatory burden. The empirical section of the report relies to a great extent on these two sources, principally the *Doing Business* index, since these measures must be regarded as the most ambitious attempts to measure companies' regulatory burden in an international perspective. The Fraser Institute's indicators have mainly been used to test the robustness of the results. There are other measures of regulatory burden (or regulatory quality), however, and these will also be briefly described in this section. The intention is mainly to provide an introduction to each of the measures available and to indicate the measurement issues they are associated with. All the measures must be seen as approximations of the regulatory burden.

2.3.1 Doing Business – the World Bank

Over the past few decades the World Bank has compiled an extensive database intended to permit comparisons of regulatory framework and bureaucracy between countries: *Doing Business*. It has also compiled a ranking table that currently comprises 183 countries which it ranks every year by how easy it is to run a business. The ranking is constructed on the basis of 10 different components which each measure the regulatory burden in different areas of regulation. These components are presented in Table 2 (see also Figure 1). The aggregated value then consists of the mean value of the various components.

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Table 2 World bank regulation areas

Starting a business	Protecting investors
Procedures, time, cost and minimum share capital for starting a new company.	Strength of investor protection index: scope of accounting index, scope of management responsibility and minority shareholder protection
Construction permits	**Paying taxes**
Procedures, time and cost to get a mortgage, inspections and heating, water, electricity connection	Number of taxes, time to prepare and register tax rebates and tax repayment, total tax as a percentage of profit before all tax payments.
Employing workers	**Trading across borders**
Difficulties in employing, working time regulation index, difficulties in dismissing, cost of dismissal	Documents, time and cost for importing/exporting
Registering property	**Enforcing contracts**
Procedures, time and cost for registration and acquisition of real estate	Procedures, time and cost for solving a commercial dispute.
Getting credit	**Closing a business**
Strength of legal rights index, scope of Credit information	Recovery percentage from bankruptcy, bankruptcy legislation

Source: World Bank (2010b)

It should be noted that the World Bank's measures of regulatory burden are limited in that they do not include all relevant aspects. For example, the ranking does not consider security matters, the percentage of qualified human capital in the total population of the country, the macro-economic situation, corruption levels and the underlying strength of the country's institutional structure, or the quality of the infrastructure. Nor do the World Bank's measures of regulatory burden consider regulation of the financial system. The methodology is designed to measure the regulatory burden of listed companies. This measure of regulatory burden is derived from the formal sector in the 183 counties included in the World Bank project.

Doing Business does not measure all the effects in detail and should be regarded as an indication of what should be done to improve the conditions for business in each of the 10 areas included. One way of deciding whether the World Bank measurements serve as an approximate measure of regulatory burden is to perform a correlation test with other databases that measure regulations. Appendix 1 contains a correlation test between the World Bank indicators of regulatory burden and the measurements of regulatory burden made by the Fraser Institute, which shows that there is a strong correlation between the two measurements.

Table 3 below shows the 20 highest ranked countries in the World Bank index. Sweden is ranked 18th on average, but is much further down the list in some areas, for example employment (117th place). This is also shown in Figure 1. It is also possible to use the data to see which countries have carried out most reforms in each area of regulation. The World Bank calls the countries who have reformed three of the ten regulation areas "Top Reformers". These countries are ranked by the change in ranking of the regulation areas since the previous year. There were 60 counties that had not made any reforms at all

between 2003 and 2008 to reduce the regulatory burden associated with opening a company. These countries mainly comprised developing countries in Africa. According to Djankov (2008), the three most important areas for deregulation between 2003 and 2008 were as follows: cancellation of outdated formalities, standardised company documentation and reduction in minimum capital to open a company.

In this context, it should be mentioned that the World Bank states in its latest report that Sweden has improved its regulatory framework and made things easier for companies (World Bank 2010a). The World Bank writes in its report: "*Within the group of top 25, Sweden improved the most in the ease of doing business, rising from 18 to 14 in the ranking. It reduced the minimum capital requirement for business start-up, streamlined property registration and strengthened the investor protections by increasing requirements for corporate disclosure and regulation the approval of transactions between interested parties". (World Bank, 2010a).* The changes mean that Sweden has improved its ranking from 18th to 14th place. Sweden's 2011 ranking is shown in brackets in Table 3. This contains the 2010 figures, since these are the latest figures used in the empirical analysis in Section 5.

Table 3 Regulation ranking for the 20 highest placed countries in the world.

Country	Doing Business	Starting a business	Construction permits	Employing workers	Registering property	Getting credit	Protecting investors	Paying Taxes	Trading across borders	Enforcing Contracts	Closing a business
Singapore	1	4	2	1	16	4	2	5	1	13	2
New Zealand	2	1	5	15	3	4	1	9	26	10	17
Hong Kong	3	18	1	6	75	4	3	3	2	3	13
United States	4	8	25	1	12	4	5	61	18	8	15
United Kingdom	5	16	16	35	23	2	10	16	16	23	9
Denmark	6	28	10	9	47	15	27	13	6	28	7
Ireland	7	9	30	27	79	15	5	6	21	37	6
Canada	8	2	29	17	35	30	5	28	38	58	4
Australia	9	3	62	1	34	4	57	47	27	16	14
Norway	10	35	65	114	8	43	20	17	9	4	3
Georgia	11	5	7	9	2	30	41	64	30	41	95
Thailand	12	55	13	52	6	71	12	88	12	24	48
Saudi Arabia	13	13	33	73	1	61	16	7	23	140	60
Iceland	14	33	31	56	13	30	73	31	73	2	16
Japan	15	91	45	40	54	15	16	123	17	20	1
Finland	16	30	47	132	27	30	57	71	4	8	5
Mauritius	17	10	42	36	66	87	12	12	19	66	73
Sweden **(2011 ranking)**	**18** **(14)**	**43** **(39)**	**19** **(20)**	**117** **(n.a.)**	**20** **(15)**	**71** **(72)**	**57** **(28)**	**42** **(39)**	**7** **(7)**	**51** **(52)**	**18** **(18)**
South Korea	19	53	23	150	71	15	73	49	8	5	12
Bahrain	20	63	14	13	22	87	57	13	32	117	26

Source: World Bank (2010b) Doing Business 2010 – Reforming through difficult times.

2.3.2   World Economic Freedom Index – Fraser Institute[7]

The Fraser Institute collects data in close collaboration with 76 other institutes around the world. The objective of the Fraser Institute's Index is to rank countries according to their degree of economic freedom (Economic Freedom of the World, EFW). The index encompasses a total of 141 countries and goes back to 1980. The *Economic Freedom* index has been calculated on the basis of five main areas: size of the public sector, regulations of and charges for trade, sustainable monetary politics, ownership and the rule of law, and finally, *regulation of credit, labour and business*. It is these last indicators that we use in parts of the subsequent analysis. The *Economic Freedom* index contains a total of 42 variables, weighted together. Each component is rated on a scale from 0-10, which describes the underlying distribution. The components in each of the five areas are used to calculate an average for the five areas. These five areas then form the basis for ranking the countries. The regulation areas covered by the index are shown in the table below.

Table 4 The Fraser Institute's regulation areas as included in the *Economic Freedom* index

Credit market regulations	Hiring and firing regulations
Right of ownership of banks, International competition in the bank sector, private credits, interest rate controls/negative real interest rates	This component is a subcomponent of regulations in the labour market
Business regulations	**Labour market regulations**
Price controls, administrative requirements, share capital requirements for new businesses, extra costs/bribes, costs for tax evasion, licensing requirements/restrictions	Minimum wages, centralised wage agreements, mandatory costs in conjunction with dismissal, mandatory costs for industrial injuries, military service (This is included in the employment protection sub-components).

Source: Fraser Institute (2010) – World Economic Freedom www.freetheworld.org

The economic freedom measure has been designed to measure the relationship between institutions and the political instruments in a country. The factors which are frequently mentioned when economic freedom is discussed are as follows: individual choice, market freedom and free trade, freedom of establishment (free entry to competition in the marketplace) and protection for individuals and their property.

This means that the institutions and the political instruments should provide good infrastructure for trade and protection for individuals and their property. When these factors are provided, the country receives a high ranking.

Table 5 below shows the 20 highest ranking countries in the Fraser Institute *Economic Freedom* index Sweden lands in 40th place when all five sub-components are considered. Sweden was given a value of 7 on a scale from 1 to 10 for the regulation area. This means that Sweden did better than the others in this area. It is possible to see a clear correlation between the Fraser Institute's *Economic Freedom* index and the Word Bank's ranking – the same countries are ranked among the 20 best in both cases. The correlation is also high.

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[7] *Economic Freedom of the World (EFW)*

Table 5. The 20 highest ranked economies in 2007, according to *Economic Freedom*

Country	Economic freedom	Credit market regulations	Labour market regulations	Employment protection	Business regulations	Total regulations
Hong Kong	1	9.3	7.3	8.1	7.5	8.3
Singapore	2	9.2	7.9	7.0	8.0	8.1
New Zealand	3	10.0	3.7	7.6	7.7	8.4
Switzerland	4	8.9	8.9	7.4	7.0	7.8
Chile	5	9.2	9.2	7.9	7.0	8.0
United States	6	9.3	7.3	8.4	6.7	8.1
Ireland	7	8.7	4.3	6.5	6.9	7.4
Canada	8	9.3	9.3	7.2	7.1	7.9
Australia	9	9.5	9.5	7.2	6.7	7.8
United Kingdom	10	9.7	4.9	7.2	6.6	7.8
Estonia	11	9.7	9.7	5.0	7.3	7.4
Denmark	12	9.4	9.4	7.7	7.3	8.2
Austria	13	9.2	9.2	4.8	6.8	6.9
Luxemburg	14	9.0	3.2	6.5	6.9	7.5
Panama	15	9.2	3.7	5.9	5.9	7.0
Finland	16	9.6	4.2	4.5	6.9	7.0
Mauritius	17	8.9	3.5	6.8	6.7	7.5
Taiwan	18	8.6	8.6	4.7	5.9	6.4
United Arab Emirates	19	7.8	7.8	6.2	7.2	7.4
Bahrain	20	9.2	9.2	8.5	7.0	8.2
Sweden	**40**	**9.3**	**9.3**	**4.7**	**7.0**	**7.0**

Source: Fraser Institute (2010) – World Economic Freedom www.freetheworld.org The figures are for 2007.

2.4   *Other measures of regulatory burden*

In addition to the World Bank and the Fraser Institute, a few other sources of data are worth mentioning briefly, although none were used in the continued analysis in this report, however.

The OECD has been working since 1990 on compiling a database of regulations in product markets (Product Market Regulation, PMR) in the OECD countries. The OECD's objective is to develop quantitative indicators for regulations and legislation which affect competitiveness. PMR is based on questionnaire surveys which are carried out every five years. These measure price regulation and administrative costs which constitute establishment barriers and barriers to trade and investment.

Another measure of regulation quality is the IMD World Competitiveness Index which ranks countries according to their competitiveness. The ranking is based on a total of 20 different factors, including regulations and the quality of the institutional framework.

In addition to these, the World Economic Forum has a Global Competitiveness Index which is also intended to measure the competitiveness of each country. The World Economic Forum constructs its index on the basis of 12 different components, which in turn are subdivided into further subcomponents, only some of which measure the regulatory burden.

2.4.1   Swedish data related to companies' administrative burden[8]

To conclude this section, the Malin database in Sweden is worth discussion. The Malin database contains the results of Swedish measurements of companies' administrative costs, using the so-called standard cost model[9]. This data is not used in this survey, since it is neither intended for international comparative studies or makes such studies possible.

Measurements of administrative costs are available from 2006 and are updated annually in Malin. The principal objective is to assist ministries and public authorities in analysing and developing measures that can improve the regulatory structure in Sweden. Just as in many other databases, Malin has various functions intended to predict in the best possible manner the effect that various changes in regulations would have on companies' administrative costs. Malin's functions are thus:

- Quick and simple access to the results of the surveys carried out of companies' administration costs

- Possibility to track changes in companies' administrative costs over time.

- Possibility to perform simulations using the results of the measurements in order to visualise and appraise the effects of changes to regulations or their application on companies' administrative costs.

The results from Malin are used for benchmarking, to determine how administrative costs change in line with the Government's goal of reducing companies' administrative costs related to all national regulations by at least 25% between 2006 and 2010. Since 2006, administrative costs have fallen by 7%.

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[8] *Swedish Agency for Economic and Regional Growth database for the results of measurements of companies administrative costs.*
[9] *According to the standard cost model, administrative costs are defined as a company's costs for establishing, storing or transferring information or data which ensue from requirements stipulated in laws, ordinances and by-laws or instructions contained in recommendations. In order to measure these administrative costs, representatives of companies are interviewed to gain an impression of the time they spend handling the demands. The results of the measurements show what regulations cost to administer in time and money for companies in Sweden. The project and establishment of the Malin database started in 2004. It is owned and administered by the Agency for Economic and Regional Growth and is tasked by the government with measuring and following up how companies' administrative costs develop.*

3 Theoretical frame of reference for the effect of the regulatory burden on business and business dynamics

A suitable point of departure for analysing the indirect cost of regulations and the way that regulatory burden affects company behaviour and economic activity, is to study how investments are affected. Regulations can affect investments via various mechanisms, which subsequently affects economic growth and productivity development. Note that we are discussing investment in its broadest sense in this context, which includes investment in both material and intellectual property. If a company or a businessman chooses to set up business in a market, this should for example be regarded as an investment decision. Recruitment and employment decisions can also be regarded as investment decisions. These then influence previously established companies' decisions by affecting competition in the market in question. In addition, the regulatory burden probably affects business and company dynamics directly. Regulations can for example have an influence on the speed at which a company adapts to changes in its environment. In other words, a heavy regulatory burden can have negative consequences as regards production dynamics, with subsequent allocation losses. Ultimately, the regulatory burden can then affect productivity and economic growth, thus also directly affecting employment levels. Figure 2 illustrates in schematic form how regulations affect investment activities, which in turn affects growth and productivity.

Figure 2 Regulations, investments and economic growth
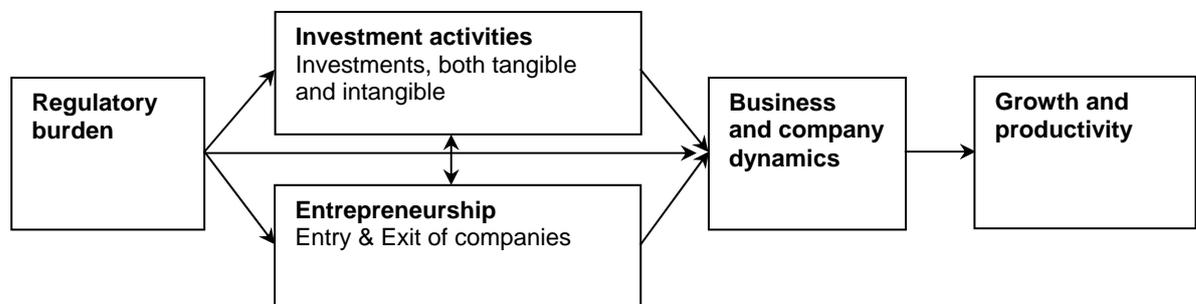
The following section begins with a discussion of how regulations affect investments, followed by a discussion of how regulations and the regulatory burden affect new companies (entry), and business and profit dynamics, and ends with a discussion of the effect of regulations on production dynamics and resource allocation. This theoretical analysis then forms the basis for the continued empirical analysis in Section 4.

A company or even a whole industry can be analysed by means of just a few equations: production function, cost function and profit function. This analytical approach can then be used to study the way that regulations and the regulatory burden affect investment decisions, production dynamics, entry and exit of companies, and profit dynamics.

A production function like the one below can be used for a company (or an industry):

$$Y = f(K,L) = \alpha K^{\beta} L^{1-\beta} \tag{3.1}$$

where Y represents production volume (turnover), which is a function of the production factors *capital*, K, and *labour*, L[10]. The income that the company generates with its activities and operations then becomes production volume multiplied by the price of the product or service, *p*. In addition to what the employees cost in the form of wages and interest on the capital (yield requirement), the company has costs for input material. These can be subdivided into *fixed costs* and *variable costs*, FK and RK in the formula below, respectively. Variable costs vary with the volume of production. The profit function of the company can thus be expressed as follows:

$$\pi = pY - RK(Y) - FK \tag{3.2}$$

This simple analytical approach is used in this section and all theories presented in the following can be derived from it. It is possible to understand the economic consequences of the regulatory burden by analysing how the regulatory burden affects these relationships.

3.1 Rules and investment activity

The influence that regulations and the regulatory burden have on investments depends on how they influence future cash flows and internal interest rates. The value of a company or a particular asset, V_{it}, can be expressed as the discounted present value of future cash flows, KF_{it+n}:

$$V_{it} = \sum_{n=1}^{\infty} \frac{KF_{it+n}}{(1+r_i)^n} \tag{3.3}$$

KF_{it+n} is the expected cash low in period *t*. r_i represents the capital cost, also referred to as the opportunity cost of capital, i.e. the return that the investment must produce to be profitable (at a given risk level). Note that *KF* can be either positive or negative, i.e. an activity at a company generates both positive cash flows in the form of revenue and negative cash flows in the form of expenditures for the activity (in this case, the cost of regulation compliance).

In the present value method, investments will be profitable as long as the value of the discounted future cash flow exceeds the initial investment cost, I_t. In other words, investment continues as long as $V_{it} \geq I_{it}$. If the capital cost (*r*) increases (falls), investments will fall (increase). The investment decision is also affected by a change in the future cash flow (*KF*).

Regulations and regulation costs can be expected to affect both the nominator and the denominator in equation (3.3), i.e. both *KF* and *r*. Assume that V_{it} represents the value of the company/asset in the absence of regulations. It is now easy to demonstrate that there are two ways in which regulations can influence investments. The following equation shows how that the value of a company is affected if we assume that regulations affect future cash flows.

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[10] $\alpha K^\beta L^{1-\beta}$ *is a so-called Cobb-Douglas function, which is commonly used in empirical applications of economic theory. Among other things, it forms the basis of the empirical analysis of production dynamics in this section.*

$$(V_{it}^s - V_{it}) = \sum_{n=1}^{\infty} \frac{(KF_{it+n}^s - KF_{it+n})}{(1 + r_i)^n} \tag{3.4}$$

V_{it}^s is the value of the company and KF_{it+n}^s are the cash flows after a regulation has been introduced. If the regulation leads to an increase in the value of the future cash flows $(KF_{it+n}^s > KF_{it+n})$, investments will also increase. In a corresponding manner, investments will be reduced if regulations lead to a reduction in the value of the cash flows.

Regulations and regulatory compliance can for example be assumed to lead to the company being affected by regularly recurring costs for administering and complying with them. The way in which the cost structure and investments are affected by these costs naturally depends on how the specific regulation is written. Some regulations for example entail only an initial, one-off cost, a good example being the Planning and Construction Act which entails an initial cost for every new construction project. Many regulations, however, entail a recurring "fixed cost". An example of this are the accounting and reporting requirements that require every company to draw up an annual report. In this context, it should be noted that regulations can both increase and reduce a company's costs.

In addition to affecting a company's cash flow, regulations can also affect the risk/insecurity of an investment. If this occurs, it will be reflected in the required return, *r*. If uncertainty as to future cash flows increases, the yield requirement (capital cost) will also increase.

$$(V_{it}^s - V_{it}) = \sum_{n=1}^{\infty} KF_{it+n} \left\{ \frac{1}{(1 + r_i^s)^n} - \frac{1}{(1 + r_i)^n} \right\} \tag{3.5}$$

V_{it}^s is the value of the company and r_i^s is the yield requirement after a regulation has been introduced. If regulations lead to an increase in the uncertainty of future cash flows, this will result in an increase in the yield requirement, which in turn causes the discounted present value to fall. This will eventually lead to less investment.[11]

The reasoning above can be used to analyse among other things how regulations should be designed,. It can be assumed that framework legislation and detailed legislation have different effects on investment activities. A reasonable assumption is that more detailed legislation will result in less uncertainty about the interpretation and application of legislation and regulations. For this reason, detailed legislation can be expected to lead to less uncertainty about future cash flows and thus reduce the yield requirement, *r*. On the other hand, detailed legislation will probably lead to higher compliance costs, which means that cash flows are affected negatively. Conversely, it might be that framework legislation is associated with lower compliance costs but greater uncertainty.

There is thus a probable trade-off between detailed legislation and framework legislation, where the optimum is the mix that reduces regulatory costs for companies. When a new regulation is introduced, or when a regulation is changed, it is often difficult to separate the effects of future cash flows from the effects of risk and yield requirement, in particular

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[11] *This approach can be used to analyse how the share market reacts to changes in regulation, i.e. financial data can be used to evaluate the economic effects of such changes. See Schwert (1977) for a discussion of the method.*

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considering that a company often consists of a portfolio of projects that generate different cash flows with different yield requirements. Yield requirements also commonly vary over time.

The way that the regulatory burden affects yield requirements is investigated empirically in Section 4.1.

3.2   Regulatory burden, the company's cost function and start-ups

If regulations and regulatory burden entail a significant increase in fixed costs for companies, this will have a direct impact on competition, which will affect industry and company dynamics. This in turn will have long-term effects on economic growth and capacity for economic development. Regulations and regulatory burden can be assumed to constitute so-called barriers to entry, i.e. difficulties in setting up new companies. A barrier to entry can be defined as something that makes it more difficult for an entrepreneur to immediately establish a presence in a market. Patents are a classic example of such a barrier. Patent rights give sole rights to the company that owns the patent rights to a product, and thus a monopolist position, which thus obstructs the establishment of new companies. Other regulations and the regulatory burden that apply to companies are also barriers to entry, however, and the difficulty in establishing new companies will thus increase as the regulatory burden increases. The following sections contain discussions of how regulations and regulatory burden affect barriers to entry and what the economic consequences are. Regulations and regulatory burden can principally affect the competitive situation in a market in two ways: first, the regulatory burden can entail a fixed start-up cost, which then constitutes a direct barrier to entry; second, regulations can affect production costs for an industry (company) and thus affect the number of companies who establish themselves.

3.2.1   Regulations as a fixed cost

In addition to constituting an initial start-up cost for new companies, regulations and regulatory burden can affect the cost function of a company in other ways. Regulations can affect both fixed and variable production costs. Assume for example an industry where every single company has the following total cost function:

$$TK = FK + cY \tag{3.6}$$

TK represents the total cost, which is a function of the fixed cost, *FK* and a variable cost, *c*, per unit that is produced by the industry, *Y*. This means that *Y* represents the production volume and *c* the variable cost per unit produced. *FK* represents all the costs that companies in the sector have, irrespective of the volume they produce. Examples of fixed costs are cost of premises, accounting costs, etc. For the sake of simplicity, we ignore the fact that the definition of fixed and variable costs varies depending on the time horizon in question. In the short term, a company cannot for example change its machinery and its cost of premises. However, these costs also become variable in the long term. When the economic effects of regulatory burden on a specific company or industry are analysed, this

must naturally be considered and the cost function formulated to reflect the impact of regulatory compliance on the cost structure.[12]

The cost structure and above all the fixed costs are very important for the competitive situation in a market.

In a sector or industry, one can expect new companies to be established until such time as the expected profit, π, for a company, no longer covers the fixed costs. New entries will thus continue until the following criterion has been met: $\pi_n \geq FK > \pi_{n+1}$. It can be seen from this that the entry of new companies into a market is a function of the fixed costs. If E_t represents entry in period t, the entry equation can be written:

$$E_t = \alpha(\pi_{t-1} - FK) \qquad (3.7)$$

where π_{t-1} represents the profits in the industry during year t-1. From this, one can see how regulations can affect entry and company concentration in an industry. Assume that administration and regulation compliance affect the fixed costs *(FK)* positively. An increase in fixed costs leads to fewer companies entering the market and the concentration of companies increases. It can be seen from equation (3.7) that the entry of new companies reduces profits:

$$\pi_t = \pi_{t-1} - \beta E_t \qquad (3.8)$$

The following is obtained by substitution from equation (3.7) to equation (3.8):

$$\pi_t = (1 - \alpha\beta)\pi_{t-1} + \alpha\beta FK \qquad (3.9)$$

This is in principle an empirically testable equation. Due to the very stringent requirements as regards detailed statistics, most empirical surveys have mainly been done in the form of cross-sectional studies (see Mueller (2003) for a discussion) The problem with cross-sectional studies is that they ignore the dynamic aspects and quite simply exclude the profits previous year in equation (3.9). Fixed costs are replaced by some proxy for industrial/company concentration. A more detailed method discussion about the way dynamic models are weighted can be found in Eklund and Wiberg (2009).

Figure 3 illustrates the way in which establishment of new companies leads to a fall in profits and convergence towards equilibrium profits[13]. In a similar manner, companies will be forced out of a market where profits are too low. Exit of companies, i.e. when companies leave the market or are declared bankrupt, will take place until the remaining companies' profits reach the equilibrium level.

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[12] *The total cost function TK = FK +cY can be formulated as follows: TK = TPK + TRK = FPK + FRK + cY + rY, where TPK is total production cost, TRK total regulation cost, FPK fixed production cost, FRK fixed regulation cost, cY variable production cost and rY variable regulation cost.*

[13] *Please note that equilibrium profit does not correspond to zero profit; the economic profit (equilibrium profit) is determined by the required return on the capital.*

Figure 3 Profit dynamics
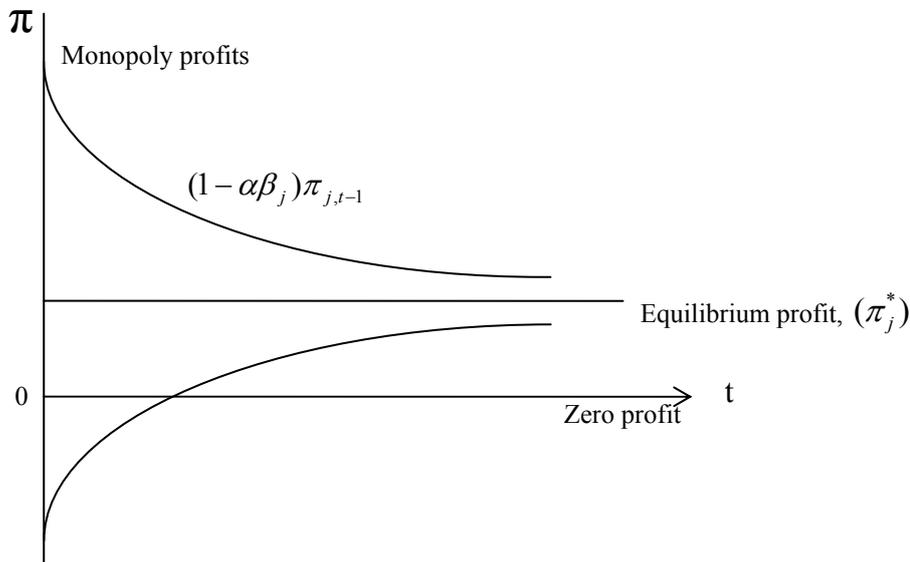
There are no studies of this type that have investigated how the regulatory burden affects entry costs and thus the profit dynamics. It is clear that various forms of regulation and the costs they entail affect the company's cost function. Exactly how a company's costs are affected naturally depends on the way the regulations are written. We have assumed above that mainly the fixed costs are affected, i.e. the burden of having to comply with regulations that is not related to the magnitude of the activity. This must be considered a reasonable assumption in many cases. Regulations and regulatory burden can also affect a company's cost function in other ways. For example, it is possible that the regulatory burden is a variable cost, i.e. every unit of a commodity or service produced is associated with some form of regulation cost. Here too, it can be shown in the same way that this leads to a fall in prosperity.

3.2.2   The regulatory burden as a one-off cost (*sunk cost*)

The following equilibrium criterion for an industry was given in the section above:

$\pi_n \geq FK > \pi_{n+1}$. This says quite simply that entry of new companies will continue until the profit for establishing one more company is no longer high enough to cover the fixed costs. Entry continues, in other words, until the profit has converged towards the long-term equilibrium profit.

This might for example be due to registration costs, licensing, issuing of permits etc. These costs are often characterised as one-off costs, which means in turn that companies who are already in the market in question no longer have this cost; only new companies are affected. Profits for a new company must in other words exceed the fixed costs (*FK*) plus the initial start-up costs (*UK*). Start-up costs will thus constitute a barrier to entry, which changes the equilibrium criterion: $\pi_n \geq (FK + UK) > \pi_{n+1}$. Intuition is simple: assume that the start-up cost for setting up in a market amounts to SEK 1 million. This means that companies in the industry can gain "monopoly profits" of up to SEK 1 million before they risk attracting further competitors. Only when the potential profit exceeds the fixed costs of SEK 1 million will it be profitable for a new company to establish itself.

An important effect to consider in a discussion of how the regulatory burden affects company dynamics is any learning effects which could eventually lead to a reduction in the fixed costs. It is probable that costs would fall as and when companies learn to handle and understand the regulations. It is probably more difficult (more expensive) for an entrepreneur to produce the first annual report than the second, etc. Given fixed compliance costs, this means that existing, mature companies probably have lower compliance costs. If this is the case, it has important consequences for competition and the opportunities for new companies to enter the market in question. The effects of learning on fixed costs are illustrated in Figure 4.

Figure 4 Scale economies v. learning effects
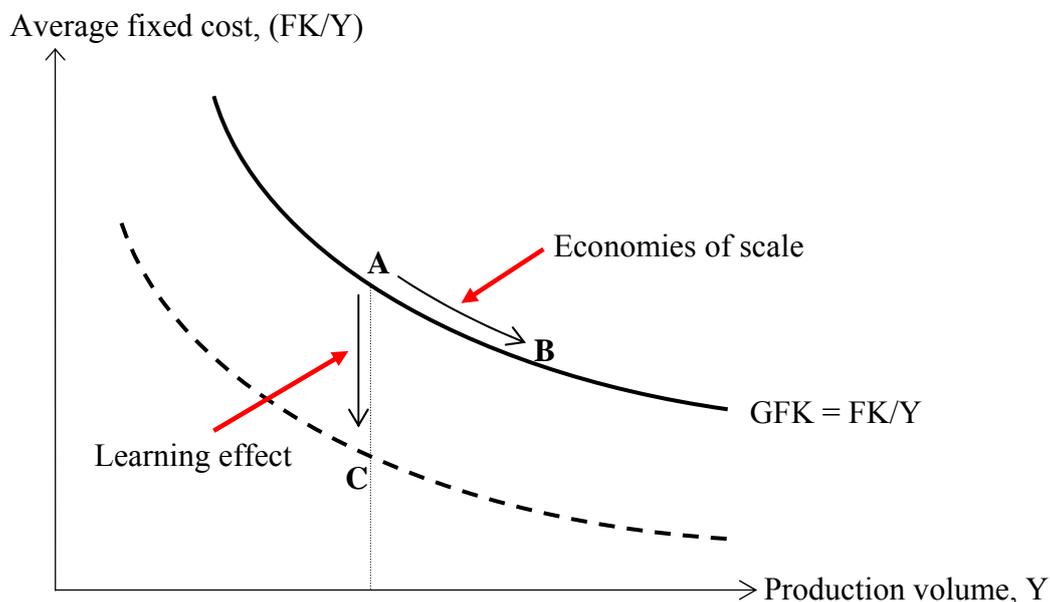
In a market with significant learning effects, existing companies can thus generate excessive profits without being threatened by the entry of competing companies.

3.3   The effects of the regulatory burden on production dynamics and resource allocation

The discussion above is mainly limited to how compliance costs and the regulatory burden affect the economy and competitive situation via their impact on the entry of new companies. There are several ways in which regulations and regulatory burden can affect already established companies. This section covers the way in which a company's production dynamics can be affected by the regulatory burden. 'Production dynamics' refers to how the company adapts its production to changes in product range and demand. These changes can take place on both the product range side, in the form of changed production costs, e.g. new wage levels, and the demand side, in the form of rising or falling demand for the company's goods and services.

Irrespective of whether a change takes place on the demand or the supply side, the regulatory burden and regulations can affect the adaptation process via either the capital

stock or the labour force. It can be assumed that some regulations will result in a time delay in adaptation of both capital stock and labour force. As distinct from input materials etc. regulations and the regulatory burden are not a direct monetary cost; they should preferably be seen as a time cost: labour market regulations prevent a company from employing or dismissing people when the market situation changes. In the same way, environmental regulations or the Planning and Construction Act cause time delays when the company wants to change its production. These types of friction, which can affect both the capital stock and labour force in a company/industry, can be analysed by means of so-called production functions.

A company's production can in principle be described as a function of the inputs capital (K) and labour (L). The production volume is determined by a combination of these inputs:

$$Y(t) = f(K(t), L(t))$$

(3.10)

i.e. the production volume Y is a function of the inputs capital (K) and labour (L). The optimum combination of K and L is determined by the cost of capital (interest rate), r, and labour cost, w. The company optimises its production as follows:

$$\min_{L \geq 0, K \geq 0} \quad w(t) * L(t) + r(t) * K(t)$$

(3.11)

$$S.t. \quad f(K(t), L(t)) \geq Y(t)$$

The time notation, t, shows that this is a dynamic optimisation problem, i.e. all the variables have a time dependency. Optimisation assumes in other words that production costs are minimised in every time period.

Optimisation of this expression only means that the cost of input goods is minimised for every given production volume.[14] When the company has chosen a production volume, it then attempts to minimise its costs for capital and labour.

The dynamic effects can be illustrated by means of so-called isocost and isoquant curves, which are derived from the equations above. Figure 5 illustrates the way in which the company chooses its combinations of capital and labour. The straight lines between the axes are the isocost curves. These show the amount of capital and labour that can be used for a specific budget. The gradients of the isocost curves are thus determined by a trade-off between capital cost, r, and labour cost, w, (i.e. the gradient is: $-r/w$). This is illustrated by curves Y_1 and Y_2 in Figure 5. The exact gradient is determined by the ease of substitution between capital and labour, i.e. the extent to which capital can be replaced by labour and vice versa. The company should minimise its production cost by choosing the combination of labour and capital that is determined by the intersection point between the isocost and isoquant curves. If the company wants to produce a volume equivalent to Y_1, it should choose the point determined by L_1^* and K_1^*.

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[14] *It is easy to show that this is the same as maximising the profit.*

Figure 5 Production dynamics in a friction-free environment

L

Unregulated
growth line

$-r/w$

L^*_2

L^*_1

$Y_2 = f(K, L)$

$Y_1 = f(K, L)$

K^*_1 K^*_2

K
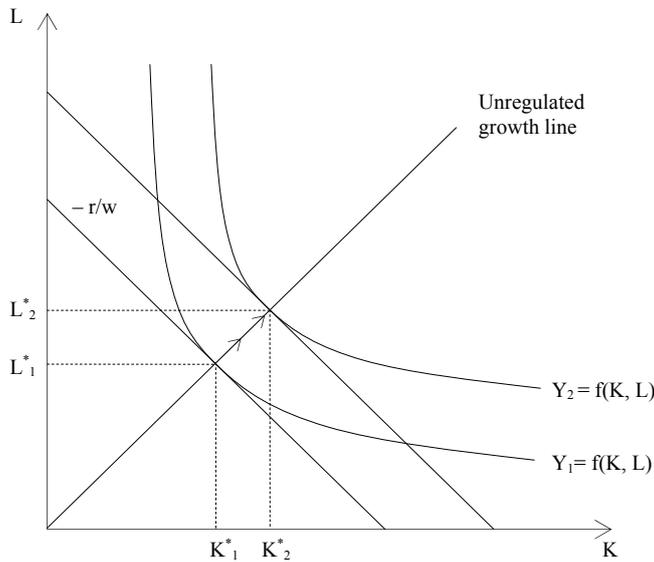
Figure 6 Production dynamics and regulatory burden

L

Unregulated
growth line

$-r/w$

L^*_2

L^*_1

Regulated
growth line

$Y_2 = f(K, L)$

$Y_1 = f(K, L)$

K_4 K^*_1 K^*_2 K_3

K
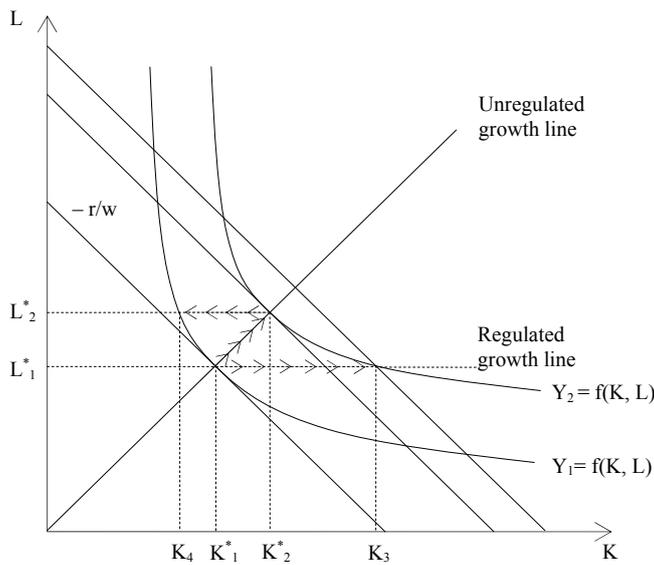
In an entirely friction-free environment where the capital markets are fully efficient and there are no labour market frictions, a company's production will always be optimised. When there is a change in the demand for a company's goods and services, production is quickly adapted to its new equilibrium position. This can be illustrated in Figure 5. Assume that demand for the company's goods or services increases. When this occurs, production volume will increase from *Y1* to *Y2*. If there is no market friction, production will move from the intersection of L^*_1 and K^*_1 to L^*_2 and K^*_2.

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If there is market friction, an optimum combination of production factors will not be used, which means that production will take place at higher cost. In Figure 6, market friction that leads to less labour than optimum being used, leads to production of Y taking place with a combination of L_1^i and K3 instead of L_2^i and K_2^i. This example contains frictions that prevent the company from adapting its labour force, which leads to "over-adaptation" of the capital stock. Conversely, it is fully possible that the frictions that prevent adaptation of the capital stock will spill over to greater adaptation of the labour force. In other words, these types of friction lead to dynamic allocation losses when production costs are not minimised.

International studies have shown that the rate at which companies adapt to changes in their environment and to changes in supply and demand differs considerably between countries (e.g. Desai and Eklund, 2009). The exact extent to which production dynamics in different countries are affected by regulatory burden and regulations remains to be determined and is therefore an important area for research.

4   Empirical analysis of the economic effects of the regulatory burden

This section of the report presents empirical analyses of how the regulatory burden affects: 1) yield requirement; 2) entrepreneurship; 3) profit dynamics; 4) production dynamics; and 5) economic growth. We have relied on the World Bank *Doing Business* indicators for measurements of the regulatory burden. To test the results' robustness we also present selected regressions where the Fraser Institute's *Economic Freedom* Index has been used.

4.1   Risk, yield requirement and regulatory burden

As discussed at the beginning, regulations and the regulatory burden can affect investment behaviour. In conventional investment theory, investments are evaluated by means of the so-called net value principle (NV) (see section 3.1 and equation (3.3)). Models that are commonly used in financial theory can be used to investigate in what ways the regulatory burden affects the yield requirement.

According to the so-called Capital Asset Pricing Model (CAPM)[15] , the expected yield from a share (asset), $E(r_i)$, can be calculated as follows:

$$E(r_i) = r_f + \beta_i (E[(r]_m) - r_f) \tag{4.1}$$

In this model, β_i measures the sensitivity of the security/share to market risk (systematic risk). r_m is the yield on market portfolio m. r_f represents the risk-free interest. This model says quite simply that the yield from a share consists of the risk-free interest plus a risk premium that varies with the magnitude of β. The expected yield, $E(r_i)$, obtained is quite simply the internal interest rate used in the present value method in equation (3.3). The expression $E(r_m) - r_f$ is the price of the risk in efficient market portfolios. In the CAPM model, only the market portfolio has any significance as regards the risk premium. This model can be developed into a so-called multi-beta CAPM model by including additional factors that can be expected to affect the yield requirement. Metron (1973) and Friend (1976) were among the first to include such additional further factors. We follow their approach by including measures of the regulatory burden as a factor that can affect the yield requirement.

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[15] *An alternative method of determining the effects of regulatory burden on the yield requirement would be to use a so-called arbitrage pricing model. This is not possible, however, since the largest portion of the variation in the different measures of regulatory burden is in the cross-section, whereas the variation with time is negligible.*

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Table 6 Variables for calculation of the yield requirement

Variable	Explanation	Source
National stock market index	The national stock market index has been adjusted for dividends and is expressed in USD	Morgan Stanley MSCI
World market index	The world market index has been adjusted for dividends and is expressed in USD Source: Morgan Stanley MSCI	Morgan Stanley MSCI
R_{it}	Monthly dividend, calculated from national indices	Morgan Stanley MSCI
R_{mt}	Monthly dividend, calculated from the world market index	Morgan Stanley MSCI
Regulatory burden	*Doing Business* data	World Bank

Statistics for the yield from national stock markets and the yield from a world market portfolio are needed to investigate how the regulatory burden affects yield requirements. In principle, it is possible to make these calculations using the yield from shares in the world's stock markets. For the sake of simplicity, we have used the national stock market indices from 49 countries and a global share market index. The indices have been adjusted for dividends and are expressed in USD, which guarantees that they are consistently defined and include all relevant dividends. The indices extend over an 11-year period from 1995 to 2001, which corresponds to 129 months (dividends for 10 years). We use a global share market index consisting of a weighted average of the national indices from 49 countries as a measure of the world market portfolio.

Econometric estimation of CAPM is done in two stages. The beta values are estimated in the first stage, using time series data; a separate equation is estimated for every country where monthly yield is the dependent variable and the yield for the world market index is used as the explanatory variable[16]. The results of the first stage of the analysis are shown in Table 7. The table contains estimated beta values from stage one and average yield for every country included in the study.

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[16] *In the first stage, the following equation is estimated separately for every country:*
$r_{it} = \alpha_i + \beta_i(r_{mt}) + \varepsilon_{it}$. *In stage two, the standard valuation of the CPM model list is estimated,*
generally in the following manner, $E_i = \alpha_i + RP_m(\tilde{\beta}_i) + \varepsilon_i$.

Table 7. Estimated beta values and average yield

Country	Estimated beta values	Average yield
Argentina	1.12	0.165
Australia	0.87	0.128
Austria	0.61	0.122
Belgium	0.8	0.127
Brazil	1.85	0.2
Canada	1.11	0.16
Chile	1.02	0.083
China	1.14	0.017
Colombia	0.52	0.179
Czech Republic	0.63	0.205
Denmark	0.84	0.15
Egypt	0.46	0.274
Finland	1.62	0.221
France	1.07	0.125
Germany	1.26	0.105
Greece	0.95	0.164
Hong Kong	1.2	0.108
Hungary	1.3	0.287
India	0.65	0.108
Indonesia	1.46	0.101
Ireland	0.85	0.107
Israel	1.07	0.135
Italy	0.94	0.131
Japan	0.87	0.011
Jordan	0.15	0.158
Malaysia	0.94	0.044
Mexico	1.44	0.175
Morocco	0.06	0.115
Netherlands	1.08	0.106
New Zealand	0.81	0.106
Norway	1.07	0.14
Pakistan	0.41	0.141
Peru	0.69	0.156
Philippines	1.06	-0.061
Poland	1.37	0.166
Portugal	0.82	0.107
Russia	2.13	0.413
Singapore	1.15	0.045
South Africa	1.11	0.114
South Korea	1.59	0.149
Spain	1.14	0.178
Sweden	1.42	0.172
Switzerland	0.79	0.124
Taiwan	1.1	0.022
Thailand	1.63	0.028
Turkey	2.15	0.322
United Kingdom	0.77	0.103
United States	1	0.121
Venezuela	1.01	0.172

In stage 2, it is now possible to use the estimated beta values and the average yield for each country to study how the regulatory burden affects the yield requirement. We estimate the following equation to investigate this:

$$\bar{r}_i = \alpha_i + RP_m\left(\hat{\beta}_i\right) + RP_{RB}\left(Doing\ Business_i\right) + \varepsilon_i \tag{4.2}$$

$\bar{r}_i$ is the average yield in country i between 1995 and 2005, α_i is the regression constant, which is an econometric estimation of the risk-free interest (global average), RP_m is the price of the risk, RP_{RB} is the yield requirement (derived from the regulatory burden). Finally, ε_i represents a statistical error term. The results are shown in Table 8.

Table 8 Yield requirement and regulatory burden

VARIABLES	(1) Average yield
Beta values	0.064***
	(0.023)
Doing Business	4.94e-4*
	(0.000)
Constant	0.053*
	(0.028)
Observations	43
R^2	0.237
Adjusted R^2	0.198

Note: The dependent variables are on the top line. Robust standard deviations are shown in brackets

*** p<0.01, ** p<0.05 and * p<0.10 designate the level of statistical significance. 6 countries disappear at this stage, since data is not available.

The results in table 8 show that the regulatory burden, measured in *Doing Business*, increases the required return on investments, which is negative for investment. One reason might be that regulations can affect the company's risk, i.e. regulations affect the level of uncertainty as regards future costs and revenues. We have estimated the constant in the regression to 0.053. The economic interpretation of this is that the average risk-free interest for all countries in the analysis has been estimated at 5.3%, which must be considered reasonable. This can also be seen as a sign that the estimation as a whole is correct.

4.2 Regulatory burden and entrepreneurship

In this section, we estimate the correlation between entrepreneurship and regulations. Entrepreneurship is measured using several different measures. Five different measures of entrepreneurship were used, taken from the Global Entrepreneurship Monitor (GEM), COMPENDIA, the World Bank and the OECD. The measures reflect different phases and dimensions of entrepreneurship. Data from the World Bank *Doing Business* index is used as a measure of the regulations. We use the aggregated index in our analyses.

The dependent variables which measure entrepreneurship are taken from different sources and capture different dimensions of entrepreneurship. A short description of the variables

used in each model is given below. Entrepreneurship variables consist of two variables from GEM data; necessity-based and opportunity-based entrepreneurship. Two other variables, taken from COMPENDIA, measure the total proportion of self-employed people and the proportion of self-employed people exclusive of the agricultural sector[17]. Finally, we measure entrepreneurship as the creation of new companies, using data from the World Bank. Regarding the measure of entrepreneurship based on GEM, it can be pointed out that the distinction between necessity- and opportunity-based entrepreneurship makes it possible to distinguish the driving forces behind entrepreneurship. Necessity-based entrepreneurship can be assumed to lead to short-term improvement, since the companies which enter the market via this type of entrepreneurship fall away to a greater extent in a financial downturn. The arguments here are that these company formations are not founded on innovative visions but are an alternative to labour market policy measures. For this reason, we can assume that these entrepreneurs well react differently to a different regulatory burden than opportunity-based entrepreneurs. Self-employment and new start-ups reflect different aspects of entrepreneurship. Self-employment is regarded as a static measure of entrepreneurship, whereas new start-ups and GEM reflect the dynamic influx of entrepreneurs into the market (see Wennekers et al, 2002) Earlier research shows that the correlation between entrepreneurship regulations varies, depending on what dimensions of entrepreneurship are used.

We include GDP per capita, education, unemployment and industrial structure as control variables. These control variables are commonly found in empirical literature. GDP per capita reflects the demand side of the economic structure, which can be assumed to affect entrepreneurship. GDP per capita, industrial structure and education levels also reflect a country's development level. GDP per capita is calculated using a logarithmic transformation to eliminate problems of non-normality. Unemployment can be assumed to have two types of effect on entrepreneurship. The most logical effect is that unemployment has a direct influence on macroeconomic conditions and thus on the demand side of the economy. The other effect is on the supply side, i.e. high unemployment leads to generation of entrepreneurship as an alternative, which means that higher unemployment contributes to higher growth in entrepreneurship, all other things being equal. Unemployment is thus assumed to be able to have both a negative and a positive effect on entrepreneurship. Which effect is predominant is thus an empirical question. Earlier research has shown that the effect can vary over time and space. Table 9 gives a detailed description of the variables.

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[17] *The agricultural sector is excluded here since there are a great many self-employed people in the sector. Countries with a large agricultural sector thus tend to have high shares of self-employed, which can give incorrect interpretations when measuring the entrepreneurial activities that we are interested in.*

Table 9 Definition of variables; entrepreneurship and regulatory burden

Variables	Year	Explanation	Source
Dependent variables			
Opportunity based entrepreneurship	2001-2006	Percentage of the population active in entrepreneurship, since they see future possibilities	Global Entrepreneurship Monitor (GEM)
Necessity based entrepreneurship	2001-2006	Percentage of the population active in entrepreneurship, since there are no other alternatives in the labour market.	Global Entrepreneurship Monitor (GEM)
Total percentage of self-employed	1972-2008	COMPENDIA is a harmonised database which covers 30 OECD countries. The data is derived only from individuals who are active as self-employed people, i.e. self-employed in relation to the total labour force.	COMPENDIA-Self Employment
Total percentage of self-employed, excluding the agricultural sector	1972-2008	COMPENDIA is a harmonised database which covers 30 OECD countries. The data is derived only from individuals who are active as self-employed people, i.e. self-employed, in relation to the total labour force.	COMPENDIA-Self Employment
New Business	2000-2007	The World Bank New Business is based on the formal sector	World Bank
Independent variables			
Aggregated DB	2006-2010	Aggregated *Doing Business*, ranking of 183 countries. The country with the highest ranking is assumed to have the best conditions for doing business.	World Bank
Unemployment	1969-2008	The total unemployment in a country.	International Labour Organisation
GDP per capita	1970-2009	GDP per capita, adjusted for PPP (constant 2005 international $). Covers more than 225 countries.	World Bank
Basic education	1970-2008	Net secondary education. Percentage of pupils in school in relation to the percentage of the population of the same age. English term: net enrolment rate (NER)	World Bank – World Development Indicator
Higher education	1970-2009	Percentage of the population with higher education	World Bank – Education Statistics
Industrial structure		Number of wage-earning industrial workers in relation to the total labour force	International Labour Organisation

The correlation between entrepreneurship and regulations is investigated using two different methods to increase reliability and validity of the results. We use both cross-sectional and panel data analysis for the measures of entrepreneurship and regulations where we have sufficient data.

a) *Specification and results - cross-sectional analysis*

Since the *Doing Business* index is not available for the same years as several of the entrepreneurship variables, we have here used a mean value for all variables in this part of the analysis. The final data thus contains cross-sectional data for 44 countries. In the regression analysis, we estimate the equation below, where coefficient β_1 indicates the effects of the regulatory burden (RB) on entrepreneurship. GDP/capita, education level and measures of industrial structure and unemployment are used as control variables as in previous empirical studies. The regression is specified as follows:

$$\begin{aligned}
Entreprenurship &= \alpha + \beta_1(RB_j) + \beta_2(Unemployment_j + \beta_3(BNP/Capita_j) \\
&+ \beta_4(High\ Education_j) + \beta_5(Low\ Education_j \\
&+ \beta_6(Industry\ structure_j) + \varepsilon_j
\end{aligned}$$

(4.3)

Table 10 shows the results of the cross-sectional analysis. Regarding their interpretation, it should be mentioned that the magnitude of the coefficients cannot be interpreted unambiguously because the measure of *Doing Business* is a ranking and does not show the distance between the steps in the ranking[18]. For this reason, we can only interpret the coefficients on the basis of their signs. The only measure of entrepreneurship which is significant is the *new start-up* variable. The results are reported in Table 10. This is probably due to the major measurement problems which the entrepreneurship variables are associated with. Many surveys have shown that necessity based entrepreneurship has little effect on economic growth. As for opportunity based business creation, one often sees a positive significant effect on economic growth on the other hand (See for example Acs and Varga, 2005).

Table 10 entrepreneurship and regulations – cross-sectional analysis

VARIABLES	(1) Necessity business	(2) Opportunity business	(3) Self-employed	(4) Self-employed (excluding agriculture)	(5) New start-up
Doing Business	0.011	-0.013	0.001	0.001	-0.047**
	(0.011)	(0.018)	(0.000)	(0.000)	(0.019)
Basic education.	-0.043	-0.111**	-0.002	-0.002	-0.059
	(0.034)	(0.053)	(0.001)	(0.002)	(0.079)
Higher education.	0.128**	0.210	0.001	0.003**	0.004
	(0.051)	(0.138)	(0.002)	(0.001)	(0.120)
Unemployment	-0.000	0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log GDP	-1.423*	-2.306	-0.073*	-0.023	0.372
	(0.823)	(1.733)	(0.041)	(0.046)	(0.959)
Industry	-6.553	-12.611	-0.365	-0.035	-0.543
	(7.894)	(11.581)	(0.479)	(0.468)	(11.271)
Constant	18.563**	38.173**	1.093**	0.447	12.835
	(8.006)	(15.303)	(0.394)	(0.463)	(10.466)
Observations	41	41	23	23	38
R^2	0.639	0.505	0.720	0.443	0.297
Adjusted R^2	0.575	0.418	0.615	0.234	0.161

Note: The dependent variables are on the top line. Robust standard deviations are shown in brackets.

*** $p<0.01$, ** $p<0.05$ and * $p<0.10$ designate the level of statistical significance.*

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[18] *A detailed description of the Doing Business index and its method can be found in chapter2.*

b) *Specification and results - cross-sectional analysis*

There is insufficient data to perform a panel data analysis for one of the measures of entrepreneurship, i.e. combining cross-sectional data with time series data.[19] This is possible for the measures of entrepreneurship from GEM, i.e. necessity- and opportunity-based business creation. The same independent variables are used as in the previous section to study the correlation between entrepreneurship and regulations.

Table 11 shows the results of regulations on entrepreneurship when the analysis is made with the panel data method.[20] The coefficient for the measure of regulatory burden has a negative sign for necessity-based entrepreneurship, but is not statistically significant. On the other hand, we find a statistically significant negative correlation between regulations and opportunity-based entrepreneurship. This confirms the conclusion from the multiple regression analysis, which indicated that the regulatory burden mainly affects innovation-driven entrepreneurship.

Table 11 Entrepreneurship and regulatory burden – cross-sectional analysis

VARIABLES	(1) Necessity-based business	(2) Opportunity-based business
Doing Business	-0.003	-0.036**
	(0.008)	(0.018)
Basic education.	0.058	-0.007
	(0.040)	(0.098)
Unemployment	0.000	-0.000
	(0.000)	(0.000)
Log_GDP	-3.747***	-4.747
	(0.873)	(2.966)
Industry	-20.109***	-28.535
	(7.133)	(17.494)
Constant	37.200***	59.851**
	(7.233)	(25.843)
Observations	67	67
No. countries	67	32
Adjusted R^2	0.72	0.39

Notte: The dependent variables are on the top line. Robust standard deviations are shown in brackets.

*** p<0.01, ** p<0.05 and * p<0.10 designate the level of statistical significance.

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[19] *We have made a number of specification tests to increase the reliability and interpretation of the results. A so-called VIF test does not indicate strong presence of multiple co-linearity (also referred to the correlation matrix in Appendix 1). The test for the presence of excluded variables shows that there might be other possible variables that explain entrepreneurial spirit and regulations. This is a problem which occurs in the research world and, given the lack of available data, one must ignore it and give all other conceivable arguments. Finally, we have tested for heteroskedasticity. Robust standard deviations are used to avoid heteroskedasticity problems.*
[20] *The Hausman test is used to test the model specification. The Hausman test consistently showed that a random effect model is preferable to a fixed effect model.*

There are several earlier surveys related to the correlation between entrepreneurship and regulatory burden. Klapper, Laeven and Rajan (2004) showed in their study that a shift from the 75th percentile in the cost of starting a business to the 25th percentile increased developing countries' GDP growth by 25- 50% per annum. Lower costs related to starting a business and registering a company thus have a positive effect on GDP development and the effect can be considerable.

Another newly completed study (Ardagna and Lusardi, 2009) uses micro-data from a wide selection of industrialised countries and developing countries to investigate how the regulatory burden related to starting companies, contract law and financial development affects people's choice to become entrepreneurs. The study focuses in particular on the correlation between the regulatory burden and financial development in the economy, plus a number of individual characteristics that constitute important determining factors for entrepreneurship, such as gender, previous business experience and social networks. The results showed that more regulations related to starting a company damped the positive effect of previous business experience. This also held after checking for level of financial development. As for the role of the regulatory burden in women's entrepreneurship, the results indicate that women are more likely to become entrepreneurs in countries which have a larger number of rules related to starting a business. This result can be explained by the fact that women in these countries find it more difficult to find other employment. This effect is also accentuated in countries with a lower degree of financial development, which further strengthens this reasoning. It is remarkable that people with previous business skills are less likely to become entrepreneurs again in countries which have extensive regulation related to establishing companies. Also, people who know entrepreneurs are less likely to become entrepreneurs themselves in economies characterised by extensive regulation related to establishing companies.

Djakov et al (2002) studied how the regulatory burden is related to establishing a company in 85 countries. The regulatory burden included comprises the number of procedures, official time and costs related to starting up a new company. The data clearly shows that the official cost in connection with starting up a company is extremely high in most countries. Countries with extensive regulation related to new start-ups also have a higher level of corruption and a larger informal economy than economies with a lighter regulatory burden. Nor does the number of regulations appear to have a positive effect on the quality of official services. More democratic countries tend to have fewer and simpler regulations for starting companies. These results are thus not consistent with the *public interest theory of regulation;* instead, they *support the public choice*-argument, which holds that regulations related to starting a company mainly benefit bureaucrats and public authorities.

4.3   Regulatory burden and profit dynamics

As discussed in section 3, microeconomic theory predicts that industries and markets where companies have high profits will attract new, competing companies. From this perspective, profits which exceed the opportunity cost of capital are only a transitory phenomenon. Companies and markets which have high profits will attract competitors and this will lead to profits converging towards more normal levels. This process is illustrated in Section 3, Figure 4.

Profits must be subdivided into various subcomponents to study a company's profit dynamics . Dennis C. Mueller (1986, 1990) has proposed that profits (π) can be subdivided as follows:[21]:

$$\pi_{j,t} = c + r_j + s_{j,t} \tag{4.4}$$

where $\pi_{j,t}$ represents the profits from company j at time t, c the return or profit the company has in a competitive situation (competitive return) and r_j a permanent profit component specific to the company (firm specific rent) This might for example be a risk premium. S_{jt} is a firm-specific temporary profit component. For companies in a competitive market, the equilibrium, long-term profit can be assumed to be equal to the competitive return, i.e. $\pi_{j,t}$ = c. Henceforth we will refer to the long-term equilibrium return for company j as π_j^*. The temporary profit component, s, is assumed to fall over time according to:

$$s_{j,t} = \varphi_j s_{j,t-1} \tag{4.5}$$

Parameter φ determines the rate at which profits fall. If this parameter is assumed to lie between minus one and plus one ($-1 \le \varphi \le 1$), profits will converge towards the long-term equilibrium profit. The following auto-regressive, first-degree function is obtained through substitution.

$$\pi_{j,t} = (c + r_j)(1 - \varphi_j) + \varphi_j \pi_{j,t-1} \tag{4.6}$$

This is reduced in turn to the following, empirically testable equation[22]:

$$\pi_{j,t} = \alpha_j + \varphi_j \pi_{j,t-1} + \varepsilon_{j,t} \tag{4.7}$$

where $\alpha_j \equiv c + r_j \equiv \pi^*$, and $\varepsilon_{j,t}$ is a common statistical error term. Note that the convergence parameter in this model tells us the percentage of yesterday's profit that remains today. If the parameter is 1, this tells us that the profit is the same as yesterday. All other things being equal, a low convergence parameter means that competitive pressure is higher and that convergence towards normal profits proceeds more rapidly.

Accounting information about profits is needed to allow equation (4.7) to be estimated empirically. We use the return on assets (RoA), taken from the Compustat Global database. The variables which we use in this analysis are summarised in Table 12. Possible effects of fluctuations in the business cycle must also be removed. We therefore normalise the return on assets (*RoA*) as follows:

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[21] *It is possible to sub-divide the profit into further categories. For example, Waring (1996) suggested that the temporary profit should be subdivided into an industrial and a company-specific component.*

[22] *The long-term forecast equilibrium profit for company j,* $\hat{\pi}_{jp}$ *, can thus be estimated as*

$$\hat{\pi}_{jp} = \frac{\hat{\alpha}_j}{1 - \hat{\varphi}_j}.$$

$$\overline{RoA}_{j,t} = RoA_{j,t} - \left(\sum_{j=1}^{n} RoA_{j,t}\right)\Big/_{n} \tag{4.8}$$

We then use the adjusted return measure to estimate the following empirical equation:

$$\overline{RoA}_{j,t} = \alpha + \lambda_1 \overline{RoA}_{j,t-1} + \lambda_2 \overline{RoA}_{j,t-1} \times Doing\ Business_{j,t} + \varepsilon_t \tag{4.9}$$

Note that the *Doing Business* index is included in the equation as an interaction term, which means that the marginal effect on the model is equivalent to the convergence parameter. This is thus a first-degree auto-regressive model (AR1).

Table 12 Variable List

Variables	Year	Explanation	Source
Dependent variable			
Return on Assets	1998-2010	Return on assets is defined as income before extraordinary expenses minus total dividends, divided by total assets and then multiplied 100.	Compustat Global
Independent variable			
Regulatory burden	2006-2010	*Doing Business* index	World Bank

The regression analysis shows that the regulatory burden affects the convergence parameter in a positive direction, which means that the regulatory burden helps to relieve competition pressure. An important observation in this context is that slow profit convergence implies systematic misuse of resources and that monopoly rents endure over time. The results are reported in Table 13.

Table 13 Regulatory burden and profit dynamics

VARIABLES	(1) RoAt
RoA.t-1	0.244***
	(0.010)
RoAt-1*Doing Business	0.009***
	(0.000)
Constant	0.053***
	(0.020)
No. of companies	38 346
R^2	0.060
Adjusted R^2	0.060

Note: The dependent variables are on the top line. Robust standard deviations are shown in brackets,
*** p<0.01, ** p<0.05 and * p<0.10 designate the level of statistical significance.

Since the data on which the analysis is based was not normally distributed, we trimmed 5% off the dataset at each end of the distribution.

4.4   Regulatory burden and production dynamics

Section 3 contained a discussion, from a theoretical perspective, about how the regulatory burden can affect production dynamics in established companies. The purpose of this section is to investigate empirically whether the regulatory burden has any effect on production dynamics. There are several empirical approaches to studying this question, all associated with both advantages and disadvantages. In this section we have chosen to study the effects of the regulatory burden by calculating the rate at which the company adapts its production capacity to changes in turnover.

The following method gives a measure of how fast the company adapts its capital stock to changes in turnover: *Elasticity of capital stock in relation to turnover*, i.e. the percentage change in capital stock for a 1% change in turnover In practice, this is a measure of the efficiency with which capital is (re)allocated from companies and industries with falling turnover (i.e. poor future prospects) to companies and industries with rising turnover (i.e. good growth prospects). See Desai and Eklund (2009), Eklund (2008) and Wurger (2000) for a more detailed discussion of the method.

The method can be derived from an assumption about proportionality between a company's capital stock and its production volume (see Section 3 and equation (3.1)). At any point in time, the company's capital stock, K, can be assumed to be in strict proportion to the production volume, Y. This can be expressed as:

$$K_t^* = kY_t \tag{4.10}$$

where *k* is the so-called capital output coefficient. For the sake of simplicity, we assume that K_t^* is identical to the actual capital stock, K_t. This means that net investments, NI_t, and $(K_t - K_{t-1})$ are proportional to the changes in the desired capital stock, $K_t^* - K_{t-1}^*$. Net investments; NI_t, can thus be expressed as follows:

$$NI_t = \lambda(Y_t - Y_{t-1}) \tag{4.11}$$

In this formula, net investments are proportional to an accelerator λ (the so-called accelerator coefficient). Given that $K_t^* = K_t$, $\lambda = k$, which is an equilibrium assumption. This equilibrium assumption is not normally fulfilled but it is not important for our objective (see Desai & Eklund, 2009 for a discussion)[23].

Gross investments I_t. are obtained by adding re-investments that are proportional to the old capital stock δK_{t-1}. Gross investments can thus be expressed as:

$$I_t = \delta K_{t-1} + \lambda \Delta Y_t \tag{4.12}$$

The following is obtained by dividing both sides of the equation by K_{t-1} :

$$\frac{I_t}{K_{t-1}} = \delta + \lambda \frac{\Delta Y_t}{K_{t-1}} \tag{4.13}$$

Since $K_t^* = kY_t$ equation (4.13) can be rewritten:

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[23] *The assumption means that the capital stock is always optimum and is immediately adapted to changes in turnover. The implicit elasticity is then equal to 1.*

$$\frac{I_t}{K_{t-1}} = \delta + \lambda^* \frac{\Delta Y_t}{Y_{t-1}}$$

(4.14)

where $\lambda^* = (\lambda/k)$, which is quite simply the elasticity of the capital stock in relation to turnover. This formulation is also useful empirically when the equation is normalised, which reduces heteroskedasticity. Note that if $K_t^* = K_t$ at every point in time, this means that $\lambda = k$, which in turn means that $\lambda^* = 1$.

We estimate the following equation empirically, for every country where we have access to data:

$$\frac{I_{i,t}}{K_{i,t-1}} = \delta + \alpha_i + \theta_t + \lambda^* \frac{\Delta Y_{i,t}}{Y_{i,t-1}} + \varepsilon_{i,t}$$

(4.15)

where λ^* is the elasticity of the capital stock in relation to turnover, I is gross investments made by the company in period t and K is the capital stock.

Access to a rich micro-data at company level is needed to estimate the elasticity of the capital stock in relation to turnover. Information about the capital stock, net investments and turnover is needed for an empirical estimation of equation (4.15). This data has been acquired from Standard & Poor's Compustat Global database, which contains detailed accounting information for listed limited companies in a large number of countries. Table 14 shows the variables used and how they are defined.

Table 14 Variable List

Variables	Explanation	Source
Dependent variables		
Elasticity of the capital stock in relation to turnover	Estimated in accordance with equation (4.15) above, using the measures of net investments, turnover and capital stock.	
Gross investments, I	Gross investments are measured as follows: I = Profit after tax (IB) –dividends (DVT) + depreciation (DP) + Δequity (SSTK-PRSTKC) + Δdebts (ΔDT) + F&U (XRD). *(Compustat Global variable codes in brackets).*	*Compustat Global*
Turnover, S	Turnover (SALES), Source: Compustat Global (The Compustat Global variable codes in brackets).	*Compustat Global*
Capital stock, K	The capital stock is defined as the net value of the fixed assets used in production.[24]. (PPENT), Source: Compustat Global (Compustat Global variable codes in brackets).	*Compustat Global*
Independent variables		
GDP	Log GDP, 1995 year values.	World Development Indicators.
Economic growth	Mean GDP growth between 1980 and 2002.	World Development Indicators.
Regulatory burden	*Doing Business* index	World Bank
Labour market rigidity	Labour market rigidity index	Botero et al (2004).

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[24] *This is a narrow value of the definition of capital stock. An alternative is to use total assets (AT). The correlation between these two values is so high, however, that the choice does not noticeably affect the results.*

Data is available for a total of 11,948 listed companies in 44 countries. The dataset consists of a total of 61,292 observations. Since we use panel data and are primarily interested in determining country-specific measures of capital stock elasticity, we use a panel data model with fixed time and company effects (α_i and θt). The time effects reduce possible problems with cyclical fluctuations in investment behaviour. The fixed company effects take care of non-observable heterogeneity among the countries. See Desai and Eklund, (2009) for a more detailed discussion of the method).

The elasticity of the capital stock in relation to turnover (i.e. equation (4.15)) has been estimated separately for each of the 44 countries. The results are shown in Table 15.

Table 15 Estimated values for capital stock elasticity.

Country	$\hat{\lambda}_j^*$	t-value	Std. Err.	R^2	No. of firms	No. obs.	Period
Australia	0.621	13.7	0.045	0.09	377	2047	1999-2005
Canada	0.849	15.0	0.057	0.14	303	1646	1999-2005
Hong Kong	0.756	8.24	0.092	0.12	101	550	1999-2005
India	0.687	13.6	0.051	0.17	169	912	1999-2005
Ireland	1.464	6.99	0.210	0.26	33	178	1999-2005
Israel	0.609	2.05	0.297	0.06	26	140	1999-2005
Malaysia	0.400	16.4	0.024	0.15	524	2371	1999-2005
New Zealand	0.829	3.02	0.275	0.07	52	234	2000-2005
Pakistan	0.367	3.09	0.119	0.12	26	164	1998-2005
Singapore	0.776	18.9	0.041	0.25	301	1363	2000-2005
South Africa	1.064	6.26	0.170	0.09	114	512	2000-2005
Thailand	0.523	9.91	0.053	0.13	217	1182	1999-2005
United Kingdom	1.276	18.8	0.068	0.09	691	3774	1999-2005
United States	1.160	42.5	0.027	0.16	2137	11642	1999-2005
British legal origin *	**0.884** **(0.813)**	**54.7**	**0.016**	**0.11**	**5071**	**26715**	**-**
Argentina	0.600	7.73	0.078	0.37	21	114	1999-2005
Belgium	1.266	8.05	0.157	0.18	72	400	1999-2005
Brazil	0.551	8.41	0.066	0.15	96	524	1999-2005
Chile	0.431	7.96	0.054	0.20	80	438	1999-2005
Colombia	0.283	1.88	0.151	0.13	10	54	1999-2005
France	1.575	14.8	0.106	0.10	362	1976	1999-2005
Greece	1.034	9.96	0.104	0.27	55	296	1999-2005
Indonesia	0.342	4.92	0.069	0.07	170	764	1999-2005
Italy	0.937	8.14	0.115	0.11	160	738	2000-2005
Mexico	0.715	8.58	0.083	0.31	57	308	1999-2005
The Netherlands	1.595	11.2	0.142	0.15	113	620	1999-2005
Peru	0.675	8.89	0.075	0.44	18	123	1997-2005
Philippines	0.645	12.8	0.050	0.31	69	373	1999-2005
Portugal	1.219	6.62	0.184	0.30	26	140	1999-2005
Spain	0.942	11.8	0.080	0.25	76	410	1999-2005
Turkey	0.567	2.53	0.224	0.06	29	156	1999-2005
French legal origin *	**1.155** **(0.836)**	**27.6**	**0.042**	**0.10**	**1414**	**7434**	**-**
Austria	1.167	7.47	0.156	0.25	43	248	1999-2005
Germany	1.579	18.7	0.085	0.12	431	2344	1999-2005
Japan	0.603	38.5	0.016	0.24	2860	13230	2000-2005
South Korea	0.817	21.4	0.038	0.35	203	927	2000-2005
Switzerland	0.946	12.6	0.075	0.21	142	782	1999-2005
Taiwan	0.725	16.0	0.045	0.26	180	972	1999-2005
German legal origin *	**1.098** **(0.973)**	**48.6**	**0.023**	**0.13**	**3859**	**18503**	**-**
Denmark	0.977	7.08	0.138	0.12	86	470	1999-2005
Finland	1.619	9.21	0.176	0.20	84	454	1999-2005
Norway	2.340	5.38	0.435	0.07	89	404	2000-2005
Sweden	1.177	6.91	0.170	0.05	173	961	1999-2005
Scandinavian legal origin *	**1.279** **(1.528)**	**11.2**	**0.115**	**0.06**	**432**	**2289**	**-**

Country	$\hat{\lambda}_j^*$	t-value	Std. Err.	R^2	No. of firms	No. obs.	Period
China	0.482	30.5	0.016	0.21	1130	6108	1999-2005
Hungary	0.730	4.41	0.165	0.29	11	60	1999-2005
Poland	1.331	5.88	0.227	0.29	19	119	1998-2005
Russia	0.434	3.42	0.127	0.36	12	64	1999-2005
Socialist/Communist origin [a]	**0.492** (0.744)	**31.2**	**0.016**	**0.20**	**1172**	**6351**	**-**
Average/total[a]	**0.914** (0.902)	**77.5**	**0.012**	**0.10**	**11948**	**61292**	**-**

Categorisation of different legal origins follows La Porta etc (2003). Elasticity has been estimated using the so-called fixed effect model, with company and time effects.

[a]These are weighted averages, which gives different countries different weights. Simple averages are given in brackets.

4.4.1   What effect does the regulatory burden have on capital stock elasticity?

In order to be able to answer the question of how the regulatory burden affects capital stock elasticity it is necessary to carry out a second step in the analysis and use the so-called weighted elasticities as dependent variables in a second regression analysis. The basic equation is as follows:

$$\tilde{\lambda}_j^* = \alpha + \beta_1(RB_j) + \beta_2(GDP_j) + \beta_3(Growth_j) + \beta_4(Labour\ market\ rigidity_j) + \varepsilon_j \quad (4.16)$$

$\tilde{\lambda}_j^*$ represents the estimated values of capital stock elasticity in relation to turnover (for country j). $RB_{jis's}$ represents the regulatory burden in country j. GDP per capita (logarithmic values), economic growth measured as annual percentage change in GDP per capita and a labour market rigidity measure are included as control variables.

Table 16 Regulatory burden and profit dynamics

VARIABLES	(1) Capital stock elasticity	(2) Capital stock elasticity
Doing Business	-0.005***	-0.006***
	(0.001)	(0.001)
Log GDP	0.025	
	(0.035)	
GDP growth	-0.063**	
	(0.025)	
Labour market rigidity	1.108***	1.263***
	(0.282)	(0.281)
Constant	0.162	0.580***
	(0.942)	(0.118)
Observations	43	44
R^2	0.529	0.469
Adjusted R^2	0.480	0.443

*Note: Dependent variables on top line. Robust standard deviations in brackets Statistical significance levels indicated by asterisks. *** p<0.01. ** p<0.05. * p<0.10.*

The reason why the measure of labour market rigidity is included as a control variable is that the friction that affects a production factor negatively results in higher elasticity for other production factors. This is illustrated in Section 3, Figure 6. We use capital stock elasticity as a measure of production dynamics so it is necessary to check for frictions that affect the company's ability to adapt the labour force negatively. The results are shown in table 16 and for the *Doing Business* subcomponents in table 17. Note that the *Doing Business* measure of the regulatory burden in the labour market field is not significant, at the same time as the measure of labour market rigidity is significant. This is consistent with the discussion in section 3.3 on how the regulatory burden can be expected to affect production dynamics.

Table 17 Doing Business indicator sub-components and production dynamics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Starting a business	-0.004** (0.002)									
Construction permits		-0.003** (0.001)								
Employing workers			-0.001 (0.001)							
Registering property				-0.001 (0.001)						
Getting credit					-0.009*** (0.002)					
Protecting investors						-0.002 (0.002)				
Paying taxes							-0.005*** (0.001)			
Trading across borders								-0.006*** (0.002)		
Enforcing contracts									-0.004*** (0.001)	
Closing a business										-0.005*** (0.001)
Log GDP	0.033 (0.036)	0.023 (0.040)	0.022 (0.042)	0.015 (0.044)	0.011 (0.038)	0.021 (0.044)	0.052 (0.033)	0.018 (0.037)	0.003 (0.038)	0.012 (0.039)
GDP growth	-0.074* (0.037)	-0.081** (0.034)	-0.104*** (0.034)	-0.114*** (0.031)	-0.071** (0.029)	-0.111*** (0.033)	-0.078** (0.031)	-0.084*** (0.024)	-0.096*** (0.028)	-0.072*** (0.024)
Labour market rigidity	1.005*** (0.327)	0.893*** (0.283)	0.966** (0.392)	0.836** (0.326)	1.359*** (0.303)	0.904** (0.340)	1.027*** (0.273)	0.862*** (0.263)	0.804*** (0.288)	0.903*** (0.285)
Constant	0.031 (1.025)	0.323 (1.096)	0.355 (1.136)	0.617 (1.214)	0.495 (1.030)	0.401 (1.188)	-0.363 (0.936)	0.542 (0.944)	0.986 (1.019)	0.609 (1.039)
Observations	43	43	43	43	43	43	43	43	43	43
R^2	0.451	0.410	0.375	0.382	0.532	0.382	0.543	0.518	0.503	0.498
Adjusted R^2	0.393	0.348	0.309	0.317	0.483	0.317	0.495	0.467	0.451	0.445

Note: Dependent variables on top line. Robust standard deviations in brackets Statistical significance levels indicated by asterisks.

*** $p<0.01$. ** $p<0.05$. * $p<0.10$.

4.5 Regulatory burden and economic growth

The reason why some countries have faster growth than others has been the basic question in political economic research. This section analyses the correlation between economic growth and regulatory burden. The results of previous studies include findings that regulations and institutions have a considerable effect on growth. The research on the subject includes findings that the structure of a country's institutions is of great importance for long-term growth and prosperity. Countries which have had better political and economic institutions are also richer today. Our reasoning is based on the influence of regulations on economic development, where regulatory burden is measured by the *Doing Business* index and the *Economic Freedom* index.

A study by Djankov (2006) analysed the effects of regulatory burden on growth and found a negative correlation between regulatory burden and growth. Haan (1999) applies the Economic World Freedom index as a measure of regulatory burden to examine its influence on growth. The main result says that greater economic freedom generates economic growth.

The growth equation that we estimate empirically is as follows:

$$\text{GDP per capita}_{it} = \alpha_i + \beta \, (\text{regulatory burden}_{it}) + \beta(\text{population}_{it}) + \beta(\text{internet}_{it}) \quad (4.17)$$

$$+ \, \beta(\text{basic education}_{it}) + \varepsilon_{it}$$

The specification applies to an observation in a country i (=1....n) for year t = 1970-2010. The explanatory variables are as follows: population in each country, foreign trade as a percentage of total GDP, use of Internet and basic education. These variables are transformed into logarithmic form; the coefficients are thus interpreted as the percentage change between variables. The explanatory variables[25] are taken from the World Bank's database.

The regression results are presented in table 18. We consider the fact that the material consists of panel data[26]. The results presented in the report are estimated with fixed time effects.

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[25] *A descriptive table containing an explanation of all variables can be found below.*
[26] *The Hausman test shows that fixed effects for each year are most suitable for the data.*

Table 18 Variable List

Variables	Year	Explanation	Source
Dependent variable			
GDP per capita	1970-2009	GDP per capita (constant for year 2000 in USD) measures the country's economic development.	World Development Indicators.
Independent variables			
Doing Business	2006-2010	The aggregated *Doing Business*, ranking of 183 countries. The country which is ranked highest thus has more flexible entrepreneurial activity. Singapore was rated highest in 2010. Sweden had 18th place.	World Bank
Economic Freedom Index	1970-2008	Aggregated *Economic Freedom* Index The countries which were ranked highest by the Fraser Institute were Hong Kong, followed by Singapore. Sweden was ranked 40th. Data is only available for every 5th year between 1970 and 2000. Data is available for every year between 2000-2008.	Fraser Institute
Internet	1970-2009	Internet users per 100 inhabitants	World Bank – World Development Indicator
Population	1970-2009	The total population of the country	World Bank – World Development Indicator
Compulsory school	1970-2009	Net secondary education. Percentage of pupils in school in relation to the percentage of the population of the same age. *Primary completion rate. total (% of relevant age group)*	World Bank – World Development Indicator
Trade	1970-2009	Percentage of GDP that comes from trade	World Bank – World Development Indicator

Source: www.worldbank.org.and http://www.freetheworld.com/

The regression results show a negative correlation between economic growth, measured as change in GDP per capita, and regulations, quantified by means of the *Doing Business*-index. The explanatory variables used in the regression to check for the country's economic performance are described in Table 18 above.

The regression shows that a high value in the *Doing Business*-index has a negative effect on growth. In addition, the statistical coefficient is significant at the 1% level, please see Table 19.

A general feature of all the model specifications we have tested is that the explanatory level is between 60% and 80%. The Fraser Institute's *Economic Freedom* of Index also has a significant effect. These results can be found in Appendix 2.

The results also show that most of the subcomponents in the Doing Business index also have negative signs. The following subcomponents are statistically significant: starting a business, building permits, financing, investor protection, barriers to trade, and exit. This means that all the subcomponents mentioned have a negative influence on growth. Due to space constraints, these results are not included in the report.

We also analysed the separate effects from the three subcomponents included in *Economic Freedom*. It was found here that credit regulations were the only ones which were *not* statistically significant. The other two variables which measure regulatory burden are statistically significant at the 1% level. Regulations in the labour market are negative for growth, with an effect which is statistically significant at the 1% level, whereas regulations related to business operation have a positive, statistically significant effect.

Table 19 Economic growth and regulatory burden

OLS	(1)
VARIABLES	**GDP/capita**
Doing Business	-0.007***
	(0.001)
Internet	0.545***
	(0.037)
Population	0.016
	(0.020)
Compulsory school	0.289
	(0.210)
Trade	-0.013
	(0.098)
Constant	6.499***
	(1.067)
Observations	282
R^2	0.797
Adjusted R^2	0.793

Note: Dependent variables on top line. Robust standard deviations in brackets
*** $p<0.01$. ** $p<0.05$. * $p<0.10$ indicate the level of statistical significance.*

5 The political economy of the regulatory burden

Why do we then tend to get so many, sometimes dubious, regulations which are negative for business operation? Why does the regulatory burden arise? How can "effective regulations" be defined and how can the development of such regulations be facilitated and the regulatory burden reduced in the long-term?

5.1 Effective regulations

It is important to underline, as pointed out at the beginning, that some types of regulations are extremely important for the conditions for business operation, the company's ability to development, job creation, etc. Well-functioning institutions of this type play a crucial role in creating economic growth (see for example Acemoglu, Johnson and Robinson (2001) and Rodrik, Subramanian. and Trebbi, (2004)). These types of rules generally tend to be described as "the rules of the game" and can be either formal, i.e. laws and regulations, or informal, for example social standards etc. Institutions and regulations constitute restrictions on individuals', companies' and organisations' ownership of property and affect the incentive structure in society to a large extent (see for example North 1991 and 1994).

The most fundamental economic institution is the right of private ownership, or ownership protection, including the basic economic freedoms such as freedom of contract, freedom to run a business and freedom to start a company. The distinguishing characteristic of a free market is voluntary contracts within the framework of the system of private ownership. Companies are also subject to a set of contractual relationships. There is strong empirical support for the view that these rights and freedoms are crucial to the development of the common good (see Berggren & Karlson 2005). The index used in the empirical part of this survey, the World Bank *Doing Business index*, is largely based on the view that protection of the right of ownership and freedom of contract is the foundation of a good business climate. To put it simply, regulations of this type can be said to be "effective"; they lead to efficient resource allocation in society. Thus, they do not lead to an economic cost to society but rather to greater benefit to society.

An important insight in this context is that freedom of contract and the competition which ensues from this, permits the complex coordination and development of the common good which characterises the present-day global economy. Epstein (1996) made a significant comment, viz. that the rules of play which consist of the right of ownership and freedom to enter into contracts are "simple rules for a complex world". The complex world needs few, simple and clear rules, perhaps contrary to what one might first believe.

However, regulations or institutions, – depending on how they are designed – can also have negative consequences. If and when regulations become less appropriately designed, or quite simply become too many, negative types of cost arise, which risk strongly impairing society's incentive structure and thereby the prerequisites for growing companies.

Hayek (1973), who won the Nobel Prize in Economic Sciences in 1974, made an important distinction between what he calls *law* and *legislation*. The first merely constitutes the general rules of play for the market economy, whereas the latter is legislation intended to achieve various types of specific political goals and outcomes. It is this latter type of laws and regulations which risk creating a negative regulatory burden for companies and thereby a loss of efficiency for society

The basic political economy textbooks generally identify three basic tasks for politics:[27] the first is to provide so-called public goods. Unlike ordinary so-called private goods, these goods and services are considered difficult to finance and produce in a private market, partly because they benefit many people at the same time, irrespective of whether the recipients of the service want it or not, and also because it is difficult or impossible to exclude those who have not paid for the good or service in question. In practice, this concerns defence, the legal system, the courts, the police etc.[28] From our perspective, the most important aspects might be the maintenance of private ownership rights and the market economy's rules of play.

The other task is to ensure that goods and services with large positive external effects, so-called *merit goods*[29], are provided to a greater extent than would otherwise be the case. This concerns things like education and medical care. By 'positive external effects' is meant that production of these goods and services is also considered to lead to good outcomes for people other than those who consume them directly, such as when a higher education level and better public health leads to increased growth. Correspondingly, large external negative effects such as pollution or over-fishing are regarded as justifying government intervention.[30]

Both of these first two tasks are thus defended by a type of efficiency argument. The idea is that society as a whole enjoys greater prosperity if the state creates laws and regulations which solve so-called *market failures,* and ensures that public goods and positive external effects are provided. These efficiency justifications for regulations, however, have lost some support in recent decades. The reason is mainly the research which has its origins in Coase's (1960) basic insight that, as long as transaction costs are not insuperable and ownership rights are well-defined, competition and freedom of contract will eliminate many external effects and public goods, and will actually lead to effective solutions. The regulatory need that remains then consists of measures intended to reduce transaction costs and define ownership rights and to provide efficiency raising public goods and solve problems with external effects.

The third task is to create a fairer distribution of various resources in society. The decisive argument here is no longer economic efficiency but is instead normatively motivated. In the following analyses, we will only indirectly consider this task and quite simply assume that it has been dealt with.

Given these points of departure, which for the sake of argument we assumed were well known among political decision-makers, the question is why Sweden and many other countries have so many dubious regulations – regulations which are negative for business

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[27] *Further subdivisions of what is referred to the efficiency argument are often made. See Stiglitz (2000), for example.*
[28] *Exactly what should be included in these public goods in practice is open to debate. It is worth noting that technical developments have affected demarcation to a considerable extent. Using modern technology, it is often possible to charge individually for using roads, telecom networks, fishing waters, airspace etc. For further examples, see Foldvary & Klein (2003).*
[29] *Even if we at times only define merit goods as goods which are introduced for paternalistic reasons, i.e. because individuals are not considered to know what is best for them. Common examples are seat belt regulations and basic education.*
[30] *This category can of course also be debated. For example, there are large demarcation problems and risks that government initiatives will force out desirable private initiatives. We will have to leave this criticism unanswered in this context. See Cowen & Crampton (2003) for a general critique .*

and society's efficiency? The question is also why it appears to be difficult to reduce this regulatory burden and reduce the number of ineffective regulations. The graph below illustrates the correlation between the number of regulations and benefit to society – some rules, in particular the rules of play of the market economy, are more effective, but when more and more regulations with other purposes are introduced, effectiveness and benefit to society are reduced.

Figure 7 Regulation graph
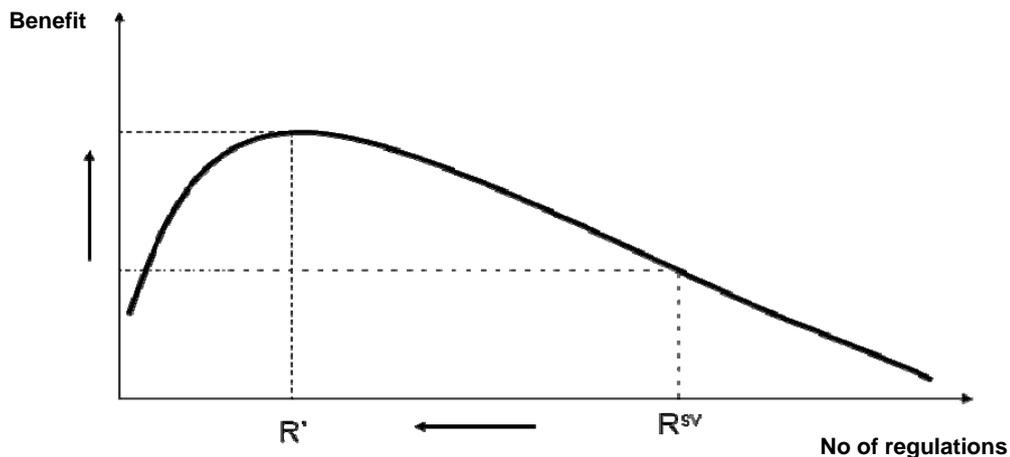
Why is it so difficult to get politicians to achieve "effective rules" (point R'), i.e. rules that create prerequisites for functioning markets, provide public goods that increase efficiency, and solve problems with external effects instead of making decisions which lead to a regulatory burden with no benefit and less effectiveness (R^{sv})? And why does it appear to be so difficult to reduce this regulatory burden when they knowing that it exists? What is needed for Sweden to be able to move from R^{sv} to R' in the long-term?

5.2   Reasons for the regulatory burden

There is today a large body of research about the reasons why we have so many regulations in the area of political economy that are dubious as regards their effectiveness, particularly in the *Regulatory Economics* research field, where political decision-making is analysed by means of economic methods. Applied to the regulatory burden, two relatively distinct tendencies can be distinguished (Karlson 2002).

5.2.1   Political failures and rent-seeking

The best-known is the *public choice* school's analysis of so-called *political failures* (see Buchanan and Tollison 1984 and Mueller 2003 for overviews). Viewed in this perspective the political process is strongly influenced by special interests and short-term thinking, which blocks effective regulations and instead leads to over-regulation.

The disproportionately strong influence that special interests can be expected to have can mainly be explained by different groups in society having differing abilities to organise themselves and influence politics than wider, more general interests. Small, concentrated interest groups can be expected to have greater impact than wider, more general interests. It is more interesting to organise, influence the media etc. if the advantages can benefit a

few rather than if the advantages are distributed to many people. For example, the interests of producers in a few established large companies and export industries can be expected to have greater influence than the interests that are shared by a large number of small, scattered companies. Previously established organisations and various types of insiders also have this advantage. Really broad interests such as consumers and taxpayers generally risk remaining entirely unorganised.

The consequence is that these privileged groups can be expected to have disproportionately greater influence on the political process and the creation of regulations (see Peltzman 1976 in particular). The cost of these regulations, the regulatory burden, are distributed among wider groups of companies and citizens, where each individual actor has no reason to offer resistance. Correspondingly, these well-organised groups block regulatory changes that are to their disadvantage. This not seldom takes place in a symbiosis with the bureaucracy put in place to administer the regulations in question. These groups in themselves constitute a special interest that safeguards the existing regulatory system.

One of the best-known contributions to this research was made by Nobel Laureate George Stigler's so-called *capture theory* (1971), which shows that companies and organisations have frequently managed to capture or take command of the regulatory authorities or other public bodies, and get them to reduce competition, raise prices or benefit the company or organisation in question in other ways, rather than opposite. It is easy to imagine examples from Sweden, ranging from municipal level to various state supervisory authorities.

From this perspective, both the demand and supply of regulations will thus be *higher* than what is economically justified. In addition, the regulations introduced cannot be expected to be effective – on the contrary, the regulations that are intended to attain specific goals and outcomes will dominate the creation of regulations.

Various interests can thus be expected to acquire various kinds of privileges (so-called rent seeking) by requesting regulations and politicians and bureaucrats, in order to gain votes and influence, will respond by offering regulations and limitations in right of ownership and freedom of contract (Helm 2006).

5.2.2   Unexpected outcomes from well-intended measures

The other, possibly less well-noted approach to explain the origin and permanence of the regulatory burden can be found in the so-called *Austrian school*. The point of departure here, is that every regulation is in itself well-intended and possibly well-justified, but these interventions in the functioning of markets and civil society, over and above purely effective regulations, more or less inadvertently create distortions and problems, which in turn justify new interventions, which in *their* turn justify new interventions, in a form of self-reinforcing spiral. The classic reference is Ludwig von Mises' "A Critique of Interventionism" (Mises 1977, Mises 1985. See also Hayek 1944).

The argument is thus that many regulations impair the market system's competition, price systems and innovative capacity, irrespective of how well-intentioned they are, which in turn creates new problems that cause new interventions. A typical example is rent control, which was introduced in Sweden in 1942, which caused queues, a black market, insufficient building construction, housing shortages, etc., which in turn led to market interventions for input material, the "million homes programme", housing subsidies, the "utility value principle", etc. It is noticeable that every new intervention tends to create new interest groups with a motive to retain and protect the regulations in question. More

examples can be found in the labour market and the social field. Some parts of the environmental legislation also have consequences of this kind.

5.3   Possible measures

The general conclusion from this research is thus that effective regulations and low regulatory burden are difficult to achieve, since new regulations will constantly be demanded by various special interests and are often offered by bureaucrats and well-meaning politicians. This also means that it is not particularly easy to try to abolish existing regulations. Various special interests will do everything they can to block their curtailment or abolition. Both the supply of and demand for regulations will be *higher* than is economically justified, illustrated by point R_{sv} in Figure 7.

The question is then what can be done. A combination of disseminating knowledge about the effects of regulatory burden and improving forms of political decision-making will be most successful. Without an understanding of the importance of reasonable conditions and rules of play for business and market economy for societal efficiency and the creation of prosperity, no improvement can be expected.

The method that is recommended in the research described above, however, is to try to reduce the generation of new laws and regulations which are not effective in the long-term, by introducing various kinds of *constitutional limitations on political decision-making*. The new preliminary inspection of new laws and regulations by the *Swedish Better Regulation Council* is one attempt in this direction. However, the council's constitutional standing and independence should be further reinforced – a suggestion along these lines is presented in the next section. The council's mandate could also be enlarged to include existing regulations.

Constitutional changes are probably needed to gain long-term control of the growing regulatory burden and reduce the built-in short-term tendency and susceptibility to special interest influence in politics. Of special importance are clearer protection in the constitution of the right of private ownership to a strengthened constitutional state, judicial reviews, power sharing and more institutional competition inside and outside each country (see for example Hayek 1979 and Buchanan and Brennan 1985). The recently (2010) decided amendment to the constitution in Sweden, which will among other things strengthen the status of the courts, is a step in this direction.

The most fundamental correlation, that between the quality of the legal system and economic growth, is well documented in modern growth research literature.[31] The higher the quality, the greater the rate of growth. The most important aspect is that the quality of the legal system is a prerequisite for right of ownership and freedom of contract are respected, which gives economic actors the incentive to direct their energies towards productive activity. An analysis of the concept of ownership and the fundamental importance of the right of ownership for a good society can be found in (Berggren and Karlson 2006).

It is thus important to both attempt to ensure that the new regulations which are produced are better and more effective, at the same time as over-regulation and introduction of ineffective regulations are prevented from the outset by making appropriate improvements

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[31] *See for example Barro and Sala-i-Martin (1995, pp 428-461), Barro (1996), Carlsson and Lundström (2002).*

to the constitution. In the long term, this is probably the only sustainable way to reduce companies' regulatory burden.

6   How should rules be designed most efficiently?

One important conclusion from both the theoretical reasoning above and from the empirical results is that it is not only the total regulatory burden in itself that should be in focus. It is rather the efficiency with which every single regulation is designed that is of the greatest importance (see (Helm 2006) for a critical discussion of the goals related to reducing the aggregated regulatory burden). Some regulations actually contribute to effective use of resources, possibly mainly the regulations that create prerequisites for functional markets, provide public goods that increase efficiency, and solve problems caused by external effects.

It is probably not possible to give a more precise answer as to what constitutes an effective regulation. In addition, many regulations are motivated with ethical and moral considerations rather than effectiveness arguments. For this reason, the focus should probably be on the process of designing and introducing new regulations (legislation), i.e. in addition to evaluating existing regulations, it is necessary/desirable to have well-designed procedures for designed regulations.

Two criteria must be met for a regulation to be economically justified: First, some form of problem, such as a market failure, must exist, i.e. insufficient production of public goods that increase efficiency and management of external effects (which cannot be solved by improving market economy's rules of play). Naturally, the problem does not need to be a strictly defined economic problem; it may be some form of *social regulation* (see Section 2). Second, it must be possible for society to deal with or rectify the problem through legislation or regulations. It is not enough to merely identify a problem for an intervention to be justified, it must also be possible to improve the situation through regulation. Not until these criteria have been met are regulations economically justified

The fact that a public intervention is economically justified does not however guarantee that a regulation will be introduced, nor that it would be effective if it were. For every given problem or market failure, there are generally several alternative solutions. From this perspective, an efficiently designed regulation could be said to be the measure that rectifies the observed problem (market failure) at the lowest possible cost. A rule that is economically effective for society is therefore a rule that gives rise to the greatest economic benefit to society, i.e. of all the possible alternatives, the economically effective regulation is the one that generates the greatest net benefit (surplus) in a so-called economic cost benefit analysis.

The next question is how society ensures that the regulations that generate the greatest economic surplus (net benefit) are the regulations that are actually introduced? There is no easy answer to this either.

A first important step is to ensure that new regulations are preceded by a comprehensive consequence analysis that details the economic effects of the regulations in question:

- A comprehensive cost-benefit analysis where costs and benefits (gains in prosperity) are given monetary values as far as possible.

- A cost-effectiveness analysis of different alternatives.

The problems associated with cost-benefit analyses are well documented and they have accordingly acquired a somewhat tarnished reputation among economists and sociologists in Sweden. A comprehensive discussion of the problems related to cost-benefit analyses

lies outside the scope of this report. It should be sufficient, however, to point out that irrespective of what the problems with a method might be, a carefully conducted analysis is probably a better basis for decisions than no analysis at all.

One problem associated with cost-benefit analyses, however, is that they are very sensitive to the assumptions related to discount rates, alternative scenarios, etc. Both the USA and Canada have solved many of these problems on the one hand by ensuring transparency in the evaluation process and on the other by providing the authorities with standardised values, e.g. in the form of discount rates. Authorities also receive support from impact analysis experts. Both the USA and Canada have drawn up clear guidelines for how cost-benefit analyses should be made (Treasury Board of Canada. 2010). The cost-benefit analyses made by public authorities in conjunction with the introduction of new regulations then form the basis of so-called Regulatory Budgets, where the total cost of the regulations are documented. The Office of Management and Budget (OMB) in the USA submits an annual report to Congress, containing a summary of the economic costs and benefits to society generated by new regulations during the past year.

Since cost-benefit analyses do not tell us whether there alternative regulations (solutions) which are more economically profitable, cost-effectiveness analyses that evaluate different alternatives are also needed. In other words, correctly implemented cost-benefit analyses tell us which regulations are most effective.

6.1   The Swedish Better Regulation Council – a possible institutional mechanism for more effective regulations?

Regulatory public authorities and commissions in Sweden now have to carry out consequence analyses and append them to proposed regulations. The Swedish Better Regulation Council, which is an independent government-appointed committee of enquiry under the Ministry of Enterprise, Energy and Communications, is tasked among other things with examining proposed new and amended regulations which have consequences for businesses. The Council's tasks also include examining the impact assessments:

> *"The task of the Council is thus to constantly take a position on whether new or amended statutes are formulated in such a manner as to achieve their purpose as simply as possible for the business concerned and at relatively low administrative cost to the business. The Council must also assess the quality of the impact assessments." (Swedish Better Regulation Council, 2010)[32]*

The Swedish Better Regulation Council currently consists of four ordinary representatives, four alternate members and a secretariat which prepares the cases. The Swedish Better Regulation Council's task is thus to examine how regulations have been drawn up from a business perspective and issue opinions as to whether the impact assessments are satisfactory.

Both the USA and Canada have created institutional frameworks to prevent regulations which are far too costly to society from being introduced.[33] The basic principle is simple: regulatory authorities are expected to produce impact assessments which contain both a cost-benefit analysis, that as far as possible will generate monetary values for the factors

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[32] *Dir. 2008:57 and Dir. 2008:142.*

[33] *Many countries have created various forms of supervisory authorities, but the USA and Canada are probably the two countries who have come furthest in this work. Germany for example has had a Regulation Council since 2006, which has a similar function to the Swedish Better Regulation Council (Nationaler Normenkontrollrat, 2009)*

that influence the calculation, and a cost-efficiency analysis that shows that the chosen regulation is the most cost-effective one from an economic perspective. These impact assessments are then examined by a body that is independent of the regulatory authority.
This type of institution probably functions as a gatekeeper and prevents interest groups from forcing through regulations that benefit special interests but create higher costs to society than benefits. The Office of Management and Budget (OMB) has this function in the USA. In Canada, which has largely copied the American model, it lies with the Treasury Board.

To be able to effectively influence the introduction of new regulations, in our opinion, the Swedish Better Regulation Council has a far too limited mandate as regards the breadth of the matters/areas they examine, nor does it have the authority or possibility to influence the design and introduction of new regulations, at any rate when compared with the OMB in the USA and the Treasury Board in Canada.

The Swedish Better Regulation Council themselves emphasise the importance of the quality of the impact assessments for their work and ability to determine the most appropriate measure for correcting a perceived problem (Swedish Better Regulation Council 2009). One possible reform in Sweden would be to extend the Swedish Better Regulation Council's mandate to give it the power to block a new regulation if they consider the impact assessment to be unsatisfactory. The Council should also be given an extended mandate to consider the total economic consequences of new regulation and not just the current narrow task of considering the administrative costs they generate.

In this context, the Swedish Better Regulation Council can be compared with the Legislative Council, which can approve or reject any proposed new legislation on the grounds of whether the proposal is consistent with current legislation and conforms with the stipulations of the Constitution. The Legislative Council thus has a strong mandate. The Swedish Better Regulation Council could be given a similar role, with the task of examining new regulations from the perspective of enterprise and the economy.

7   Conclusions

Many countries, including Sweden, are working to reduce the administrative burden that regulatory compliance creates for companies. The assumption behind this simplification of regulations is that the regulatory burden constitutes a significant obstacle to business development. There is also strong support in research results that both the demand and the supply of regulations tend to be *higher* than is economically justified.

The work of simplifying regulations and the regulatory burden debate, however, focus relatively narrowly on the direct costs, in the form of companies' administrative costs. The intention of this report is to broaden the discussion and analyse the indirect effects of the regulatory burden. A further intention is to investigate the direct and indirect costs of the regulatory burden theoretically and empirically and attempt to answer the question of what constitutes effective regulation and how this can be achieved.

A central problem is how the regulatory burden can be defined in an adequate manner. The concept is broadened in this report to comprise the total costs to society that the regulations generate. The next problem that follows from this is how the regulatory burden should be measured. Since it is not possible to measure the total economic costs to society directly, the report mainly relies on the World Bank's so-called *Doing Business* index, which provides a relative measure of the regulatory burden in 183 countries.

There are strong theoretical indications that the indirect economic consequences of the regulatory burden are considerable. The regulatory burden can theoretically have several indirect effects. To begin with, it can be expected that competitive pressure and entrepreneurship would be affected since the entry of new companies is negatively affected. These effects mainly occur through the companies' cost structure is affected by the regulatory burden and cause entry barriers etc. Substantial effects on production dynamics probably also occur since regulations can cause frictions that reduce a company's ability to adapt to changes in its environment. This leads in turn to considerable allocation losses. Similarly, there is reason to expect that the yield requirement rises as the regulatory burden increases and that this has negative repercussions on investment. Altogether, these negative indirect effects can result in lower economic growth.

In the empirical analysis, we find support for many of these effects, among other things that production dynamics are poorer and the yield requirements higher in countries that have relatively heavy regulatory burdens. The negative effects on production dynamics manifest themselves in the form of enterprises being less able to quickly adapt to external changes. The effects on entrepreneurship were also investigated; these results however were weak, probably due to considerable measurement problems. Lastly, we find that countries with a light regulatory burden exhibit more rapid economic growth in GDP per capita.

The overall conclusion we draw from our theoretical and empirical analysis is that the indirect economic costs that follow from a high regulatory burden are considerable and probably appreciably more significant than the immediate, direct costs.

Assuming that the economic costs to society are considerable, the question arises of what makes economic regulations effective and what is needed to prevent ineffective regulations?

It is not possible to give an unambiguous answer, from an economic perspective, to what characterises an effective regulation, apart from demonstrating that some well-known regulations create the conditions for functioning markets, provide public goods that increase efficiency and solve problems with external effects. The central task is thus to find methods that ensure that the economic advantages exceed the costs.

There is much that indicates that a combination of disseminating knowledge about the considerable economic costs of the regulatory burden and better political decision-making routines is the most successful approach. Without knowledge of the importance for reasonable conditions and rules of play for business and market economy for societal efficiency and creation of prosperity, no improvement can be expected.

Our conclusion is also that the institutional framework that surrounds the design and introduction of new regulations is of central importance. It is important to have an independent body or public authority that critically examines new regulations in order to guarantee as far as possible that only effective and economically profitable regulations are introduced. Good examples of this type of institutional arrangement can be found in the USA and Canada. New regulations in these countries are preceded by impact assessments that contain both cost-benefit and cost-efficiency analyses. Both countries also have an independent authority that examines these analyses and is also mandated to prevent a new regulation if they consider the impact assessment to be inadequate.

A possible way forward for Sweden would be to reinforce and enhance the Swedish Better Regulation Council's mandate, possibly by an amendment to the constitution, combined with clearer guidelines for public authorities, explaining what impact assessments should comprise. Properly carried out, these changes can result in more economically effective regulations.

Lastly, there is continued need for further research concerning the indirect economic effects of the regulatory burden and the underlying mechanisms. The details of how the institutional framework should be designed to promote the creation of economically effective rules in the best way possible must also be studied more closely. There is also a great need to develop systems for examining the indirect economic costs to society of the regulatory burden in existing laws and regulations.

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Appendix 1

Table 1 Correlation matrix – Regulations from Doing Business och Economic Freedom of the World

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Doing Business	1														
2	Starting a business	0.818*	1													
3	Construction permit	0.724*	0.557*	1												
4	Employment	0.582*	0.604*	0.421*	1											
5	Registering property	0.339*	0.184	0.288	0.379*	1										
6	Getting credit	0.802*	0.582*	0.500*	0.574*	0.331*	1									
7	Protecting investors	0.437*	0.511*	0.228	0.402*	-0.002	0.409*	1								
8	Paying taxes	0.792*	0.737*	0.608*	0.526*	0.294	0.620*	0.321*	1							
9	Barriers to trade	0.710*	0.501*	0.549*	0.327*	0.174	0.576*	0.201	0.611*	1						
10	Enforcing contracts	0.667*	0.540*	0.442*	0.369*	0.299*	0.472*	-0.043	0.611*	0.559*	1					
11	Closing a business	0.825*	0.628*	0.630*	0.369*	0.207	0.571*	0.230	0.529*	0.604*	0.562*	1				
12	Credit rules (EFW)	-0.602*	-0.364*	-0.610*	-0.331*	-0.311	-0.401*	-0.084	-0.406*	-0.431*	-0.478*	-0.649*	1			
13	Labour rules (EFW)	-0.437*	-0.482*	-0.288	-0.830*	-0.280	-0.510*	-0.408*	-0.347*	-0.143	-0.194	-0.302*	0.339*	1		
14	Company rules (EFW)	-0.809*	-0.677*	-0.656*	-0.517*	-0.361*	-0.697*	-0.269	-0.777*	-0.754*	-0.586*	-0.682*	0.534*	0.495*	1	
15	Aggregated EFW	-0.734*	-0.638*	-0.592*	-0.778*	-0.401*	-0.683*	-0.369*	-0.614*	-0.491*	-0.477*	-0.619*	0.727*	0.854*	0.807*	1

Source: A cross-correlation table matrix of variables which measure the regulatory burden in different dimensions. Doing Business and The Fraser Institute. The asterisk * shows a 5% significance level. EFW = Economic Freedom of the World Index from The Fraser Institute. Note that these indices are inverted in relation to the World Bank cost of doing business index.

Appendix 2

Tests of robustness

In order to test the robustness of the results and consider the fact that there are large measurement problems associated with the World Bank *Doing Business* indicators, this section reports regressions where the World Bank indicators have been replaced by the Fraser Institute Economic Freedom of the world index (EFW). We use four different measures of the regulatory burden.

**Figure 1 Measures of the regulatory burden from the Fraser Institute**

Source: Fraser Institute
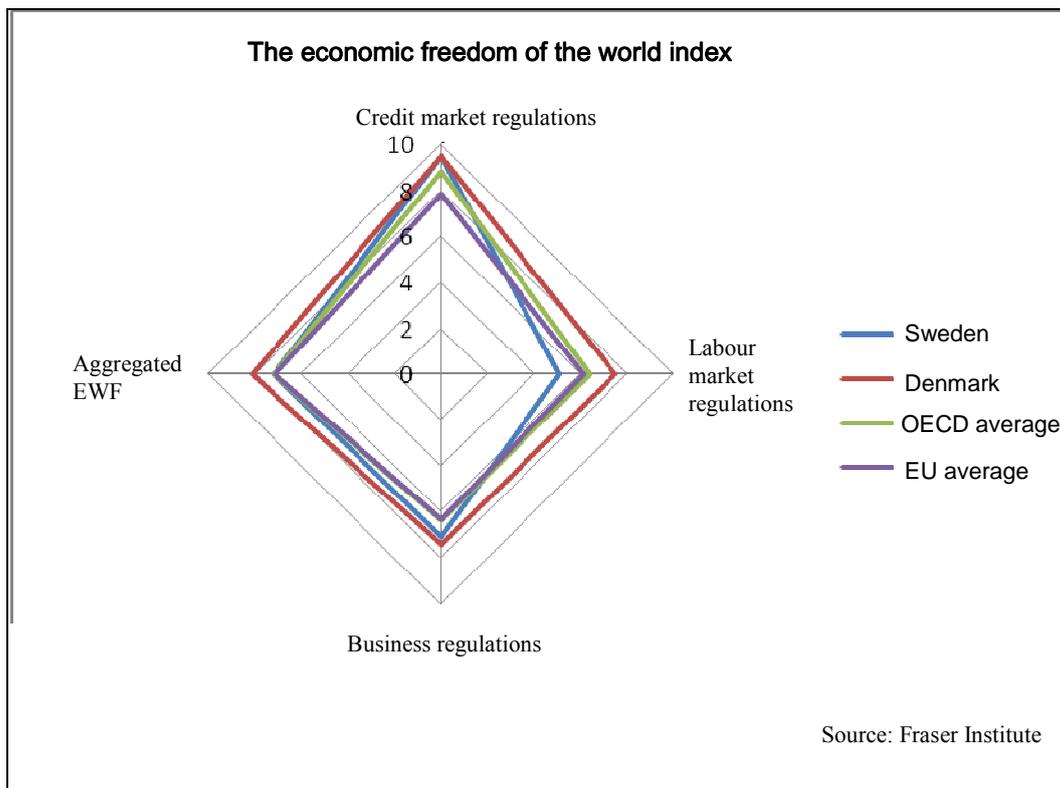
Table 2 Regressions using the World Economic Freedom Index

VARIABLES	(1) Elasticity of capital	(2) Elasticity of capital	(3) Elasticity of capital	(4) Elasticity of capital
Aggregated EFW	0.172***			
	(0.054)			
Company rules (EFW)		0.216***		
		(0.050)		
Labour rules (EFW)			0.004	
			(0.048)	
Credit rules (EFW)				0.154**
				(0.057)
Log_GDP	0.016	-0.010	0.013	0.019
	(0.041)	(0.037)	(0.043)	(0.047)
GDP Growth	-0.081**	-0.078***	-0.103***	-0.092***
	(0.031)	(0.022)	(0.036)	(0.028)
Labour market rigidity	1.325***	1.285***	0.931**	1.141***
	(0.319)	(0.268)	(0.363)	(0.292)
Constant	-1.073	-0.480	0.455	-1.187
	(1.253)	(0.927)	(1.298)	(1.347)
Observations	38	38	38	34
R^2	0.477	0.585	0.389	0.535
Adjusted R^2	0.413	0.534	0.315	0.471

Note: Dependent variables on top line. Robust standard deviation in brackets.

*** p<0.01. ** p<0.05 and * p<0.10 indicate the level of statistical significance.

Table 3 Yield requirement and Economic Freedom

VARIABLES	(1) Mean yield
Beta value	0.052
	(0.034)
Aggregated EFW	-0.022*
	(0.011)
Constant	0.245***
	(0.090)
Observations	48
R^2	0.190
Adjusted R^2	0.154

Note: Dependent variables on top line. Robust standard deviations in brackets

*** p<0.01. ** p<0.05 and * p<0.10 designate the level of statistical significance. Note that the EFW index is inverted compared with the Doing Business indicators. In other words, the coefficient is given an inverted sign.

Table 4 Economic growth and Economic Freedom of the World Index

OLS VARIABLES	(2) GDP_capita
Aggregated EFW	0.093**
	(0.044)
Internet	0.259***
	(0.033)
Population	-0.107***
	(0.023)
Compulsory school	1.715***
	(0.161)
Trade	-0.172*
	(0.095)
Constant	2.610***
	(0.937)
Observations	717
R^2	0.617
Adjusted R^2	0.615

Note: Dependent variables on top line. Robust standard deviations in brackets

*** p<0.01. ** p<0.05 and * p<0.10 indicate the level of statistical significance.

The Swedish Agency for Growth Policy Analysis (Growth Analysis) is a cross-border organisation with 60 employees. The main office is located in Östersund, Sweden, but activities are also conducted in Stockholm, Brussels, New Delhi, Beijing, Tokyo and Washington, D.C.

Growth Analysis is responsible for growth policy evaluations and analyses and thereby contributes to:

• stronger Swedish competitiveness and the establishment of conditions for job creation in more and growing companies
• development capacity throughout Sweden with stronger local and regional competitiveness, sustainable growth and sustainable regional development.

The premise is to form a policy where growth and sustainable development go hand in hand. The primary mission is specified in the Government directives and appropriations documents. These state that the Agency shall:

• work with market awareness and policy intelligence and spread knowledge regarding trends and growth policy
• conduct analyses and evaluations that contribute to removing barriers to growth
• conduct system evaluations that facilitate prioritisation and efficiency enhancement of the emphasis and design of growth policy
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