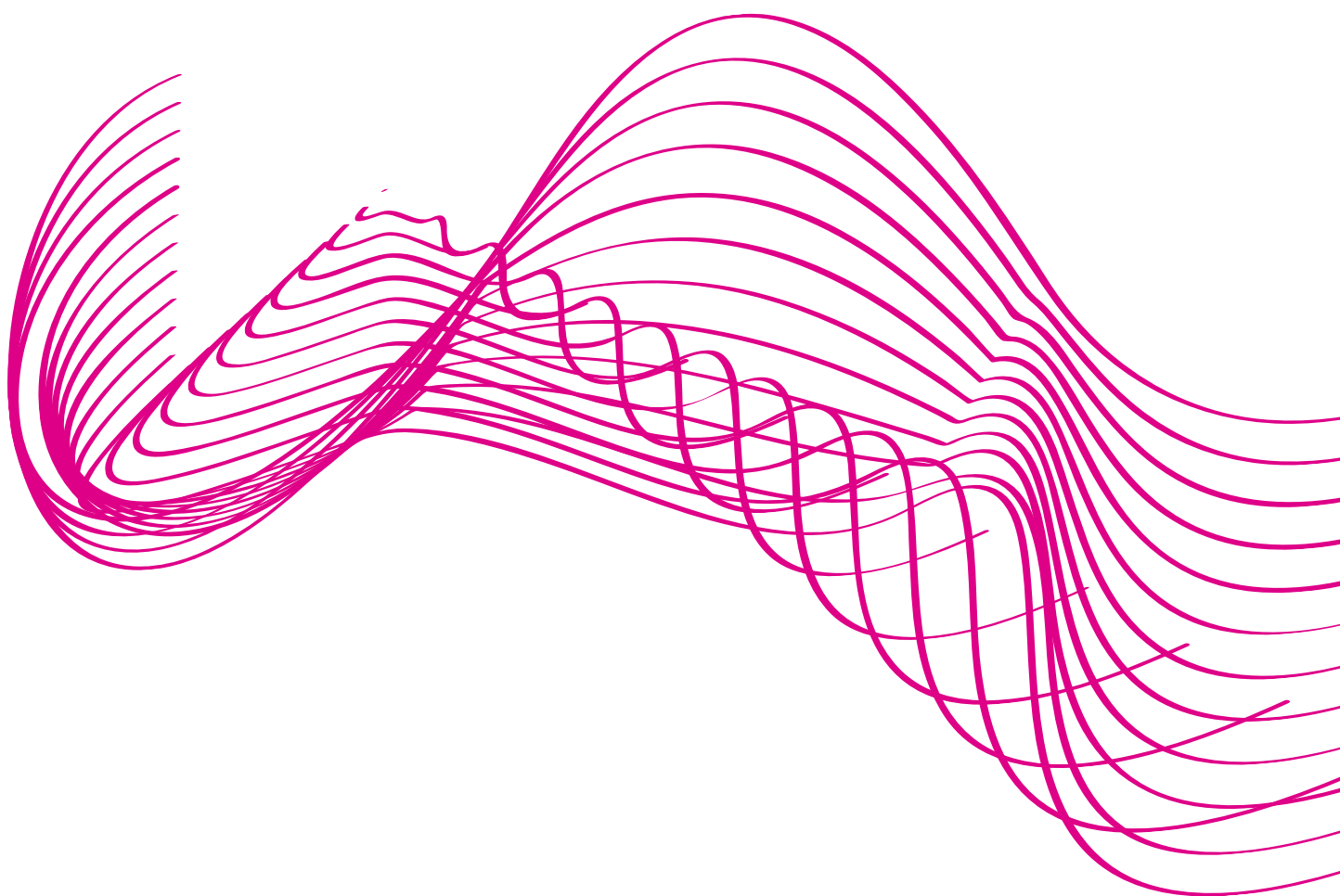




Measuring Regulatory Performance

THE ECONOMIC IMPACT OF REGULATORY POLICY:
A LITERATURE REVIEW OF QUANTITATIVE EVIDENCE

By David Parker and Colin Kirkpatrick



**THE ECONOMIC IMPACT OF REGULATORY POLICY:
A LITERATURE REVIEW OF QUANTITATIVE EVIDENCE**

This study provides a critical literature review of the theory and quantitative evidence of the impact of regulatory policy. The theory is addressed through a causal chain analysis which connects regulatory policy through the “better regulation” agenda to economic outcomes. The literature review is intended to provide a reasonably representative sample of studies on regulatory policy and governance in general; administrative simplification and reducing regulatory burdens; ex ante and ex post analyses of regulations; consultation, transparency and accountability; and regulatory institutions. The main policy lessons are highlighted, alongside discussion of the limitations of the literature in terms of content and coverage.

FOREWORD

OECD countries require better information about where investments in programs to improve regulations should be focused to pay growth and welfare dividends. This is necessary to target scarce resources for reform efforts, and also to communicate progress and generate the political support needed for implementing regulatory policy reforms. The OECD work on *Measuring Regulatory Performance* is intended to assist countries with the task of identifying this information through the development of measurement frameworks and the collection and interpretation of salient data (www.oecd.org/regreform/measuringperformance).

The OECD is developing a framework for Regulatory Policy Evaluation to help countries evaluate the design and implementation of their regulatory policy against the achievement of strategic regulatory objectives (OECD, forthcoming). Its development has been informed by a series of three expert papers.

This paper surveys the literature on existing attempts at measuring the contribution of regulatory policy to improved performance. It is the third paper in the OECD series of expert papers on Measuring Regulatory Performance. A first paper was prepared by Cary Coglianese, to discuss the attribution of changes in economic or welfare outcomes to changes in regulation and regulatory policy and suggest outcome indicators for regulatory policy. A second paper was commissioned by the OECD from Professor Claudio Radaelli, Director of the Centre for European Governance at the University of Exeter and Oliver Fritsch, Associate Research Fellow at the University of Exeter, to examine country practices for measuring the performance of regulatory policy, and develop options for a set of indicators that OECD countries can use for their regulatory policy evaluation (access the experts' papers available at www.oecd.org/regreform/measuringperformance).

This paper has been prepared by David Parker (Emeritus Professor of Privatization and Regulation at Cranfield University) and Colin Kirkpatrick (Emeritus Professor of Development Economics at the University of Manchester). Christiane Arndt and Gregory Bounds, OECD Regulatory Policy Division, commented on earlier drafts and Philipp Beiter, OECD Regulatory Policy Division provided research assistance. Any remaining errors remain the authors' sole responsibility.

The project of developing a framework for Regulatory Policy Evaluation has also been directly supported by the Government of Canada, which in 2011 provided a financial contribution to the project, and by the Government of Spain, which hosted an expert workshop on Measuring Regulatory Performance in Madrid on 26-27 September 2011. Overall the work has benefitted from the active engagement of the steering group on Measuring Regulatory Performance, which has had an advisory role in the project. The steering group is an ad hoc body of delegates to the Regulatory Policy Committee.

The OECD Regulatory Policy Committee

The mandate of the Regulatory Policy Committee is to assist members and non-members in building and strengthening capacity for regulatory quality and regulatory reform. The Regulatory Policy Committee is supported by staff within the Regulatory Policy Division of the Public Governance and Territorial Development Directorate. For more information please visit www.oecd.org/regreform.

The OECD Public Governance and Territorial Development Directorate's unique emphasis on institutional design and policy implementation supports mutual learning and diffusion of best practice in different societal and market conditions. The goal is to help countries build better government systems and implement policies at both national and regional level that lead to sustainable economic and social development.

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EXECUTIVE SUMMARY

OECD member countries have been engaged with regulatory reform and improving regulatory processes for a decade or more, in the expectation that there will be significant improvements in economic welfare outcomes. But in the absence of clarity about how and why the changes should lead to improvements, policy failures are likely. The critical public policy challenge is to ensure that the expected economic benefits from regulatory changes are both achieved and outweigh any economic costs imposed. This requires firm evidence on how different policies perform. Evidence on the outcomes of regulatory policies should help policymakers design regulatory measures that work better.

The purpose of this study is to strengthen the evidence base available to policymakers for the design of regulatory policy. The study aims to achieve this in two related ways. Firstly, it provides a review and discussion of the theories, arguments and models concerned with explaining why a sound regulatory policy and governance can have real world effects for the economy (e.g. in terms of higher economic growth). Secondly, the study provides a critical review of the quantitative evidence on the impact of regulatory policy in terms of economic outcomes. More specifically, the study reviews the theory and quantitative evidence on the impact of the processes that governments put in place to achieve better regulation, or what may be called, regulatory management.

The study is not concerned with particular types of regulation, such as employment law or competition law, but rather with the processes for improving regulation. The following processes are discussed: regulatory policy and governance in general; administrative simplification and reducing regulatory burdens; *ex ante* and *ex post* analyses of regulations; consultation, transparency and accountability; and regulatory institutions.

The paper is organised as follows. Section 1 provides an overview and introduction to the study. Section 2 looks at the theoretical causal chain between regulatory policy, better regulation and economic outcomes. Section 3 summarises the form and content of the relevant empirical studies. Section 4 draws lessons for regulatory reform and highlights gaps and weaknesses in the literature. Section 5 summarises the main findings.

The results of the study suggest the following lessons for policy makers. Firstly, the effects of regulation are context specific. The literature on regulatory policy and governance in general seems to confirm that poorly designed regulation can stifle economic activities and ultimately reduce economic growth. However, it also appears that regulatory governance and the institutional framework in a country may mitigate the damaging effects.

Second, it is difficult, and sometimes impossible, to provide robust quantitative evidence of a causal relationship between a regulatory policy change and the impact on economic outcomes such as economic growth. The preponderance of research on regulatory policy has relied on highly aggregated data bases, such as the World Bank's Doing Business and Governance Indicators. In terms of method, regression analysis is frequently used to identify the statistical significance of the regulatory variable and the economic outcomes under investigation. Policymakers need to be aware of the limitations of regression analysis in interpreting the results.

Third, the reliance on regression analysis to investigate the relationship across countries between regulatory variables and economic outcomes has shifted attention away from the use of country specific case study evidence in the policy process. While this type of evidence may not be readily applicable to other countries, and may not always be expressed in economic values, it is particularly useful in developing regulatory policy measures that are context specific.

Fourth, most quantitative studies deal with the costs of regulation and give little or no attention to quantifying the benefits of regulation. For the policymaker, it is important to compare the estimated costs of regulation alongside the benefits of regulation, even if the latter are often not monetised.

To summarise, there are considerable methodological and data difficulties in achieving robust quantified evidence on the economic impacts of regulatory policy. These challenges mean that caution must be exercised in drawing firm policy conclusions from the results of this review of quantitative studies on regulatory policy. The survey has revealed that the effects of “better regulation” reforms on economic welfare are still only partially understood. At the same time, the review has failed to produce any solid evidence that regulatory reform has done more harm than good.

1. Introduction

In market economies economic theory justifies state regulation where there are appreciable externalities, missing or incomplete markets, information asymmetries or public good¹ attributes in economic transactions. Regulation is intended to correct these market failures and thereby add to economic efficiency and growth. In practice, governments also intervene and regulate in cases where market transactions are perceived to lead to socially unacceptable income and wealth distributions, or there is an expectation that the public should have access to certain goods and services (e.g. health care and education) irrespective of ability to pay (sometimes referred to as “merit goods”). Economic theory has less to contribute to the discussion of the income and wealth distribution and the merit goods arguments for regulation than it does to the analysis of externalities, information asymmetries, public goods and missing markets.

The outcome is sometimes referred to as “the regulatory state” (Majone, 1994), in which market transactions and government regulations co-exist, sometimes uneasily. Modern economies could not function or function smoothly without some regulation (e.g. of property rights, company law, law of contract etc) and regulation can provide important economic and social, including environmental, benefits. Of course, these benefits need to be set against the costs associated with regulation. The “failures” of regulation are widely publicised. For some observers, regulatory outcomes fall short of the expected benefits of regulatory interventions in terms of improved economic performance. Regulation may be driven by special interest groups lobbying for legislative changes for their own personal gain (Stigler, 1971; Peltzman, 1976). Even where this is not so, regulations may not achieve their intended policy objectives or may do so at unacceptable cost in terms of economic distortions. Certainly businesses complain frequently and vigorously about damaging regulations and regulatory “red tape”. In other words, regulations are indispensable to the operation of effective economies and societies by underpinning market rules (e.g. law of contract) and protecting property rights and the rights of citizens. These are sometimes referred to as “market-support rules”. At the same time, economic, environmental and welfare pressures raise the demand for regulation above the minimum needed for operating a market economy.

The awareness of regulatory costs has led to attention being placed on countries making progress in terms of reducing “red tape” or regulatory burdens on business and improving regulatory processes, including scrutiny of new regulatory proposals and the existing stock of regulations. International organisations like the OECD and the World Bank have been instrumental in drawing the attention of countries to regulatory reforms and understood “best practices”. The intention is to create a policy environment conducive to “better regulation” or “smart regulation”.²

While the evidence points to progress having been made in improving regulatory practices in OECD countries, the pace of improvement has been uneven, with big differences in implementation.³ Where changes to regulation are introduced the expectation is that there will be improvements to economic and welfare outcomes. But in the absence of clarity about how and why the changes should lead to improvements, policy failure is likely. The critical public policy challenge is to ensure that the expected regulatory benefits from regulatory reforms are both achieved and outweigh any regulatory costs imposed. But this requires firm evidence of how different policies perform. Evidence on the outcomes of regulatory policies should help policy makers design regulatory measures that work better. Similarly, evidence on the success, or otherwise, of regulation can be used for public accountability purposes.

The purpose of the study is to review and discuss the literature on theories, arguments and models concerned with why a sound regulatory policy and governance can have real world effects for the economy (e.g. in terms of higher economic growth). More specifically, the study reviews the evidential literature on the processes that governments put in place to achieve better regulation. This may be called, broadly, *regulatory management*. The selection of literature to be included in the report was undertaken in

conjunction with the OECD during the study period. The OECD has recently confirmed the importance of countries committing “at the highest political level to an explicit whole-of-government policy for regulatory quality”. The OECD has defined regulatory policy as “the process by which government, when identifying a policy objective, decides whether to use regulation as a policy instrument, and proceeds to draft and adopt a regulation through evidence-based decision making”. The policy should commit governments, *inter alia*, to maintaining “a regulatory management system”, “articulating regulatory policy goals, strategies and benefits clearly” and considering “the impacts of regulation on competitiveness and economic growth”. Especially stressed are adhering “to principles of open government, including transparency and participation in the regulatory process”, establishing “mechanisms and institutions to actively provide oversight of regulatory policy procedures and goals”, the use of Regulatory Impact Assessment (RIA) and applying “appropriate [...] risk assessment, risk management, and risk communication strategies” (OECD, 2011).

The objective of this study is to assess the extent to which the published empirical evidence supports the regulatory reforms introduced internationally. The study is not concerned with particular types of regulation, such as employment law or competition law, but rather with the processes for improving regulation. The paper is organised as follows. The next section, Section 2, looks at the theoretical causal chain between regulatory policy, better regulation and economic outcomes such as higher GDP growth, higher productivity, more innovation and more entrepreneurship. Section 3 summarises the form and content of the relevant empirical studies and Section 4 draws lessons for regulatory reform and highlights gaps and weaknesses in the literature. The paper concludes, in Section 5, by summarising the main findings.

2. Causal chain analysis and the empirical methods

The study addresses what theories and models exist in the literature to explain the impact of improvements to regulatory policy on economic and welfare outcomes. It is clear, however, that there is no body of theory or models, as such, in the literature dealing with the precise effects of particular policies. For example, there is no precise “theory” of the effect of the adoption of public consultation before regulating on GDP growth. In economics there are well-developed theories on particular aspects of regulation, such as rate of return over price cap regulation in utility industries, and literature on “regulatory capture”, but the discussion of other aspects of regulatory policy is arguably less one of deep theory and more one of assumptions and propositions. In particular, the economics literature appraises regulation drawing on broader economic principles to do with competitive and non-competitive markets, sometimes referred to collectively as neoclassical economics.

Therefore in the literature, instead of an identifiable economic theory of specific regulatory policies (e.g. administrative simplification) and specific economic and welfare outcomes (e.g. higher economic growth), the result is a series of propositions about the impact of regulatory management on economic indicators drawing from neoclassical economics. These can be set out as a causal chain. In addition, in practice regulatory policy is deeply embedded in political processes and is informed by alternative disciplines to economics, notably political science and constitutional law. While politics and law are essential attributes of regulatory policy, they are not the central focus of this study, which is concerned with regulatory policy and its economic effects.

Some general propositions commonly appear in discussions of regulatory policy, which can be summarised as:

1. Regulation can be supportive of market transactions and may result in significant economic, social and environmental benefits. At the same time, ill-designed regulation can have appreciable economic costs, leading to the concept of the “regulatory burden”.

2. In particular, regulation can cause serious economic distortions that lower economic growth or GDP, damage investment and competitiveness and reduce entrepreneurship.
3. Regulatory costs may act as a barrier to entry into industry in the form of one-off set up costs (e.g. installing equipment to meet health and safety laws) and on-going annual costs (e.g. preparing returns and facilitating inspections).
4. Regulation can be unduly costly to comply with, administer and enforce.
5. Regulatory simplification can reduce the regulatory burden.

In testing these propositions often a distinction is made between administrative costs, namely the costs associated with the provision of information to stakeholders including government (e.g. completing and submitting forms), and compliance costs or the costs inherent in meeting the aims of the regulation (e.g. costs of installing new safety equipment and the associated training).⁴ There are also direct and indirect costs, and benefits, from regulation. For example, regulation may not only affect the behaviour of those targeted by a rule (direct effects) but invoke behavioural change elsewhere in the economy (indirect effects). Studies that aim to address the economic and welfare outcomes of a policy change should identify and measure both sets of effects.

From the review of the literature reported in Section 3 below it is clear that studies vary in terms of their coverage of administrative and compliance costs and direct and indirect effects.

2.1. Establishing the causal chain

In recent years countries have undertaken a number of initiatives in the policy field with a view to introducing “better regulation”. The aim is to ensure that regulation occurs only when it does improve social welfare and that regulatory changes do so with the minimum net cost or maximum net benefit to society. From a policy making perspective, it is important to appreciate how and why a regulatory intervention can be expected to result in a particular impact. The passage from regulatory policy to economic impact will often involve a complex set of inter-related variables, each of which can influence the final outcome, making it difficult to isolate the fraction of the observed impact that is due to the initial regulatory intervention.

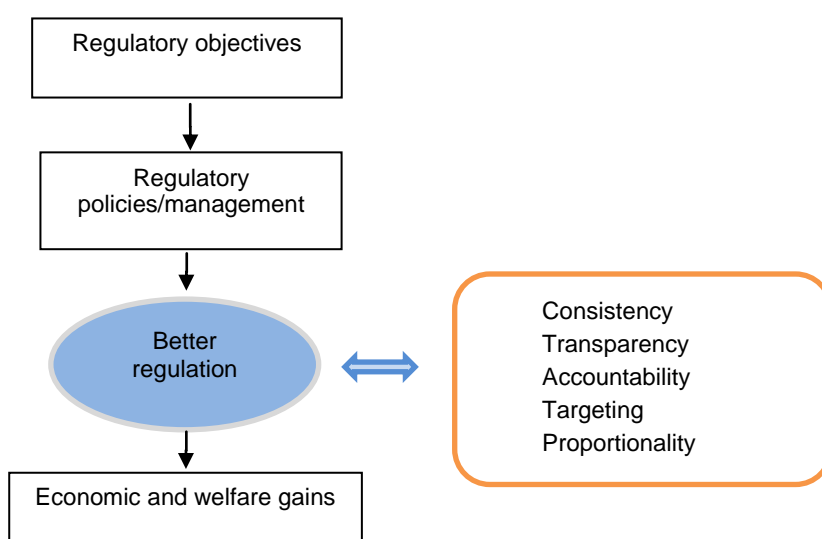
Causal chain analysis is a technique for explaining the way in which a regulatory intervention results in an economic impact. By helping to understand the “how” and “why” questions surrounding regulatory impact, causal chain analysis can provide policy makers with relevant information on the consequences of their policy decisions. Particular forms of regulatory management, such as the adoption of “independent regulators” or “RIA”, contribute to what is termed “better regulation”. The attributes of better regulation are those commonly adopted across the OECD. They were articulated in the UK by Sir Philip Hampton in 2005, in terms of consistency, accountability, transparency, proportionality and targeting rules.⁵ The expectation is that conformance to these attributes of better regulation leads in turn to economic improvements, such as higher GDP growth, higher productivity, more business start-ups etc.⁶

The better regulation agenda has been concerned with the effects of particular regulatory methods and tools. These initiatives include administrative simplification and burden reduction, the use of regulatory impact assessments (RIAs), creating greater transparency in regulatory decision making, the adoption of appropriate consultation practices with stakeholders, introducing new regulatory oversight bodies at the centre of government,⁷ taking a more risk-based approach to regulating, and tackling compliance and enforcement issues.⁸ All of these initiatives are aimed at both reducing the quantity of unnecessary or over-costly interventions and improving the quality of the remaining body of regulation. In principle it would be possible to divide up the different methods and tools of regulatory policy and look for a unique causal

chain relating to each component separately. However, this is unnecessary for our purposes, since all of the methods and tools promoted are intended to improve regulation and regulatory outcomes. They are all intended to contribute to “better regulation”. It would therefore be repetitive to analyse each causal chain independently. The approach adopted in this paper is to map the causal chain through the concept of “better regulation”.

The causal chain relationship adopted in this study to review the results of particular forms of regulatory policy on the economy is summarised in Figure 1.

Figure 1. The causal chain

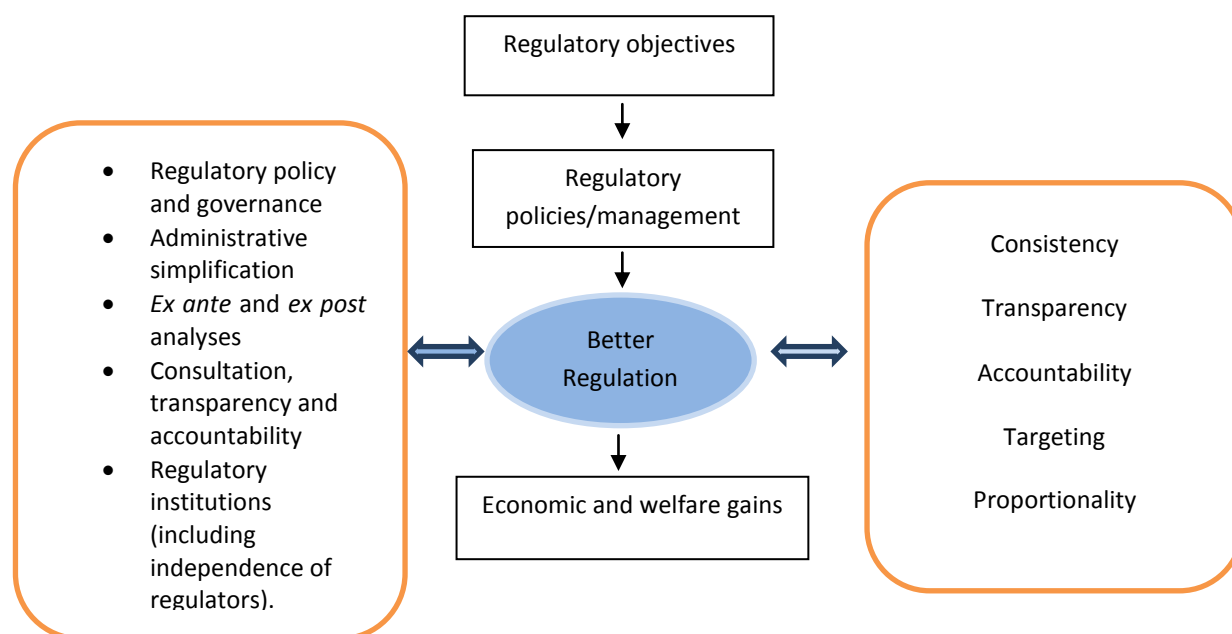


The literature review reported in Section 3 focuses on the impact of regulatory policies, tools and institutional arrangements used by government, rather than on specific regulations or the regulation of specific sectors e.g. telecommunications. In Section 3 the evaluation of the empirical literature has been divided into five main policy categories, based on common themes. These categories are:

- Regulatory policy and governance in general;
- Administrative simplification (including reducing regulatory burdens, opening one stop shops and shortening the time for opening a business);
- *Ex ante* and *ex post* analyses of regulations (including evidence-based analysis of new regulations and regulatory oversight bodies to ensure regulatory quality);
- Consultation, transparency and accountability;
- Regulatory Institutions (including independence of regulators).

Figure 2 expands the causal chain model in Figure 1 to include these policy categories.

Figure 2. The causal chain and specific regulatory policies



For each of the policy categories relevant studies were read based on guidance from the OECD. The studies were selected because they were primarily concerned with an empirical analysis of cause and effect rather than merely with the description or advocacy of a particular regulatory technique or model. The results and findings are summarised in the next section, using the causal chain analysis. In Section 4 of the paper a judgment is made on the overall quality and reliability of the results and the lessons to be learned.

2.2. Empirical methods to evaluate the economic impact of regulatory policy

The following comments provide guidance on the forms of analysis adopted when evaluating different regulatory policies in the literature review section of the paper, below.

Economic theory is used in empirical studies to predict the causal links between regulation and economic impacts. The causal chain analysis is greatly strengthened by empirical testing of the relationships derived from economic theory, provided the relevant economic data are available. Ideally, the effects will be quantified using monetary values. Monetary valuation allows different impacts to be compared and added together to provide a single measure of the economic impact. However, in practice economic impacts may not always be readily quantifiable in monetary values and instead qualitative evaluation may have to be used.

This paper is primarily concerned with reporting quantitative research on the economic impact of regulatory policy.

By applying appropriate analysis it is possible to attribute economic outcomes to particular regulatory interventions. In empirical studies the impact attributed to a particular policy intervention is commonly estimated by comparing the observed outcome with the *hypothetical counterfactual*, i.e. what would have happened in the absence of the intervention. However, by its very nature the counterfactual is usually unknown. The counterfactual used might therefore be estimated, for instance on the basis of the past trend in economic growth. But the risk remains that the result is an inaccurate representation of the reality.

An alternative method is called *randomised control testing* (RCT) (Shaffer, 2011). Adopted widely in the physical sciences and medicine, a randomised controlled testing or trial involves comparing usually two groups, one subject to the intervention being studied (e.g. a new drug) and the other without the intervention. In the sciences and medicine people can be allocated randomly to the two groups to avoid biased results. However, when applied to regulatory policy interventions, random allocation is not possible. The application of randomised controlled trials is therefore problematic when studying regulation (and other public policies). In the studies reported in Section 3 sometimes comparisons were made between two or more groupings, for example of institutions or countries. The results need to be treated with care, however, because of the non-random allocation.

In principle, whatever the precise form of testing, the study of the impact of regulatory policies may use four broad types of analysis: Descriptive statistics including correlation, cost-benefit analysis, regression analysis and simulations.

- i) *Descriptive statistics/correlation.* Descriptive statistics such as labour productivity measures or figures on the rates of new business start-ups or business innovations may be used to describe the effects of a change in regulatory process or change in regulatory management. Correlation analysis is often used to measure the link between these descriptive statistics and the change in regulatory process. For example, improved regulatory processes may be associated with higher productivity or more entrepreneurship. Correlation analysis is usually simple and straightforward to use. However, the approach has weaknesses. It often cannot be firmly demonstrated that the productivity improvements or more entrepreneurial endeavour are necessarily the result of regulatory reforms. The results may be coincidental or the explanation for the economic benefits may lie elsewhere, for example in improved economic competitiveness unrelated to the regulatory changes. In other words, correlation is not necessarily the same thing as causality. In such circumstances, descriptive statistics including correlation coefficients may provide misleading indicators.
- ii) *Cost-benefit.* Cost-benefit analysis involves a systematic association of the economic costs and benefits and a regulatory reform. The study focuses on one or more changes in regulatory management and researches in detail the specific costs and benefits (direct and indirect) resulting from the changes. The studies typically involve a case study methodology, involving analyzing a group of regulatory changes within one or more countries or government departments or one specific regulatory proposal. Not all of the comparisons may be statistical because not all effects may be quantifiable. While this method provides useful detail and learning on specific regulatory reforms, the results may not be generalisable to other governments or government departments. This is because, by their very nature, cost-benefit studies are specific to the particular circumstances of each regulatory change. Conceptually, a change in economic welfare refers to the difference between total economic benefits and total economic costs, that is, net benefits. Where all impacts are monetised, it is possible to calculate the net benefits of regulatory policy. Where reliable information on the economic value of benefits is missing, the assessment will be limited to the evidence on costs. If it can be safely assumed that benefits are constant and are not affected by cost savings measures, then it is more reasonable to measure impacts solely in terms of the economic costs of a regulatory policy. This is sometimes referred to as a *cost effectiveness*

study. Cost-benefit analysis is typically used to estimate the impact of regulatory proposals, including estimating the impact of introducing regulatory management tools such as RIA on economic outcomes. An example of a “RIA on RIA” will be discussed in the literature review (see Ministry of Justice of the Socialist Republic of Viet Nam, 2008).

- iii) *Regression analysis.* Multiple regression analysis is central to the mathematical modelling of economic relationships called *econometrics*. It includes statistical techniques for modeling and measuring the relationship between one dependent variable (e.g. GDP growth) and other, so-called independent or explanatory, variables that can be expected to cause changes in the dependent variable (e.g. labour input, investment and technology). An additional explanatory variable reflecting the nature of regulation or a regulatory change can be added to the independent variables, either as a separate variable or as an interactive variable (e.g. interacting with the level of investment). This may take the form of a “dummy” or “binary” form, with a value of 1 when there is “good regulation” or a “regulatory improvement” and zero in other cases or there could be a scaling between 0 and 1. Regression analysis has the distinct advantage over descriptive statistics of enabling the researcher to take into account the effects of a number of variables at the same time and measure their relative importance. Validity tests in the form of “statistical significance tests” can be applied to each variable and to the regression equation as a whole, adding to confidence that the results are robust. Regression analysis is usually more appropriate than case study analysis when researching events across time or across countries, provided there is adequate quantitative data. Regression analysis relies on the existence of appropriate data and accurate modelling of the interrelationship between the variables, preferably based on a recognised economic theory. In particular, the smaller the sample size the larger the margin of error or uncertainty that attaches to the estimated results. Also, if the modelling does not include important explanatory variables or the cause and effect relationship is not properly specified then the results will not be reliable. Moreover, where there is high inter-correlation among the explanatory variables the statistical tests for significance may fail. Methods have been developed, and continue to be developed, to respond to these and other potential difficulties.
- iv) *Simulations.* Simulations in economics typically involve a model of linked economic sectors, reflecting how the output of one industry is an input to another. Input-output simulations are concerned with the relationship between inputs and outputs in the economy. Simulation techniques have been used to assess the effects of regulation using what are commonly referred to as computable general equilibrium (CGE) models. The WorldScan model⁹ is of this type. It is a recursively dynamic general equilibrium model for the world economy that has been used for assessing the effects of regulation. It was developed to analyse long-term issues in international economics and has been used to evaluate regulatory policy impact assessments with interesting results. But while simulations are attractive, their use is not widespread in the regulatory field. This is partly because of the preference in the economics profession for regression analysis, but also because the models are limited in number and expensive to develop. They are also based on a set of assumptions about the relationships between inputs and outputs that may not always hold in practice.

In summary, the four methods all have their share of advantages and disadvantages. In general, most empirical studies in economics adopt a form of regression analysis because of its perceived superiority over the other methods, in terms of providing robust or statistically validated results. All four methods have been used in the literature to which we now turn, but with a predominance of regression studies. In reporting the results the form of empirical analysis adopted is identified.

3. Literature review

In this part of the paper we review some of the literature on particular aspects of regulatory policy. It should be noted that there is a literature on specific types of regulation, such as product market regulation and employment laws. For example, Nicoletti and Scarpa (2003) using OECD industry level data find that product market regulations that curb competition and private governance have a negative impact on productivity by delaying technological change and catch up. Conway *et al.* (2006) using OECD product market regulation indicators to investigate the economic impact of product market regulation on labour productivity growth in OECD countries conclude that restrictive product market regulation slows the process of adjustment through which best practice production techniques diffuse across borders and new technologies are incorporated into the production process.¹⁰ The study by Feldmann (2009), using data from 73 economies over the period 2000 to 2003, finds that stricter employment regulations appear to increase unemployment. While this literature is complementary to the studies reviewed below, it is not our main focus.

The chief concern is with regulatory policy rather than the specific content of regulation. The literature review looks at the categories identified earlier, namely regulatory policy and governance in general, administrative simplification, *ex ante* and *ex post* analyses of regulations and regulatory institutions, consultation, transparency and accountability.

3.1. Regulatory policy and governance in general

Regulatory policy is concerned with the institutional arrangements to promote regulatory quality across the government. Regulatory governance is concerned with the political oversight of regulatory policy. In the studies reviewed below the precise compass of the term varies, as detailed. Also, due to the precise variables used and the scope of each study, there can be some question as to which category they should be placed in. In particular, studies can range across a number of regulatory issues and therefore they could, for example, be listed under the Regulatory Policy and Governance heading or the Administrative Burdens heading. We accept that allocation to one or other of these two categories can be somewhat arbitrary.

Below is a selection of studies that have empirically examined the impact of regulatory policy and governance on macroeconomic performance and for which welfare outcomes are reported.

Box 1. Regulatory policy and governance

Summary: a number of studies of regulatory policy and governance have been published in the last ten years. Reviewed below are those by Jacobzone *et al.* (2010); Loayza *et al.* (2004); Djankov *et al.* (2006); Jalilian *et al.* (2007); Gorgens *et al.* (2003).

The studies use various proxies for regulatory governance and cover a range of regulatory policies and economic effects. In general, the studies suggest that there is evidence of a statistically significant and positive relationship between regulatory policy and governance and economic growth; while regulatory governance and the institutional framework in a country can mitigate the damaging impacts of particular regulatory policies (e.g. product and labour market regulation) on economic growth.

One of the studies, by Gorgens *et al.*, estimates that a heavily regulated economy might grow on average by about 2% to 3% less per annum than less heavily regulated ones, although this effect is mainly in terms of comparisons between moderately and highly regulated countries.

The studies in detail

Jacobzone et al. (2010). This study offers an empirical analysis of the relationship between regulatory policy and governance, as defined by the OECD to include economic and non-economic regulation, and covering regulation policies, regulatory institutions, regulatory procedures and regulatory tools.¹¹ Analysis (called principal components analysis) is used to convert the quantitative information in the OECD surveys in 1998 and 2005 on the quality of OECD countries' management systems (see OECD, 2009b) to observed variables. Mainly regression analysis is then used to assess the relationship between Regulatory Management System (RMS) and indicators of economic outcomes. The first dimension, "Institution, Tool and Capacity Building", reflects the institutional framework and capacity to assess new regulations. The second dimension, "Stock Oriented Strategies, Simplification", captures strategies aimed at administrative simplification, burden reduction and *ex post* review of regulations. Each country is assigned a rank based on each principal component score, and these ranks are used as indicators of RMS quality. The RMS quality dimensions are then used to estimate econometrically the impact of improvements in RMS on a variety of economic impact indicators, including total employment, employment in the business sector, business sector GDP, and business sector labour productivity. While the regression analysis is constrained by the small sample size and lack of time series data, the results indicate a significant and positive impact on employment, GDP, and labour productivity in response to improvements in regulatory management systems.

Loayza et al. (2004). By contrast, this study provides an empirical estimate of the impact of regulatory policy on GDP growth and volatility in a large sample of developed and developing countries, using a cross country regression. Drawing on a range of data sources, a set of indicators is created capturing regulation of entry and exit, international trade, fiscal burden, contract enforcement, labour markets and financial markets. Each index measures the intensity of the regulation on a scale of 0 to 1. A composite index for the "product market" is constructed from the entry, trade, financial markets including bankruptcy, and contract enforcement indicators. In an extension to the basic specification, the regulation indices are interacted with a governance proxy variable, which is constructed from information on experts' perceptions on public accountability, absence of corruption, and rule of law in countries. Six data sources are used to construct the indices: the World Bank's *Doing Business* index, indices from the Fraser Institute and the Heritage Foundation on economic freedom, and databases relating to the labour market, corporate tax rates and international country risk. The sample covers up to 76 countries in the late 1990s.

The authors find a negative causal relationship between economic growth and overall regulation and separately product market and labour regulation. The relationship between regulation and GDP volatility is less consistent. However, the index of fiscal burden is found to have no significant link with economic growth. Also, the results for labour market and product market regulation become small as the overall quality of a country's institutional framework improves, suggesting that better institutions help mitigate, and may even eliminate, the adverse impact of regulation on macroeconomic performance.¹² At the world median level of governance, a one standard deviation increase in "overall regulation" (capturing the average of the seven indicators mentioned above) is predicted to lower annual GDP growth per capita by 0.4 percentage points. But "if the quality of governance is sufficiently high, an increase in [the overall index of] regulation can have a positive impact on growth".

Djankov et al. (2006). These authors use the World Bank's *Doing Business* database to establish the relationship between the burden of business regulations and economic growth. The World Bank's Index covers 183 countries and measures the regulatory burden in terms of the costs (including time costs) of starting a new business, obtaining construction permits, employing workers, registering property, getting credit, paying taxes, trading across borders, enforcing contracts and closing a business. The database provides an annual ranking for almost 200 countries on the "costs of doing business", and the study uses seven components in the database that measure the regulatory burden affecting business to create an

aggregate index.¹³ The aggregate index is then used in a regression model based on panel data (cross-country and time series data combined) for the period 1993-2002. The results show a statistically significant relationship between the regulatory business burden and economic growth of a country in various specifications of the model. The findings suggest that moving from the worst to the best quartile of business regulation implies a 2.3 percentage point increase in average annual growth.

Jalilian, Kirkpatrick and Parker (2007). The authors use the World Bank Governance Indicators data (Kauffman and Mastruzzi, 2005) to derive a measure of the quality of regulatory policy and governance. The governance indicators are: voice and accountability, political instability, government effectiveness, regulatory quality, rule of law, control of corruption. A regulatory quality index, which measures the regulatory burden on business, and a government effectiveness index, which measures the quality of public provision, competence of civil servants, and the credibility of government decisions, are used separately and in combination in regression analyses as measures of overall regulatory quality. Two methods of estimation are used to estimate the impact of regulation on economic growth. One is based on cross-section analysis, which measures directly any possible impact that regulation has on economic growth. The second is based on panel data, which uses a “fixed effects” technique to estimate indirectly the growth contribution of regulation. This procedure produces consistent estimates even where annual data are not available for the regulation variable.¹⁴ The results show that the regulatory variables have the expected signs in terms of causation and are statistically significant in all cases. The results are consistent with the hypothesis that regulatory quality has a positive and causal impact on economic growth. However, in common with other single equation regression analyses, the results may be weakened by problems of reverse causation, where higher economic growth leads to better regulation.

Gorgens et al. (2003). This study uses cross-country regression analysis to estimate the impact of regulation using the Fraser Institute’s *Economic Freedom Index*¹⁵ as the measure of regulatory burden. They suggest that a more heavily regulated economy might have economic growth on average lower by about 2% to 3% than less heavily regulated ones. The effect is mainly, however, in terms of comparisons between moderately and highly regulated regimes.

Table 1. Regulatory policy and governance in general

Study	Causal chain: theory/propositions	Economic impact indicator	Empirical method/ Evidence-based on	Findings
Jacobzone <i>et al.</i> (2010)	Regulation inhibits market dynamics. Market dynamics promote static and dynamic efficiency which results in higher productivity and economic growth.	Regulatory indicator: Preliminary analytical estimates using the 1998 and 2005 surveys of indicators of systems for the management of regulatory quality. <i>Data source:</i> 1998 and 2005 surveys of Indicators of Regulatory Management Systems, www.oecd.org/regreform/indicators .	Multiple regression analysis.	The findings tend to support the view that improvements in regulatory management system quality yield significant economic benefits. The findings are consistent and coherent across four economic dimensions: total employment, employment in the business sector, GDP in the business sector, and labour productivity.
Loayza <i>et al.</i> (2004)	Regulation damages GDP growth per capita and increases GDP volatility.	Regulatory Indicator: 1) Seven indicators reflecting the severity of regulation for firm's activities are constructed from various data sources: entry, exit, labour markets, fiscal burden, international trade, financial markets, and contract enforcement. These "regulatory burden" indicators are subsequently further aggregated to comprise higher-level indices of product-, labour-, fiscal- and overall-market regulation indices. <i>Data sources:</i> Doing Business, Index of Economic Freedom, Economic Freedom of the World, Labor Market Indicators Database, The Corporate Tax Rates Survey, International Country Risk Guide 2) Index of "governance quality": quality of regulation and the general context that determines how regulation functions (measured by the absence of corruption in the political system, the prevalence of law and order, and the level of democratic accountability). <i>Data sources:</i> International Country Risk Guide Dependent variable: 1) Economic growth (average annual rate of per capita real GDP growth) 2) Macroeconomic volatility.	Multiple regression analysis.	Statistically significant and negative relationship between regulatory burdens and economic growth. However, the relationship is weaker when the quality of regulatory governance and the institutional framework increases. The results for GDP volatility were less consistent.

Djankov <i>et al.</i> (2006)	The burden of business regulations impacts adversely on economic growth. Regulation increases firms' costs, leading to a misallocation of resources. Regulation also lowers the rate of technological progress.	Regulatory Indicator: Aggregate index of business regulations based on seven components of costs of doing business (starting a business, hiring and firing, registering property, getting credit, protecting investors, enforcing contracts, closing a business). Aggregate index calculated for 135 countries. <i>Data Source:</i> World Bank Doing Business database Dependent variable: Annual average GDP per capita growth rate 1993-2002.	Multiple regression analysis.	A statistically significant relationship found between the regulatory business burden and the economic growth of a country in various specifications of the model. The findings suggest that moving from the worst to the best quartile of business regulation implies a 2.3 percentage point increase in average annual growth.
Jalilian <i>et al.</i> (2007)	Regulatory quality and governance impact in terms of firms' costs and lower productivity and economic growth.	Regulatory Indicator: 1)Regulatory Quality, based on regulatory burden on business of ineffective quantitative controls 2) Regulatory Governance, based on quality of public provision, competence of civil servants and credibility of government decisions. <i>Data source:</i> World Bank Governance Indicators. Dependent variable: Average per capita growth 1980-99.	Multiple regression analysis.	Statistically significant and positive causal relationship between the quality of regulatory policy and governance and economic growth.
Gorgens <i>et al.</i> (2003)	The impact of regulation on countries' economic growth.	Regulatory Indicator: Economic Freedom (e.g. size of government, economic structure and use of markets, freedom to use alternative currencies, legal structure and security of private ownership, freedom to trade with foreigners, and freedom of exchange in capital markets). <i>Data source:</i> The Fraser Institute's <i>Economic Freedom</i> index Dependent variable: GDP growth.	Multiple regression analysis.	Degree of regulation does impact on GDP growth. A more heavily regulated economy might grow on average by about 2-3% less than less heavily regulated ones. However, the effect is mainly in terms of comparisons between moderately and highly regulated regimes.

3.2. Administrative simplification and reduction of burdens (including opening one-stop shops and shortening the time for opening a business)

The subject of administrative simplification and the reduction of regulatory burdens is concerned with reforms in regulatory policy that reduce the administrative costs of regulation. Reducing regulatory burdens, opening one stop shops, shortening the time for opening a business and lowering business entry costs and regulatory burdens can be expected to improve national economic performance. There have been a number of studies on this subject and the following text reports examples specifically on administrative costs and entry costs and reducing regulatory burdens.¹⁶

Box 2. Administrative simplification and reduction of regulatory burdens

Summary: the studies discussed are in three parts: (i) the CPB Netherlands Bureau for Economic Policy Analysis (2004), Gelauff and Lejour (2006), the Swedish Agency for Growth Policy Analysis (2010) and the Australian Government Productivity Commission (2006) studies are on regulatory including administrative burdens on business; (ii) Klapper, Laeven and Rajan (2006), Djankov, La Porta, Lopez-De Silanes and Shleifer (2002) and Ciccone and Papaioannou (2007) are concerned with identifying the effects of market entry regulations and the effects of “red tape” on entrepreneurship; and (iii) Costa and Aubyn (2012) provide results on the possible effects of legal-simplification programmes. The broad proposition in the literature is that reducing the regulatory burdens on business, including the costs and delays of starting up new businesses, as well as managing existing ones, will lead to more new market entry and dynamic efficiency gains in terms of entrepreneurship or productivity. The studies on administrative simplification and reduction of regulatory burdens have the following in common in that they endeavor to assess how regulation impacts on business behavior.

A number of the studies use regression analysis to identify the effects of regulation, but the CPB Netherlands Bureau study involves a simulation model, WorldScan. This study suggests that reducing administrative costs would increase labour efficiency, and for the EU-25 countries in 2005 cutting administrative costs by 25% would have raised GDP by around 1.1%. The estimated longer-term effect was even larger, with an increase in real GDP of between 1.4% and 1.7%. Using the same simulation model, Gelauff and Lejour conclude that a 25% reduction in administrative costs from simplifying regulation in the EU 25 countries could lead to a long run gain in GDP of 1.5% in 2025, although with sizeable cross-country differences. Similarly, the Swedish Agency for Growth Policy Analysis, using regression analyses, conclude that the regulatory burden had a negative effect on investment and competitive pressures and made the capital stock less responsive to changes in turnover. The study also found that there is a negative relationship between economic growth and regulatory burdens. The conclusions of the studies by Djankov *et al.* and, Klapper *et al.* are consistent with the notion that regulation can diminish the entry of new firms into markets.

The main finding in the study by Ciccone and Papaioannou is that in countries where the legal status to operate firms can be obtained more quickly, there is significantly more entry in industries that experience expansionary global demand and technology shifts. In their study of legal-simplification programmes, Costa and Aubyn conclude that the long-term impact on total factor productivity could be about 0.6% on average.

In Australia, regulatory reforms in the National Reform Agenda are estimated to increase national GDP by 1.3% as a result of a 20% reduction in regulatory compliance costs (Australian Government Productivity Commission).

The studies in detail

The CPB Netherlands Bureau for Economic Policy Analysis (2004). This research calculates the effect of administrative burdens across the EU, based on an earlier calculation which estimated that the administrative burden of regulation in the Netherlands was equivalent to about 3.6% of Dutch GDP in 2002. This figure was obtained with the aid of the Standard Cost Model developed within the Government of the Netherlands and now used extensively elsewhere.¹⁷ The research assumes that the economic cost of the administrative burdens in the Netherlands can be applied to other EU Member States. A general equilibrium model called WorldScan is used by the Netherlands Bureau for Economic Policy Analysis (CPB). The model distinguishes 10 goods and services sectors, a labour market, and a capital market for each of 23 countries and regions. The model simultaneously takes account of the different products and factors of production in the world economy including Europe. The model is calibrated on input-output tables and trade data. Product and factor markets are expected to clear, in particular there is no frictional unemployment.

Taking into account interdependencies among the separate product and factor of production markets in the economy, the model solves for the economic equilibrium that maximises welfare across the economy. The modelling assumes that the administrative costs of regulation are largely made up of wages for workers firms need to hire to comply with Government regulations and to provide the government with information. Reducing the administrative burden implies that some of these workers can contribute directly to production. The reduction in administrative costs is therefore modeled in the form of an increase in

labour productivity. It is assumed that the cost reduction is achieved by making the administrative process more efficient and the effectiveness of government regulation is unaffected.

Two simulations are used based on reducing administrative costs. In both, labour efficiency rises by 1.6% for all sectors in the EU-25 countries in 2005. In the first simulation R&D spillovers are assumed not to exist. In the second simulation they are introduced. The results for the first simulation are attributed to extra capital accumulation and the second allows for extra R&D investment. The initial impact on GDP from reducing administrative costs by 25% was around 1.1%. The higher labour efficiency leads to a higher return on investment, inducing investors to allocate more funds to the EU. The longer-term effect was even larger, with an increase in real GDP of 1.4% attributable to higher savings, more investment and extra capital. The long-term effect on real GDP is 1.7% for the EU-25 when allowance is made for the possibility that a rise in production results in more R&D spending in each sector of the economy. However, if the administrative burden is undertaken within one Member State only rather than across the EU, the figures are smaller. This is due to price effects and a change in the Member State's terms of trade with other countries diminishing the benefits.

Gelauff and Lejour (2006). The study provides *ex ante* estimates of the impact on labour productivity and GDP growth of achieving the EU's target reduction in administration burdens.¹⁸ The study also uses the WorldScan global general equilibrium (GE) model. The simulated outcomes are related to a baseline scenario which describes the time path of the target economic variables in the absence of an administrative burden reduction programme. The simulated outcomes relate to the years 2025 and 2040. The difference between policy variant simulations and the baseline describes the effects of implementing the EU's Lisbon target for administrative burden reduction.

The Netherlands information on administrative costs is used as the benchmark for the other Member States of the European Union. Inter-country differences in the level of administrative costs are estimated using World Bank cross country information on the time required to start up a new business. Again, to study the reduction of administrative costs in the GE simulation the authors assume that these costs largely consist of wages for workers that firms need to hire to comply with government regulations and to provide the government with information.

The results of simulating a 25% reduction in administrative costs suggest that there would be an initial 0.9% increase in GDP. But in the long run, when the capital stock is assumed to adjust to the higher level of labour productivity, the gain in GDP would be 1.5% in 2025.¹⁹ However, there are sizeable cross country differences reported in terms of the impact of a 25% reduction in administrative costs on labour productivity. These range from 0.9% in the UK to 1.8% in Portugal and 2.0% in Hungary and the rest of EU, reflecting national differences in the baseline level of the administrative burden.

The Swedish Agency for Growth Policy Analysis (2010) carried out a study of the impact of regulatory burdens on companies. A main result was that the indirect economic costs resulting from regulations borne by business in a country "are considerable and are much larger than the immediate, direct costs." The direct costs are the burdens on the public and private sectors of administering and complying with a regulation. The indirect costs on business are the wider compliance costs. The research uses the World Bank's *Doing Business* index to measure the regulatory burden across countries based on 10 components and an aggregated mean score for each country. The Fraser Institute's *Economic Freedom* index was used to test for the robustness of some of the results using the *Doing Business* indicators.

Various modelling was undertaken. The results suggest that the regulatory burden increases the required return on investment and therefore has a negative effect on investment. One possible explanation offered is that regulations affect the level of uncertainty as regards future costs and revenues and therefore increase investment risk. In parallel analysis, the correlation between entrepreneurship and regulation was measured with entrepreneurship defined using five different indicators. GDP per capita, industrial structure and education levels were used as control variables (i.e. other independent variables that might be expected to affect the rate of entrepreneurship in a country, other than regulation). The results were weak with only one of five entrepreneurship measures seemingly correlated with regulation, using the World Bank's Index as the measure and based on normal tests for statistical significance. This set of results was put down to possible measurement problems associated with the entrepreneurship variables.

Another part of the analysis relates to the effect of regulation on profitability. The result suggests that regulation slows down the convergence of profitability, or in more general terms suggests that regulation reduces competitive pressures, as reflected in profitability trends. However, the equation used, which includes only the lagged dependent variable (lagged rate of return by one period), may not capture the true dynamics of profitability. A further part of the study is concerned with the responsiveness or elasticity of the capital stock in relation to turnover. The results confirm that the degree of the regulatory burden does reduce capital stock elasticity. That is to say, the capital stock is less responsive to changes in turnover, suggesting that businesses adapt less successfully or quickly to changes in turnover where regulation is high.

Finally, the study looked at the regulatory burden and economic growth. The regression model revealed a negative correlation between economic growth and regulation, as measured by the *Doing Business* index and subcomponents of the index. However, and surprisingly, openness to foreign trade, education and population were shown to have no statistically significant effect on economic growth. The paper does not comment on these results. One possible conclusion is that the modeling is not entirely robust.

Djankov et al. (2002). The research is concerned with the entry of start-up firms in 85 countries, in 1999. The authors report that the number of procedures required to start up a firm varied from a low of 2 in Canada to a high of 21 in the Dominican Republic, with the world average being around 10. The minimum official time for a start up varied from a low of two business days in Australia and Canada to a high of 152 in Madagascar, with a world average of 47 business days. There were similarly wide estimates of the official cost of following the procedures, ranging from equivalent to under 0.5% of per capita GDP in the USA to over 4.6 times per capita GDP in the Dominican Republic. Three measures of entry regulation were used: the number of procedures that firms must go through; the official time required to complete the process; and the official cost. Procedures were classified as one of five types: safety and health, environmental, tax, labour, and a residual category. Correlation analysis was used, but there is only limited information provided about the precise statistical method(s), apart from reference to t-tests (tests for the statistical significance of particular coefficients on the endogenous variables). A later stage of the paper reports the results of regressions of seven consequences of regulation on a number of official procedures. The results suggest that compliance with international standards, e.g. on pollution, declines as the number of procedures rises. Using corruption as the dependent variable, more regulation is associated with worse corruption scores.

Klapper et al. (2006). The authors use the Amadeus database on European firms for the years 1998 and 1999, a commercial database of financial information on firms across 34 Western and Eastern European countries.²⁰ Entry is measured as the ratio of new firms to the total number of firms in an industry and is regressed on industry and country dummy variables, industry share and industry and country characteristics (to control for industry and country specific effects, respectively). Various checks are made of the robustness of the results and for causality.

The results suggest that countries with more costly entry regulations experience slower growth in the number of firms in industries with “naturally high-entry”. Naturally high-entry is benchmarked using information from especially the USA but also Europe. The focus is on the cost of meeting the regulatory requirements for setting up a limited liability company. Costly regulations hamper the creation of new firms, especially in industries that should naturally have high entry and particularly in richer countries or countries that are not corrupt and where the regulations are more likely to be enforced. Also, regulatory costs require new entrants to be larger and cause incumbent firms in naturally high-entry industries to grow more slowly. The growth in value added per employee for firms older than two years is relatively lower in naturally high-entry industries in countries where there are higher bureaucratic barriers to entry. To control for other factors that might impact on market entry, control variables are added, namely financial development, labour regulation and protection of intellectual property. The conclusion is that “entry regulations hamper entry, especially in industries that naturally should have high entry.” Smaller firms are particularly dissuaded from entry.

The study confirms that entry regulations have economic costs over and above the direct costs of compliance and enforcement. However, the effects of entry regulations are seen mainly in developed countries or countries where there is little corruption.

Australian Government Productivity Commission (2006). In Australia a National Reform Agenda (NRA) comprising three streams — competition, regulatory reform and improvements to human capital — has been promoted. The regulatory reform stream comprises of two distinct sets of initiatives. The first is designed to promote best-practice regulation making and review. The second focuses on reducing the regulatory burden in “hot spots” where overlapping and inconsistent regulatory regimes are perceived to be impeding economic activity. The study uses national and international studies of the compliance costs and efficiency costs (distortionary effects in the economy) of regulations, to estimate regulatory costs for Australia. The Standard Cost Model is used to estimate administrative costs.

Based on the evidence, the study concludes that NRA-consistent reforms have the potential to reduce compliance costs by up to 20 per cent. If this reduction could be achieved, the additional benefits would amount to around AUD 8 billion (in 2005-06 prices). After a period of adjustment GDP could increase by around 1.3%. However, it should be recognised that the results do not appear to have been subject to external peer review, like those published in refereed journals. This comment also applies to the other studies by governmental bodies reviewed below. This is not to suggest that the results are invalid, merely that they may not have been subject to independent review.

Cicccone and Papaioannou (2007). They study whether cutting “red tape” fosters entrepreneurship in industries with the potential to expand. Various regressions based on differing assumptions and variables are adopted. Cross country data comes from the UNIDO 3-IndStat database. Data on administrative delays in the time taken to obtain legal status to operate firms in 45 countries are taken from Djankov *et al.* (above), and combined with industry-level data on employment growth and the growth in the number of establishments during the 1980s. Two benchmarks are used: one proxies free-entry industry employment growth due to global technology and demand shifts, using US-industry estimated employment growth; the other uses a free-entry industry employment growth in a hypothetical country facing world-average demand and technology shifts. The main empirical finding is that in countries where the legal status to establish firms can be obtained more quickly, there is significantly more entry in industries that experience expansionary global demand and technology shifts. Sensitivity analysis is adopted and certain checks are conducted. For example, the administrative delay is found not to be due to the country’s level of economic development.

Costa and Aubyn (2012). A panel factor-augmented VAR analysis is used to measure the long-run impact of legal-simplification programmes (LSP) on total factor productivity (TFP).²¹ The database is 40 countries from 1996 to 2009 and uses macroeconomic data from the AMECO database of the European Commission and institutional data from the Worldwide Governance Indicators of the World Bank (2010), supplemented where necessary with data from other sources. Principal component analysis is used to generate final data for the institutional variable.

If a LSP is implemented leading to a permanent increase in the quality of a country's institutions, the long-run impact on TFP is found to be significant and on average about 0.6%. However, the results are based on the assumption that the costs of implementing a LSP are not high. Simpler laws may be easier to understand and administer, but the result could also be an ambiguous and incomplete legal system. Given that a LSP may require a substantial change to existing law, extensive changes might be expected to be expensive to implement and could even result in legal confusion. Much will turn on the extent of the LSP and the current legal and constitutional structure in each country.

Table 2. Administrative simplification and reducing regulatory burdens

Study	Causal chain: theory/propositions	Economic impact indicator	Empirical method/Evidence based on	Findings
CPB (2004)	Reducing administrative burdens for businesses within the EU will lead to a significant gain in economic efficiency by boosting investment and adding to the increase in production and labour productivity.	Indicator: Administrative costs that are largely made up of wages that firms need to pay to hire workers to comply with government regulations and to provide the government with information. Data source: WorldScan, based on input output tables and trade data.	Simulation study: general equilibrium model.	Two simulations were used. The initial impact on GDP from reducing administrative costs by 25% was around 1.1%. The longer-term effect was even larger, with an increase in real GDP of 1.4% attributed to higher savings, more investment and extra capital. When allowance is made for the possibility that a rise in production results in more R&D spending in each sector of the economy, the long-term effect on real GDP is 1.7% for the EU-25.
Gelauff and Lejour (2006)	Reduction in the administrative cost burden raises labour productivity and economic growth.	Indicator: Administrative costs and labour productivity and GDP growth data. Source: WorldScan with data for 10 sectors and 23 countries and regions.	Simulation study: general equilibrium model.	The results of simulating a 25% reduction in administrative costs show that on average labour productivity and economic growth in the EU rise by 1.5% and 0.9% respectively, by 2025.

The Swedish Agency for Growth Policy Analysis (2010)	The effects of regulatory burdens on economic growth, investment and entrepreneurship. Also, the effects in terms of reducing competitive pressures and the responsiveness of the capital stock to changes in turnover.	Indicator: Index of regulatory burden. Source: The World Bank's <i>Doing Business</i> index and the Fraser Institute's <i>Economic Freedom</i> index.	Multiple regression analysis.	There is a negative correlation between economic growth and regulatory burdens, and the regulatory burden increases the required rate of return on investment. There is also confirmation of reduced competitive pressures due to regulation and reduced capital stock elasticity. However, the study was unable to find a statistically significant effect of regulation on entrepreneurship, perhaps due to defects in the data or modelling.
Djankov <i>et al.</i> , 2002	Regulation of entry of start-up firms leads to higher economic costs.	Indicator: Number of official procedures to be completed and time taken. Source: <i>World Bank Doing Business</i> .	Multiple regression analysis.	Based on start up firms in 85 countries, evidence of high official costs of entry in most countries and countries with heavier regulation of entry having higher corruption and larger unofficial economies.
Klapper <i>et al.</i> (2006)	Costly regulations to set up a limited company hamper the creation of new firms, especially in industries that should naturally have high entry and particularly in richer countries or countries that are not corrupt and where the regulations are more likely to be enforced. Regulatory costs force new entrants to be larger and cause incumbent firms in naturally high-entry industries to grow more slowly.	Indicator: Amadeus financial database of companies for 1998 and 1999. Market entry measured as the number of new firms to the total number of firms in an industry. Source: Amadeus financial database of companies for 1998 and 1999.	Multiple regression analysis.	The results suggest that countries with more costly entry regulations experience slower growth in the number of firms in industries with high entry. A shift from the 75 th percentile in the cost of starting a business to the 25 th percentile increased developing countries' GDP growth by 25%-50% per annum. The growth in value added per employee for firms older than two years is relatively lower in naturally high-entry industries in countries where there are higher bureaucratic barriers to entry.
Australian Government Productivity Commission (2006)	Regulatory burdens may impede economic activity. Study of regulatory reform initiatives designed to promote best-practice regulation making and review and to reduce the regulatory burden, as part of a wider governmental reform agenda.	Initiatives drawing from Australia's National Reform Agenda (NRA).	Based on national and international studies of regulatory costs and the Standard Cost model: Various statistical and regression analyses.	Reductions in compliance costs by 20% due to NRA consistent regulatory reform efforts are estimated to lead to increases in GDP by 1.3%.

Ciccone and Papaioannou (2007)	Data on the time taken to comply with government entry procedures in 45 countries from Djankov <i>et al.</i> (above) combined with industry-level data on employment growth and the growth in the number of establishments during the 1980s.	Indicator: Time taken to obtain legal status to operate a firm in 1999. Source: World Bank, <i>Doing Business</i> .	Multiple regression analysis.	The main empirical finding is that in countries where the legal status to operate firms can be obtained more quickly, there is significantly more entry in industries that experienced expansionary global demand and technology shifts. Cutting “red tape” fosters entrepreneurship in industries with the potential to expand.
Costa and Aubyn (2012)	The effects of legal-simplification programmes in terms of improving the quality of institutions in industrialised countries. Complex legal systems may inhibit TFP growth.	Indicator: Total factor productivity Source: A database of 40 countries from 1996 to 2009 and using principally macroeconomic data from the AMECO database of the European Commission and institutional data from the Worldwide Governance Indicators of the World Bank..	Regression analysis using a panel factor-augmented VAR model.	If a LSP is implemented leading to a permanent increase in the quality of a country’s institutions, the long-run impact on TFP is found to be significant and on average about 0.6%.

3.3. Ex ante and ex post analyses of regulations (systematically undertaking ex ante and ex post reviews of regulations; evidence-based policy making)

Regulatory impact assessment (RIA) is a widely used regulatory management tool, and is aimed at both reducing the quantity of unnecessary or over-costly regulations and improving the quality of the remaining body of regulation. The *ex ante* assessment of regulations in the early stages of the policy cycle helps to improve the quality of new regulatory proposals by analyzing the problem that the regulation is intended to solve, identifying alternative ways of dealing with the problem, and assessing the likely positive and negative impacts of adopting the proposed regulation. RIA is a widely used regulatory management tool for conducting an *ex ante* assessment of regulations. Where possible, the RIA provides quantified estimates of the positive and negative impacts, using economic values.²² The RIA methodology can also be used to review the net benefits of an existing regulation, and to ensure that regulations remain up to date, cost-justified, cost-effective and consistent and are delivering their intended policy objectives. RIA also contributes to the attributes of good regulation in terms of transparency, accountability, consistency, targeting and proportionality.

Below is a selection of studies that have included economic valuation in the analysis of regulations.

Box 3. *Ex ante* and *ex post* analyses of regulations

Summary: most of the published evaluation studies on RIA have concentrated on the quality of the procedural processes associated with the preparation of RIA assessments, rather than on the impact on better regulation. Some of the research has been concerned with regulatory oversight bodies. The studies that are reviewed below have been selected from the limited body of RIA literature which uses economic analysis in assessing benefits and costs and in estimating the results of applying RIA as a tool for *ex ante* and *ex post* analysis of regulations.

Each of the studies is based on single country evidence, covering the United States (Hahn and Tetlock, 2008; Farrow, 2000; Graham, 2008), State of Victoria in Australia (Abusah and Pingario, 2011) and Vietnam (Ministry of Justice of the Socialist Republic of Viet Nam, 2008). A range of measures is used to assess the economic impact of RIA. Overall, the studies show that the adoption of RIA has had a positive effect on economic welfare, particularly where the internal RIA process is subject to external scrutiny.

The studies in detail

Abusah and Pingario (2011). The authors study the Regulatory Impact Assessment (RIA) process in the state of Victoria in Australia between 2005/56 and 2009/10. Since 2004 the Victorian Competition and Efficiency Commission (VEC) has been tasked with independently assessing RIAs produced against the Government of Victoria's guidance on the preparation of RIAs. Once a draft RIA has been developed, it should be independently assessed by the VCEC against state guidance. The estimated savings are measured over the ten year life of the regulations, generally using a real discount rate of 3.5%. The estimates in the paper are best regarded as midpoints of a range and are therefore indicative.

For the period studied the estimate is that gross savings of AUD 902 million were achieved in present value terms (taking a 10 year life for the regulations). The average annual saving over the five years studied was AUD 180 million. The majority of these savings were due to changes to new/amending regulatory proposals rather than to changes to existing regulation through a sunset process. Almost a half of the total savings were due to a proposal not being implemented or a requirement removed after scrutiny. In terms of cost effectiveness, for every dollar incurred by the key parties involved in the RIA process, gross savings of between AUD 428 and AUD 56 were identified. The conclusion is that "the RIA process has led to significant savings in the costs imposed by Victorian regulations, relative to a situation with no RIA process". The results highlight the value of the RIA process and may also reflect the benefits of having an independent body scrutinise the analysis of regulatory and legislative proposals. However, and as the authors acknowledge, the figures over-estimate the true benefits from RIA because the analysis concentrates only on gross cost savings. It does not consider benefits that might have been reduced as a result of removing or reducing regulatory requirements. Also, the gross savings reported do not include any increases in the costs imposed by particular regulatory instruments over the period. It is assumed that any increases in the regulatory burden would have also occurred in the absence of the RIA process. The study therefore exaggerates the real economic benefits of adopting the RIA process and of independent scrutiny. Nonetheless, the figures are so large that, even allowing for limitations in the scope of the analysis, the results do confirm the value of both RIA and independent scrutiny of RIAs produced by government departments.

Ministry of Justice of the Socialist Republic of Viet Nam (2008). A study in Vietnam into its law making processes concludes that the adoption of RIA can improve the legal process with benefits in terms of more rational law making and legal certainty. The study is premised on the argument that low quality regulation and implementation increases health and safety risks and reduces government effectiveness. Businesses in Vietnam currently face high search costs, uncertainty and regulatory risk due to "lack of security in understanding legal obligations." Public administration also faces high search costs and uncertainty over which legal documents are valid at any point in time.

The study applies a form of “soft” benefit cost analysis which involves the use of quantitative and qualitative evidence. Benefits are calculated by estimating the monetary value of savings in administrative and policy costs. Costs are estimated in terms of the monetary value of the additional salary costs involved in preparing the RIA and draft legislation. Expected results using RIAs for six legal reforms are presented; a preliminary RIA and policy statement with each proposal for law contained in the Annual Legislative Program; codification of the law; simultaneously revising parts of laws and by using omnibus law; requiring RIA for new legal norms; reducing the categories of legal instruments; and enhancing transparency through expanding mandatory public consultation. The expectation is that implementing legal reform, drawing on RIA processes, will boost investment, job creation and growth. The use of RIA is found to be associated with annual benefits over costs of some VND 2 717 159 000 000 (0.24% of Vietnamese GDP in 2008). Important benefits that cannot be monetised are also claimed. However, the method used for estimating the benefits is not clearly explained and some calculations in the report are apparently based on “estimates of the effects of national regulatory reform programs in other countries”.

Farrow (2000). The study looks at the Executive Office review and oversight of US federal regulation, as implemented by the establishment of the Office of Information and Regulatory Affairs. The focus is on whether there is evidence that review has actually improved performance. The paper uses information on the status of regulations and their estimated economic impact and cost-effectiveness data. The primary concern is with regulations that became law, though some attention is paid to regulations that were withdrawn or rejected. The results indicate that the Executive Office is associated with rejecting some regulations that would have been economically inefficient on a cost-benefit basis, but there appears to have been no efficiency improving impact on the difference between proposed and final regulations or on the cost effectiveness of regulations that are implemented. Several models are estimated. One is based on the hypothesis that Executive Office review alters the probability of the rejection of a new rule. The approach adopted includes a Probit regression type of analysis which models two outcome possibilities; one whether the rule was rejected or not. Another model estimates whether the cost-per-life saved was reduced by review. The data set is based on that published at various time since 1986 by John Morrall, an economist, on cost-per-life saved for various regulations. The results suggest that the higher cost-per-life saved does increase the probability of a rule being rejected, although no rule actually rejected is correctly predicted by the equation. In other words, review may help to reject some uneconomic regulation, but rejected regulations have not been strongly correlated with increasing cost-per-life saved. There appears to be either no effect or a perverse effect of Executive Office review on the cost-per-life saved between the proposed and final stages of regulation. Finally, Executive Office review does not seem to reduce the cost-per-life saved of regulation. However, this study deals only with regulation relating to cost-per-life saved, and there may be missing data issues.

Hahn and Tetlock (2008). They evaluate the contribution of economic analysis to the quality of RIA reports, based on the regulatory proposals submitted to the US President’s Office of Management and Budget. Cost benefit analysis, where economic values are estimated for costs and benefits, has been a requirement for each new major regulation since 1981. Using the OBM’s information on 95 major regulatory rules from 1995 to 2005, the authors find that in 14 cases (14.7%) the monetised value of costs exceeded the monetary value of benefits. The authors also find that the quality of the economic analysis applied to the estimation and valuation of impacts has fallen short of the OMB analytical guidelines, and there is a failure to provide sufficient information to make an informed judgment on the potential impacts of the regulatory proposal. No clear upward trend in the quality of cost benefit analysis in regulatory assessments is detected.

The study also estimates the costs and benefits of strengthening the economic analysis of regulatory impacts. Comparing average OBM and consultancy staff costs incurred in producing an economic analysis for a major regulation with the average benefits of eliminating regulations with negative net benefits that were implemented between 1995 and 2005, provides a rough estimate of net benefits in excess of USD 250 million per year from improved use of economic analysis.

Graham (2008). The research examines the history of lifesaving regulation in the United States and shows how the application of economic cost benefit (ECBA) analysis to the valuation of the savings in human life can strengthen the evidence base of regulatory decision making. The article also argues that the use of ECBA to estimate the economic value of benefits of life saving shows how the economic evidence on the benefits of life saving regulation acted as a safeguard against “capture” of the regulatory process by special interest group lobbying and influence. The paper is based the work of the Office of Information and Regulatory Affairs (OIRA) in the White House Office of Management and Budget. The period covered is 2001-2006, when significant advances were made in the OIRA’s use of ECBA in estimating the benefits of life saving regulations. Examination of the *ex ante* estimates of benefits and costs in the regulatory proposals considered by OIRA over this period indicates that the annual rate of net benefits in 2001-2006 was 262% larger than in the previous eight years. Lifesaving rules for clean air accounted for the majority of the estimated net benefits of federal regulation during this period.

The paper also uses case study evidence – reducing diesel engine exhaust emissions, reducing sulphur and nitrogen oxides from coal plants and increasing the fuel efficiency of cars and light trucks – to show the improvement in benefit estimation that resulted from the improved use of economic cost benefit analysis.

This article demonstrates the value of using economic valuation techniques in regulatory policy analysis. However, as the author acknowledges, there are technical difficulties with the application of ECBA to impacts that do not have a market value and expert opinion is often divided on the reliability of the shadow price estimates. Equally important, the non-quantifiable benefits and costs may be significant.²³ The use of “soft” cost benefit analysis, where the regulator is required to show that the benefits “justify” the costs is therefore recommended.²⁴

Table 3. Ex ante and ex post analyses of regulations

Study	Causal chain: theory/propositions	Economic impact indicator	Empirical method/evidence based on	Findings
Abusah and Pingario (2011)	The use of RIA and central scrutiny of the RIAs produced leads to improved departmental RIAs, and therefore improved regulation.	Estimated cost savings in RIA reports. <i>Data Source:</i> RIA reports for state of Victoria, Australia, 2005/6 – 2009/10.	Cost evaluation of RIAs.	Gross savings of AUD 902m in present value terms were achieved. The majority due to changes to new/amending regulatory proposals. Almost a half of the total savings were due to a proposal not being implemented or a requirement removed after scrutiny. In terms of cost effectiveness, for every dollar incurred by the key parties involved in the RIA process, gross savings of between AUD 428 and AUD 56 were identified. However, only cost savings, not benefits forgone by not regulating, were quantified.
Ministry of Justice of the Socialist Republic of Viet Nam (2008)	Adoption of RIA can improve the legal process with benefits in terms of more rational law making and legal certainty. Low quality regulation and implementation increase health and safety risks and reduce government effectiveness. The expectation is that reform will boost investment, job creation and growth.	Regulatory Indicator: estimate of the economic costs and benefits of undertaking RIA studies which result in improved regulatory quality. <i>Data source:</i> Not known.	Case studies of the legal process.	Six legal reforms are categorised. The overall conclusion is that the use of RIA and complementary reforms such as enhancing transparency through expanding mandatory public consultation will lead to better laws with less uncertainty. The use of RIA is found to be associated with annual benefits over costs of some VND 2 717 159 000 000. The expectation is that reform will boost investment, job creation and growth.
Farrow (2000)	Better processes for monitoring new regulations and regulatory changes will lead to improved economic outcomes.	Regulatory Indicator: Cost-effectiveness data on individual regulations. <i>Data sources:</i> US Executive Office reports, cost effectiveness data.	Descriptive statistics and profit analysis.	The Executive Office rejects some regulations that would have been economically inefficient (on a cost benefit basis), but there appears to have been no efficiency improving impact on the difference between proposed and final regulations or on the cost effectiveness of

Hahn and Tetlock (2008)	Improved use of economic cost benefit analysis for the valuation of impacts will result in better quality regulation.	Regulatory indicator: data on the use of economic analysis when quantifying benefits and costs in RIAs. Source: OMB reports.	Evaluation of the use of economic valuation of benefits and costs in US Office of Management and Budget regulation proposals. Descriptive statistics.	regulations that are implemented. No evidence that economic analysis has had a significant impact on the quality of regulation.
Graham (2008)	The use of economic valuation techniques in estimating the benefits and costs of regulation will improve the quality of new and existing regulation and contribute to better regulation.	Regulatory Indicator Change in net benefits resulting from use of economic valuation techniques. Source: OIRA case studies containing estimates of <i>ex ante</i> benefits and costs of regulation proposals 2001-06.		Greater economic valuation of life saving benefits increased the net benefits of new regulation.

3.4. Consultation, transparency and accountability

Adherence to the principles of open government, including transparency, accountability and consultation, helps in ensuring that regulation serves the public interest and is informed by the needs of those interested in and affected by regulation. The adoption of the tools and instruments of open government “enables public scrutiny, gathering facts from those affected by proposals, safeguards against corruption and promotes citizens’ trust in government, through increased transparency and public participation” (OECD, 2011, p. 15). The underlying logic is that adherence to the principles of open government will contribute to better regulation and mitigate important constraints to economic performance, by, for example, reducing the risk of regulatory policy failure, improving policy consistency and lowering corruption and vulnerability to capture by particular interest groups.

Below is a selection of studies that have empirically examined the impact of open government processes on economic welfare outcomes.

The studies in detail

The European Court of Auditors (2010). A recent report on the impact assessment procedures used by the European Commission found that consultation had been carried out for nearly all IAs. However, these consultations were often “targeted” rather than “open” and were used primarily to gather evidence for the analysis, rather than to contribute to accountability and transparency with stakeholders. The Commission did not conduct a public consultation on draft IA reports, and although consultations were sometimes used to identify possible policy options during the IA preparation stage, they virtually never concerned the Commission’s preliminary assessment of alternative policy options. This was confirmed by stakeholder organisations, who said that they would like to see an interim version of the IA report in advance of the Commission proposal.

Box 4. Consultation, transparency and accountability

Summary: The contribution of open government to better regulation, in the form of consultation, transparency and accountability of regulatory management, is difficult to quantify. Consequently, most of the literature has concentrated on evaluating the quality of the open government processes, rather than on estimating the economic benefits and costs of open government.

All of the studies included in this section provide evidence on the impact of open government, particularly in terms of consultation procedures. Two of the studies, namely the European Court of Auditors (2010) and Persson (2005) assess performance in terms of an undefined “best practice” standard of open government. Only one study (the Ministry of Justice of the Socialist Republic of Viet Nam, 2008), attempts to assess the economic costs and benefits of adopting open government consultation procedures.

While the studies seem to confirm the potential benefits from consultation and open government, there still remains considerable inconsistency in governments’ approaches to achieving the benefits. It seems that there is still much to be done in terms of achieving consultation, transparency and accountability in regulatory policy.

Persson (2005). The study provides a detailed evaluation of the effectiveness of the European Commission’s strategy for consultation on EU policy, in the context of the proposal for a new European chemicals policy (the REACH system for Registration, Evaluation, and Authorization of Chemicals). The process for developing a strategy on REACH started in 1999 with an initial brainstorming meeting which comprised input from more than 150 stakeholders, including regulators, scientists and industry. A detailed Impact Assessment was put out to open internet consultation in October 2003. Analysis of the more than 6,000 contributions to the consultation showed that two thirds of those submitting proposals to the Commission represented the industry while only six percent represented NGOs and other civil society associations. Moreover, an overwhelming majority of participants were national actors from the largest Member States rather than transnational actors. Persson concludes that open consultations did not bring about equal participation from different group of actors, raising concern when measured against standards of democratic governance.

Ministry of Justice of the Socialist Republic of Viet Nam (2008). This study was referred to in the discussion of the studies on *ex ante* and *ex post* analyses of regulation. A further part of the study is concerned with law making processes. It uses an *ex ante* RIA approach to assess the potential impacts of introducing mandatory public consultation for all draft legal documents. The economic benefits and costs of extending mandatory consultation to all legal proposals are quantified and show a positive net economic benefit. The net benefits of consultation are put at up to VND 2 782 376 942 500 (0.25% of Vietnamese GDP in 2008).

Table 4. Consultation, transparency and accountability

Study	Causal chain: theory/propositions	Economic impact indicator	Empirical method/Evidence based on	Findings
European Court of Auditors (2010)	Consultation procedures enhance the quality of RIA.	Impact Indicator: Frequency and timing of consultation; analysis of stakeholders who engaged in consultations. Source: European Commission IA reports.	Documentary evidence.	The consultations were often “targeted” rather than “open” and were used primarily to gather evidence for the analysis, rather than to contribute to accountability and transparency with stakeholders.
Persson (2005)	“Open” consultation engages a wide range of stakeholder groups in the policy process leading to improved regulation.	Impact Indicator: Quality of consultation process. Source: Published information on stakeholder consultation on EC REACH proposal.	Case study analysis of internet consultation responses.	Responses are predominately from industry groups with underrepresentation of civil society groups.
Ministry of Justice of the Socialist Republic of Viet Nam (2008)	Adoption of mandatory consultation as part of RIA improves the quality of legal documents and the effectiveness of regulation. It also improves democracy and the engagement of citizens with the policy process.	Impact Indicator: Estimated net benefits of mandatory consultation. Costs include public sector administrative costs. Benefits include reduction in private sector costs of complying with new regulations. Source: Internal government estimates of costs. Benefits of consultation are not quantified.	Internal estimates and international case study evidence.	The benefits of requiring mandatory public consultation with publication of draft legal documents on website and with 60 days consultation period are greater than the costs. The benefits of consultation in terms of reducing the costs relating to both the flow and stock of regulations are each put at up to VND 1 400 000 000 000.

3.5. Regulatory institutions (including independence of regulators)

It is common practice in OECD countries for government to delegate responsibility for the regulation of specific sectors or industries to a regulatory agency. This occurs most frequently in the basic infrastructure sectors (telecoms, power, transportation) and in the financial sector. The OECD (*Draft Recommendation of the Council on Regulatory Policy and Governance, 2011*) advocates that governments should “Develop a consistent policy covering the role and functions of regulatory agencies in order to provide greater confidence that regulatory decisions are made on an objective, impartial and consistent basis, without conflict of interest, bias or improper influence” (OECD, 2011, Annex Para.7). By giving regulatory agencies a high degree of autonomy (independence) the risk of political interference in the day to day operations of the agency is reduced, which in turn is expected to enhance regulatory credibility and commitment. Conversely, where there is an absence of regulatory independence, there is a risk that the regulator will seek to change the operating terms and conditions that have been agreed with the regulated body or bodies before the contract period is ended. Regulatory time inconsistency (the so-called “hold-up”

problem) will adversely affect utility firms' investment decisions. Based on this reasoning, a positive relationship is predicted between the level of regulatory independence and economic welfare.

For illustration, below is a selection of studies that have empirically examined the impact of regulatory independence on economic welfare outcomes.

Box 5. Regulatory institutions (including independence of regulators)

Summary: There is an expanding empirical literature on the relationship between regulatory independence and economic outcomes. Four examples of this literature are included in this section: Cambini and Rondi (2010); Edwards and Waverman (2006); Bortolotti *et al.* (2011); and Gilardi and Servalli (2011). In each case econometric regression analysis is used to analyse the data. The studies cover a number of sectors – financial, telecommunications, and infrastructural utilities – in the EU15 countries. The economic performance indicators used in these studies include privatised utilities' investment, incumbent operators' connection charges in telecommunications, capital adequacy ratios in the banking sector, and market valuation. Dummy variables are used as proxies for independent regulation, and a variable to allow for the influence of government is also included in the regression equation.

In general, the results confirm that economic outcomes are improved where there is an independent regulatory agency. However, the effectiveness of the independent regulator is influenced by government, either where government retains an ownership share in privatised utilities or where the government's political commitment to regulatory independence is weak.

The studies in detail

Cambini and Rondi (2011). They examine the investment decisions of 92 EU regulated utilities taking into account three key institutional factors – the degree of regulatory independence, share of state ownership, and the government's political orientation. For the empirical analysis the authors use an unbalanced panel of publicly traded utilities and transportation infrastructure operators from EU 15 Member States, covering the period 1994 to 2005. The data are for firms that are either regulated by independent regulatory agencies, ministries, government committees or local governments and have varying degrees of state ownership. Two alternative measures of regulatory independence are used in the regression analysis. The first is a dummy variable, which is equal to 1 in the years in which the firm is subject to regulation by an independent regulatory agency and equals zero otherwise. The value of the dummy variable was determined by drawing on a range of documentary evidence. The second measure used is an index of regulatory independence, which takes a value between 0 (no independence) and 1 (full independence). The dependent variable is investment, which is estimated from capital stock data using an equilibrium stock adjustment model.

To test for the impact of regulatory independence on investment behaviour, firm panel data on investment are regressed on a set of independent variables, including regulatory independence, degree of public ownership and political orientation, and also variables to allow for the separate interaction between regulatory independence and political orientation and with public ownership. The results show that when the dummy variable measure of regulatory independence is used, it is positive and statistically significant, indicating that the equilibrium level of investment is higher when the independent regulator exists. Similar results are obtained when the alternative measure of regulatory independence is used. The results are consistent with the theory that suggests that regulatory independence improves the regulated firm's investment incentives.²⁵

Overall, the results provide support for the argument that the establishment of independent regulatory agencies strengthens firms' confidence in the consistency and stability of the regulatory environment and that this, in turn, contributes positively to investment decisions.

Edwards and Waverman (2006). Their research examines the effects of regulatory agency independence and public ownership on regulatory outcomes in EU telecommunications. In many countries liberalisation of network infrastructure to allow new market entrants has preceded privatisation, creating problems for regulation where the state has a dual role of regulator and owner of the regulated incumbent. To mitigate these potential problems, independent regulatory authorities have been established to oversee and regulate interactions between incumbents and entrant firms. This paper tests whether the regulated interconnect rates that entrants to the telecommunications sector must pay to incumbent operators are affected by public ownership and the existence of an independent regulatory authority.

An index of regulatory independence of telecommunications institutions in each EU founding member state is constructed covering the period 1997 to 2003. Public ownership is allowed for by use of a dummy variable coded as 1 if the government share in the incumbent operator is greater than 0.5 and as 0 otherwise. The percentage of the population living in urban areas is used as a control variable for cost variation between EU member states. The dependent variable is the per minute rate charged for call termination on incumbent fixed line networks. A year fixed effects variable is also included in the basic equation.

Regression analysis is used to test the basic model and the results show, as predicted, that public ownership has a positive effect on local interconnect rates, while regulatory independence has a negative effect. However, when an interaction variable between public ownership and regulatory independence is included, the main effect of regulatory independence is no longer significant and the interaction variable is significant and negative. This result is interpreted as evidence that regulatory independence matters only when the government holds a share in the incumbent operator.

A problem with the regression results is that there may be unobserved variables that simultaneously determine both the measure of regulatory independence and interconnect rates (an example of a problem in econometrics known as missing variable bias). To allow for this potential bias, the paper applies an instrumental variable procedure to the panel dataset.²⁶ The results from the second stage regressions are similar to the first stage results; all coefficients maintain their sign and statistical significance. Further econometric tests confirm the robustness of the second stage regression results.

In summary, the evidence provided in this study for the EU telecommunications sector confirms that formal institutions promoting regulatory independence mitigate the upward effect that public ownership of the incumbent operator has on interconnect rates. But where the sector is fully privatised, regulatory independence has little or no effect. In interpreting the result that regulatory independence has no effect on economic outcome in a fully privatised sector, it should be noted that the empirical analysis relates to a single measure of performance, namely interconnect rates. This leaves open the possibility that regulatory independence can have a significant impact on other performance indicators even where the sector is fully privatised.

Bortolotti et al (2011). They study the effect of the establishment of independent regulatory agencies on the market-to-book ratios of publically traded European regulated firms from 1994 to 2005. The authors argue that the overwhelming majority of firms privatised in OECD countries continue to be under government control. Continuing government share ownership and control increases the possibility of “capture” by the government, as part-owner, which increases the value (or economic rent) of the owners’ (public and private) stake in the firm.

Table 5. Regulatory Institutions (including regulatory independence)

Study	Causal chain: theory/propositions	Economic impact indicator	Empirical evidence based on	Findings
Cambini and Rondi (2010)	Independent regulatory institutions strengthen investor confidence in the regulatory environment and have a positive impact on investment decisions.	Impact Indicator: Annual investment by regulated utilities. Data source: <i>Worldscope</i> .	Multiple regression analysis applied to panel data for 92 EU regulated utilities over the period 1994-2005 to test for the relationship between investment and regulatory independence.	The variable for regulatory independence shows a positive and statistically significant relationship with the investment variable.
Edwards and Waverman (2006)	Independent regulation is an effective instrument for regulating prices.	Impact Indicator: Call termination charges made by the incumbent network to new network users. Data source: EU Reports on the Implementation of the telecommunications Regulatory Package' covering the period 1998-2003.	Multiple regression analysis applied to panel data for EU telecommunication firms.	Independent regulation is effective in controlling price increases when the incumbent operator is publicly owned.
Bortolotti <i>et al.</i> (2011)	Part-government ownership in privatised utilities allows regulatory capture to occur.	Impact Indicator: Market value of privatised utilities. Data source: <i>Worldscope</i> , 1997-2003.	Multiple regression analysis applied to panel data on EU15 privatised utilities for the period 1994 to 2005.	Independent regulation is less effective when government retains an ownership share in privatised utilities.
Gilardi and Servalli (2011)	The degree of regulatory independence has a positive effect on regulatory compliance.	Impact Indicator: Capital ratios of banks. Data source: <i>The Banker Database</i> .	Multiple regression analysis.	Independence of regulatory authority improves regulatory outcomes.

The authors then test the null hypothesis that government ownership of utilities regulated by an independent regulatory authority should not affect regulated firms' market value. The empirical analysis uses an unbalanced panel of 88 publically traded utilities and transportation infrastructure operators from the EU 15 member states, covering the period 1994 to 2005. A dummy variable is used to differentiate between the years when the firm was subject to regulation by an independent regulatory authority and years when it was not subject to independent regulation. A range of instrumental variables are used to allow for potential endogeneity bias. The dependent variable is the regulated firms' market to book value ratios. The results provide robust evidence for rejecting the hypothesis. Independent regulation in combination with residual state ownership positively affects the market value of regulated firms. The positive relationship between firm value and the government's stake is particularly strong and significant in countries where political institutions do not constrain the power of the executive. The authors conclude that where the institutional foundations for regulatory commitment are weak, the government tends to affect the independent regulatory process in order to benefit state owned firms.

Gilardi and Servalli (2011). This research examines the effect of regulatory independence in the banking sector by focusing on the response of banks to capital adequacy requirements which are set by an international framework, the Basel Accord, but are implemented by national regulatory authorities. Specifically, the authors investigate how capital ratios correlate with regulatory requirements, the independence of regulators, and whether the regulator is a regulatory agency or a central bank. The empirical analysis uses panel data methods (combining cross country and time series data) and relies on a dataset of large banks in fourteen European countries from 1997 to 2010. The data include time varying information on the independence of regulators.

The predicted relationship is that capital ratios will be higher when regulators are more independent. If independence increases the credibility of policy commitments, then banks should comply with regulatory requirements more strictly if the regulator is more insulated from political pressure. The regression results show that capital ratios tend to be higher when regulators are more independent, but more so if the regulator is an agency than if it is the central bank.

4. Key findings

The literature review is concerned with empirical studies on regulatory policy and governance in general, administrative simplification (including reducing regulatory burdens, opening one stop shops and shortening the time for opening a business), *ex ante* and *ex post* analyses of regulations (including evidence-based analysis of new regulations and regulatory oversight bodies to ensure regulatory quality), consultation, transparency and accountability in the regulatory process, and regulatory institutions (including independence of regulators). The studies provide a number of important insights into our knowledge of regulatory policy.

An important limitation of the empirical literature on regulatory policy and governance is the concentration on the costs of regulation. The studies reviewed are predominantly focused on regulatory costs to the economy. Indeed, they commonly use the term “regulatory burden” to describe the consequences of regulation. This can be explained in terms of the difficulties that are encountered in attaching an economic value to benefits. Nevertheless, the omission of economic benefits of regulation from many of the studies covered in this review should be borne in mind when interpreting the empirical results.

To begin with, the literature on regulatory policy and governance appears to be the most extensive. Using various proxies for regulatory governance and covering a range of regulatory policies and economic effects, the studies seem to confirm that regulation, when it is not well designed, can stifle economic activities and ultimately reduce economic growth. However, it also appears that regulatory governance and the institutional framework in a country may mitigate the damaging impacts. The effects of regulation therefore appear to be context specific. Also, one problem with the literature is that a number of the measures used to quantify the “regulatory burden” aggregate various regulations into a single measure. It is to be expected that different regulations will impact differently on the economy. But there is little in the way of evidence in the literature on the economic effects of particular types of regulatory instruments or tools that allows firm conclusions to be drawn on what works best in terms of regulatory policy, and under what conditions. This is particularly of concern given that governance and the institutional framework are shown to mitigate the potential negative economic effects of regulation. Moreover, the use of highly aggregated data in cross country analyses means that the more subtle relationships between particular regulations and economic variables are possibly concealed or lost in the aggregation.

There is also a growing literature identifying the effects of regulation on the entry of new firms into industries and on the level of entrepreneurship. In general, the conclusions are consistent with the notion that regulation can reduce the entry of new firms into markets, though the effects on entrepreneurship are much less well established, probably because of difficulties in measuring the degree of entrepreneurship separately from the entry of new firms. However, there is a need for more studies of the interrelationship between regulatory policy and administrative simplification, including deepening our understanding of the effects on starting and sustaining new businesses and business innovations. This suggests a need for a wider range of indicators and supporting data of both regulatory administration and the perceived effects.

Turning to studies of *ex post* and *ex ante* analyses of regulations, the literature is much sparser than for governance or administrative simplification. There are some evaluation studies on the use of RIA, but these concentrate on the quality of the procedural processes rather than on the impact of better regulation *per se*. Overall, they suggest that the adoption of RIA has a positive effect on economic welfare, particularly where the internal RIA process is subject to some form of independent external scrutiny. However, as there are still few studies in this field and because the studies are concerned with the experiences in an individual country, the results may not be readily generalised. Similarly, the contribution of open government to better regulation, in the form of consultation, transparency and accountability of regulatory management, seems to have been adequately addressed in very few studies. No doubt because of the difficulty of measuring consultation, transparency and accountability and quantifying the effects, most of the literature concentrates upon describing the quality of government processes and the perceived benefits rather than rigorously quantifying the specific contribution in terms of economic benefits and costs.

In addition, there is limited empirical literature on the relationship between regulatory independence and economic outcomes. This is particularly surprising given the huge emphasis that has been placed on the merits of “independent regulation” by institutions such as the OECD, the European Commission and the World Bank (e.g. OECD, 2002, p. 95). The four studies reviewed, covering a number of economic sectors, do confirm that economic outcomes are improved where there is an independent regulatory agency. However, the studies also suggest that the effectiveness of independent regulation is influenced by government through a continued share ownership in the regulated company or by the threat of continuing political interference in regulatory decisions. Again, it seems that the results may be context specific, with the effectiveness, and credibility, of independent regulation dependent upon wider governance issues in a country.

Moreover, data availability appears to drive the method, content and direction of the empirical research undertaken. The concentration of research on regulatory policy in the field of governance and administrative burdens can be explained in terms of the existence of well-established data bases such as the World Bank’s *Doing Business* and *Governance Indicators*, or the Fraser Institute’s *Economic Freedom* indices. But even this data has its limitations, being based on expert, but nevertheless subjective, opinion surveys. Data used to investigate the other categories of regulatory policy, i.e. *ex ante* and *ex post* analyses of regulations, consultation, transparency and accountability, and regulatory institutions, are more limited in their coverage. For example, the OECD survey data on the quality of OECD countries’ management systems is limited to three surveys conducted in 1998, 2005 and 2008.²⁷

In terms of method, most of the studies reviewed used econometric regression analyses to identify the statistical significance of the regulatory variable and the economic outcomes under investigation, after allowing for other variables that might impact on the results (control variables). By contrast, there has been limited use of simulation techniques, with just two of the papers reviewed making use of this method. Both use the *WorldScan* model developed by the Netherlands Bureau for Economic Policy Analysis (CPB). Of course, there are many country and industry case studies on regulatory content, processes and results, especially relating to particular industries or sectors of the economy. It is beyond the scope of this literature review to identify and analyse these case studies. Many tend to be descriptive and lack quantification,

which is the focus of this review. One cost-benefit study including some quantification, relating to the Vietnamese economy, has been identified and reported.

Regression analysis is well established in economics as a technique for investigating the relationship across countries between regulatory variables and economic outcomes. Used appropriately it provides statistically validated results that provide some reassurance that the results are robust. Nevertheless, there are some important caveats about the use of regression analysis that should be noted.

The first caveat relates to the limitations of regression analysis in assessing impact. Do the observed differences in economic performance result from the regulation under investigation or from other factors? Unless care is used results can be statistically significant, yet still mislead about the degree of the effect or even the whole causal relationship. The evidence of a statistically significant relationship between the dependent variable (e.g. regulation) and the independent variable (e.g. GDP growth) does not prove that the causality chain runs from regulation to economic outcomes. It is equally plausible to argue that higher economic growth, for example, encourages lower regulation or that economies performing less well may be more prone to regulating in an attempt to solve problems. The direction of the causal link is then reversed. Methods exist to address this problem, notably the use of what are called “instrumental variables” in regression models, but the result may not be entirely successful.²⁸ Although a number of the studies reviewed attempted to control for causation, it may still be the case that countries with stronger economic conditions invest more in regulatory policy or otherwise create better regulations. As helpful as the studies are for some purposes, they may have limits as a basis for making causal inferences.

The regression analyses discussed above were often based on panel data, which combines time series data (data over time) with cross-country data (comparing across countries in a particular year). The regressions involved estimating a “best fit” equation to represent the relationship between the dependent (determined) variable and the independent (determining) variables. Such an analysis assumes that the pattern found is common across all countries in the sample. In reality, cross-country heterogeneity can make it difficult to quantify the link between regulation and performance on a cross-country basis. This can be expected to be a serious limitation if regulation is context specific and its effects diminished or enhanced by factors such as the level of effective governance, law and order, corruption etc within countries. These problems are exacerbated when cross-country differences occur over time.

A second set of reservations relates to data adequacy. If the data are unreliable or “noisy” then the regression results may be misleading. Sometimes proxy variables are used in the absence of direct measures of regulation, such as of market entry barriers. This is common practice in econometrics in the absence of other, more appropriate, data; but it is essential that the proxy variables are apposite and not just what are available. Particular care needs to be taken with proxy variables for regulatory costs. There is an important distinction to be made between administrative costs – those associated with the provision of information to stakeholders including government (e.g. completing and submitting forms) – and policy and compliance costs – the costs inherent in meeting the aims of a regulation (e.g. the costs of installing new safety equipment and the associated training). In assessing the overall costs of regulation it is important to include both. Also, there are also usually direct and indirect costs from regulation, including potential spillover effects on other parts of the economy. Capturing the full costs of regulation in regression analyses (and for that matter in other methods of quantification), especially using proxy variables, is therefore challenging.

A third limitation of regression analysis, and which extends to simulations and case studies, relates to the policy making process. Aggregated analyses of the “regulatory burden” give little or no guidance to the policy maker on which particular areas of regulatory policy need to be reformed if the negative impact on economic performance is to be reduced. Put simply, the results provide qualified confirmation of the desirability of regulatory reform but offer no guidance on the particular reform measures that are likely to

be effective in strengthening economic performance. This weakness is compounded by knowledge that the use of “best fit” regression equations to estimate the impact of regulation in the future assumes that past experience can be projected into the future. But common sense tells us that “history never repeats itself” and the relationship between regulation and economic growth is almost certain to change over time.

Fourth, most studies deal with “regulatory burden” at the economy level, while regulatory policy may be formulated and enforced at the sub-national level. There is risk therefore that differential effects at the regional and local levels are glossed over or ignored. Equally, regulation can be expected to impact differently at the sectoral and industry levels. In particular, most studies being at the economy level fail to distinguish the results for different sizes of businesses. Large enterprises might be expected to be better resourced to comply with regulations than smaller firms and therefore regulation may impact more severely on the latter.

Fifth, regulation is often treated as a “stock” or quantity, while the main economic effects may well result from the “flow” or changes in regulation. It is quite possible that the problem for business may be less the scale of regulation but rather the frequency with which regulations change. Changes in regulation may be more costly to deal with than existing regulation. Once a business has undergone the “set up” costs of complying with a regulation, removing it may provide little in the way of cost savings. Indeed, if the costs are “sunk”, removing them may achieve no cost savings to business. Replacing them with new regulations, intended to be less burdensome, may actually impose a net cost, contrary to the intention. The frequency or regularity with which businesses need to comply with a regulation may be important and this too is not captured in data concerned simply with the quantity of regulation. In other words, understanding the dynamics of regulatory policy requires a more refined approach to regulation than exists in the current literature.

Lastly, the literature faces a number of other potential problems. To begin with, regulation is intended to change behaviour to *improve* economic, social, health and safety or environmental outcomes. Market economies cannot function without regulation, for example to protect property rights and the law of contract, and environmental challenges have opened up a new field of extensive regulation to protect the planet. The results of studies that concentrate upon regulatory costs or “burdens” can therefore provide misleading policy results because the crucial importance of regulations to the economy are ignored.²⁹ In this case the results from the empirical studies are at best partial in nature, leaving aside the other potential limitations of the empirical analysis, as described above. The results do not capture the true welfare effects of regulation and therefore of reducing regulation. .

As Coglianese (2012, p.30) aptly comments, while the results of such research are not necessarily flawed and the research may be “valuable for some purposes”, “due to these indicators’ primary focus on regulatory burdens, studies based on them cannot provide a complete basis for comparing overall regulatory performance.” To summarise, there are considerable data and methodological challenges to achieving robust empirical results and it seems clear that the richness of regulatory policy is not captured in studies of the “regulatory burden” based on indices of the quantity of regulation

5. Conclusions

This study has provided a review of a number of quantitative studies on regulatory policy, categorised under separate headings dependent upon the chief theme of the papers. The review does not claim to be comprehensive. Time and resources restricted the analysis to a sample of studies, chosen with the assistance of the OECD and intended to be reasonably representative of the full literature.

The results of the study suggest the following lessons for policy makers. First, the effects of regulation are context specific. The literature on regulatory policy and governance in general seems to confirm that poorly designed regulation can stifle economic activities and ultimately reduce economic growth. However, it also appears that regulatory governance and the institutional framework in a country may mitigate the damaging effects. In other words, policy makers should be alert to the dangers of adopting a “one size fits all” approach to regulatory reform and instead recognise the need to modify and adapt regulatory management processes to meet each country’s institutional and regulatory endowment.

Second, it is difficult, and sometimes impossible, to provide robust quantitative evidence of a causal relationship between a regulatory policy change and the impact on economic outcomes such as economic growth. This highlights the importance of evaluating the effects of regulatory policy and management in terms of better regulation outcomes, rather than relying only on evidence of economic impact. The scope of quantitative study is restricted by the existence of data. The preponderance of research on regulatory policy has relied on highly aggregated data bases, such as the World Bank’s Doing Business and Governance Indicators. In terms of method, regression analysis is frequently used to identify the statistical significance of the regulatory variable and the economic outcomes under investigation, after allowing for other variables that might impact on the results (control variables). Used appropriately, regression analysis provides statistically validated results that can provide some reassurance that the results are robust. Nevertheless, policymakers need to be aware of the limitations of regression analysis in interpreting the results. In particular, statistically significant results may not be sufficient to draw empirical inferences about the extent to which the regulatory change has actually caused any of the observed change in economic indicators or outcomes.

The reliance on aggregate analyses of the impact of regulation in general limits the usefulness of the results for policy making, since they give little or no guidance on which particular areas need to be reformed. Put simply, the results provide qualified confirmation of the desirability of regulatory reform but offer no guidance on the particular reform measures that are likely to be effective in strengthening economic performance. Unfortunately, data bases for investigating the impact of particular categories of regulatory policy are much more limited in scope, and consequently, there is less quantitative evidence on the economic effects of separate types of regulatory instruments.

Third, the reliance on regression analysis to investigate the relationship across countries between regulatory variables and economic outcomes, has shifted attention away from the use of country specific case study evidence in the policy process. While this type of evidence may not be readily applicable to other countries, and may not always be expressed in economic values, it is particularly useful in developing regulatory policy measures that are context specific.

Fourth, most quantitative studies deal with the costs of regulation and give little or no attention to quantifying the benefits of regulation. For the policymaker, it is important to compare the estimated costs of regulation alongside the benefits of regulation, even if the latter are often not monetised. This is particularly important where regulation is intended to improve not just economic outcomes, but also social, health and safety and environmental welfare. This means that the results from the empirical analyses are partial in nature, and do not necessarily capture the true welfare effects of regulation and therefore of reducing regulation.

In spite of its inherent limitations in terms of coverage, the review reveals that the quantitative research has focused largely on general governance issues and certain administrative regulatory burdens. There seems to have been less literature on *ex ante* and *ex post* analyses of regulations, the economic effects of consultation, transparency and accountability in the regulatory process, and the economic effects of independent regulators. In other words, a number of the aspects of what are often projected as the “better regulation” agenda at official levels is under-tested, and in some cases seemingly un-tested, in terms of the net economic benefits.

There is therefore a challenge to future researchers to fill the clear gaps that currently exist in our knowledge of regulatory policy. The future research agenda should involve extending the literature review, presented above, so as to incorporate studies which, given the time constraints in preparing this paper, may have been overlooked. Future research should particularly address the gaps in the literature identified, notably on risk-based regulatory management but also on *ex ante* and *ex post* regulatory processes and the value of governments having independent regulatory oversight bodies.

Quantitative evidence on the impact of regulatory policy is in scarce supply. This paper is an attempt to address the lacuna by summarising the current state of the literature. The results and conclusions should be treated as preliminary. There is much more work to be done. But the survey has revealed that while “better regulation” is often proclaimed it is still only partially understood. There are big voids in knowledge that should be filled before the “better regulation” agenda can be judged to be firmly evidence-based.

NOTES

1. Public goods in economics are goods that have the properties of non-excludability (it is not possible, or not possible at reasonable economic cost, to exclude non-payers from consuming the good) and non-rivalry (consumption of the good by one person does not reduce another person’s consumption of the same good).
2. The term ‘smart regulation’ is used as an alternative to ‘better regulation’. Smart regulation involves an integrated approach to regulatory policy across the regulatory cycle. See, European Commission (2010) Commission Work Programme 2010 Time to Act. COM(2010)/135/final.
3. OECD (2009a), “Improving the Quality of Regulations”, *Policy Brief*, November, Paris. For example, most countries now report having adopted Regulatory Impact Assessment (RIA). However, in less than half of the OECD countries is there systematic quantification of corresponding costs and benefits of new regulations. In some countries e.g. Australia, Canada, New Zealand, UK and USA the focus of scrutiny is on new regulations; while in Germany, the Netherlands, Mexico and Sweden it is more focused on existing regulations. In some régimes the emphasis is on administrative costs, while in others there is a wider scrutiny of regulatory costs.
4. Administrative costs are a specific subset of compliance costs.
5. Hampton, P. (2005), *Reducing administrative burdens: effective inspection and enforcement* (HM Treasury, London). That is to say, regulation should be *consistent* to avoid unnecessary uncertainty for the private sector; *accountable* to the democratic process; *transparent* in terms of operation and effects; *proportional* when tackling market failures; and *targeted* at the problem to be addressed, to avoid unintended impacts elsewhere in the economy.

6. For example, transparency can reduce the role of special interest groups in shaping regulation in their own interest.
7. E.g the Office of Information and Regulatory Affairs within the Office of Management and Budget in the USA; the Regulatory Policy Committee in the UK; ACTAL in the Netherlands, the NKR in Germany; Regelrådet in Sweden; the Komise pro hodnocení dopadů regulace (Regulatory Impact Assessment Board) in the Czech Republic, the Victorian Competition and Efficiency Commission in the state of Victoria in Australia, and the Impact Assessment Board of the European Commission. See also, Cordova – Novion, C. and Jacobzone, S. (2011), “Strengthening the institutional setting for regulatory reform”, *OECD Working Papers on Public Governance*, No. 19, OECD Publishing, Paris.
8. Also included is consideration of alternatives to state regulation such as self-regulation; OECD (2009b), *Report on Indicators of Regulatory Management Systems 2008*, Paris; OECD (2010a), *Regulatory Reform and Competitiveness in Europe*, Paris.
9. www.ecmodels.eu/index_files/Page542.htm. The WorldScan model is used in CPB Netherlands Bureau for Economic Policy Analysis (2004) *Reducing the administrative burden in the European Union*, August, CPB, as discussed below.
10. Also, see for example Schiantarelli, F. (2008), “Product Market Regulation and Macroeconomic Performance: A review of cross-country evidence”, *Boston College Working Paper*, No. 623; <http://fmwww.bc.edu/EC-P/WP623.pdf>; Bouis, R. and Duval, R. (2011), “Raising Potential Growth After the Crisis. A quantitative assessment of the potential gains from various structural reforms in the OECD area and beyond”, *OECD Economics Department Working Papers*, No. 835, OECD Publishing.
11. This includes regulatory oversight bodies and ministerial responsibility for regulatory policy, governance structures for regulators, tools for improving the quality of new regulations such as regulatory impact assessments, systematic procedures to consider alternatives to regulation, consultation on draft regulations, risk-based approaches to the design of regulation and compliance strategies, transparency in communication and access to regulations, and programmes for improving the quality of existing regulations such as administrative simplification strategies and burden reduction and ex post regulatory review and evaluation.
12. Similarly, Crafts argues that at OECD governance standards there is no adverse effect of regulation on growth; Crafts N. (2006) ‘Regulation and productivity performance’, *Oxford Review of Economic Policy*, Vol. 22, No. 2, pp. 186-202.
13. The components are: starting a business, protecting investors, employing workers (hiring and firing), registering property, enforcing contracts, getting credit and closing a business.
14. The fixed effects estimator does require, however, that each included variable varies significantly within countries. The regulatory variables may not satisfy this requirement since institutions usually change slowly.
15. www.heritage.org/ The Index is based on a series of measures for each country, including indicators for business regulation, government spending, fiscal and trade policy, property rights, investment, the labour market, corruption, and money and finance.
16. Other examples can be found in Crafts (2006).
17. The Standard Cost Model is used in a number of countries. It provides the basis for consistent approaches to valuing administrative burdens. About 30 countries work together in the Standard Cost Model network on challenges and issues related to applying the standard cost model: see www.administrative-burdens.com/.

18. The report also assesses the impact of four other parts of the Lisbon strategy – employment, human capital, research and development and the internal market for services. Administrative burden calculations are based on estimates from Kox, H. (2005), Intra-EU differences in regulation-caused administrative burden for Companies, CPB Memorandum, CPB Netherlands Bureau for Economic Policy Analysis, who combined Dutch data on the total administrative burden with the data from Djankov *et al.* on inter-country differences in firm start-up costs; Djankov, S., La Porta, R., Lopez-De Silanes, F. and Shleifer, A. (2002), “The Regulation of Entry”, *Quarterly Journal of Economics*, Vol. CXVII, No.1, pp 1-37.
19. The results for 2040 show an increase of 1.6% in EU labour productivity and GDP.
20. The database is provided by Bureau van Dijk and contains financial information on over five million private and publicly owned firms across 34 Western and Eastern European countries. The sample used in the study is a subset of over three million firms in 21 countries. Eurostat data are used for numbers of, and employment in, firms of different sizes.
21. The panel factor-augmented VAR analysis is a relatively new econometrics method. A VAR statistic has three components: a time period, a confidence level and a loss amount (or loss percentage).
22. Market values can often be used to calculate the economic value of costs and benefits. However, economic values need to be calculated indirectly when market prices do not exist. The most common areas for ‘missing’ market prices are public health (for example, the value of an improvement in life expectancy), and the environment (for example, the value of biodiversity protection). Economic values also need to be calculated in situations where market prices are imperfect (for example, monopoly markets).
23. “Non-quantified benefits and costs are a legitimate concern, and there is no scientific basis for assuming that non-quantified benefits are always balanced out by non-quantified costs. Even if a rough balance exists on average, the non-quantified benefits may be larger in some rulemakings while the non-quantified costs may be larger in others. Thus, it is important that analysts provide regulators with as much information as possible about non-quantified impacts, especially those items that could be important enough to tip the scales in favour of one regulatory option over another.” Graham J.D. (2008), “Saving lives through administrative law and economics”, *University of Pennsylvania Law Review*, Vol. 157, p. 524.
24. “Hard” CBA requires all benefits and costs to be valued in economic terms, allowing total benefits to be compared with total costs.
25. The coefficient on the share of government ownership, however, is not significantly different from zero, and therefore does not confirm the theoretical prediction that investment will be lower when the firm is partly or wholly owned by the state.
26. The use of instrumental variables allows consistent estimation in cases where the explanatory variables are correlated with the error term in a regression equation. This may occur where there is reverse causation or relevant explanatory variables are omitted from the model or there are measurement errors. An instrumental variable attempts to estimate the causal effect of, say, variable *h* on variable *i* using a third variable *j* which affects *i* through its effect on *h*.
27. See www.oecd.org/regreform/indicators, for discussion of coverage of the three sets of indicators.
28. For a brief description of instrumental variables see footnote 26 above.
29. As for example Loayza *et al.* (2004, p. 5) state in their study: ‘It is not our purpose to evaluate the success of specific regulations at meeting their stated objectives, nor do we pretend to judge the impact of regulation on social welfare dimensions beyond the influence of economic growth and volatility.’

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