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SUCCESSFUL STRATEGY AND POLICY

Gjalt de Jong

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Gjalt de Jong, PhD
University of Groningen/Campus Fryslân

Series Editor
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BIOGRAPHY

Gjalt de Jong, PhD (Oentsjerk, 1968) is Director of the Centre for Sustainable Entrepreneurship at Campus Fryslân at the University of Groningen. He also is Associate Professor of Strategy at the Faculty of Economics and Business at the University of Groningen. He received his Master's degree in Economics and a PhD degree in Business Administration from the same university. He is a senior member of the Faculty's research institute. Prior to his current appointment, he served as a senior advisor at PricewaterhouseCoopers and KPMG.

De Jong has extensive experience in research into strategic issues. He publishes on key strategic issues related to leadership, organizational structures, inter-firm collaboration, globalization and public policy. His research is interdisciplinary, multi-level and multi-method.

De Jong has extensive experience in university education. He has developed and supervised virtually every conceivable form of educational activity for students of Bachelor's and Master's programmes and postgraduate studies. He has coordinated educational programmes for economics, business and management. He has managed both large international programmes and small national groups. He has coordinated thesis programmes for various departments and has supervised hundreds of research projects on strategy themes.

De Jong has extensive experience as a senior advisor in consultancy for the private and public sectors. He developed his consulting skills throughout his career with leading consultancy firms and their international clients. He provides strategy advice to leaders of international companies, but also to managers from small and medium-sized enterprises, universities, government and network organizations.

De Jong plays an active role in public debates. He combines his knowledge with research, education and advice in developing and challenging opinions on contemporary regional and national strategic issues. He regularly gives guest lectures and public presentations.

CHAPTER 1. INTRODUCTION

1.1 Introduction

This is the fifth monograph in the series of the Centre for Sustainable Entrepreneurship. Previous monographs have addressed successful strategy in relation to characteristics of individuals, organizations, alliances and context. Public policy is among the most important features of the modern world economy. The relation between successful strategy and policy therefore is the subject of discussion in this fifth monograph.

Successful strategy always has been related to public policy one way or the other. The regulation of business –and other not-for-profit sectors such as healthcare or education– is a legitimization of policymaking in the contemporaneous world economy following, among others, a number of crises and the identification of the world challenges. The financial crises induced new rules and institutes in order to prevent that such events happen again. Grand challenges such as healthy ageing, clean water, safety or the circular society also call for government interventions by means of regulation. Representatives of the European Union, OECD, United Nations or the World Economic Forum translate their envisioned solutions for the world challenges in new rules or other policy measures.

The sentiment about the usefulness of public policy and regulation is mixed. On the one hand, some scholars point to the positive effects of regulation and regulatory institutions for the welfare of nation states. According to these scholars, regulation creates welfare and is a necessary condition for economic growth. They indicate that a lack of regulation and low-quality policy institutions often correlate with enduring national poverty and low levels of economic growth. On the other hand, other scholars align with an often advocated business view that too many rules exist. Many firms feel limited in their entrepreneurial spirit and their business opportunities by government induced regulation. Firms often complain about the overload of regulation that is imposed on them. This triggers strategic behavior. Large firms, for example, substantially invest in lobbying. The aim of a lobby is to bend existing regulation in a firm's favor or to prevent the introduction of new rules that might hamper a firm's financial performance. The tobacco and pharmaceutical industries are well-known example of lobby-intensive sectors. Scholars often point to the negative effects of lobbying. Large firms obtain a competitive advantage over small firms due to lobbying. Small firms often lack the resources and experience needed to successfully undertake a lobby. The examples of lobbying show that successful strategy and regulation are strongly related in the modern world economy.

This monograph intends to contribute to the debate about strategy and public policy. It presents a dual approach to foster the discussion. First, it offers foundations for a quantitative and longitudinal assessment of the underlying causes of regulation. A

quantitative and longitudinal analysis of regulation offers an opportunity to (i) test whether or not regulation has increased or decreased over time, and (ii) make an assessment of the underlying causes of regulation dynamics. Such a quantitative assessment requires to carefully thinking about concepts, causalities, measurements, and econometric techniques. The first chapters in this monograph address these issues and present solutions to measure the evolution of regulation (Chapter 2) and to measure antecedents of regulation change (Chapter 3) and to study new regulation production (Chapter 4). The quantitative studies concerning the evolution of regulation are complimented with a new theory of top policy teams (Chapter 5). This new theory of top policy teams enables innovative ways to analyze causes of regulation dynamics other than those addressed in the previous chapters.

Second, this monograph studies the consequences of regulation for business performance. The final two chapters in this monograph therefore facilitate the discussion about the usefulness of regulation for firm performance. It does so for national contexts (Chapter 6) as well as for an international comparative perspective (Chapter 7).

The outline of this chapter is as follows. The second section offers a literature review of research achievements in the field of public administration. Public administration is the scientific discipline that aims to understand the behavior and the decisions of governments and legislative institutions. The field of public administration therefore offers in-depth foundations that are useful for the understanding of the causes and consequences of regulation dynamics – the subject of this monograph. Finally, the third section presents the structure and outline of this book.

1.2 Literature Review

Public administration research has focused on the causes and consequences of public policy in general and more recently of regulation in particular. This section offers an overview of relevant studies in the field to facilitate the thinking about the usefulness of regulation in the modern world economy.

The consequences of regulation have been addressed in public administration research (for reviews, see Bozeman & Feeney, 2011; van Witteloostuijn & de Jong, 2012; Hudson et al., 2009). Bozeman's red tape theory (2003), for example, explains that most rules start out with some implied causal purpose that for someone things will be made better. Bozeman classifies red tape into 'rules born badly' (e.g., due to an inadequate comprehension of the means and ends of rules by rule-makers) and 'good rules gone bad' (e.g., due to misapplications). Empirical studies in public administration have consistently reported negative effects of red tape on various dimensions of

organizational behavior and performance, among which, work alienation, job satisfaction and public sector motivation (Coursey & Pandey, 2007; Feeney, 2011). In a similar vein, public policy research shows that business regulation hampers the start-up of new companies and innovation (Arnold, Nicoletti, & Scarpetta, 2008) inducing policy makers to review their regulatory practices and regulatory stocks (World Bank Group, 2006). Despite intensified deregulation programs, concerns have been advocated that regulation still significantly impacts firm activities negatively (e.g., OECD, 2010) indicating a need for more in-depth and more empirical research of the underlying causal mechanisms that determine the production of regulation, which is one of the issues addressed in this monograph.

In Western societies, many governments feel that they face a tension (Olson, 1997; Torres, 2004). On the one hand, they aim to design smaller, cheaper and more effective systems of public administration. On the other hand, they want to deliver better public services. In an attempt to relieve this tension, governments experiment with many different ways of improving performance. They try to reduce costs by means of, for instance, entrepreneurship, decentralization of services and private sector styles of management. As a result, profound changes in the organization of the public system have taken place (Diefenbach, 2009; Meyer & O'Tool, 2008). In this context, the debate about the added value and dynamics of regulation takes center stage. When reading the literature, five different explanations or drivers for the production of regulation can be identified, at least.

A first driver for the production of regulation derives from bureaucracy studies that, inspired by the work of Weber, started in the end of the 1970s. Weber's theory focuses on the relationship between organizational structures, on the one hand, and administrative behavior, performance and change, on the other hand (Weber 1978, but see also Brunsson & Olson, 1993, or Olson, 1997). Weber perceived bureaucratization as an outcome of calculation and interest, guided by experience. As Hilbert (1987) argues, when applied to societies, the distinctive feature of the Weberian framework is not bureaucracy per se, but rationalization in terms of a creative human activity that will perpetuate itself indefinitely. This explains why bureaucratization is difficult to reverse. There is no "ultimate project evaluation," implying that civil servants and other policy-makers can never decide about the desirability of the creation of new regulation. According to Hilbert (1987), this bureaucratic rationality is inherent to the regulation creation process, and therefore cannot be removed. Parkinson (1957) and Downs (1967) offer similar explanations for the existence and growth of bureaucracies (see, for instance, Jochimson, 2009).

A second driver for the production of regulation derives from the dynamics of the

contemporaneous deregulation programs (Adcroft & Willis, 2005; Boyne, Martin, & Walker, 2004). These deregulation programs are part of the new public management (NPM) ideology. The first NPM approaches were introduced in the late 1970s (Kirckpatrick, Ackroyd, & Walker, 2005; Page, 2005; Pollit & Boukaert, 2004). As with many schools of thought, NPM intends to offer blueprints as to how public sector organizations should be designed, organized and managed (Deem, 2004; Dunleavy, Margetts, Bastow, & Tinkler, 2005). Put bluntly, NPM considers old-style public sector organizations to be inefficient and rigid organizations that are staffed with incompetent and uncontrollable employees who misuse their position (Olson, 2005). The reforms that are proposed are based on a private management ideology, rooted in neoclassical economics that prescribes privatization, market competition and, above all, deregulation (Evetts, 2009; Torres, 2004).

From the perspective of NPM, the ideal government is envisioned as an interorganizational network that facilitates cooperation and consensus-seeking via flat and flexible organizations (Barzelay, 2000; Marinetto, 2003). NPM initiatives initially received support, but today an increasing number of NPM proponents acknowledge that NPM generates adverse outcomes (Hood & Peters, 2004). Examples of NPM failures are increasingly available. Schick (1996), for instance, reviews the pioneering NPM activities in New Zealand (see also Dunleavy et al., 2005; Moynihan & Roberts, 2002). New Zealand has approximately 3.5 million inhabitants. Due to NPM activities, more than 300 separate agencies and 49 different ministries were created. A meta-study of Hodge (2000), for example, reveals that decentralization of public services is accompanied by increased centralized control over the strategy and policy of the decentralized units. This paradox is an example for the often-observed counter-expected results of policy initiatives: decentralization leads to centralization and to formalized and rigidly structured hierarchies rather than flexible and network type of organizations (Diefenbach, 2007; Hogget, 1996). As Diefenbach (2009) concludes, the envisioned improvements that should, in theory, follow from NPM programs are often overruled by an increase in formal requirements and relational complexity, which eventually leads to a misallocation of government time and resources.

A third driver for the production of regulation concerns the limited cognitive capabilities of regulation-makers. March and Olson (1989, 2004) offer an elegant perspective on the question whether regulation over-production exist and, if so, to what extent. By and large, regulation over-production implies that an optimal level of regulation can be identified, but one may wonder whether such an optimum can be determined to begin with. March and Olson study the potential positive and negative effects of regulation. On the one hand, by itself, regulation does not necessarily imply rigidity or inflexibility, because it may even prescribe change. Furthermore, regulation

may have positive effects, such as a contribution to democratic equality (Evans & Rauch, 1999; Henderson, Hulme, Jalilian, & Philips, 2007). On the other hand, all this notwithstanding, March and Olson argue that regulation has negative effects as well. As said, regulation embodies obligations, rights, and interests, and therefore constrains the allocation of attention, priorities and perceptions. Regulation, like any form of written legal documents, is, in varying degrees imprecise, inconsistent and/or obligatory. This is inherent to any written text, and fundamentally due to the limited cognitive capabilities of civil servants and other policy-makers who cannot foresee all future contingencies ex ante when writing a rule to solve a particular problem. Of course, the issue of cognitive limited abilities dates back to the work of Herbert Simon. It is key in transaction cost economics (Williamson, 1985), too, which suggests that contracts are needed to limit the opportunities of and incentives for opportunistic behavior.

The implication of the above is that it is difficult to know exactly whether regulation has positive or negative effects. Due to the inherent limits of written regulation, attributing causal effects from regulation to specific organizational outcomes is hard to do. Civil servants or other regulation-makers do rarely, if ever, know how positive or negative a particular new regulation is or will turn out to be. Given that civil servants or other policy-makers are not aware of the marginal effect of an additional new regulation, they will continue to create new regulation under the presumption that each new regulation by itself has positive effects, and will have a particular (unknown) goal to serve.

A fourth driver for the production of regulation derives from ecology-based research (March, Schultz, & Zhou, 2000; van Witteloostuijn, 2003; van Witteloostuijn and de Jong 2007, 2008, 2010). The platform for ecology of law is sociology's population ecology. Population ecology was originally developed to understand the growth and decline patterns of organizational populations (like industries with commercial enterprises, populations of labor unions or sets of voluntary organizations) throughout their history (Carroll & Hannan, 2000) and recently has been applied to understand the birth and decline of political parties (Lowery et al. 2010, 2012). Population ecology emphasizes how competition for scarce common resources and mutualism based on complementary functional differences affects organizational founding and failure rates. From this perspective, a domain specific set of rules are a population, too. The argument is that the dynamics of regulation is determined both by its own history and rule stock characteristics. That is, national rules are populations of entities which, like any other population such as those comprising of organizations, human beings or animals, are subject to ecological forces such as density-dependent mechanisms.

Van Witteloostuijn and de Jong (2010), for example, predict an inverse U-shaped relationship between rule density and rule birth. This non-monotonic relationship is determined by processes of competition and legitimation, as reflected in two ceteris paribus hypotheses that combine into the prediction of a reversed U-shaped density-dependence effect on rule birth. One the one hand, Weberian and post-Weberian bureaucracy theory argues that "rules breed rules". The application and production of national rules provide legitimation to public administration. New rules try to solve voiced problems, but often introduce new issues. Therefore, new rules induce the need for yet another set of new rules. By introducing a rule, demand for additional rules is boosted as the audience is triggered to ask for more, being aware of the potential to regulate. On the other hand, learning theory suggests that rule-making bodies learn all the time, being associated with mechanisms that dampen rule dynamics. The pre-emption effect, for example, implies that problem availability reduces over time. In all, learning produces a set of rules that are able to absorb new issues, while reducing the need for the creation of new rules. The larger the density of rules, the higher the likelihood that an existing rule can deal with emerging issues. Hence, the density-dependence effect is negative.

Parliamentary institutions are a fifth driver to monitor and manage regulation processes. Research in political science and public administration highlights "agency" problems due to the fact that political parties with divergent preferences need to agree on common goals that are reflected in government bills (Martin, 2004; Martin & Vanberg, 2005; Tsebelis, 2002). Specifically, agency problems arise because cabinets need to delegate the law-making responsibilities to senior ministers. However, the delegation of law-making tasks and responsibilities involves risks. That is, despite their professional attitude, ministers may not be able to resist the tendency to behave according to their own preferences, or to those of the political party they represent. Hence, they may move government bills in their preferred direction (Döring, 1995). For that reason, coalition partners have incentives to monitor the law-making activities of ministers from partner parties in the rule-production process, in order to prevent that controversial laws are set in stone at an early age, after which time-consuming negotiation processes would be needed to "repair" the damage done. There are various institutional mechanisms to influence legislative processes such as party discipline, inner cabinet or parliamentary committees or filibuster techniques that each determine the legislative agenda and legislative debate in the parliamentary chambers (Andeweg & Thomassen, 2010; Oosterwaal & Torenvlied, 2011). Recent studies highlight the importance of ex parte lobbying, the coalition agreement, and junior ministers, respectively. Lobbying and rent-seeking theories argue that much regulation is introduced or removed in order to serve the self-interests of special interests groups. Yackee (2011), for instance, theorizes that interest groups play a

key role during the pre-proposal stage; particularly, group influence manifests itself through agenda building and agenda blocking. In other words, she argues that interest groups "help to set the regulatory agenda by affecting the content of proposed rules; at other times, groups lobby to eliminate unwanted items from agencies' policy agendas during the pre-proposal stag" (Yackee 2011:2). She untangles the effect of ex parte lobbying, that is, "off the public record" conversations in which lobbyist share policy and political information with regulators. Direct and bidirectional communications (e.g., face-to-face or telephone contacts) allow lobby groups to reinforce, reiterate, and repeat their arguments to agency rule-makers. Overall, Yackee's findings confirm that "off the record" lobbying matters for content changes in American policy making processes.

The coalition agreement is another important mechanism used to constrain and limit the behavior of ministers. Studies on coalition agreements suggest that ministers are the agents of the coalition parties' leadership and are 'hired' to execute the program decided by the leadership and laid down in the coalition agreement (Andeweg, 2000). Moury (2010), for instance, studies how ministers behave in multiparty governments, including the motivation for their actions and the leeway that coalition parties give to their delegates (cf. Timmermans 2003; Timmermans & Moury, 2006; Müller & Strøm, 2008). For six governments in Belgium, Italy and The Netherlands in the 1992-2002 period, she shows that a majority of the electoral pledges were transferred into cabinet decisions and that a majority of cabinet decisions were effectively constrained by the coalition agreement. Although the small number of case studies did not allow for a formal test of hypotheses, Moury (2006) cannot find evidence that the length of the coalition agreement, the entry of party leaders to government and the number of ministers participating in the negotiations have an effect on cabinet decisions.

Another line of research emphasizes the use of junior ministers to fulfill the (ex post) monitoring need of coalition parties (Müller & Strøm, 2000; Thies, 2001). A party can maintain some influence over a policy field by appointing a junior minister from its own rank in a ministry supervised by a senior minister from one of its coalition partners. It has been suggested that junior ministers are a compensation for the loss of policy (Laver & Shepsle, 2000) or office (Mershon, 2002) in multiparty coalitions. In modern parliamentary democracies, senior ministers initiate and pursue the process of rule production, among others, following the prioritization within the coalition agreement and supported by the civil servants in their department. A junior minister can nowadays amend and (re-)direct policies as well not only by taking legislative initiatives on her own but also, for example, by alerting her party of deviating policies or by frustrating the legislative process.

1.3 The structure of the book

The field of public administration research offers valuable insights to studying the "strategy-policy" causality. In a world where new knowledge is ever-increasing and almost instantaneously available, we would expect diminishing importance for governments and public policy. Interestingly, however, governments appear to be increasing rather than limiting their legitimacy in the modern world economy. As said, public policy cannot be ignored in the design and implementation of organizational strategy. This is relevant for private companies of all sizes as well as not-for-profit organizations such as those in healthcare or education.

Successful strategy and policy therefore is the theme of this monograph, anticipating two fundamental questions. First, why do some countries have a lot of rules while others do not? This question is addressed in Chapters 2, 3, 4 and 5. Second, does regulation determine the strategic success of companies, and if so, how? This question is addressed in Chapters 6 and 7.

Chapter 2 presents a quantitative assessment of the evolution of national rules. Many politicians advocate the need to reduce bureaucracy but few offer empirical evidence that they successfully met this target. Chapter 2 designs and implements a method enabling rule counting over long periods. The establishment of times series of national rules offers a first-ever opportunity systematically to investigate whether and how bureaucracy changes over time, a matter often complained of by the public and businesses.

Chapter 3 focuses on rule changes. In the lifecycle of rules – from creation, amendment to repeal – change is ever-present. Building on the organizational ecology and top management demography literature, Chapter 3 explains that existing rule stocks, and ministerial and policy unit characteristics, determine a country's evolution through changing national rules.

Chapter 4 explains the birth rate of new rules using an interdisciplinary approach building on ecology, demography and institutional theory. In so doing it also solves a range of methodological complexities which accompany inter-temporal, interdisciplinary and quantitative studies of rule dynamics. The chapter offers a wide range of fact-based actions for governments to take to successfully stop or decrease the stockpiling of rules which plague modern democracies.

Chapter 5 presents a new theory for a top policy team perspective of regulation production. It is well-known and accepted in business research that top management teams determine the strategy and the performance of a firm. A similar line of

argumentation is presented in chapter 5. Chapter 5 offers theoretical foundations to analyze whether and how different sets of senior and junior ministers result in different patterns of regulation dynamics. A set of senior and junior ministers is the top management team of a department. Such a top policy team potentially co-determines the regulation production of their department. Top policy teams are almost by definition demographically diverse. Based on business and social psychology research on group functioning, chapter 5 presents various theoretical propositions for the relationship between top policy team heterogeneity and regulation production. The new theory presented in this chapter enables innovative future research about regulation dynamics in the modern world economy.

Chapter 6 questions whether and how national regulation impacts on organizational performance. It has often been suggested that we are over-regulated and that regulation hampers innovation and entrepreneurship. Chapter 6 studies the impact of different dimensions of regulatory red tape on the performance of private companies and identifies, among other things, that sales turnover growth is limited by regulation cost and rule inconsistency.

Chapter 7 offers an international perspective on the effects of regulation for successful strategy. This chapter argues that regulation stock, quality and predictability can all impact on firm regulatory compliance costs. Using unique data from companies in OECD countries, Chapter 7 convincingly supports the main proposition that too much regulation indeed limits business performance. This indicates that governments have opportunities to unlock economic growth by limiting their own regulatory competence.

CHAPTER 2. EVOLUTION OF NATIONAL RULES

Summary

Politicians have displayed a keen interest in the build-up of regulations and bureaucracies for quite some time now. A case in point is the Netherlands. The second Balkenende cabinet, though, was vowing to downsize the number of rules as one of its main policy initiatives. Evaluating the success of such a policy requires the measurement of changes in rule volumes. Doing so is no easy task. Using higher education legislation as a case study, this paper attempts to chart and explain developments in regulation volumes for the period 1986 – 2004. For the time being, there appears to be no evidence that rule levels are on the decline – in fact, the reverse is the case. We also provide evidence for a so-called ecology of law, suggesting that the rules-breed-rules mechanism is difficult to put to a halt.

Our study offers various implications for policy-makers. Policy-makers can design different mechanisms aimed at constraining the ecological processes that would otherwise lead to rule overproduction. No introduction of new rules and, at most, only amending existing rules to new circumstances would be the most efficient way to reduce the rule birth rate. However, this is easier said than done. A more realistic option is to attach an explicit date for repeal of any new rule – a so-called sunset clause. This pre-specified end-date for a new rule circumvents the fact that existing rules are almost never annulled. Once rules come into existence they are there to stay. Another option would be that for every new rule that is introduced, a number of existing rules of similar size should be repealed. A related policy is the introduction of a quota system – i.e., a fixed number of new rules per ministry per year.

Key words: rule evolution, ecology of rules, minister profiles, higher education

2.1 Introduction

Many organizations and citizens complain about increasing bureaucracy and over-regulation. Managers from education institutes, for example, regularly report long lists of often conflicting and incomprehensible ministerial guidelines and regulations. In a similar vein, the business world blames reduced competitiveness on increasing regulation. Although this lament has not surfaced overnight, it does appear to be attracting more and more attention in Western societies. This was one of the main reasons, for instance, why the Dutch and the French voted no against a European constitution. Another case in point is Germany, where the Merkel administration has promised to reduce the bureaucratic burden of over-regulation. Ever since the rise and fall of Pim Fortuyn, Dutch politicians have joined in the plaintive chorus, too. Witness the Balkenende II cabinet's plan to reduce the administrative burden for the business world by 25 per cent. A further example is a recent report from the Dutch Scientific Council for Government Policy entitled Proofs of good service provisions

(Wetenschappelijke Raad voor het Regeringsbeleid, 2004). Behind this optimistic title lurks a sobering analysis: the quality of the public service is suffering under a rising stream of rule changes, often under the watchful eye of one of the many new bodies in regulatory land.

The theme of the lament is not only the fatigue that individuals face in their dealings with bureaucracy. A second tune highlights the negative impact on the economy and society as a whole. Evidence for the performance-damaging effect of over-bureaucratization and over-regulation is reported by, e.g., Olson (1996). Under the yoke of increasing bureaucracy and over-regulation, processes and transactions are becoming inefficient, new initiatives are nipped in the bud, employers and employees lose motivation, the effectiveness of policy implementation is reduced, and so on. The 1996 study by Olson points out that low economic growth is in many cases caused by 'wrong' (read 'bureaucratic') government policy that leads to considerable wastage of money and resources. Another example is the small business growth-reducing impact of regulation, as revealed in the comparative study of Capelleras, Mole, Greene and Storey (2005)[1].

In order to design effective de-bureaucratization measures, we need to understand why rule overproduction occurs in the first place: what are the underlying processes driving the never-stopping production of new rules? In recent years, empirical research within organization studies has begun using counting methods to examine the evolution of organizational bureaucracies – in other words, counting the number of regulations that are "born", changed or "killed" each year, often over a period of several decades. A good example in this tradition is the US study of red tape at Stanford University during the 1960s, 1970s and 1980s (Schulz, 1998; and March, Schulz and Zhou, 2000). A key finding was that the number of rules had jumped from 58 in 1961 to 127 in 1987. New rules were introduced with great regularity, while old ones were seldom or never scrapped. The most alarming conclusion was that the more rules there are, the more rapidly will new rules emerge. The growth in the number of rules is therefore an explosive process – and one which cannot be stopped easily. The aim of the current study is to apply this ecological logic to the case of nation-level rule production.

De Jong and Herweijer (2004) have attempted to chart the number and the growth of rules in the Netherlands using counts. The results can be seen at a glance in Table 1.

1 To some extent our study relates to the concept of 'red tape' because we estimate and explain the rule production for a particular domain. However, 'red tape' is particularly concerned with unnecessary or even pathological rules (Bozeman, 1993). We neither make a qualitative nor a quantitative assessment of the impact of education rules on higher education institutes (see Donker van Heel et al., 2004). Thus, strictly speaking, whether or not national rules really turn into red tape depends on the type of rules, on the burdens they infer and on whether they are enforced at all.

Table 1. The growth of Dutch national rules

Year	Laws	Orders in council and royal decrees
1980	1,100	
1988	1,432	
May 2002	1,722	2,611
January 2003	1,749	2,644
January 2004	1,800	2,675

Source: de Jong and Herweijer (2004).

For the most recent three years, de Jong and Herweijer (2004) distinguish between formal laws, orders in council and royal decrees (for definitions, see below). In the period from 1980 to January 2004, the number of laws rose by over 60 per cent from 1,100 to 1,800. By January 2004, over 12,000 formal laws, orders in council and ministerial regulations were in place. Opinions differ as to how much impact the European Union has had on Dutch regulation[2]. In general, however, studies show that a clear majority of regulations are national in origin.

In the following sections, we report on the results of a detailed case study of the evolution of regulation in the specific field of higher education in the Netherlands. In doing so, we are contributing to the existing literature in at least five ways. Firstly, we are adding a count database to the meagre supply of such databases. Because counts like that of de Jong and Herweijer (2004) are few and far between, we need to build up a collection to flesh out studies of what determines the evolution of regulation. Secondly, we need rule counts in order to test 'common-sense' hypotheses concerning regulation growth or reduction. After all, the perceived burden of bureaucracy in the

2 On the one hand, the Dutch Court of Audit (Algemene Rekenkamer, 2004) claims that today over half of Dutch regulation originates from Brussels. Their source is an unsubstantiated percentage in a circular from the Government Finance Inspectorate from 2002. De Jong and Herweijer (2004), on the other hand, estimate that 16 per cent at most of new national rules and regulations are prompted by the EU. This finding is supported by research in Denmark, Austria and the United Kingdom (Page, 1998; Bovens and Yesilkagit, 2004; Blom-Hansen and Cristensen, 2003). With regard to the administrative burden, it is claimed that 40 per cent comes from outside the Netherlands (Tang and Verweij, 2004). According to the Dutch Ministry of Finance (see www.administratievelasten.nl), the 'administrative burden' is the cost for business of complying with the requirement, under government rules and regulations, to provide information. Given this definition of the burden of regulation, the 'administrative burden' constitutes only part of the costs related to regulation. It does not, for instance, include the costs borne by citizens as consumers, employees, investors or students.

field is often at odds with what is proclaimed in government or political quarters (REA, 2005). The question is, therefore, whether public perceptions are based on reality. The Dutch Ministry of Education, Culture and Science (EC&S) is an interesting case in this respect, given its reputation of a rule-producing machine. Thirdly, we provide insight into a counting methodology. Because counting rules is no easy task, we hope here to make a contribution to the accumulated knowledge of effective and workable methods. Fourthly, we develop and provide evidence for a so-called ecology of law, suggesting that the rules-breed-rules mechanism is difficult to put to a halt. Indeed, the empirical test of such ecological insights cannot be carried out without detailed rule count databases. Fifthly, we present the results of a first regression analysis, with rule birth as the dependent variable. Although are time series is too short to estimate extensive models, our more limited specification nicely illustrates what an ecology of rules has to offer. To set the scene, we first briefly summarize this ecology of law argument in the next section.

2.2 Ecology of law

Building upon the study of the evolution of organizational rules (Schulz, 1998; March et al., 2000), van Witteloostuijn (2003) suggests a so-called ecology of law. Using metaphors derived from the bio-ecology of species, the ecology of law focuses on the explanation of the evolution of rules by identifying the mechanisms that drive the "birth", "mutation" (or change) or "death" of rules. In a nutshell, such an ecology of law would imply three hypotheses, at least. Of course, more hypotheses can be developed. However, in the context of the current study, this set of three hypotheses presented below suffices to bring across the core of an ecology of law.

First, the legislation process has a powerful internal dynamic. The social organization of rule production resembles a classical Weberian bureaucracy. That is, the growth in the number of rules increases as the stock volume of rules increases. As a consequence, the rule stock expands almost 'of its own accord'. Old regulations and laws are seldom or never scrapped; at most, they are amended. De Jong and Herweijer (2004: 236-237; our translation) conclude that '[l]aws are usually amended, with many amendments leading to the addition of articles. During their life most laws expand [and] … departments gradually increase their productivity in the area of ministerial regulations.[3] A simple conclusion presents itself: 'rules breed rules.' The first hypothesis is therefore that rules create rules. That is,
Hypothesis 1 (rules breed rules): The larger the stock of rules, the higher the growth rate of rules.

The growth in rule production is reinforced by the interaction with rule producers.

3 The word 'productivity' is used in a non-economic sense here: departments do indeed 'produce' many rules, but this productivity may not have any added societal value.

Our inspiration here is the theory behind the impact of top managers' demographic characteristics on decisions, behaviours and achievements (Finkelstein and Hambrick, 1996). There, the argument is that managerial characteristics, such as educational background and career experience, are key determinants of what managers think, prefer and do (see, e.g., Boone, van Olffen, van Witteloostuijn and De Brabander, 2004; Boone, van Olffen and van Witteloostuijn, 2005). The second hypothesis is as simple as the first: 'rule-makers breed rules.' The increase in national rules will rise in proportion to the number of rule-making and rule-monitoring officials. So, rule-makers breed rules. This logic gives:
Hypothesis 2 (rule-makers breed rules): The larger the number of rule-makers, the higher the growth rate of rules.

Further following the above managerial demography logic, the argument is that, for instance, the Ministry of Justice will continue to produce more rules as it employs more legally trained policy analysts. The Second Chamber of the Dutch Parliament will pass more legislation on education when the number of educational specialists increases. If, for example, the Minister of Education has a background in education, he or she will display a greater drive to produce rules. The close network of educational specialists in the Second Chamber and the sizeable bureaucracy thus explains why the Ministry of Education, Culture and Science is notorious for excessive regulation. The third hypothesis is therefore a more subtle one: rule-makers become more productive in proportion to their affinity with the substance of the rules – or, affinity breeds rules. This suggests, for the example of the minister,
Hypothesis 3 (affinity breeds rules): The higher the minister's affinity with her or his domain, the higher the growth rate of rules.

In this paper, we will test these three hypotheses. First, though, the next section will offer the key part of the raw material needed to do so: the evolution of the number of rules over time in a specific domain (higher education), decomposed in the underlying rates of birth, change and death.

2.3 Collecting data

The critical unit

The many definitions of what constitutes a 'national rule' in both the academic literature and everyday usage have given rise to a Babel-like confusion. This is largely because the different groups of rules and different levels of regulation are run together. For national regulations, we can distinguish between laws in the formal sense (as laid down by parliament), orders in council and royal decrees (as determined by the cabinet), together with ministerial guidelines and circulars (as established by a specific ministry). The regulations can be categorized according to their legal status,

which is connected with the body establishing them. Laws in the formal sense have the highest status; they are laid down by parliament and hence pass through the entire – time-consuming – institutional legislative process. For this reason, we have opted in the present study to examine the dynamics of formal laws – in this case, the focus has been on legislation relating to higher education[4]. Follow-up research can, of course, target other forms of regulation, since laws are only the formal tip of the regulation iceberg[5].

An act is a collection of national regulations that are created during the institutional process[6]. A formal law has a particular structure, with the text being divided into titles, sections, articles, sub-articles, paragraphs, clauses and sub-clauses. This division into different levels is an important one. Each section of a law deals with part of the domain in question. The literal text of a law – that is, the lowest level within the structure of the act – codifies the national regulations and the outcomes of the national institutional decision-making process for a specific domain. Our focus is on the lowest level of text in a formal law (frequently a clause or sub-clause, but often a paragraph) as the critical unit of study. This allows us to chart the dynamics of national regulation at the most detailed level, thus maximizing the flexibility of the resulting database: where necessary, analysis can be carried out at higher levels of aggregation.

In this context, we should point out that because entire acts, sections or parts are only seldom amended, this level of analysis is critical to empirical studies of the underlying dynamics of national regulation. The results of the institutional dynamic are usually expressed at the most detailed level of legislation – namely the text. In other words, if we record amendments at too high a level of aggregation, we run a greater risk of missing the underlying dynamic, notwithstanding the fact that it does most definitely exist. Finally, we should add that not all laws are structured in the same way. What is more, even within the same domain – such as higher education – the structure often changes over successive laws. Consistency can only be guaranteed at the most detailed level of regulation, as each law contains text at that level.
The source of national regulations – in our case, higher education acts – are the many editions of the Staatsblad, which publishes all formal laws, together with all accompanying changes. Many Dutch university libraries, including that of the University of Groningen, have a complete archive of Staatsblad editions. We prefer these hard-copy archives to the existing digital databases (available on overheid.nl or

4 For the sake of variety, we use terms such as laws, regulations and rules interchangeably. Strictly speaking, though, this study focuses on formal laws only.
5 The Dutch ministry of Education, Culture and Science is well-known for its excessive production of ministerial guidelines and circulars. However, no database exists that documents these rules. In fact, the ministery does not have any procedures to document or store any class of rules (cf. Donker van Heel et al., 2003), except for formal laws that are required to be published in the Staatsblad.
6 For an overview of the Dutch legislative process for formal education acts, we refer to Postma (1995).

wetten.nl), which are managed by the Staatsuitgeverij, the government's publisher, but which are not historically complete[7]. The digital databases go back to about 1995, which is insufficient for a study of the long-term dynamics of regulation. Moreover, searching for information in the digital archives requires the design of algorithms based on core words. There is a high risk that an incomplete algorithm will lead to an incomplete overview of acts (and particularly of amendment acts). Finally, all digital texts still need to be converted to a word-processing program before the mother file can be used for empirical and statistical analyses.

The relevant domain

Before making a start on data collection, it is useful to present a rough outline of developments in the relevant legislative domain. Table 2 presents a historic survey of the principal acts relating to higher education[8].

The first Dutch Education Act after the French period, dating from 1801, regulated primary education. Acts and regulations on education did exist before then, but we have little detailed information about them. The Dutch education system was shaped in the early 19th century[9], with the first higher education act passed in 1815. The post-war period in any case saw the introduction of eight major acts for this sector, each one replacing in part its predecessors. Thus the most recent major act (the Higher Education and Research Act – or, using its Dutch acronym, the WHW – of 1992) replaced the comparatively recent acts of 1985 and 1986, together with several other regulations, including the Enabling Act regulating access to higher professional education (from 1985: Staatsblad 59) and the somewhat dated Royal Decree of 26 September 1851. The WHW is the focus of the present study because it remains at present the most recent, major formal higher education act.

The next step in data collection involved compiling a list of all amendments to the WHW and earlier acts. The main source was the WHW itself, as published in the Staatsblad. Each time an amendment is made, however minor, the act begins with a detailed summary of all previous amendments with reference to the editions of the Staatsblad in which they appeared. Each amendment act has a specific date on which it appeared in the Staatsblad. For our research, we took this date as the time

7 The studies of de Jong and Herweijer (2004), Page (1998) and Bovens and Yesilgakit (2005) use electronic data files or web-enabled databases as their most important sources of information. These studies present cross-sectional estimates or data for a limited number of years. In some instances, they interpolate the data to obtain estimated time series of national rules. The present study does neither deny the importance nor the validity of these research methods, but takes a complementary perspective. To be able to address the underlying causal mechanisms in the evolution of national rules we attempt to construct actual rather than estimated time series. This implies that we need to count the actual (that is, non-interpolated) number of rules in each year in our observation period. For that reason, we prefer to use hard-copy data sources that offer the opportunity to do so.

8 Strictly speaking, our count relates to acts in the area of higher education and academic research. For the sake of brevity, however, we refer each time only to higher education.

9 Sketching the history of the Dutch education system is beyond the scope of this article (for this, see Boekholt and De Booy, 1987; and Dodde, 1993).

Table 2. Principal Dutch higher education acts

No	Year	Act
01	1815	Royal Decree (King Willem I)
02	1876	First Higher Education Act (Minister Huizenga)a
03	1905	Amendment Higher Education Act (Minister Kuyper)
04	1937	Amendment Higher Education Act
05	1947	Finance Higher Education Act (Minister Gielen)
06	1960	University Education Act
07	1970	University Governance Reform Act (MinisterVeringa)
08	1975	University Education Act
09	1981	Two-Phase Structure University Act (Minister Pais)
10	1985	University Education Act (WWO)
11	1985	Higher Vocational Training Act (WHBO)
12	1986	Implementing Act WWO
13	1986	Implementing Act WHBO
14	1986	Open University Act (WOU)
15	1992	The Higher Education and Research Act (WHW)

Notes:

(a) A Dutch minister is similar to a British secretary of state, and the other way around. Note that the Netherlands is a proportional representation democracy with coalition cabinets. Hence, the Dutch "minister-president" is not as powerful as the British prime minister.

when the act and its amendment took effect. Although in some cases the act itself provides additional regulations and dates in relation to its entry into force, this is less important for our purposes; publication in the Staatsblad completes the institutional process. Each amendment act gives the specific location of the amendment (a section, article, sub-article, paragraph, sub-paragraph, clause, sub-clause, or sentence), and

details the substance of the amendment in question. We verified our list by consulting several other sources, in particular the Schuurmans and Jordens educational editions over subsequent years, together with the information on education legislation from educational specialists in Postma (1995), Zoontjens (1999) and Vermeulen (1999).

Measuring events

There are roughly two ways of determining the size of a national regulation stock: by the space it takes up (in square centimeters) or by the number of sentences, literally. As the correlation between these two measures is probably very high, it will generally make little difference which one is used. Although both methods are laborious, it is somewhat easier to count national regulations in terms of sentences than to measure them in terms of the space they take up. Moreover, there are two complicating factors to be considered. Firstly, counting the sentences in the different editions of the Staatsblad presupposes a constant format in terms of type face, size, margins and line spacing[10]. A random sample for recent years shows this to be correct. Secondly, after acts are introduced in the Staatsblad, some have a new text placement that incorporates all amendments. This text placement forms the new point of reference for all subsequent amendments. The text placement itself, as with the original act, is of course not counted.

The results presented below relate to amendments to the WHW (1992), WOU (1984), WWO (1985) and WHBO (1985), together with the implementing legislation for the WWO (1986) and WHBO (1986). Please note that we did not count the first four main acts themselves – only their amendments. We did, however, count the implementation acts, together with amendments, because these imply an amendment to the original acts. We included every amendment – no matter how minor – to the above-mentioned acts. With the help of the relevant amendment act, each amendment was itself classified into one of three main groups: (i) the creation (birth) of a new rule, (ii) a change to an existing rule or (iii) a repeal (death) of an existing rule. In almost all instances, the amendment can be explicitly classified in one of these ways. For the second group, we introduced a further classification, depending on the ultimate implications in terms of the scale of change. A replacement can have three outcomes: no size implications (e.g., an entire sentence is replaced by a new entire sentence of the same size); an increase in size (e.g., an entire article containing five sentences is replaced with a new article of ten sentences); or a reduction in size (e.g., a sub-clause containing five sentences is replaced with a new sub-clause of two sentences). We decided to record the change events in these sub-categories, so that we could later make a definitive choice, depending on the question that needed answering and the type of analysis.

10 Of course, this applies to the measure in terms of space as well.

2.4 Empirical results

WHW (1992)

Our starting point was the 1992 WHW, which consists of 16 sections (some of which are sub-divided into titles). All articles in this act regulate the organization of the higher education sector in the broadest sense of the word. With this act, the Ministry of Education, Culture and Science sought to regulate almost all aspects, with section 7 as its core. All other sections relate to organization and funding, or ensure the technical implementation of the law itself. First of all, we established the size of the act by counting the number of articles and sentences. The results, presented in Table 3, function as a benchmark measure, among other things to establish the relationship between the number of articles and number of sentences.

Table 3. The size of WHW in articles and sentences

Chapter	Description	Number of articles	Size in %	Number of sentences	Size in %
Chapter 1	General provisions	18	4.43	265	4.42
Chapter 2	Plan and finance	14	3.45	214	3.57
Chapter 3	Consultation	3	0.74	22	0.37
Chapter 4	Personnel	7	1.72	104	1.73
Chapter 5	Supervision	5	1.23	55	0.92
Chapter 6	Curriculum	16	3.94	222	3.70
Chapter 7	Education	68	16.75	1,284	21.40
Chapter 8	Interorganizational cooperation higher education institutes	1	0.25	18	0.30
Chapter 9	Governance and organization universities	85	20.94	1,134	18.90
Chapter 10	Governance and organization higher education institutes	31	7.64	504	8.40
Chapter 11	Governance and organization open universities	29	7.14	431	7.18
Chapter 12	Governance and organization academic hospitals	23	5.67	216	3.60
Chapter 13	Governance and organization scientific research institutes	11	2.71	102	1.70
Chapter 14	Crown and appeal	1	0.25	44	0.73
Chapter 15	Deductions, finance, compensation and penalty clauses	7	1.72	36	0.60
Chapter 16	Temporary and implementation provisions	86	21.18	1,197	19.95
Appendix		1	0.25	152	2.53
Total		406	100.00	6,000	100.00

Table 3 shows that the original WHW contained a total of 406 articles and 6,000 sentences. The size of the individual sections varies enormously. Small sections making up less than one per cent of the total (such as sections 3, 8 and 14, together with their schedules) stand alongside the three large sections (7, 9 and 16), which together account for more than 55 per cent of all articles. The same picture emerges if we measure size in terms of the number of sentences. While at first glance there seems to be little difference between the two measures, subtle differences are discernible, which are set out in detail in Tables 4 and 5.

Table 4. The size of WHW ranked by articles

Chapter	Description	Number of articles	Size in %	Number of sentences	Size in %
Chapter 16	Temporary and implementation provisions	86	21.18	1,197	19.95
Chapter 9	Governance and organization universities	85	20.94	1,134	18.90
Chapter 7	Education	68	16.75	1,284	21.40
Chapter 10	Governance and organization higher education institutes	31	7.64	504	8.40
Chapter 11	Governance and organization open universities	29	7.14	431	7.18
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Chapter 1	General provisions	18	4.43	265	4.42
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Chapter 4	Personnel	7	1.72	104	1.73
Chapter 15	Deductions, finance, compensation and penalty clauses	7	1.72	36	0.60
Chapter 5	Supervision	5	1.23	55	0.92
Chapter 3	Consultation	3	0.74	22	0.37
Chapter 8	Interorganizational cooperation higher education institutes	1	0.25	18	0.30
Chapter 14	Crown and appeal	1	0.25	44	0.73
Appendix		1	0.25	152	2.53
Total		406	100.00	6,000	100.00

Table 5. The size of WHW ranked by sentences

Chapter	Description	Number of articles	Size in %	Number of sentences	Size in %
Chapter 7	Education	68	16.75	1,284	21.40
Chapter 16	Temporary and implementation provisions	86	21.18	1,197	19.95
Chapter 9	Governance and organization universities	85	20.94	1,134	18.90
Chapter 10	Governance and organization higher education institutes	31	7.64	504	8.40
Chapter 11	Governance and organization open universities	29	7.14	431	7.18
Chapter 1	General provisions	18	4.43	265	4.42
Chapter 6	Curriculum	16	3.94	222	3.70
Chapter 12	Governance and organization academic hospitals	23	5.67	216	3.60
Chapter 2	Plan and finance	14	3.45	214	3.57
Appendix		1	0.25	152	2.53
Chapter 4	Personnel	7	1.72	104	1.73
Chapter 13	Governance and organization scientific research institutes	11	2.71	102	1.70
Chapter 5	Supervision	5	1.23	55	0.92
Chapter 14	Crown and appeal	1	0.25	44	0.73
Chapter 15	Deductions, finance, compensation and penalty clauses	7	1.72	36	0.60
Chapter 3	Consultation	3	0.74	22	0.37
Chapter 8	Interorganizational cooperation higher education institutes	1	0.25	18	0.30
Total		406	100.00	6,000	100.00

Table 4 presents an overview of the WHW, ranking the size of its sections in terms of the number of articles, whereas Table 5 does the same for the number of sentences.

Indeed, section rankings based on the number of articles are not the same as rankings based on the number of sentences.

The creation of new regulations

The following sub-analysis relates to the 'birth' of new regulations in higher education. The count totals are listed in Table 6, which shows that the number of rule births in the period 1986 – 2004 fluctuated enormously from year to year. Although there does appear to be a cyclical trend – with fat years following lean ones –, this pattern is not absolutely clear. We would require a longer period of time to establish that. In our period (1986 – 2004), a total of 803 new regulations on higher education were created, with a total size of 7,829 sentences. The average size when enacted was 9.75 sentences per new regulation. Each year during this period, higher education had to contend, on average, with over 42 new regulations, averaging 412 sentences in length. There was not a single year that saw no new rule added to the existing stock of education regulations.

Table 6. The birth of new rules in Dutch higher education

Year	Number	Size	Average size
1986	237	2,503	10.56
1987	15	171	11.40
1988	18	110	6.11
1989	10	56	5.60
1990	35	146	4.17
1991	2	13	6.50
1992	21	320	15.24
1993	15	176	11.73
1994	72	445	6.18
1995	7	68	9.71
1996	33	448	13.58
1997	96	1,193	12.43
1998	49	446	9.10
1999	20	298	14.90
2000	10	52	5.20
2001	7	19	2.71
2002	115	1,070	9.30
2003	13	103	7.92
2004	28	192	6.86
Total	803	7829	9.75

Amendments to or change of existing regulations

The next expression of the institutional rule dynamics concerns amendments to (i.e., changes of) the existing stock of rules. Table 7 distinguishes between amendments that had a neutral effect on size (i.e., number of sentences), and those that led to an increase or decrease.

Table 7. Amendments to existing rules in Dutch higher education

Year	Neutral		Increase			Decrease		
	Number	Size	Number	Size	Average size	Number	Size	Average size
1986	203	0	47	318	6.77	15	119	7.93
1987	9	0	5	30	6.00	0	0	0
1988	17	0	2	12	6.00	0	0	0
1989	14	0	0	0	0.00	0	0	0
1990	18	0	6	70	11.67	16	152	9.50
1991	4	0	0	0	0.00	0	0	0
1992	66	0	4	27	6.75	6	55	9.17
1993	59	0	2	18	9.00	0	0	0
1994	39	0	1	3	3.00	0	0	0
1995	12	0	0	0	0.00	0	0	0
1996	35	0	11	157	14.27	16	207	12.94
1997	42	0	0	0	0.00	3	35	11.67
1998	47	0	4	67	16.75	1	7	7.00
1999	34	0	0	0	0.00	0	0	0
2000	21	0	1	11	11.00	5	25	5.00
2001	77	0	0	0	0.00	0	0	0
2002	93	0	8	48	6.00	3	8	2.67
2003	13	0	0	0	0.00	0	0	0
2004	23	0	0	0	0.00	0	0	0
Total	826	0	91	761	8.36	65	608	9.35

Here, too, the picture is very diverse. Again, in no single year was there no amendment to an existing rule. In the period covered by the study, there were a total of 826 neutral amendments, 91 'positive' amendments (averaging 8.36 sentences), and 65 'negative' amendments (averaging 9.35 sentences). On balance, however, the size of the rule stock rose gradually as a consequence of the amendment process.

Repeals or deaths of existing rules

Finally, Table 8 presents an overview of the pattern of repeals and 'deaths' – a comparatively rare event.

Table 8. Repeals of existing rules in Dutch higher education

Year	Number	Size	Average size
1986	128	530	4.14
1987	3	49	16.33
1988	11	27	2.45
1989	2	4	2.00
1990	13	152	11.69
1991	3	5	1.67
1992	38	116	3.05
1993	5	5	1.00
1994	13	66	5.08
1995	5	5	1.00
1996	11	125	11.36
1997	23	1091	47.43
1998	12	74	6.17
1999	4	11	2.75
2000	11	63	5.73
2001	9	53	5.89
2002	36	184	5.11
2003	4	12	3.00
2004	5	37	7.40
Total	336	2609	7.76

Again, the pattern is a capricious one. During our observation period, a total of 336 higher education regulations were repealed, with an average size of 7.76 sentences – numbers much lower than in the case of rule birth.

The stock of national education regulations

The previous sections demonstrate that all rule events occurred: births, changes and deaths – hardly a surprising finding. More important is the question as to the net evolution of the rule stock. Are more rules created than are repealed, and what is the total impact on the volume of laws if amendments are included? In other words, is the stock of national regulations in the higher education domain declining – the aim of the policy to cut rules and regulations – or is it in fact increasing? Table 9 shows the net changes and the cumulative volume outcomes, taking the year 1986 as the benchmark.

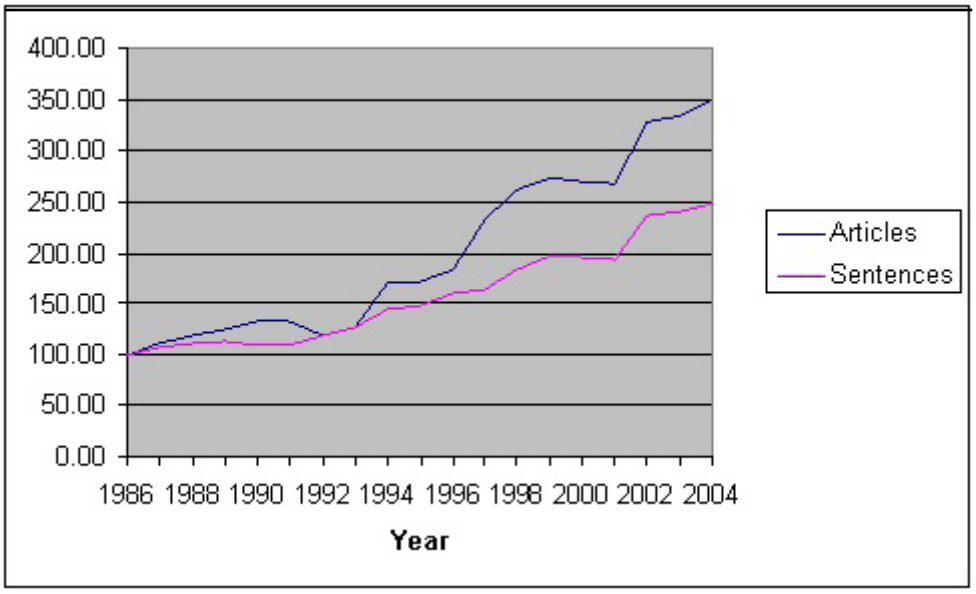
Table 9. The stock of national rules in Dutch higher education

Year	In number of articles		In number of sentences	
	Net mutation	Cumulative stock	Net mutation	Cumulative stock
1986	141	141	2,172	2,172
1987	17	158	152	2,324
1988	9	167	95	2,419
1989	8	175	52	2,471
1990	12	187	-88	2,383
1991	-1	186	8	2,391
1992	-19	167	176	2,567
1993	12	179	189	2,756
1994	60	239	382	3,138
1995	2	241	63	3,201
1996	17	258	273	3,474
1997	70	328	67	3,541
1998	40	368	432	3,973
1999	16	384	287	4,260
2000	-5	379	-25	4,235
2001	-2	377	-34	4,201
2002	84	461	926	5,127
2003	9	470	91	5,218
2004	23	493	155	5,373

The 'net' change is, of course, the balance of new regulation births plus the 'positive' amendments, minus the number of repeals and 'negative' amendments. The neutral amendments can be omitted as they do not affect the size of the rule stock. The cumulative stock in any year is the volume in the previous year corrected for net changes. The conclusion is clear: the rule stock rose sharply in the period from 1986 to 2004, including the years of the second Balkenende government that has as one of its priorities to cut back on regulations.[11] In terms of number of articles, it jumped from 141 to 493, and for number of sentences from 2,172 to 5,373. Based on the figures in Table 9, Figure 1 now shows the growth of the cumulative rule stock in terms of articles and sentences, with 1986 as the base year.

11 Given the enthusiasm of Mark Rutte, the former State Secretary for Education, for 'reform', the end is not yet in sight. We can expect, for instance, that his voucher scheme for higher education will be accompanied by the required legislative force. Here, the idea is that students receive a pre-fixed batch of vouchers – worth the tuition fees equivalent to, say, four years of full-time course work in higher education – that they can spend whenever and where-ever they like, so promoting competition among higher education institutes.

Figure 1. The growth of national rules in Dutch higher education (1986 = 100)



The quantity of higher education regulations has grown since the mid-1980s, only gradually at first, but explosively since the mid-1990s. In less than 20 years, the cumulative stock has risen by almost 250 per cent in terms of articles and almost 150 per cent in terms of sentences. On the basis of our count, we therefore conclude that the rule stock has increased by 8 to 14 per cent annually. This means that the number of formal laws on higher education has doubled in less than ten years. We should also point out that the growth rate base is rising sharply: the period required to double the quantity of such legislation has decreased considerably over time.

An ecology of law

As said, national rules are not often suspended. Although the rules are frequently changed, this does not impact on the national stock of rules. Hence, a thorough comprehension of the underlying forces that foster rule birth is crucially important to the understanding of a nation's rule-producing 'machinery'. Below, we will analyse the three underlying causal processes – i.e., rule density, rule-makers and affinity of rule-makers – that we hypothesize to have determined the birth of national rules in the domain of higher education in the Netherlands (1986-2004).

We measure the dependent variable, rule birth, as a combination of the event and the size of the event. We calculate rule density in each year as a result of 'net' changes to regulations. The 'net' change is the balance of new regulation births plus the 'positive'

amendments, minus the number of repeals and 'negative' amendments. The neutral amendments can be omitted, as they do not affect rule density.

For the Dutch Ministry of Education[12] we counted the number of civil servants in the observation period. For this, we used different sources of information: that is, Knippenberg and van der Ham (1994), the annual financial reports from the Ministry of Education published by the Second Chamber, and recent estimates of the number of civil servants by the Dutch Ministry of Internal Affairs. Since only a very few of these years have no data, we were able to interpolate those values from the surrounding years. We have measured rule-makers as the logarithm of the number of civil servants.

The demographic characteristic concerning the 'fit' of the Minister of Education to the rule-making domain derives from the curricula vitae from the Dutch Ministers of Education. These curricula vitae are all stored and maintained in the Dutch National Parliamentary Archive Institute. Additionally, many of these ministers have bibliographies that describe their personal and professional life in great detail. We have measured 'fit' as a percentage that expresses the amount of experience in education over the entire career that a minister has had prior to becoming minister. As many of the ministers are recruited from the field, most of them already have a given level of experience in higher education, for example, due to a board position at a university. In a few instances, a minister did not have any relevant experience. In such a case, the fit grows from zero in the first year to full-fit in the third year. The reason is that a minister is usually highly educated and therefore will quickly learn about the specific domain at the department. In our observation period, due to elections and turnover of cabinets, different ministers headed the Ministry of Education. These ministers usually changed positions somewhere in the middle of a calendar year. To obtain an annual estimate for a 'representative' minister in a given year with a change of ministers, we calculated tenure in terms of the number of days (including a caretaker period), and used this as a weight for the fit of ministers.

We apply event-history techniques that estimate the significance or non-significance of the hypothesized determinants of the birth of national rules (Blossfeld and Rohwer, 1995). We chose 'year' as the time interval, which resulted in nineteen observations. Since the dependent variable is continuous, we can apply the usual Maximum Likelihood estimation procedure implemented in E-views. The descriptive statistics are provided in Table 10, and the regression results in Table 11.

12 We leave out the 'Culture and Science' extension, for the sake of brevity.

Table 10. Descriptive statistics a

	Mean	S.D.	1	2	3	4
Rule Birth	49.10	136.73	1.00			
Rule Density	108.70	774.81	0.30**	1.00		
Civil Servants (log)	8.03	0.09	0.17*	-0.10	1.00	
Minister Fit	94.80	9.90	0.23*	-0.69**	-0.67**	1.00

(a) * $p < 0.05$, and ** $p < 0.01$. The figures for rule birth and rule density are divided by 1,000 for presentation purposes only.

Table 11. Regression results a

	Rule Birth
Constant	2.62
	(1.86)
Rule Density	0.08**
	(0.03)
Civil Servants	-0.37
	(0.23)
Minister Fit	0.29**
	(0.10)
Adjusted R^2	0.43

(a) Standard errors in brackets; * $p < 0.05$, and ** $p < 0.01$.

Table 10 shows that all values of the correlation coefficients are below 0.80, which is the common threshold value for multicollinearity. We have also inspected our sample for autocorrelation and heteroscedasticity, revealing that these issues did not arise. The adjusted R2 indicator of 0.43 is satisfactory; it ensures that a substantial part of the variation in rule birth is explained by the three covariates. The estimated parameter for rule density is positive, as expected, and highly significant. Our Hypothesis 1, therefore, receives support. The estimated parameter for civil servants is negative, but not significant. We need to reject our Hypothesis 2, and conclude that the 'stock' of civil servants does not determine the introduction of new rules in Dutch higher education. One explanation for this may be that the during our observation period the number of civil servants at the Ministry of Education has been fairly stable. On average, it increased with 0.86 percent per year. The analysis supports our Hypothesis 3: the fit of the minister to the domain of higher education significantly increases rule

births for higher education. To summarize, the empirical results provided support for our explanation of national rule births. The significant results indicate that the effect of rule density is stronger than the effect of minister fit. This confirms our suggestion that the rules-breed-rules mechanism is among the strongest causal forces that determine the birth of new national rules.

2.5 Conclusion

Conventional wisdom concerning national rules in modern Western societies proclaims that there are too many rules and that their number is growing exponentially. This may create an ever-growing bureaucratic system that may impose unnecessary and abundant costs on citizens and organizations (cf. Olson, 1996). Surprisingly, however, quantitative assessments of the evolution of national rules have hardly ever been conducted, leaving many questions ill-understood or unaddressed. Most fundamentally, why are national rules created in the first place? In the context of the evolution of national law, rule birth is one of the most important events, particularly when birth rates exceed repeal rates.

In this paper, we have shed light on the dynamics of the national regulation of higher education in the Netherlands. We have shown that ever more regulations are being added to the existing stock over ever shorter time periods (cf. de Jong and Herweijer, 2004). Within a period of ten years, regulations on higher education have doubled. If the current trend continues, the doubling time will be reduced considerably in the near future. To a certain extent, our results confirm the perceptions in the educational field and of the wider public, with the profusion of regulations in all educational sectors reflecting the commonly-held view that governments suffer from regulation mania. Our study is one of the first to have empirically tested this general hypothesis. However, it is not so much the absolute number of regulations, but rather the rate of growth of these regulations that surpasses our expectations. This growth rate is not in line with the size of the sector. During this period, the number of students increased with 34 per cent and total government expenditures for higher education with 76 per cent (in 2000 constant prices). Hence, the growth rate of higher education rules – 250 per cent in terms of articles and 150 per cent in terms of sentences – far exceeds the growth rate for the size of the higher education sector. This paper offers different explanations for this trend. Our point of departure is that ecological processes together with demographic characteristics of rule-makers determine the introduction of new rules. We expect that both endogenous forces inherent in any population – and thus also within classes of national rules – as well as exogenous forces (hence, specific characteristics of rule-makers) determine rule birth. This view provides the added value of this study for the existing stock of knowledge about national bureaucracy (e.g., Watson, 1985; La Torre, 1997; de Vries, 2000; 2002).

Additionally, we developed a method of counting which – in line with our definition of a national rule – has allowed the construction of time series for rule births, changes and repeals. By doing so, we complement recent studies in our research domain that offer cross-sectional evidence or estimates for a limited number of years for national rules (Page, 1998; Bovens and Yesilkagit, 2004).

On the basis of our data we have estimated a (simple) model that predicts linear relationships between different covariates and rule birth. Overall, our empirical results support our theoretical framework. The stock of rules expands due to its powerful internal dynamics: that is, rules create rules. However, this is not true for the 'stock' of civil servants. We have not been able to provide evidence for the hypothesis that the proportion of new rules aligns with the proportion of rule-makers. One explanation for this might be that the number of civil servants at the Ministry of Education during our period of observation has been fairly stable. The results do indicate that the fit of the minister in terms of her or his educational experience career prior to becoming a minister is important: they become more productive if their affinity with the substance of higher education rules is higher.

There are several policy implications that can be derived from this study, particularly for governments such as the Dutch one whose explicit intention is to reduce the national regulation stock. There are different possibilities for keeping the ecological processes in check. Limiting the introduction of new rules and only amending existing rules to new circumstances would be the most efficient way to reduce the birth rate over a number of years. The assignment of an explicit date for the repeal of a new rule is a similar policy opportunity. This pre-specified end-date for a new rule circumvents the fact that existing rules are almost never annulled. Once rules come into existence they are there to stay. An other opportunity would be that for every new rule that is introduced, a number of existing rules of similar size should be repealed. A related policy consideration would be the introduction of a quota system – i.e., a fixed number of new rules per ministry per year. Such a system could be complemented with a price mechanism. Together, this may introduce a market – or, in the case of more than one ministry, markets – of national rules in which the system of quota and prices may equalize the demand and supply for national rules.

We envision two opportunities for future research, which may help to overcome some of the limitations in our study. First, because of the small size of our sample (that is, nineteen observations) we included a limited number of variables in our regression model. These offer a steppingstone for a full-blown demographic ecology of national rules. Adding to this paper's benchmark specification, many more characteristics and theoretical foundations can and need to be considered in future work. Studies

in the field of parliamentary activism offer helpful insights for this because these studies offer a detailed overview of both information sources as well as decision-making processes for national legislation (Andeweg and Irwin, 2005; Andeweg and Tomassen, 2005). For example, it has been argued that since the 1980s the members of parliament have become much more active – for example, the number of amendments to bills and committees sharply increased – among other things due to better education and payments (resulting in professional politicians) as well as a more volatile political climate (Andeweg, 1992). Taking this into account, future models may include demographic features of cabinets (team composition features such as the number of cabinet parties; age spread and educational background of ministers; power position of cabinets and election events) and other key decision-makers in the legislative process (such as the chairmen of the various educational advisory committees per political party and the many advisory boards that are involved in the legislative process). Of course, all these suggestions require that the window of observation is expanded.

Second, the collection of new data for other rule domains or from other European countries, such as Germany, France or the United Kingdom, would enable the generalizability of our findings to be verified (cf. Pollitt, 2006). Europe offers a natural laboratory for empirical research in the ecology of national rule evolution, since different European countries have produced different evolutionary trajectories in different institutional settings. The collection of new data from other domains allows cross-population dynamics to be tested. For example, it might be that the population of Dutch rules for higher education is a reaction to the dynamics of rules for elementary education.

CHAPTER 3. CHANGING EXISTING NATIONAL RULES

Summary

This study will empirically analyse the evolution of national rule changes for the domain of post-war Dutch higher education. We focus on rule changes because in the life cycle of rules – births, changes and repeals – change is the most common event. Our theoretical framework is mainly based on the organisational ecology and top management demography literatures. We will be integrating these perspectives, adapting them to our research context. In so doing, we focus on rule density, the minister's demographic characteristics (such as age and tenure) and the cabinet's features (e.g., power and turnover) as determinants of rule changes. The empirical results provide significant support for the majority of our theoretical predictions. Overall, the results suggest that the ecological processes are the most robust, followed by the characteristics of the ministers and the demographic features of the cabinets.

Keywords: rule evolution, ecology, minister characteristics, cabinet characteristics

3.1 Introduction

Today, virtually all civilised economies have an advanced legal system in terms of rule density and its accompanying juridical institutions. Much of our contemporaneous economic and social life is organised in and around national rules. However, in many countries there is an ongoing process of demand for and supply of national rules that never seems to reach an equilibrium. The key aim of this paper, therefore, using the example of post-war Dutch higher education, is to understand the underlying causal processes that determine rule dynamics at a nation-state level, particularly the processes that underlie changes in national rules. In the life cycle of rules – births, changes and repeals – change is an important but often neglected event because they are often difficult to identify. A rule birth generates a new element in the rule system and, likewise, a rule repeal removes an existing element from the system. These events 'shock-wise' alter the rule system. Rule changes, however, transform rule systems more incrementally, in a gradual and persistent way.

Another particular feature is that they take place within the framework of existing rules and, therefore, the prior history of a rule emerges as a possible factor in its change (March, Schulz & Zhou, 2000): whereas any one rule has only one birth, it can have a number of revisions over its lifetime. In other words, a rule may accumulate a history of revisions, and that history may affect its subsequent development. Finally, policy-makers often take incremental decisions not only because there are few opportunities to do otherwise, but also because rules are often the result of a social interaction process involving intricate negotations and compromises (Lindblom, 1959; Foppen, 1989). Incrementalism offers checks and balances that warrant the use of up-to-date knowledge and that safeguard the positions of all actors and parties that are

involved in the decision-making process. Indeed, Foppen (1989, p. 27) concludes that incrementalism in particular characterises Dutch educational policy.

Our subject of study, the dynamics of national rule change, is addressed from a perspective similar to the evolutionary traditions in economics (North, 1990; Benson, 1998; Whitman, 2002) or biology (Masters and Gruter, 1992). In its innate domain (that is, the law), ever since the early twentieth century there has been an ongoing debate on whether and how national rules evolve (Kocourek and Wigmore, 1918; Gager, 1920). On the one hand, there are those who suggest that law does evolve, and that this is an organic process in and of itself (Luhman, 1981) with a key role for rule-makers (Watson, 1987). On the other hand, the opponents of this view agree that there are changes in law, but reject that this necessarily implies a 'succession of stages' with 'progress' resulting in 'complex systems', but rather stress autonomous forces (Frier, 1986). La Torre (1997), for example, concludes that "one of the motors for the transformation of law is just the fact that the rules it is made up of change through their application" (1997, p. 347).

National rules are also often equated with 'red tape', one of the key concepts in studies of public administration (Kaufman, 1977). Red tape is frequently considered to be a pathology because it usually implies excessive or meaningless paperwork and unnecessary rules or procedures (Bozeman, Reed and Scott, 1992). Although some point to the beneficial advantages of red tape (Landau, 1991), many others have tried to identify and understand the causes of so-called pathological rules. Bozeman (2003), for instance, classifies the reasons for red tape into 'rules born badly' and 'good rules gone bad'. The causes for the former category include: (1) an inadequate comprehension of the means and ends of rules by rule-makers; (2) over-control – that is, formalization as a response to uncertainty and ambiguity; and (3) compromise and democracy, with too many irrelevant parties participating in the rule-making process. Compromise and democracy may imply rule drift and entropy, changes in implementation and the functional object of a rule, and misapplication. As Bozeman argues, these factors may lead to the evolution of otherwise good rules into red tape. The key theoretical foundations of our study derive from the organisational ecology and top management demography literatures. Both literatures reflect well-established traditions in the management and sociology domains. Organisational ecology studies the evolution of populations of organisations over time, focusing on the key organisational events of organisational birth, growth, decline and death. Top management demography focuses on the behaviour and performance of people within organisations, particularly top management teams. Following van Witteloostuijn (2003) and van Witteloostuijn and de Jong (2007), we will argue below that both traditions can be nicely combined to develop a theory of the evolution of national

rules, arguing that the process of changing national rules is – at least in part – driven by an internal evolutionary dynamic (organisational ecology) in interaction with features of ministers and cabinets (top management demography).

We purposely adopt this specific interdisciplinary and multilevel approach in the context of our aim to contribute to a deeper understanding of national rule changes. By doing so, we attempt to align with extant theories of the evolution of law. Many law studies, for example, have addressed the content of rules and the applications thereof within a country-specific constitutional and legal context. Of course, the importance of ministers and cabinets in the law-making process is well known, and has been addressed extensively elsewhere. However, we seek to provide theoretical foundations for these perspectives that result in testable hypotheses. To be sure, many of the theoretical foundations that we use – as well as the associated pieces of prior empirical evidence we will refer to – are designed in order to understand the impact of manager and top management team characteristics in for-profit (that is, business) organisations. Of course, the application of these theoretical perspectives to law-producing institutions requires some care because of the inherently different nature of government vis-à-vis for-profit organisations. For one thing, many of the challenges that business managers and top teams face – and which are likewise explicitly addressed in the top management demography literature – are not present in government bodies. Standard business challenges such as the size, composition and structure of the top management team are not much of an issue in the context of our study because they are, by and large, simply institutionally given constants. Beyond that, the application of insights from the top management demography literature to national government agencies seems to be a very helpful research approach for understanding the underlying dynamics of national rules. It therefore warrants an application in studies of public administration.

Taking the above into account, our key premises for this study are threefold. First, we perceive that national rules change autonomously and are changed by rule-makers who operate within rule-making groups, which are embedded in an institutional environment. At any point in time, each of these has specific characteristics that are determined by path-dependent processes. Second, the underlying causal processes of rule changes manifest themselves in observable regularities. In other words, histories of written national rules have general statistical properties, developing in systematic ways. Third, the lack of empirical work in existing research on national rules leaves ongoing debates unsettled (with the notable exception of Jennings and Schulz, 2004). In this paper, we will attempt to do precisely this: to quantitatively analyse national rule changes from an intertemporal perspective.

In the next section, we will provide the theoretical foundations of our study. Moreover, we will specify hypotheses about the drivers of changes to national rules, combining insights from organisational ecology with those from top management demography. After that, we will introduce this study's research methods, addressing such issues as the counting of national rules and the measures of the variables. Then, we will present our empirical evidence. Additionally, we will offer some qualitative reflections on our results. Finally, we will conclude with an appraisal.

3.2 Theory and hypotheses

Ecological Processes

An ecological approach towards national rule changes will be our point of departure. Within organisation studies, the ecological foundations of dynamic forces have increasingly taken centre stage. The density-dependence effect is one of the leading theoretical perspectives in a domain of organisation studies that is known as organisational ecology (Hannan and Freeman, 1989; Hannan and Carroll, 1992). Two density-dependence hypotheses are important (Baum and Oliver, 1992). The first hypothesis relates to competition and vital rates, predicting negative density dependence for birth rates. This mechanism is well established in economics: if the number of organisations is increasing, organisational entry rates will be depressed, since large-number competition will reduce profit opportunities and survival rates. The second hypothesis involves legitimation and vital rates, suggesting positive density dependence for birth rates. This is the well-known sociology of institutionalism, which argues that an organisational form's societal acceptance increases with the frequency at which this form is observed in the real world. Together, competition and legitimation produce an inverse U-shaped density-dependence hypothesis for birth rates (and, applying mirror-image reasoning, a U-shaped relationship for death rates). Empirical evidence is reported for a wide variety of organisational populations, varying from telephone companies and semiconductor producers to accountancy firms and labour unions (Carroll and Hannan, 2001).

This argument has been applied to the evolution of formal organisational rules (Zhou, 1993; Schulz, 1998; March, Schultz and Zhou, 2000). In this context, two alternative theories can be applied. On the one hand, Weberian and post-Weberian bureaucracy theory argues that rules breed rules – that is, rule application and rule production offer legitimation for bureaucracies. The optimistic interpretation of bureaucracies suggests that a process of ongoing adaptation of an organisation's set of rules keeps the latter well suited to coordinate teamwork and resolve conflict. The pessimistic view argues that bureaucracies embody a rule-making machine that operates in a manner largely independent of the outside world, producing red tape just for the sake of producing red tape. Both theories, however, predict that the density-

dependence effect will be positive. On the other hand, organisation learning theory suggests that an organisation changes rules over time in response to performance information concerning the effectiveness of current rules in dealing with emerging organisational issues. That is, the larger the rule density, the greater the likelihood that new organisational issues can be covered by stretching the interpretation of an established rule or by changing an existing rule. After a certain period of time, though, the density-dependence effect turns negative.

Our first hypothesis reflects these ecological processes, but within the population of national rules in this case (cf. Jennings and Schulz, 2004). On the one hand, national rules are adapted – that is, changed – in response to new issues arising in society. As societies evolve along a path of increasing complexity, there is a growing need for amended rules that target these new complexities. The legislation cycle has a powerful internal dynamic. The social organisation of rule amendments resembles a classic Weberian bureaucracy: the growth in rule changes increases as the volume of rules increases. Old rules are seldom abolished altogether; most often, they are simply amended. On the other hand, rule-making bodies will learn from sorting out rules that work well from those that do not. Over time they will abolish rules that are ineffective. Learning produces a set of rules that are capable of absorbing new issues, thus reducing the need for amendments to rules. The larger the density of rules, the greater the likelihood that an existing rule can deal with emerging issues. Taken together, these opposite effects resemble organisational ecology's overall density-dependence argument. Hence, we arrive at
Hypothesis 1 (H1): There is a □-shaped relationship between rule density and rule changes.

Government ministers and rules

Recent organisation studies, following human capital theory (Becker, 1964), highlight differences in characteristics of managers and management teams in order to explain heterogeneity in organisational performance (Finkelstein and Hambrick, 1996). Senior executives vary in their experiences, capabilities, values and personalities. These differences cause executives to differ in their awareness and aspiration levels. That is, some executives see alternatives that others do not and align their strategy accordingly for the benefit of their organisation. Hambrick and Mason (1984), for example, propose that senior executives make strategic choices on the basis of their cognitions and values, implying that the organisation becomes a reflection of its top managers. Numerous studies have examined and found significant associations between executive attributes and organisational performance (see, for example, Murray, 1989; Preisendörfer and Voss, 1990; Brüderl et al., 1992; Halebian and Finkelstein, 1993; Pennings et al., 1998). By the same token, we propose that in

a statute-changing context, the distribution of the background features of cabinet ministers is likely to matter (van Witteloostuijn, 2003; van Witteloostuijn and de Jong, 2007).

Ministerial Age

Government ministers in general and, in our context, especially those in education consider the production of legal rules as important trophies for their career (Vermeulen, 1999; Zoontjens, 1999). In the Dutch setting, a Minister is higher in rank than a so-called Staatssecretaris (State Secretary). Given the lengthy decision-making process, many ministers start their initiatives in the first year of their tenure and collect the trophies in terms of new or amended rules in their final (in the Dutch setting, fourth) year. Over the years, amendments have become increasingly important because the introduction of new rules has become almost an impossible achievement within a minister's tenure. Nonetheless, some ministers seem to be more successful at this than others. Four demographic variables have been selected for this study: age, departmental tenure, industry experience (or 'fit') and religious preference. In line with many demographic studies, we have selected features for which we can collect information over long periods of time. The first, age (or 'tenure in life': Hambrick and Fukutomi, 1991), is one of the most salient human features that provide a link between individuals (Lawrence, 1988). Age is an important attribute because it reflects a person's background and personal experience outside the employing organisation (Wiersema and Bird, 1993). These experiences influence attitudes and beliefs. Age, according to human capital theorists, has a concave relationship with an individual's productivity (Bates, 1990). The productivity of young workers is low, but rises rapidly as their human capital increases and stabilizes as they cease to invest in training. Middle-aged workers are believed to be the most productive, whereas older workers may become less productive due to the depreciation of their skills or a lessening of effort. In line with this, we expect to find a non-monotonic relationship between the age of a minister and rule changes. So we suggest

Hypothesis 2 (H2): There is a □-shaped relationship between rule changes and the age of the minister.

Ministerial Tenure

Tenure is considered to have the best theoretical basis of all demographic variables (Pfeffer, 1983). Finkelstein and Hambrick (1990) showed that when using several measures of managerial tenure – that is, tenure in position, top management team, industry and firm – firm tenure was especially highly correlated with the other tenure measures. Therefore, firm tenure is considered to be the central indicator of the broad concept of tenure. Like age, firm tenure is generally predicted to have a concave relationship with productivity. On the one hand, firm tenure enhances productivity

because the employee learns about the specific rules, norms and values that prevail in the firm (Pennings et al., 1998). On the other hand, the more time a person spends in the same firm, the more (s)he becomes committed to established policies and practices (Finkelstein and Hambrick, 1990). In general, commitment to a status quo increases adversity to risk-taking. That is, long-tenured managers are risk averse because they have more to lose than to gain from changing an existing (equilibrium) situation. Long tenure may make managers overconfident, resulting in rigidity and resistance to reorientation (Miller, 1991). Hence, we expect to find a non-monotonic relationship between the departmental tenure of a minister and rule changes. Hence, we have

Hypothesis 3 (H3): There is a ☐-shaped relationship between rule changes and the departmental tenure of the minister.

Ministerial Experience

Our next demographic feature relates to prior experience – specifically, the 'fit' of the manager to the domain or organisation under consideration. The majority of all managers are specialists – that is, they have spent the greater part of their careers in one particular functional area, such as marketing or finance. This functional background, or any other biased experience, determines their decision-making behaviour in general, but especially so when a manager is confronted with abundant and complex information, and has to deal with the information under time pressure (Finkelstein and Hambrick, 1996). For example, the manager of a firm who has experience in finance tends to favour cost-cutting strategies in general, but especially so in times of economic crisis when short-term decisions – e.g., to prevent bankruptcy – need to be taken. Hence, executives will selectively perceive (observe, evaluate and interpret) strategic stimuli in line with their functional experiences, and will act accordingly. In a statute-making context, the distribution of personal demographic characteristics in terms of functional background is also likely to matter (van Witteloostuijn, 2003). That is, an education minister with a great deal of education-related experience is more likely to change educational rules than her or his counterpart with unrelated experience. Therefore, we formulate

Hypothesis 4 (H4): Rule changes increase in proportion to the affinity of the minister with her or his department's domain.

Ministerial religion

The final attribute, the religious inheritance and preference of the minister, allows our model to be adapted to the specificities of the Dutch rule-making setting. Religion generally is recognized as a source of ethics and values. Ever since the seminal publication by Weber (1905), it has generally been acknowledged that religion can affect the economic attitude of individuals (Iannaccone, 1998; Guiso et al., 2003).

There are, however, important differences between religions as to rule-obeying and rule-making attitudes – irrespective of the party affiliation of the minister (Janis and Evans, 1999). The Dutch education ministers have different religious preferences, and we would expect this to determine the inclination to change rules as well. Protestant ministers and cabinets envision an important role for central government with a paternalistic (parent-child) perception supported by a strong work ethic and a law-abiding citizenry. They have a strong inclination to solve economic and social issues through national rules or, when situations change, to change national rules accordingly. Catholics, on the other hand, are less obedient to central government – they organise social life in local communities – and tend to ignore and downplay the importance of national rules (cf. Putnam, 1993; Inglehart, 1999). Taking the above into account, we have

Hypothesis 5 (H5): Rule changes are negatively related to a minister's Catholic background.

Government Cabinets

Cabinet Tenure

Alongside the demographic features of ministers, we would suggest that the demographic characteristics of cabinets as a whole also determine national rule changes. In fact, Hambrick (1994) argues that the characteristics of top management teams are consistently better predictors of organisational outcomes than the characteristics of managers alone. In line with the manager-minister analogy, we apply a top management team-cabinet equivalence. In many respects, the cabinet represents the top management team or governance board of a country. That is, decisions within cabinets concerning changes in national rules resemble decision-making processes within the top management team of firms with respect to strategic decisions such as those concerning market entry, alliances or downsizing. It is accepted that changes in national legislation are often the outcome of a negotiation process between political parties represented by ministers in the cabinet. For example, the 1917 revision of the Dutch constitution that arranged equality between religious and non-denominational education was accepted by the Liberals, who had long opposed it, only because the Christian Democrats accepted the legislation for universal suffrage. In line with the demography literature concerning top management teams, we will include tenure, power, turnover and homogeneity as key demographic characteristics of cabinets within our theory of national rule changes.

The tenure of cabinets and of ministers can vary because the same minister, for example, can join two different successive cabinets. For that reason, we have included both concepts of tenure in our theoretical framework. It is rare for a Dutch cabinet to complete its four-year term of office. Since 1848 the average term – not counting

transitional governments – has not been much more than two and a half years. As far as cabinet tenure is concerned, for reasons similar to those for ministers, we are suggesting a non-monotonic relationship to rule changes. Therefore we predict
Hypothesis 6 (H6): There is a □-shaped relationship between rule changes and the tenure of the cabinet.

Cabinet Power

In the theory of strategy-making process, power is given a central position (Pfeffer, 1981). Strategic decisions are often unstructured and ambiguous, and therefore invite the use of power vis-à-vis different agents who favour their preferred choices (Eisenhardt and Bourgeois, 1988). Recent demographic studies emphasize the role of power in top management teams as a group – either in terms of power relationships or power distributions – rather than the power of the top individual alone (i.e., the manager). They argue more specifically that this is a relative concept that can only be understood within a specific context (Finkelstein, 1992; Boone et al., 2005). In the current study, the context of cabinet power (our top management team perspective) is their position in the Second Chamber (which is similar to, e.g., the British Lower House). The central essence of the power phenomenon is the ability to cause someone to do something they would not have done otherwise (Gaski, 1984). Of course, power takes centre stage in the political arena: cabinets have a legislative right to exert influence due to election results, and this is reflected in their (relative) power position in the Second Chamber. This basis for legitimacy offers the strongest source for the exercise of power, ranking above other sources of power such as rewards, coercion and expertise. In the Netherlands, rule changes must be approved in a lengthy parliamentary decision-making process involving a Second Chamber and a First Chamber. In the Dutch system, it is almost impossible for any one party to obtain a parliamentary majority. Therefore, the cabinets always involve a coalition of multiple parties. If a cabinet is supported by a large majority in the parliament, and thus has a strong legitimate power position, rule changes will be more likely to pass smoothly through the decision-making process. Therefore, we provide
Hypothesis 7 (H7): Rule changes are positively related to the power position of the cabinet.

Cabinet Homogeneity

Next, we consider the composition of the cabinet in terms of the (dis)similarity of the participating political parties. The key argument is that compositional characteristics influence the dynamics within a top management team (that is, the cabinet), making it particularly relevant for understanding outcomes (that is, rule changes) involving the top management team (Boone et al., 2005). Thus, the extent of heterogeneity among cabinet party members, it is argued, determines group dynamics, which in turn

affects cabinet team decisions and performance and, ultimately, cabinet outcomes in terms of rule changes. The consequences of team heterogeneity are mixed. On the one hand, heterogeneity may be beneficial as this implies a greater diversity of perspectives and exposure to more sources of information. Sørenson (1999) argues, therefore, that heterogeneity may be particularly beneficial in complex environments where creativity and innovation are required. However, the important drawbacks of heterogeneity are that diversity hinders communication, reduces cohesion and interferes with co-ordination (Boone et al., 1997). If not managed properly, this may in turn slow down decision processes, and increase the occurrence of conflicts and power struggles. The ideological diversity of the cabinet is often considered to be an important explanation for premature termination (Warwick, 1992). Therefore, the so-called facilitation perspective, which argues in favour of homogeneity, posits that similarity among team members – in terms of values and attitudes – enhances group cohesion and social integration, which in turn facilitates communication frequency and decision effectiveness. Most empirical studies support the beneficial effects of homogeneity in team composition. In line with this, we expect that similarities between political parties in a cabinet foster group solidarity and cohesion, leading to greater integration and a higher level of communication, along with better outcomes. So, we formulate

Hypothesis 8 (H8): There is a positive relation between cabinet homogeneity and rule changes.

Cabinet turnover

Finally, we will be including a momentum argument. The established research tradition concerning cabinet durability offers numerous explanations for the termination of cabinets (see Grofman and Roozendaal, 1997, for a helpful overview). Among other things, these studies include simple explanations – for example, cabinet crisis, elections, death or serious illness of top cabinet members, or voluntary resignation of the cabinet – as well as more advanced considerations such as the characteristics of party strength in the legislature, the ideological structure of party competition or cabinet composition, along with the institutional features of the political process. Likewise in the upper-echelon literature, turnover within a top management team is a significant strategic event (Wiersema and Bird, 1993). Various empirical studies have revealed that executive or team succession can lead to fundamental changes in the strategic activities of firms (Boone et al., 2005). In general, a new executive or top management team will feel pressure to show promptly that they were the right choice for the position. The same applies to new incoming cabinets, especially after elections, because then the new entry of parliament members and ministers occurs in one go (van Witteloostuijn, 2003). New cabinets are looking to prove that they have new energy and that they have the will to change current situations or

resolve lacunas of prior administrations in order to improve the position of their electoral public. This implies much statute-changing activity in the early periods of new cabinets. This gives
Hypothesis 9 (H9): The rate of rule changes increases after cabinet turnover.

3.3 Methods

Critical unit of research

For national regulations, we can distinguish laws in the formal sense (as laid down by parliament), orders in council and royal decrees (as determined by the cabinet), in addition to ministerial guidelines and circulars (as established by a specific ministry). The regulations can be categorized according to their legal status, which is connected with the body establishing them. Laws in the formal sense have the highest status; they are laid down by parliament, and hence pass through the entire – and time-consuming – institutional legislative process. For this reason, we have opted in the present study for an examination of the dynamics of formal laws; in this case, the focus has been on legislation relating to higher education by extending (both in terms of the time window and the number of variables) the dataset used in van Witteloostuijn and de Jong (2007).

An act is a collection of national regulations that are created during the institutional process (Postma, 1995). A formal law has a particular structure, with the text being divided into titles, sections, articles and sub-articles, paragraphs and sub-paragraphs, and clauses and sub-clauses. This division into different levels is an important one. Each section of a law deals with part of the domain in question. The literal text of a law – that is, the lowest level within the structure of the act – codifies the national regulations and the outcome of the national institutional decision-making process for a specific domain. Our focus is on the lowest level of text in a formal law (frequently a clause or sub-clause, but often a paragraph or sub-paragraph) as the critical unit of study. This allows us to chart the dynamics of national regulation change at the most detailed level, thus maximizing the flexibility of the resulting database.

In this context, we should point out that because entire acts, sections or parts are seldom amended, this disaggregated level of analysis is critical for empirical studies of the underlying dynamics of national regulation. The results of the institutional dynamic are usually expressed at the most detailed level of legislation – namely the text. In other words, if we record amendments at too high a level of aggregation, we run a greater risk of missing the underlying dynamic, notwithstanding the fact that this dynamic most definitely does exist. Finally, we should add that not all laws are structured in the same way. What is more, even within the same domain – such as higher education – the structure often changes with successive laws. Consistency can

only be guaranteed at the most detailed level of regulation, since each law contains text at that level.

The source of national regulations – in our case, higher education acts – is the many editions of the Staatsblad, which publishes all formal laws, together with all accompanying changes. We prefer these hard-copy archives to the existing digital databases (available on www.overheid.nl or www.wetten.nl), which are managed by Staatsuitgeverij, the government publisher, but which are not historically complete. The digital databases go back to about 1995, which is insufficient for a study of the long-term dynamics of regulation change. Moreover, searching for information in the digital archives requires the design of algorithms based on core words. There is a high risk that an incomplete algorithm will lead to an incomplete overview of acts (and particularly of amendment acts). Finally, all digital texts would still need to be converted to a word-processing programme to create a mother file that can be used for empirical and statistical processing.

Some historical facts about the education system in The Netherlands

Education, and its accompanying national rules, has been one of the first and most important vehicles that has not only marked the beginning of the present-day Netherlands, but has also shaped its political and institutional landscape. In fact, the very first Dutch national rule in 1801 was the one declaring education to be a concern of the nation state (Dodde, 2000; Boekholt et al., 2002). For the Dutch higher education system, it is natural to make a distinction between the pre- and post-Second World War period. Although the foundation of Dutch higher education rule system can be traced back to the pre-war period – the first national law for higher education was introduced in 1876, and amended in 1905 and 1920 – much of the content and organisation was developed in the post-war period, with the 1960 law on higher education as an important point of departure (Zoontjens, 1999). From that point on, the differences between primary, secondary, adult, vocational, special and higher education have been firmly established. For this reason, our window of observation concerns the 1960-2004 period. In terms of employment and government expenditure, higher education nowadays is one of the most important sectors in the Netherlands. It is well known for its abundant national rules and for being a sector that, increasingly, is seen as in need of deregulation. Thus, higher education is a specific domain where changes in national rules should show up.

The total number of all educational rules is unknown even at the Ministry of Education itself (cf. Donker van Heel et al., 2004). The first step in data collection has involved compiling a list of all amendments to the post-war acts. The main sources were the acts themselves, as published in the Staatsblad. Each time an amendment

is made, however minor, the act begins with a detailed summary of all previous amendments with reference to the editions of the Staatsblad in which they appeared. Each amendment act has a specific date on which it appeared in the Staatsblad. For our research, we took this date as the time when the act and its amendment took effect. Although in some cases the act itself provides additional regulations and data concerning its entry into force, this is less important for our purposes: after all, publication in the Staatsblad completes the institutional process. Each amendment act gives the specific location of the amendment (a section, article or sub-article, paragraph or sub-paragraph, clause or sub-clause, or sentence), and details the substance of the amendment in question. We verified our list by consulting several other sources, in particular the Schuurman and Jordens educational editions (which are the most important sources of information for education acts), together with the information on education legislation from educational specialists in Postma (1995), Zoontjens (1999) and Vermeulen (1999).

Measuring Rule Change Events

With regard to measuring our dependent variable – that is, rule change – it is important to consider the size of a rule event. There are roughly two ways of determining the size of a national regulation: by the space it takes up (in square centimeters) or by the number of sentences. As the correlation between these two measures is probably very high, it will generally make little difference which one is used. Although both methods are laborious, it is somewhat easier to count national regulations in terms of sentences than to measure them in terms of the space they take up. During the data-collection process, we monitored the layout of the Staatsblad. Although differences in terms of typeface, size, margins and line spacing appeared, this only marginally affected the average number of characters on one page.

With the help of the relevant amendment act, each amendment was itself classified into one of three main groups: (i) the creation of a new rule, (ii) a change made to an existing rule or (iii) the repeal of an existing rule. In almost all instances, the amendment can be explicitly classified in one of these ways. For the second group, we introduced a further classification, depending on the ultimate implications in terms of the scale of change. A replacement can have three outcomes: no size implications (for example, an entire sentence is replaced by a new entire sentence of the same size); an increase in size (for example, an entire article containing five sentences is replaced by a new article of ten sentences); or a reduction in size (for example, a sub-clause containing five sentences is replaced by a new sub-clause of two sentences). We used this first category as the measure for our dependent variable – Rule Change – because, compared to the other two categories, this was the 'purest' measure of a rule change. To some extent, the other two categories can be considered as rule

birth and rule repeal, respectively. We used this information to measure the density of national rules (see below) – one of the variables that was hypothesized to explain rule changes.

Measuring Independent and Control Variables

Rule Density

We measured 'rule density' in each year as a result of 'net' changes to regulations. The 'net' change is the balance of new regulation births, plus the 'positive' amendments, minus the number of repeals and 'negative' amendments. For each event, we adjusted our measures for the size of the event. Of course, the 'neutral' amendments – those that measure rule changes or, in other words, our dependent variable – do not affect the size of rule density.

Ministers

The demographic characteristics of the ministers – age, departmental tenure, industry experience (or 'fit') and religious preference – were derived from the curricula vitae of all post-war Dutch ministers of education. These curricula vitae are stored and maintained in the Dutch National Parliamentary Archive Institute. In addition, many of these ministers also have published bibliographies that describe their personal and professional life in great detail. All demographic variables are actual annual estimates, and thus not average values or standard deviations over a number of years. We measured the Minister's Age at the start and at the end of the period, and calculated the mean value for each active year. The active period starts with the official inauguration of the cabinet and ends with the official resignation of the cabinet (which is known at the day level). We measured Departmental Tenure in terms of the number of days a minister officially headed the department. The caretaker period was thus included in the organisational tenure of the minister. We measured Educational Fit as a percentage that expresses the amount of experience in education throughout the entire career that a minister had prior to starting as minister. As many of the ministers are recruited from the field, most of them already have a given level of experience in higher education – for example, a board position at a university. In a few instances, a minister did not have any relevant experience. In such a case, the fit is then assumed to grow from zero in the first year to full fit in the third year. The reason for this assumption is that a minister is usually highly educated, and will therefore quickly learn about the specific domain of her or his department. Religious preference was measured by a dummy variable – Minister's Religion – that equals 1 for ministers who indicate a Catholic church membership and 0 otherwise (the overwhelming majority had a Protestant background). In our observation period, the Dutch Ministry of Education was headed by sixteen different ministers due, among other things, to elections and turnover of cabinets. These ministers usually changed

positions during a year. To obtain an annual estimate for a 'representative' minister in a given year within a year of taking office, we calculated the tenure in terms of the number of days per year per active and succeeding minister (including the caretaker period), and used these as weights to obtain annual estimates for the other demographic characteristics.

Cabinets

The demographic characteristics of the Dutch cabinets in the 1960-2004 period were obtained from the Dutch National Parliamentary Archive Institute as well. All demographic variables were actual annual estimates, and thus not average values or standard deviations over a number of years.

Cabinet tenure: we measured 'Cabinet Tenure' in terms of the number of active days of an administration. The active period starts with the official inauguration of the cabinet and ends with the official resignation of the cabinet (which is known at the day level), and includes the caretaker period.

Cabinet power: we measured 'Cabinet Power' position as the number of seats the ruling coalition's parties have in the Second Chamber, which has 150 seats available. All cabinets in our observation period had at least a minimum majority position (that is, 75 seats plus one), but they often had more seats and thus held a greater power position.

Cabinet homogeneity: we measured 'Cabinet Homogeneity' as one minus the mean squared Euclidean distance of cabinet parties in terms of the political spectrum and the number of seats in the Second Chamber. The authors agreed upon the location of all political parties along a "left-right" dimension, which produced a list that was double-checked against historical evidence.

Cabinet turnover: we measured 'Cabinet Turnover' with a dummy variable that equals 1 when a cabinet is succeeded by another administration, and 0 otherwise. In our observation period, we observed eighteen different cabinets. Usually, these cabinets changed during a year. To obtain an annual estimate for a 'representative' cabinet in a given year with a change of cabinets, we calculated the tenure in terms of the number of days per active and succeeding cabinet (including the caretaker period), and used these as weights in order to obtain annual estimates for the other demographic characteristics.

Timing to take account of delays

Timing is an important issue in ecological studies. Although a priori there are few theoretical arguments concerning whether or not delayed effects will emerge and how

long these will take before they materialise, conventional wisdom suggests that many of our variables may have contemporaneous as well as delayed effects on national rule changes. The impact of cabinets and ministers, for example, may depend on the date of the cabinet or minister turnover during the year. Also, we measured the rule events from publications in the Staatsblad. The administrative process takes several months before a decision concerning national rules is published. For that reason, we included both contemporaneous and one-year delayed models in the empirical part below. Additionally, for the year 1985, we added a dummy variable – 'Dummy 1985' – in all models (that is, 1 in 1985 and 0 otherwise). In our observation period, the number of events in terms of rule births, changes and repeals fluctuated. In 1985, however, there was an absolute peak in the births of new rules in terms of events and size due to the introduction of substantive new laws all at once during this year. This was a unique event. The data also showed that with a one-year delay, there were peaks in rule changes and repeals. The dummy variable was included in all models in order to control for this peak.

Event History Analysis

Many of the testing exercises in the next section will apply event history techniques (Blossfeld and Rohwer, 1995). These techniques induce statistical regularities as to the pattern of events from time series. In organisational ecology, this methodology has been used extensively to estimate the determinants of, e.g., organisational change or exit. We chose 'year' as the time interval, which resulted in forty-five observations. We applied the negative binomial regression model (which generalises the Poisson model by introducing an individual unobserved effect into the conditional mean, and allows for over-dispersion in the data). We adopted the robust Quasi-Maximum Likelihood (QML) estimation procedure – with Huber and White specifications – implemented in E-views as this produced more consistent estimates of the parameters of a correctly specified conditional mean than the Maximum Likelihood (ML) estimation procedure.

We estimated six models. In advance, two important remarks must be made. First, as indicated above, because we are agnostic about the time it takes before any effect materialises, we separately estimated models with contemporaneous and one-year lagged variables. Second, as such, the length of our time series is not that bad at all (n = 45) – to the contrary. However, the number of observations is too limited to allow for sufficient statistical power to estimate a comprehensive model that includes all our explanatory variables. Since, to the best of our knowledge, our study is the first of its kind, we decided to run a series of smaller models to explore the suitability of the approach we propose here. Thus, Models 1 and 2 relate to H1, with Model 1 including contemporaneous density variables, and Model 2 one-year delayed ones. Subsequently, Models 3 and 4 pertain to specifications with the minister-level

variables regarding H2 to H5, again using contemporaneous (Model 3) and one-year delayed (Model 4) variables. Finally, Model 5 (contemporaneous) and Model 6 (one-year delayed) estimate the effect of the cabinet-level independent variables relating to H6 to H9.

3.4 Empirical results

Sample Characteristics

The data shows that all rule events did occur. In the observation period, we used 178 amendment laws to count the different rule events. Overall, we counted 1,815 rule births with a total size of 22,086 sentences (12.17 average size per new rule), 959 'neutral' rule changes, 123 'positive' changes with a total size of 955 sentences (7.76 average size per 'positive' change), 76 'negative' changes with a total size of 671 sentences (8.83 average size per 'negative' change), and 383 repeals with a total size of 2,734 sentences (7.14 average per repeal). As a result, the stock of national rules for Dutch higher education increased by more than eight hundred per cent in the post-war period (taking 1960 as the benchmark year). The descriptive statistics are presented in Table 1.

Table 1. Descriptive Statistics

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Rule Changes	21.31	35.62	1.00														
2 Rule Density (1000)	10711.61	10679.86	0.50 **	1.00													
3 Rule Birth (1000)	95.77	409.47	0.08	0.06	1.00												
4 Positive Changes	426.13	2232.20	0.79 **	0.14	0.18	1.00											
5 Negative Changes	183.31	651.94	0.37 **	0.26 *	0.03	0.47 **	1.00										
6 Rule Repeals	2485.02	10687.53	0.81 **	0.21	0.17	0.93 **	0.37 **	1.00									
7 Minister Age	46.53	4.55	0.05	0.37 **	-0.24 *	-0.15	0.05	-0.08	1.00								
8 Minister Tenure	1259.26	870.43	0.10	0.12	0.08	0.09	0.13	0.17	0.11	1.00							
9 Minister Religion	0.47	0.50	-0.12	-0.20	-0.14	-0.17	-0.25 *	-0.18	0.01	-0.01	1.00						
10 Minister Fit	92.25	16.38	0.10	0.13	0.10	0.08	0.13	0.09	-0.40 **	0.24 *	-0.21	1.00					
11 Cabinet Power	89.96	8.36	0.13	0.18	-0.18	-0.15	0.11	-0.11	0.09	0.11	0.12	0.07	1.00				
12 Cabinet Tenure	758.35	341.42	0.24 **	0.12	0.18	0.00	-0.03	0.09	-0.01	0.49 **	0.09	0.28 *	0.26 *	1.00			
13 Cabinet Turnover	0.36	0.48	0.19	-0.07	-0.08	0.20	-0.07	0.16	0.12	-0.26 *	-0.04	-0.29	-0.04	-0.41	1.00		
14 Cabinet Homogeneity	16.96	10.48	0.24 *	0.45 **	0.20	0.16	0.29 *	0.19	0.13	-0.01	-0.08	0.22	-0.13	0.02	-0.09	1.00	
15 Dummy 1985	0.02	0.15	-0.09	0.05	0.96 **	-0.03	-0.04	-0.04	-0.21	0.01	-0.14	0.07	-0.16	0.18	-0.11	-0.19	1.00

** $p < 0.01$; and * $p < 0.05$.

Table 1 shows that very few variables have correlation coefficients larger than 0.80 – the rule-of-thumb threshold value for multicollinearity. In fact, only the variables relating to ecological processes show multicollinearity, but this is solved via the operationalisation of rule density. Also, as might be expected, the correlation between rule birth and the 1985 dummy is high.

Regression Results

Ecological Processes

Models 1 and 2 estimate the density-dependent effects of the stock of national rules on the flow of rule changes. The results for the regression analyses of the ecological processes are reported in Table 2.

Table 2. Ecological Processes

	Model 1		Model 2	
Constant	0.3771			
Rule Density	0.0004	***		
Rule Density ^{2}	-0.0001	***		
Dummy 1985	-2.6005			
Constant			0.4829	
Rule Density (t-1)			0.0004	***
Rule Density ^{2} (t-1)			-0.0001	***
Dummy 1985 (t-1)			2.4953	
Log likelihood	-162.03		-160.23	
LR statistic	43.36	***	40.73	***
Degrees of freedom	3		3	
LR index	0.12		0.11	

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

Our empirical results provided strong support for the first Hypothesis 1. Table 2 shows that for the contemporaneous as well as for the one-year lagged specification there is a Ո-shaped relationship: the parameter estimates of rule density and its squared term have the expected and correct opposite signs, and the estimates are strongly significant. The sign of the dummy variable is negative but insignificant in the contemporaneous and positive but insignificant in the delayed specifications.

Ministers

Models 3 and 4 in Table 3 estimate the effects of the ministers' demographic characteristics on national rule changes.

Table 3. Characteristics of Ministers

	Model 3	Model 4
Constant	14.7937	
Minister's Age	-0.7240	
Minister's Age ^{2}	0.0081	
Departmental Tenure	0.0044 ***	
Departmental Tenure ^{2}	-0.0001 ***	
Educational Fit	0.0170	
Minister's Religion	-0.7084	
Dummy 1985	-3.3799 ***	
Constant		39.0078 ***
Minister's Age (t-1)		-1.8928 ***
Minister's Age ^{2} (t-1)		0.0210 ***
Departmental Tenure (t-1)		0.0031 ***
Departmental Tenure ^{2} (t-1)		-0.0010 ***
Educational Fit (t-1)		0.0497 ***
Minister's Religion (t-1)		-1.5481 ***
Dummy 1985 (t-1)		2.6336 ***
Log likelihood	-165.61	-152.95
LR statistic	36.19 ***	55.28 ***
Degrees of freedom	7	7
LR index	0.10	0.15

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

Table 3 presents an interesting difference between the contemporaneous and delayed model. If we lag all variables by one year, the number of significant relationships strongly increases. In other words, our results suggest that the demographic characteristics of ministers are important, but that they largely quantify after one year. Of course, this makes sense: it takes at least some time before a minister can make her or his presence felt and thereby change national rules, particularly in higher education.

The expected Ո-shaped relationship between the age of a minister and rule changes

cannot be identified. On the contrary, there is a reverse Ո-shaped relationship that materialises especially in the one-year delay case (in Model 3, the estimates for age and rule changes are non-significant). This implies that, contrary to our prediction, the productivity of ministers in terms of rule changes first decreases and then increases. Hypothesis 2 must therefore be rejected. Our results do support the predicted Ո-shaped relationship between tenure and rule changes. For both cases (that is, contemporaneous and one-year delayed), the estimated signs of the coefficients do have the correct opposite signs and they are all strongly significant. Hypothesis 3 thus receives support. With regard to affinity with education, Model 4 provides strong evidence – that is, a positive relationship between rule changes and the educational fit of an education minister can indeed be observed. In Model 3, this relationship was also positive, but insignificant. Hypothesis 4 is therefore partially supported. Finally, Models 3 and 4 reveal that Catholic ministers are indeed associated with less rule changes, with a significant effect in the one-year delayed specification. So, Hypothesis 5 receives partial support.

Cabinets

Compared to the ministers, we find more or less opposite effects of the demographic characteristics of cabinets as a whole on national rule changes. The results are listed in Table 4.

In terms of significance of the estimates, the model does work somewhat better in the contemporaneous case (Model 5) than in the delayed specification (Model 6). The results partially provide support for Hypothesis 6, which predicted a Ո-shaped relationship between cabinet tenure and national rule changes: the estimated parameters have the correct opposite signs and are significant in Model 5. Hypothesis 7 is partially supported, too. The predicted positive effect of the power position of the cabinet on national rule changes is significant in Model 6. Table 4 shows that cabinet homogeneity has the expected positive effect on rule changes. The parameter estimates are significant in both Model 5 and Model 6. Hypothesis 8 does thus receive full support. Finally, cabinet turnover indeed induces contemporaneous rule changes. The effects are positive in Model 5 (significant) and negative in Model 6 (insignificant). Hypothesis 9 is therefore partially supported.

We performed three different sets of robustness checks. Firstly, the empirical results may, of course, be determined by the operationalisation of our constructs. We estimated four other models that included additional variables at the cabinet level that can be viewed as alternative operationalisations of our key constructs. The first model included the number of cabinet parties – in line with the argument that more parties should result in fewer rule changes due to the greater chance of conflict

arising. The second model analysed the power position of the most dominant party in the cabinet – in line with the logic that a dominant party can implement more changes because of its strong power position in the cabinet. The third model included the distance between the two most opposed cabinet party members in terms of ideology – in line with the story that a greater ideological distance should result in fewer changes due to the risk of conflicts arising. The fourth model had a measure for cabinet turnover in terms of ideological distance between cabinets – in line with the reasoning that turnover of distant cabinets should result in more changes. Overall, the results were in line with our expectations (available upon request). Secondly, we also estimated all of our models with two alternative measures for rule changes – that is, 'positive' and 'negative' changes (for both counts and counts adjusted for size, respectively). The results for these models are virtually identical to those estimates with 'neutral' changes (again, available upon request).

Table 4. Characteristics of Cabinets

	Model 5	Model 6
Constant	-1.2299	
Cabinet Tenure	0.0061 ***	
Cabinet Tenure ^{2}	-0.0026 **	
Cabinet Power	0.0173	
Cabinet Turn-over	0.8678 **	
Cabinet Homogeneity	0.0451 ***	
Dummy 1985	-3.6264 ***	
Constant		-2.1956
Cabinet Tenure (t-1)		0.0005
Cabinet Tenure ^{2} (t-1)		-0.0003
Cabinet Power (t-1)		0.0543 **
Cabinet Turn-over (t-1)		-0.3499
Cabinet Homogeneity (t-1)		0.0353 **
Dummy 1985 (t-1)		2.2355 ***
Log likelihood	-166.51	-161.99
LR statistic	34.38 ***	37.20 ***
Degrees of freedom	6	6
LR index	0.09	0.10

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

Some Qualitative Reflections

Our quantitative research method is intended to supplement the in-depth qualitative studies that are related to our research theme (see, for example, Wachelder, 1992; van Baalen, 1995; van Wieringen, 1997). Below, we offer some qualitative reflections on our empirical results. It is beyond the scope of this article to discuss the impact of national educational policy and rules – as well as the activities of the subsequent Dutch educational ministers – for the Dutch educational sector at length (for excellent reviews see, for example, Leune, 2007; Leune and de Koning, 2001; Dodde, 1995). By way of steppingstone, we calculated the 'rule-making productivity' of the Dutch ministers of education in our observation period, as listed in Table 5, and highlight the most productive minister.

Table 5. Productivity of Dutch Education Ministers (1960 – 2004)

Period	Minister	Rule Birth	Rule Changes: Neutral	Rule Changes: Increase	Rule Changes: Decrease	Rule Repeals	Overall Productivity
1960-1963	Cals	185.15	1.56	0.00	0.00	1.12	187.82
1963-1965	Bot	4.85	0.44	0.00	0.00	0.88	6.18
1965-1967	Diepenhorst	2.06	0.77	0.52	0.26	0.26	3.86
1967-1971	Veringa	79.47	18.29	6.50	2.74	2.74	109.74
1971-1973	Van Veen	30.64	5.37	2.98	2.00	2.07	43.05
1973-1977	Van Kemenade	115.73	66.26	8.89	2.00	27.72	220.60
1977-1981	Pais	57.35	24.26	8.43	2.08	6.68	98.80
1981-1982	Van Kemenade	7.16	7.46	4.09	1.33	2.35	22.38
1982-1989	Deetman	808.09	249.48	54.59	15.59	146.89	1,274.65
1989-1998	Ritzen	311.24	304.67	26.35	41.59	118.34	802.17
1998-2002	Hermans	61.15	194.06	2.65	5.41	33.95	297.21
2002-2004	Van der Hoeven	92.36	77.53	3.57	1.34	25.08	199.88

Notes: the overall productivity per minister is measured as the sum of all rule activities.

Table 5 shows that Deetman was the most productive Minister of Education. It is likely that he ensembled a unique combination of demographic features. He was one of the youngest Protestant ministers in history (just 37 years old at the start of his career as minister; only minister van Kemenade was younger), with an optimal educational fit (among others, he was a former chairman of a leading national Protestant educational organisation) and achieved the second-highest tenure track (with 2,717 days in office, only surpassed by minister Ritzen who served 3,189 days in office). The cabinets he served were neither the most powerful nor the longest in tenure, but were among the most homogenous coalitions. Moreover, these cabinets were headed by Prime Minister Lubbers (also a Christian Democrat, like Deetman). Prime Minister Lubbers has the longest tenure track in Dutch cabinet history. Incidentally, we should add here that it

is widely acknowledged that Lubbers successfully reorganised many features of the Dutch economy (for example, a reform of the social security system and a massive reduction in government deficits during a time of severe economic decline).

Foppen (1989) offers many explanations for the inertia that often seems to characterise decision-making processes associated with national educational rule-making. For example, he argues that minister van Kemenade was strongly hampered by opposite views concerning the role and position of higher education from his own political party in the Second Chamber (i.e., the Social Democrats). Foppen (1989) offers three observations as to the extent of decision-making inertia, generally, and the relative productivity of minister Deetman, particularly. Firstly, the role of the government in higher education changed during our period of study. During the 1945-1965 period, the government identified challenges and offered suggestions for solutions; active change, however, was left to the universities, which at that time operated as an unorganised and unstructured group. A hierarchical top-down structure for national policy-making concerning higher education was almost completely lacking. This gradually changed: in the 1965 – 1980 period, the ministers and the department initiated discussions and proposals for national rules; after 1980, the government more or less centralised the decision-making process, imposing rules top-down. Secondly, many different decision-makers and lobbying groups, with equally different views and perspectives on higher education, were involved in the policy-making process in recent decades. In the beginning of the 1970s, for instance, the Academic Council took four years to reply to a proposal of the minister. It is only since the beginning of the 1980s that many of these lobbying groups professionalised and became structurally involved in the law-making process at the Department of Education. Thirdly, more than 20 years of policy fermentation, in the 1980s and beyond, in combination with the decisiveness of minister Deetman and an economic context that forced substantial restraints on the budget for higher education, resulted in the production of new rules and ammedments of existing ones. The time was finally ripe to reorganise higher education.

3.5 Conclusion

The aim of this study was to unravel underlying causal mechanisms that determine changes in national rules. We took into account the fact that changes in national rules could be the result of ecological processes, and demographic features of ministers or cabinets. Most importantly, we have empirically addressed this issue. That is, this study counted rule events – births, changes and repeals – and measured the size of each event in terms of sentences. By doing so, we have offered estimates of the stocks and changes of national rules. Based on this empirical counting exercise, we have applied event history techniques in order to estimate the relative importance of ecological processes, and the demographic characteristics of ministers and cabinets

in driving the dynamics of national rule changes.

For Dutch higher education in the post-war period (1960-2004), which is our focus of analysis in this paper, we found significant support for the great majority of our theoretical predictions. Overall, the results suggested that the ecological processes were the most robust ones, followed by the demographic characteristics of ministers and cabinets. We also addressed the issue of timing. The empirical results showed that ecological processes were important in both model specifications, whereas the impact of ministers materialised particularly after a one-year delay. The impact of cabinet demography on national rule changes appeared to be more or less instantaneous. Additionally, we found one result that explicitly contradicted our predictions: ministers' age had a convex rather than a concave relationship with national rule changes. Apparently, prior to the expanding production of national rule changes, some level of maturity in terms of age is needed.

The question is whether our models have general validity for the other constituent parts of rule dynamics as well. To that end, we re-estimated all our models with different dependent variables, particularly rule birth and the net outcome of all rule events (coined rule growth). It is beyond the scope of this study to present and discuss these results at length (available upon request). For the ecological processes, we find that our models apply equally well to rule birth and rule growth. However, we find differences for the impact of cabinet characteristics. For rule birth, the contemporaneous estimates model does not present support for cabinet changes and cabinet homogeneity. For rule growth, we find much better results for the contemporaneous models (that is, all effects are significant), but much worse results for the delayed situation (that is, except for cabinet homogeneity, all effects are non-significant). The impact of minister characteristics is comparable to the ones presented in this paper. Again, though, also differences are revealed. For example, the delayed models for rule birth show non-significant effects for fit, religion and age. Hence, future research may address a general theory of rule dynamics for which this study offers helpful points of departure.

We envision four other related opportunities for future research that should help to overcome some important limitations of the present study. First, because of the size of our sample (that is, forty-five observations – the length of our time window) we were restricted to estimating the different theoretical models separately. These models offer a basic foundation concerning the individual features of national rules changes. However, the collection of more data is needed in order to be able to test an integrated model. The collection of new data may well cover educational rules in other domains, such as primary education, but might also be extended to other

(European) countries and (European) domains as well. The latter would enable to verify the extent to which our findings can be generalised across law contexts and time periods.

Second, any theoretical model is, at best, a (biased) representation of reality, and our model is no exception. Clearly, more variables or other measurements could be added to our research model. There are many opportunities, but future work might especially address the role of the State Secretary because s/he usually has a large responsibility for facilitating the process of legislation. This would also enable to estimate the effects of the 'minister-state secretary' team composition on national rule dynamics. Concerning cabinets, it would be interesting to analyse the match or mismatch between the Minister of Education and the Prime Minister, given the important role of the latter in the weekly meetings and legislative decision-making processes of the cabinet. In terms of ecological processes, we suggest that the time differentials between rule events should be taken into account. This would enable the plasticity of national rules to be tested. Also, future research might well address the dynamics of the institutional context. Changes in the institutional context such as the size of the higher education sector, the impact of the educational network or the internationalisation of higher education might require more or other national rules.

Third, the present study focuses particularly on rule changes. Future research could explore the underlying dynamics of rule births and repeals in more detail. Above, we reported that important similarities as well as differences between the causal mechanisms of birth, changes and repeals seem to exist. The identification of constituent contingencies for each component would enable a more comprehensive understanding of the overall national rule dynamic. The in-depth case studies of policy processes concerning education in the Netherlands can offer useful points of departure (Foppen, 1989; van Wieringen, 1997). In due course, the research can be moved forward by including interaction effects between national rules and institutional settings, as well as between ecological processes and demographic characteristics of the ministers and cabinets. We might well expect that the evolution of higher education, the educational network and the economic context should align with the evolution of national rules. It has been suggested that the interaction between institutional settings and the evolution of rules does matter (Amburgey and Rao, 1996; Baum and Oliver, 1992, 1996; Pennings, Lee and van Witteloostuijn, 1998). In so doing, a co-evolutionary framework can be developed, with a balanced integration of demand and supply-side determinants of the evolution of law.

Fourth, more efforts are needed to develop a theory of 'rule-change birth'. Our longitudinal dataset indicates that national rules evolve through long periods of

incremental change punctuated by relatively rare innovations – notably, in the case of The Netherlands, that of 1985 – that radically change the state of the art (see Tushman and Anderson, 1986). That is, national rule systems seem to be revolutionised at rare intervals by discontinuous advances (sometimes called punctuated equilibrium). The discontinuity may trigger a period of rule ferment that results in a dominant design. The dominant design is preserved by incremental evolution until a new discontinuous breakthrough appears. It might be that discontinuities are not all alike. If shocks are important, we need to know more about what distinguishes between incremental improvements and dramatic advances, and why and how dominant designs occur.

CHAPTER 4. PRODUCING NEW NATIONAL RULES

Summary

To date, quantitative assessments of the evolution of national rules have only rarely been conducted, leaving many questions ill-understood and unaddressed, particularly as to the features of rule stock evolution patterns. Can such patterns be traced, and if so: can the underlying causal mechanisms be identified? This paper will address these questions. The premise is that forces endogenous to the rule system, inherent to any population of national rules, together with the demographic characteristics of rule-makers and the institutional features of the rule-making bodies jointly determine the birth rates of national rules. Given this key assumption, we offer a threefold contribution. First, we develop a theoretical framework that integrates ecological with demographic and institutional theories of the evolution of law. Second, we describe longitudinal quantitative data concerning rule (birth) events within the domain of post-war Dutch higher education legislation. Third, we apply negative binomial regression techniques in order to estimate a comprehensive theory-driven model specification of the underlying drivers of national rule birth.

Key words: ecological processes, cabinets, ministers, national rules, higher education, time series.

4.1 Introduction

Conventional wisdom concerning national rules in modern Western societies proclaims that there are too many rules, and that their number is growing exponentially. In combination with the foundation of supranational institutions, such as the European Union, this implies the creation of ever-growing bureaucratic rule-producing systems that impose unnecessary and abundant costs on citizens and organizations. But conventional wisdom may be misguided. A key assumption in this argument is that the stock of rules is growing to begin with. This would imply that the birth rate of rules is higher than the death rate: i.e., more new rules are created than old rules suspended. To explore this basic issue of the evolution of stocks of rules, quantitative assessments of the evolution of national rules are badly needed. Otherwise, many questions will remain ill-understood or unaddressed. What is actually the size of the stock of national rules? How many new rules are created on an annual basis, on average? What is the frequency of change in existing rules? At what rate are rules suspended? Are there international evolution pattern differences across different rule systems and rule areas? And, most fundamentally, is the evolution of the stock of national rules characterized by any systematic pattern that may, indeed, produce a steady increase in complexity?

This paper adds to the literature on these issues by analyzing the underlying causal processes that have determined the birth of national rules in the domain of post-war

higher education in the Netherlands (1960 – 2004). The annual variations in the stock of national rules are calculated as the accumulated difference between rule births and rule repeals per year. In the domain of Dutch higher education, national rules are not often suspended; and although the rules are frequently changed, this does not have a large impact on the size of the national stock of rules (cf. van Witteloostuijn and de Jong 2008). We argue that a thorough comprehension of the underlying forces that foster or dampen national rule birth processes is crucially important to enhance our understanding of the evolution of the degree of 'red tape'. Of course, we focus on a specific case: Dutch higher education law in 1960 – 2004. However, we believe our logic is more widely applicable.

In the current paper, we focus on national rules codified in formal law and hence recorded in written form (cf. March, Schulz, and Zhou 2000). Other examples of national legislation in written form are statutes, orders in council and decree orders. Written rules are important because much contemporary life is organized around written rules. They are important instruments designed and applied by governments to coordinate and control national institutions, such as those in higher education. In so doing, we relate to the literatures in political science and public administration on the legislative process. Our contribution to this literature is that we expand the so-called ecological approach to national rule evolution by offering an integration with demographic and institutional perspectives.

The perspective of rule-based behavior that is central to the ecological approach proposed here is part of a well-established research tradition. Conceiving institutions as collections of rules is at the heart of many institutional perspectives on human behavior in political science (March and Olson 1984), sociology (Zucker 1987), economics (North 1990), governance (Williamson 1985) and law (Eggertson 1990). In this literature, both qualitative and quantitative perspectives have been developed. On the one hand, much work in this research tradition is characterized by a focus on theory development or qualitative empirical work, implying a relative paucity of quantitative empirical studies. This extant literature predominantly examines the way in which the content of a particular rule is adapted in response to new issues arising within an institutional law context or in reaction to the stakeholders' voiced demand for new rules. On the other hand, a series of quantitative studies in the 1990s and 2000s started to estimate the determinants of processes of rule-making. In political science and public administration, this work relates to issues of national legislation (e.g., Mayhew 1991; Tsebelis 1999). In organization studies and organizational sociology, a parallel tradition focuses on the evolution of organizational rules (e.g., Schulz 1998, 2003; March, Schultz, and Chou 2000). Following in the footsteps of this quantitative work on rule-making, rather than seeking to explain why a particular

rule came into existence to begin with (that is, comparative static analysis), we aim at understanding the underlying processes that determine the births of national rules over an extended period of time (that is, intertemporal dynamic analysis).

An important premise here is that these underlying causal processes are manifest in observable regularities that drive the evolution of stocks of rules. The ecological approach focuses precisely on this – the intrinsic dynamics reflected in observable evolutionary regularities. In line with other ecological theories, we assume that histories of stocks of national written rules have general statistical properties, implying that they develop in systematic ways. In the social sciences, insights from bio-ecology have been translated such that they can be applied to the evolution of populations of social entities, rather than of species as in bio-ecology (cf. Hannan and Freeman 1977, 1984). The focus is on the drivers of the so-called vital rates of the birth, change and death of such social entities, and the implications of these combined vital rates for the macro structure of the population in terms of, e.g., concentration, density and diversity (cf. van Witteloostuijn and Boone 2006). This ecological logic has been applied in empirical studies into the evolution of a wide variety of organizational populations, including industrial firms and interest groups, as well as national and organizational rules (see below for a brief review). Particularly, we share this ecological focus with a series of studies into the evolution of interest groups in political science (cf. Gray and Lowery 1988, 1996, 2001a, b; Lowery and Gray 1993, 1995, 1997, 1998). We take this ecological approach as our starting point, to subsequently merge in insights from demographic and institutional perspectives.

So, we argue that ecological theory is particularly powerful as a steppingstone for theory development as to the evolution of national rule stocks by integrating relevant insights from other perspectives into the ecological core of the theory. One obvious candidate for cross-pollination is institutional theory. Research in public administration, too, acknowledges the importance of institutional theories (e.g., Bozeman and DeHart-Davis 1999; Chackerian 1996; Frumkin and Galaskiewicz 2004; Peter and Hogwood 1991). Not only are rules themselves often seen as institutions, as indicated above, but also are rules produced by institutions. Key drivers of rule-production are reflected in characteristics of the institutional context, such as features of the democratic procedures and the coalition in power (e.g., Maltzman and Shipan 2008). Another clear candidate for cross-fertilization is the demographic theory of rule-makers. In the end, rules are created by people. Some people are more productive or successful rule-makers than others, which can partly be explained by demographic features such as their age and experience (e.g., Martin and Vanberg 2005)

So, following van Witteloostuijn (2003), the interdisciplinary foundation of our study

combines ecology with insights from such demographic and institutional theories. In essence, we develop a demographic institutional ecology of national rule births. The argument is that the introduction of new national rules is determined both by its own history and rule stock characteristics (the ecological angle), as well as by the demographic features of national rule-makers (the demographic angle) and rule-making institutions within the institutional context of the rule-making process (the institutional angle). National rules are populations of entities which, like any other population such as those comprising of organizations, human beings or animals, are subject to ecological forces. Furthermore, a society's rule-producing machinery is composed of rule-making bodies (cabinets and parliament) and their rule-making members (ministers and civil servants) that / who operate within a particular institutional context. We hypothesize that both mechanisms separately and jointly dampen or foster the introduction of new national rules.

To summarize, the key aim of our study is to test hypotheses that derive from a demographic institutional ecology of national rules. By doing so, we intend to empirically identify and explain underlying causal mechanisms that determine the rate of national rule births. The interdisciplinary theoretical perspective and quantitative estimation methodology are the core innovative elements in this study. Our study shares both innovative elements with van Witteloostuijn and de Jong (2007, 2008). We move beyond van Witteloostuijn and de Jong (2007) by developing and estimating a comprehensive model of rule birth. Their study was largely descriptive, with a small explorative model including only three variables (national rule density, civil servant density and minister experience) for a limited time period (1986-2004). We add to van Witteloostuijn and de Jong (2008) by focusing on the more essential ecological event of rule birth (rather than rule change, as they do) and by estimating a comprehensive model including all three categories of rule birth determinants jointly (rather than their three smaller separate models).

The outline of the paper is as follows. We will first offer a brief literature review. Subsequently, we will explain in detail the theoretical logic, formulating three illustrative pairs of hypotheses as to the ecological, demographic and institutional determinants of national rule birth. Given that our study is one of the first of its kind, we focus on a sub-set of the drivers of national rule birth that we believe will illustrate succinctly what our novel approach entails. In future work, this sub-set may be expanded, of course. Next, we will introduce this paper's research methodology, addressing issues related to our counts of national rules and measures of the variables. Following that, we will present our empirical evidence. Finally, we will conclude with an appraisal, offering a reflection on opportunities for future research.

4.2 Literature review

There already are, of course, quite a few powerful theories concerning the rise and fall of national law. By and large, such theories tend to emphasize the rationality of law from the perspective of individuals, groups or societies at large (Friedman 2002; Masters and Grutter 1992; Watson 1985). Lobbying and rent-seeking theories, for example, argue that much regulation is introduced or removed in order to serve the self-interests of special interest groups. Economic theories suggest that much regulation is installed or demolished to facilitate efficient economic and social processes across societies. Within law, too, there is an ongoing debate about whether – and if so: how – national rules evolve in response to changes in the institutional context and to the relative importance of the rule-maker bodies. Our interdisciplinary framework does not deny the importance of these 'rational' explanations. However, we provide a complementary perspective by emphasizing the rather mechanistic endogeneity of many of the processes that underlie national rule-making legislation.

Indeed, in political science and public administration, an impressive quantitative research tradition focuses on issues related to such law-making processes. A seminal contribution is Mayhew (1991), dealing with legislative and executive effectiveness. Inspired by Mayhew's work, subsequent studies sought to deepen our understanding of the driving forces behind such outcome variables as legislative change, gridlock, prioritization and significance. A discussion of a few prominent examples must suffice here, by way of illustration. First, Edwards III, Barrett, and Peake (1997) offer a test of the impact of divided government on legislative gridlock, finding that the likelihood that important legislation fails to pass in the US is considerably larger under divided government. Second, Binder (1999) argues that intra-branch friction contributes to policy stalemate more than inter-branch conflict, again in the US context. Third, Martin (2004) estimates the impact of issue divisiveness and saliency on legislative prioritization in Belgium, Germany, Luxembourg and the Netherlands, indicating that issues characterized by both features are introduced earlier on the agenda. Fourth, Martin and Vanberg (2005) report that changes made to a ministerial bill draft in the course of parliamentary review in Germany and the Netherlands are significantly influenced by government issue divisiveness (positively), a junior minister from a partner party (negatively), the number of committee referrals (positively), the number of articles in the draft bill (positively) and the expiration of the bill before the plenary vote (positively). Fifth, Maltzman and Shipan (2008) estimate the forces behind legislative longevity in the US, finding that significant amendments in major legislation are more likely if, e.g., the government is divided and the House and Senate disagree at the time of enactment. Sixth, Lapinski (2008) introduces a new policy-coding scheme needed to study the effect of policy substance on the legislative process, and applies this novel scheme in a study of legislative performance in the

US.

In the context of the current study, work on law production is particularly interesting. Tsebelis (1999) studies the role of the number of veto players and ideological distance in determining the ability to produce significant laws, focusing on the introduction of significant labor laws in 15 countries in Western Europe in the 1981-1991 period. His results suggest that, indeed, the number of veto players and the coalition's ideological range negatively affect law production, with the control variables agenda control, corporatism and left ideology being insignificant. In the Appendix of her legislative gridlock paper, Binder (1999) reports a test of Mayhew's (1991) original argument. She indicates that the production of landmark laws between 1947 and 1986 in the US, using a measure based on New York Times editorials, is positively affected by the percentage of moderates and a budget surplus, with a divided government, ideological heterogeneity, time out of majority, bicameral distance, filibuster threat and public mood being insignificant. Ringquist, Worsham, and Eisner (2003) estimate the impact of public salience and technical complexity on legislation production aimed at directing the behavior of four federal agencies in the US from 1949 to 1996. Their dependent variables are based on counts of the number of bills. They find, by and large, that both public saliency and technical complexity positively affect legislation production.

In organization science, a large bureaucracy literature developed in the aftermath of Weber's (1921) classic study. From our perspective, the project on organizational rule production at Stanford University is particularly relevant (March et al. 2000). The core logic is nicely reflected in Schulz (1998). Given our ambition to develop an ecological theory of law production, a detailed discussion of this logic is warranted. Basically, Schulz' (1998) study confronts Weberian bureaucracy theory with insights from the organizational learning literature. On the one hand, Weberian bureaucracy theory argues that, for a variety of reasons, "bureaucracies frantically breed rules, and frequently … rule breeding intensifies as bureaucratization proceeds" (Schulz 1998: 845). Borrowing terminology from organizational ecology (see below), this logic suggests a positive density-dependence effect: the rate of rule birth is expected to increase with rule density. On the other hand, organizational learning theory suggests an opposite prediction: the rate of rule birth is likely to decline with rule density. Schulz (1998) discusses three mechanisms that may explain this negative density-dependence effect.

First, if rule density increases, the "problems cease to be available for further rule production" (Schulz 1998: 853). This is the preemption effect. Second, bureaucracies tend to extend the range of applicability of established rules, implying the "habitual

application of old rules to new problems", which "eliminate[s] the perceived need to create new rules" (Schulz 1998: 853). This is the codification trap effect. Third, a temporal order effect implies that in the early history of a bureaucracy rule production is high as "the low hanging fruit" is dealt with first. That is, "[i]t takes longer and longer for this process to arrive at the next problem because the next problem is rarer than the preceding one (ceteris paribus)" (Schulz 1998: 854). This is the sorting effect. In a birth rate study for Stanford University for administrative rules (1961-1987) and academic rules (1891-1987), evidence for a negative density-dependence effect is provided, by and large.

At the interface of organization and political science, the study of Deveraux Jennings, Schulz, Patient, Gravel and Yuan (2005) focuses on explaining the rate of legal rule births and revisions of sections of US regional water law over a 90-year period in the 20th century. Now, the organizational ecology angle that is central in the Stanford University organizational rule production study is replaced with a traditional political science perspective. The independent variables are the standard ecological events of birth and revision (of sections of a State's regional water act). The independent variables are the number of recent higher court cites of the water act, conservative versus progressive party control of the State, times of political transition, regional economic output, and wartime. The number of higher court cites of the water act, progressive party control of the State, political stability, low regional economic output, and wartime all positively affect the rate of rule birth and revision. So, in this study, the issue of density dependence is not considered.

In contrast, van Witteloostuijn and de Jong (2007 and 2008) start from applying organizational ecology logic to national legislation evolution. Given the largely descriptive nature of the 2007 study, we here focus our discussion on van Witteloostuijn and de Jong (2008). In this study, the logic from the (small) ecology of organizational rules literature is applied to the issue of national law change, adding insights from the political science and managerial demography traditions. Different from Schulz (1998), however, a non-monotonic hill-shaped rule density-dependence relationship is suggested. Moreover, similar to the legislation production literature, a series of political arguments are added to the basic ecological story (cabinet tenure, power and turnover), and novel demography variables are included (the minister's age, tenure, experience and religion), following the managerial demography literature. In a series of tentative empirical analyses for Dutch higher education law in 1960-2004, they report evidence for a hill-shaped density-dependence relationship, as well as for a number of significant minister and cabinet demography effects. In the current paper, we further develop the logic in van Witteloostuijn and de Jong (2008) in the context of national law birth, rather than change. In so doing, we contribute to the established

national law evolution literature by adding insights from the organizational ecology and managerial demography literatures.

4.3 Theory and hypotheses

This study explores how organizational ecology (Carroll and Hannan 2000) and the ecology of organizational rules (March et al. 2000) can be applied and adapted in order to understand the evolution of national rules along the lines suggested by van Witteloostuijn (2003), specifically focusing on national rule birth. Van Witteloostuijn (2003) suggests to merge insights from both ecological approaches with institutional theories and, especially, with the demographic literature in management (Finkelstein and Hambrick 1996). In what follows, we present a theoretical argument as to the impact of ecological processes, demographic characteristics of ministers and institutional features of cabinets on national rule births. It goes without saying that we could speculate about many interactive effects between the different rule birth determinants, or that we could add other potential determinants of the (national) rule birth process. However, because of sample size limitations, and given that this paper provides a first empirical test of a demographic institutional ecology of national rule births, we limit complexity by focusing on main effects only, leaving more complicated and extended interaction-based theory for future work. So, we will only consider the direct effects of each individual independent variable on our central dependent variable – national rule births – separately.

Ecological Processes

The ecological approach to the evolution of social entities is our key point of departure. Here, the main argument is that populations of national rules are determined by population-specific ecological processes, and by the path-dependent dynamic of these processes. Based on theoretical and empirical work over the past thirty years, organizational ecology offers a wealth of explanations for the birth, growth, change, decline and death of organizations at the population level (Baum 2002; Carroll and Hannan 2000; Hannan and Carroll 1992). The key theoretical logic of organizational ecology is built on two pillars: the ecological processes of competition and the institutional processes of legitimation. Additionally, organizational ecology has assimilated a wide variety of alternative determinants of such vital rates, from the influence of political turbulence (Carroll 1987) and social capital (Pennings, Lee, and van Witteloostuijn 1998) to strategic groups (Carroll and Swaminathan 1992) and technological change (Podolny and Stuart 1995).

Essential are ecological and institutional processes. In this context, the density-dependence theory on the effect of population density, which is the number of organizations active in the population, on all vital rates is one of the leading

theoretical perspectives in organizational ecology (Baum 2002; Hannan and Freeman 1989). Dozens of studies have predicted and provided empirical support for (inverse) U-shaped relationships between population density and (mortality) founding rates of organizations. These non-monotonic relationships are determined by processes of competition and legitimation, as reflected in two ceteris paribus hypotheses that combine into the prediction of a reversed U-shaped density-dependence effect on rule birth. The first hypothesis relates to competition and vital rates, predicting negative density dependence for birth rates. This is a well-established argument in economics: a larger number of organizations depress entry rates, as large-number competition reduces profit opportunities and survival rates. The second hypothesis involves legitimation and vital rates, suggesting positive density dependence for birth rates. This reflects well-known institutional sociology, which argues that the societal taken-for-grantedness of an organizational form increases with the frequency with which this form is observed. Together, the processes of competition and legitimation produce an inverse U-shaped density-dependence hypothesis for birth rates.

These hypotheses have been applied to the evolution of formal organizational rules in the case of Stanford University (March et al. 2000; Schultz 1998). In other work, this line of logic has been adapted in order to explain the birth rate of national rules (cf. van Witteloostuijn 2003; van Witteloostuijn and de Jong 2007, 2008). The core argument is that similar density-dependent processes can explain the birth rate of national rules. In this context, two alternative theories can be applied, as summarized in the literature review above. On the one hand, Weberian and post-Weberian bureaucracy theory argues that 'rules breed rules'. The application and production of national rules provide legitimation to public administration. Old regulations and laws are seldom or never repealed. At most, they are amended, while new rules are continuously being introduced. Often, societies and law domains evolve along a path of increasing complexity. In parallel, there is a growing need for new rules that target new complexities. New rules try to solve voiced problems, but often introduce new issues. Therefore, new rules induce the need for yet another set of new rules. In a way, this is a reflection of economics' Law of Say in the rule arena. By introducing a rule, demand for additional rules is boosted as the audience is triggered to ask for more, being made aware of the potential to regulate. As a consequence, the growth in the number of rules increases as the volume of rules goes up, implying that the rule stock expands almost 'of its own accord'.

On the other hand, learning theory suggests that rule-making bodies learn all the time, being associated with four mechanisms that dampen rule production. First, the pre-emption effect implies that problem availability reduces over time. Second, the codification trap means that the range of application of existing rules is expanded over

time. Third, the sorting effect is associated with selecting in rules that work well and selecting out those that do not. In so doing, rules that are ineffective are abolished along the way. Fourth, over time, broader rules may be created by combining existing more specific and separate rules into new more general and integrative rules. This may be called the generalizing effect.[13] In all, learning produces a set of rules that are able to absorb new issues, while reducing the need for the creation of new rules. The larger the density of rules, the higher the likelihood that an existing rule can deal with emerging issues, either by stretching the interpretation of an established rule or by changing an existing rule by adding another provision. Hence, the density-dependence effect is negative.

In principle, combining both forces may generate different hypotheses (cf. Schultz 1998). For one, either the negative or the positive density-dependence effect may dominate in the context of a specific body of rules. This would generate two alternative hypotheses, predicting a process of linearly negative or positive density dependence. When these opposite effects are taken together, we arrive at non-linear density-dependence hypotheses. On the one hand, we might assume that the negative density-dependence forces only dampen the positive effect without triggering a sign switch. This implies a hypothesis of a positive but decreasing density-dependence effect. On the other hand, following traditional organizational ecology, we may argue that, after a certain density threshold, the negative effect of density will take over, generating a sign switch. This gives the non-monotonic density-dependence hypothesis that we take as our benchmark. This gives:
Hypothesis H1 (rule density): There is an ∩-shaped relationship between national rule density and national rule birth.

Apart from rule density, rule-maker density may imply a population-internal ecological dynamic. Over the years, the size of public administration in many Western societies has grown significantly. As a result, a rule-producing and controlling bureaucracy has become the primary institutional characteristic of highly complex nation-states. This also applies to the Netherlands, where public administration is dominated by large hierarchical ministries, often with many decentralized branches throughout the country. The Dutch Ministry of Education is a well-known example of this. This ministry was founded in 1918 – prior to 1918, educational regulation was taken care of by the Ministry of Internal Affairs. Especially after the Second World War, the size of the ministry greatly increased. This was associated with intensified legislative activities. In the first years of our observation period, there was a strong need to establish the legitimacy of the ministry – something which was being challenged by many politicians and 'competing' ministries. As a result, there was a forceful inclination to produce new rules associated with a new body of law that would serve as 'trophies.' Over the years,

13 This fourth mechanism was suggested by an anonymous referee. The other three are discussed by Schultz (1998).

after the legitimacy of the ministry had been established, the continuous production of new rules served to offer legitimacy to the growing number of civil servants employed by the ministry. The production of new rules is the basis of bureaucratization; it reflects the core competence of a skilled and specialized civil servant. Due to processes of learning, socialization and specialization, rule-makers will continuously produce new rules. That is, the growth in rule production is reinforced by a growing population of rule-makers that have precisely that as their job: rule production. The result is an increase in a nation-state's red tape: the national rule birth will be positively associated with the number of rule-making and rule-monitoring officials. This relates to ecological logic, too: 'rule-makers breed rules'. Hence, we have:
Hypothesis H2 (rule-maker density): The density of national rule-makers is positively associated with national rule birth.

Demographic Characteristics

A stream of relatively recent studies of organizations focus on the analysis of the role of the demography of managers (Finkelstein and Hambrick 1996) and management teams (Boone et al. 1996), in order to explain inter-organizational differences in behavior and performance. Managers and management teams have or include different experiences, capabilities and personalities, and reflect different degrees of awareness and ambition. These differences affect their organizations' behavior and performance differently. For example, Chief Executive Officers (CEOs) with a background in finance are more likely to engage in cost-cutting strategies, and commercial enterprises headed by a CEO with an internal locus-of-control trait tend to outcompete their counterparts with 'external' CEOs (Boone, de Brabander, and van Witteloostuijn 1996; Wijbenga and van Witteloostuijn 2007). Indeed, a large number of empirical studies provide significant support for the explanatory power of a variety of the demographic characteristics of managers and teams (see Boone, van Olffen, and van Witteloostuijn 2005, for an overview). In line with this argument, we hypothesize that for the production of new national rules the background features of rule-makers and rule-making groups do matter as well.

In what follows, by way of steppingstone, we focus on the impact of a few of the minister's demographic characteristics on the rule-production process, particularly the experience of the minister to the rule-making domain and his or her age. The first characteristic reflects the minister's prior experience with the educational domain. The hypothesis that relates the experiential history or functional background of agents to their decision-making behavior is well established in the organizational behavior literature (e.g., Boeker 1997; Finkelstein and Hambrick 1996). Executives will selectively perceive (observe, evaluate and interpret) strategic stimuli in line with their experiential history and functional background, and act accordingly. In line with

this, we expect that the experience of a minister with the rule-making domain s/he is in charge of will determine the number of newly introduced rules. That is, an education minister with much education-related experience is more likely to introduce new rules than her or his counterpart without such related experience. The underlying logic relates to capabilities and routines. For one, knowledge of the domain is likely to be associated with a sharp eye for what is believed to be imperfect. Moreover, experience comes with routines as to how things should be done. Therefore, we suggest:
Hypothesis H3 (rule-maker's experience): A national rule-maker's (i.e., minister's) extent of experience in the relevant rule domain is positively associated with national rule birth.

This positive effect may be linear or non-linear. The latter could imply that the positive effect of experience is smaller the larger the degree of experience. In theory, the relationship may switch sign as well, if we assume that very experienced rule-makers start to believe that creating new rules is counterproductive. As we do not have any a priori theoretical reason to predict either shape, we simply explore this in the empirical analyses by adding the squared experience variable as well.

Our second demographic characteristic of a minister is age, or 'tenure in life' (Hambrick and Fukutomi 1991). Earlier work has revealed that this is one of the most salient human features, providing an intra-generational link between individuals (Lawrence 1988).[14] Age is an important attribute because it determines a person's background and experience outside the employing organization (Wiersema and Bird 1993). These background experiences influence attitudes and beliefs. Furthermore, age has, according to human capital theorists, a concave relationship to an individual's productivity (Bates 1990). The productivity of young workers is low, but rises rapidly as their human capital increases, and stabilizes as they cease to invest in training at older age. Middle-aged workers are believed to be most productive, whereas older workers may become less productive due to the depreciation of their skills or the reduction in their efforts. In line with this logic, we expect to find a non-monotonic relationship between the age of a minister and national rule birth. So, we formulate:
Hypothesis H4 (rule-maker's age): There is an ∩-shaped relationship between the age of the national rule-maker (i.e., minister) and national rule birth.

Institutional Features

Finally, we will consider the role of the cabinet in the rule-making process, concentrating on the institutional position of this central rule-producing body. We focus on the power position and the political composition of the cabinet as key institutional features of the governing body in the legislative process (cf. Edwards et al. 1997; Maltzman

14 Because age and tenure are often correlated, and therefore have much common variance, we decided to include the first of this pair of demographic characteristics in this study of national rule birth.

and Shipan, 2008; Tsebelis 1999).[15] Strategic decisions are often unstructured and ambiguous, and therefore invite the use of power by different agents who try to push their preferred choices (Eisenhardt and Bourgeois 1988). The essence of the power is the ability to cause someone to do something that s/he would not have done otherwise (Gaski 1984). Recent demographic studies emphasize the role of power of an organization's top management as a team, rather than the power of the individual top manager (Boone et al. 2005; Finkelstein 1992). Of course, power takes centre stage in the political arena. For instance, in political science, much theoretical and empirical work has been done on bargaining in parliamentary systems (Huber and McCarty 2001; Pech 2004), government formation processes (Martin and Stevenson 2001; Mershon 2002; Müller and Strøm 2000), and portfolio allocation and political appointments (Bertelli and Feldmann 2006; Druckman and Roberts 2005; Schofield and Laver 1985).

A key proposition is that cabinets have a legislative right to exert influence due to election results, which is reflected in their (relative) power position in the parliament (Lijphart 1999; McLean et al. 2005). In the British system, for instance, any party with 50 per cent plus one of the seats in the House of Commons has all the power it needs to pass legislation (Taylor 2007). The more seats a cabinet has, the more it can achieve in the rule-making process. The parliamentary members of cabinet parties are not anonymous individuals, operating in silent isolation. Rather, they know one another well, they are bound by tacit agreements, and they tend to follow their leaders. This is not different in the Netherlands (Andeweg 2006). New national rules must be approved in a lengthy parliamentary decision-making process. In the Dutch system, it is almost impossible for any one party to obtain a parliamentary majority (Timmermans and Moury 2006). Hence, Dutch cabinets always reflect a coalition of different political parties. If a cabinet is supported by a large majority in the parliament, and thus has a strong legislative power position, new rules are more likely to pass smoothly through the decision-making process. This gives:
Hypothesis H5 (rule-making team's power position): A national rule-making team's (i.e., cabinet's) power position is positively associated with national rule birth.

Next, we consider the composition of the cabinet in terms of the (dis)similarity of the participating political parties. A key argument in the top management team demography literature is that a team's compositional characteristics influence the dynamics within the top management team, which in turn impact upon the team's behavior and performance (Boone et al. 2005). The so-called facilitation perspective argues that team homogeneity – i.e., demographic similarity among team members –

15 Admittedly, this implies a focus on only a specific aspect of the wider institutional setting. In future work, we hope to collect cross-country data. Then, the variety in the broader institutional context offers opportunities to study the effect of different institutional rules guiding the legislative process. In the single-country context of the current empirical study, we lack this type of variation, which is why we decided to focus on what may be called institutional features of the cabinet.

enhances group cohesion and social integration, which in turn facilitates communication frequency and decision effectiveness. The cabinet is a dominant factor in the policy-making process, in particular with respect to the introduction of new national rules (Andeweg and Nijzink 1995; Martin 2004; Martin and Vanberg 2005). The cabinet sets the agenda, and primarily takes the initiative for new laws. Because of the proportional nature of the Dutch electoral system, it rarely – if ever – happens that any single party can benefit from the majority of legislative votes necessary to enact policies on its own accord. Then, government by coalition formation is unavoidable. A coalition will bring together parties with preferences that diverge on specific issues, implying that pursuing a common policy requires compromises.

As a result, parties that participate in a coalition are engaged in a 'mixed-motive game' (Huber and Shipan 2002; Strøm and Müller 2000). On the one hand, they have reason to cooperate with their coalition partners to pursue common policies successfully. On the other hand, each party faces incentives to move policy in the direction that will appeal to their party members and voters. Thus, the ideological diversity within a cabinet's coalition matters (Huber and Inglehart 1995; Budge 2001) not only to explain such issues as the duration of the cabinet formation process (Carmignani 2001) or a premature termination (Warwick 1992), but also the birth rate of new national rules. If cabinet heterogeneity is not managed properly, this may in turn slow down decision processes. Political heterogeneity within the coalition is likely to increase the number and intensity of conflicts. Due to power struggles, cabinets loose precious time. They not only have more difficulty to decide on the nature of new legislation, but also tend to need more time to introduce new rules. So, we formulate
Hypothesis H6 (rule-making team's homogeneity): A national rule-making team's homogeneity (i.e., cabinet parties' political similarity) is positively associated with national rule birth.

Again, as with minister experience, this positive effect may be linear or non-linear. The latter could imply that the positive effect of homogeneity is smaller the larger the degree of homogeneity. Similarly, the psychological literature on team heterogeneity suggests that the relationship might be reversed U-shaped (Boone et al. 2005). On the one hand, team homogeneity reduces functional conflict and increases decision-making efficiency, which would boost a cabinet's rule production. On the other hand, team heterogeneity is associated with creativity, which is likely to trigger rule-making, too. Together, both counter-forces might generate a reversed hill-shaped effect of cabinet homogeneity on national rule birth. As we do not have any a priori theoretical reason to predict whatever shape, we simply explore this in the empirical analyses by adding the squared homogeneity variable as well.

4.4 Methods

Critical Unit of Measurement and Sources of Information

Regulations can be categorized according to their legal status, which is connected with the body establishing them.[16] For national regulations, we are able to distinguish between laws in the formal sense (as laid down by parliament), orders in council and royal decrees (as determined by the cabinet), and ministerial guidelines and circulars (as established by a specific ministry). Laws in the formal sense have the highest status; they are laid down by parliament, and hence pass through the entire – time-consuming – institutional legislative process. For this reason, we have opted to examine the dynamics of formal laws, particularly legislation relating to higher education. An act is a collection of national regulations that are created during the institutional process (Postma 1995). A formal law has a particular structure, with the text being divided into titles, sections, articles and sub-articles, paragraphs, clauses and sub-clauses. Each section of a law deals with a part of the domain in question. The literal text of a law – that is, the lowest level within the structure of the act – codifies the national regulations, and so the outcome of the national institutional decision-making process, for a specific domain. Our focus is the lowest level of text in a formal law (frequently a clause or sub-clause, but often a paragraph) as the critical unit of study.

In so doing, we can chart the dynamics of national regulation at its most detailed level, which maximizes the flexibility of the resulting database. Moreover, because entire acts, sections or parts are only seldom amended, this level of analysis is critical to empirical studies of the underlying dynamics of national regulation. The results of the institutional dynamic law-making processes are usually expressed at the most detailed level of legislation – namely the text. If we would record amendments at too high a level of aggregation, we run a greater risk of missing the underlying dynamic. We should add that not all laws are structured in the same way. What is more, even within the same domain – such as higher education – the law's structure often changes over time. Consistency can only be guaranteed at the most detailed level of regulation, as each law contains text at that level.

The source of national regulations – in our case, higher education acts – is the many editions of the Staatsblad, which publishes all formal laws, together with all accompanying changes. Many Dutch university libraries have a complete archive of Staatsblad editions. We prefer these hard-copy archives to the existing digital databases (available on overheid.nl or wetten.nl), which are managed by Staatsuitgeverij, the government publisher, but which are not historically complete. The digital databases go back to about 1995, which is insufficient for a study of the long-term evolutionary dynamics of regulation. Moreover, searching for information in the digital archives

16 This and the next three sub-sections are largely based upon van Witteloostuijn and de Jong (2008).

requires the design of algorithms based on core words. There is a high risk that an incomplete algorithm will lead to an equally incomplete overview of acts (and particularly of amendment acts). Finally, all digital texts still need to be converted to a word-processing programme before the mother file can be used for empirical and statistical processing.

Rule Domain

The very first Dutch national rule in 1801 was the one declaring education to be a concern of the nation-state (Boekholt et al. 2002). Research on the Dutch higher education system makes a distinction between the pre-WWII and post-WWII period (Dodde 2000). Although the foundation of the Dutch higher education rule system can be traced back to the pre-war period – the first national law for higher education was introduced in 1876, and amended in 1905 and 1920 – much of higher education's content and organization were developed in the post-war period, with the 1960 law on higher education as an important point of departure (Zoontjens 1999). From that point on, the differences between primary, secondary, adult, vocational, special and higher education have been firmly established. For this reason, our window of observation concerns the 1960–2004 period. The current higher education system is based on a three-cycle degree arrangement, consisting of bachelor, master and PhD programs and degrees. Higher education is offered by two types of institutions: research universities (universiteiten) and universities of professional education (hogescholen). In terms of employment and government expenditure, higher education nowadays is one of the most important sectors in the Netherlands (Eurydice 2005).

The total number of educational rules is unknown even at the Ministry of Education (cf. Donker van Heel, van Zutphen, and Zoon 2004), which clearly distinguishes rules relating to higher education from those related to other educational domains (e.g., primary, secondary or vocational education). So, the domain of higher education law is clearly demarcated in the body of national legislation. The first step in data collection involved compiling a list of all amendments to post-war acts. The main sources were the acts themselves, as published in the Staatsblad. Each time an amendment is made, however minor, the act begins with a detailed summary of all previous amendments, along with reference to the editions of the Staatsblad in which they appeared.[17] Each amendment act has a specific publication date. We code this date as the time when the act and its amendment took effect. Although occasionally the act itself provides additional regulations and data in relation to its entry into force, this is less important for our purposes, because publication in the Staatsblad completes the institutional process. Each amendment act gives the specific location of the amendment (a section, article or sub-article, paragraph or sub-paragraph,

17 Additionally, as we will explain below, this fits better with the lag structure we use in the empirical analyses, as publication in the Staatsblad is the first easily observable sign of the rule-creation event.

clause or sub-clause, or sentence), and details the substance of the amendment in question. We verified our list by consulting several other sources, in particular the Schuurmans and Jordens educational editions (which are the most important sources of information on educational acts), coupled with the information on educational legislation from educational specialists in Vermeulen (1999), Postma (1995) and Zoontjens (1999).

Event Measures

We measured the dependent variable, Rule birth, on an annual basis. It is constructed as a combination of the occurrence of the event and the size of the event: i.e., our rule birth count is the number of sentences involved with the creation of new rules. There are roughly two ways of determining the size of a national regulation: by the space it takes up (in square centimeters) or by the number of sentences. As the correlation between these two measures is probably very high, it should generally make little difference which one is used. Although both methods are laborious, it is somewhat easier to count national regulations in terms of sentences than to measure them in terms of the space they take up. During the data-collection process, we monitored the layout of the Staatsblad. Although differences in terms of typeface, size, margins and line-spacing appeared, this only marginally affected the average number of characters on one page.

On the basis of the relevant amendment act, each amendment was classified into one of three main groups: (i) the creation of a new rule, (ii) a change of an existing rule or (iii) a repeal of an existing rule. In almost all instances, the amendment can be explicitly classified in one of these ways. For the second group, we introduced a further classification, depending on the ultimate implications in terms of the size of the change. A replacement can have three outcomes: no size implications (e.g., an entire sentence is replaced by a new full sentence of the same size), an increase in size (e.g., an entire article containing five sentences is replaced by a new article of ten sentences) or a reduction in size (e.g., a sub-clause containing five sentences is replaced by a new sub-clause of two sentences). We used this information in order to measure the density of national rules (see below).

Independent Variables

We measure 'Rule density' in each year as the cumulative net size result of changes to regulations. The annual net change is the balance of new regulation births plus the 'positive' amendments, and minus the number of repeals and 'negative' amendments, all measured in terms of the number of sentences. The neutral amendments can be omitted, as they do not affect the size of rule density. Our first year of observation is 1960. Because we have no count of rule density in 1959, the net rule size change in 1960 is our baseline to which we cumulatively add or subtract net rule size changes

in subsequent years. So, strictly speaking, we are measuring cumulative changes in density rather than absolute density. However, knowing the starting rule stock size in 1959 – say, x – would simply have added this value x to our annual rule density, linearly lifting the time series up without any effect on the sign and significance of the estimates reported below. To check for the hypothesized non-linear effect, we added 'Rule density' squared.

For the Dutch Ministry of Education, we counted the number of civil servants in the observation period, coined 'Civil servant density'. For this, we used different sources of information: Knippenberg and van der Ham (1994), the annual financial reports from the Ministry of Education published by the Second Chamber (Tweede Kamer), and recent estimates of the number of civil servants by the Dutch Ministry of Internal Affairs. Since only a very few of these years have no data, we were able to interpolate missing values from the surrounding years.

The demographic characteristics of ministers as to industry experience and age were derived from the curricula vitae of all post-war Dutch ministers of Education. These curricula vitae are all stored and maintained in the Dutch National Parliamentary Archive Institute. Additionally, many of these ministers have bibliographies that describe their personal and professional life in great detail. We have measured 'Minister experience' as a percentage that expresses the amount of experience in education over the entire career that a minister had accumulated prior to becoming minister. As many of the ministers are recruited from the field, most of them already have experience in higher education – for example, due to a board position at a university. In a few instances, a minister did not have any relevant experience. In such a case, we assume that experience grows from zero in the first year to full experience in the third year. The rationale is that a minister is usually highly educated, and therefore will quickly learn about the specific domain at the ministry. To explore the potential non-linear effect of minister experience, we also add 'Minister experience squared'.

We measured the age of the minister at the start and at the end of the period and calculated 'Minister age' as the mean value for each year. To test our hypothesis, we added 'Minister age squared'. In our observation period, due to elections and turnover of cabinets, sixteen different ministers headed the Ministry of Education. These ministers usually changed positions during the calendar year. To obtain an annual estimate for a 'representative' minister in a given year with a change of ministers, we calculated the tenure in terms of the number of days (including a caretaker period), and used this as a weight for the experience and age measures of ministers.

'Cabinet power' was proxied by the surplus amount of seats the coalition had in the

Second Chamber. There are one hundred and fifty seats available. Obviously, a cabinet will need at least a minimum majority position (that is, seventy-five seats plus one). Often, the coalition holds more seats that this bare minimum, thus commanding a more powerful position. The cabinet's power position is measured as the number of seats above that of the minimum majority position of 76.

We measured 'Cabinet homogeneity' as one minus the squared Euclidean distance of cabinet parties in the political spectrum, weighed by the number of seats in the Second Chamber (cf. Boone et al. 2004). The explore the potential non-linear effect of cabinet homogeneity, we also added 'Cabinet homogeneity squared'. We agreed upon the location of all political parties along a "left-right" dimension, after producing two independently made rankings, which generated a list that was double-checked against historical evidence. A numerical example may illustrate our measure. Assume a three-party coalition with liberal democrats (D66), Christian democrats (CDA) and liberal conservatives (VVD), with a seat distribution in the Second Chamber of 6, 44 and 28, respectively. Suppose that these parties score 4 (D66), 5 (CDA) and 7 (VVD) on our left-right dimension. A plot can be constructed with seats on the x-axis and left-right scores on the y-axis. In the quadrant, we can measure all pair-wise Euclidean distances, which are then summed up and divided by the number of coalition partners (3, in our example). In our observation period, we observed eighteen different cabinets. Usually, cabinet change emerged during the course of a year. To obtain an annual estimate for a 'representative' cabinet in a given year with a change of cabinets, we calculated the tenure in terms of the number of days (including a caretaker period), and used this as a weight for constructing our cabinet power and homogeneity measures.

Control Variables

We include one control variable in our regression model: a dummy variable for 1985 (coded as 1 in 1985, and 0 otherwise). In our observation period, the number of events in terms of rule births, changes and repeals fluctuates. In 1985, however, there was an absolute peak in the births of new rules, due to the mass introduction of substantive new laws during the course of this year. The 'dummy variable 1985' controls for this unique peak. Of course, many other control variables could have been added. For one, we constructed different measures that account for the size of the demand for higher education – for example, number of students and the gross national expenditure on higher education (in current and constant prices). Additionally, we constructed different clocks that account for the age of the ministry, for important laws that reformed the educational system and for different educational institutions (that are involved in the rule-making process as well). In the end, all these additional measures correlated almost perfectly either with each other or with the independent

variables that we included in the present analysis. For this reason, they were omitted from the regression models.

Negative binomial regression

We apply negative binomial regression techniques to estimate the significance or non-significance of the hypothesized determinants of the birth of national rules (Allison 1984; Blossfeld and Rohwer 1995; Carroll 1983; Tuma and Hannan 1984). These techniques induce statistical entry rate regularities from time series. Similar techniques, focusing on estimating the determinants of events (here, entry), are common in political science. Examples are studies in international relations (Box-Steffensmeier, Reiter, and Zorn 2003; Box-Steffensmeier and Zorn 2003), decision-making in the European Union (Golub 2002; König 2007), cabinet survival (Alt and King 1994; Warwick 1995) and parliament dissolution (Carmignani 2002; Strøm and Swindle 2002). To test our theoretical model, we analyzed rule birth in Dutch higher education for the period 1960–2004. We chose 'year' as the time interval, which resulted in forty-five observations.

The dependent variable is a discrete counting measure. Hence, we start from the assumption that rule births follow a Poisson distribution. In so doing, we would estimate the number of events (rule births) that occur in a specified time interval (in our case, a year). The Poisson model, however, imposes the restriction that the conditional mean of the dependent variable is equal to its variance. The negative binomial regression model generalizes the Poisson model by introducing an individual unobserved effect into the conditional mean, thus allowing for over-dispersion in the data (i.e., variance exceeding the mean). Extensive experimentation using both approaches revealed that the Poisson process was not suitable for our dataset. Hence, we will only report and discuss the results from the negative binomial model. We used the robust Quasi-Maximum Likelihood (QML) estimation procedure implemented in E-views, since this produces more consistent estimates of the parameters of a correctly specified conditional mean than the Maximum Likelihood (ML) estimation procedure does, even if the distribution is incorrectly specified (cf. Santos Silva and Tenreyo, 2006). Note that we ran our analyses with the ML estimator, too, by way of robustness check (available upon request). Indeed, the pattern of results is similar to what we report below. However, due to the non-normal nature of the distribution of our dependent variable, the ML regression models' overall goodness-of-fit statistics are problematic.

A final remark relates to the lag structure. A priori theoretical and empirical arguments as to whether or not, and if so: when, delayed effects emerge are generally missing. For rule-making processes, though, conventional wisdom suggests that our demographic

and institutional measures will have delayed effects on national rule changes, because the rule-production process initiated by a cabinet and the minister goes through a series of time-consuming constitutional steps. This is why we decided to lag all demographic and institutional covariates in our regression models with one year. That is, our dependent variable is measured at year t, as are the constant, 1985 dummy and rule density variables, and all demographic (minister) and institutional (cabinet) covariates are from year t-1. Indeed, the results reported below disappear altogether or are much weaker in the contemporaneous-throughout specification (available upon request).

4.5 Empirical results

The data shows that all rule events took place. In the observation period, we used 178 amendment laws to identify the different rule events. Overall, we counted 1,815 rule birth events with a total size of 22,086 sentences (12.17 average size per new rule), 959 'neutral' rule changes, 123 'positive' changes with a total size of 955 sentences (7.76 average size per 'positive' change), 76 'negative' changes with a total size of 671 sentences (8.83 average size per 'negative' change), and 383 repeals with a total size of 2,734 sentences (7.14 average per repeal). As a result, the (net) stock of national rules for Dutch higher education increased by more than eight hundred per cent in the post-war period (taking 1960 as our benchmark year, as explained above). The descriptive statistics and Pearson correlations are reported in Table 1. The hierarchical regression results are provided in Table 2, step by step adding ecological (Model 2), demographic (Model 3) and institutional (Model 4) variables to the baseline specification (Model 1).

Table 1. Descriptive Statistics and Pearson Correlations (a)

Variable	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. Rule birth	957.709	409.571	1.000											
2. Rule density	224.386	397.839	0.104	1.000										
3. Rule density squared	205.025	745.764	-0.171	0.921	1.000									
4. Civil servant density	2,419.844	809.611	0.115	0.102	0.068	1.000								
5. Minister experience	92.075	16.526	0.097	0.065	0.075	0.211	1.000							
6. Minister experience squared	87.447	24.350	-0.105	0.067	0.082	0.173	0.989	1.000						
7. Minister age	46.339	4.422	-0.285	-0.084	-0.168	0.072	-0.442	-0.455	1.000					
8. Minister age squared	21.664	4.012	0.278	-0.085	-0.169	0.082	-0.456	-0.468	0.999	1.000				
9. Cabinet power	90.236	8.249	0.210	0.211	0-196	0.014	-0.089	-0.093	-0.162	-0.163	1.000			
10. Cabinet homogeneity	16.961	18.377	0.244	0.150	0.158	0.564	0.230	0.226	0.163	0.152	0.158	1.000		
11. Cabinet homogeneity squared	425.031	424.741	-0.138	-0.135	-0.520	-0.145	-0.133	-0.133	-0.306	-0.152	0.158	0.964	1.000	
12. Dummy 1985	0.023	0.151	0.097	-0.083	-0.042	0.082	0.074	0.080	-0.247	-0.240	0.173	0.193	-0.147	1.000

(a) The figures for the squared terms have been divided by 100 (for Minister age squared and Minister experience squared) and 1,000 (for Rule density squared) for presentation purposes only.

Table 2. National Rule Birth in Dutch Higher Education (1960 – 2004) (a)

	Model 1	Model 2	Model 3	Model 4
Constant	10.516***	3.218***	87.404***	71.869***
	(0.151)	(0.767)	(22.046)	(25.369)
Rule density		0.005***	0.006***	0.008***
		(0.001)	(0.001)	(0.001)
Rule density squared		-0.001*	-0.002***	-0.003***
		(0.006)	(0.006)	(0.006)
Civil servant density (t-1)		0.002***	0.002***	0.001***
		(0.000)	(0.000)	(0.000)
Minister experience (t-1)			0.031	0.325***
			(0.179)	(0.118)
Minister experience squared (t-1)			-0.007	-0.002**
			(0.001)	(0.001)
Minister age (t-1)			-3.786***	-3.438***
			(1.012)	(1.131)
Minister age squared (t-1)			0.041***	0.039***
			(0.011)	(0.012)
Cabinet power (t-1)				0.121***
				(0.039)
Cabinet homogeneity (t-1)				0.291**
				(0.113)
Cabinet homogeneity squared (t-1)				-0.005*
				(0.003)
Dummy 1985	4.287***	5.732***	5.399***	4.176***
	(1.011)	(1.019)	(1.052)	(1.121)
Log Likelihood	-522.52	-443.39	-431.47	-415.80
LR statistic	77.23***	203.53***	227.36***	258.71***
degrees of freedom	1	4	8	11
LR index (pseudo-R^2)	0.07	0.19	0.21	0.23

(a) Standard errors in brackets. * $p < .05$, ** $p < .01$ and *** $p < .001$. The estimates for the path coefficients divided by the standard errors result in z-values. The accompanying *p*-values result from the standard z-distribution table.

Table 1 shows that all values of the correlation coefficients are below 0.80, which is the common threshold value for multicollinearity. The squared terms are the exception to this rule, by their very construction. However, our theory implies that they must be included. Further inspection of our data, using the comprehensive Model 4 from Table 2, revealed that neither autocorrelation nor heteroscedasticity is an issue. Autocorrelation is problematic if the residuals are serially correlated. The Durbin-Watson statistic is 2.17. This is above the critical upper-bound value for the Durbin-Watson test at the significance level of 5 per cent (1.86). Hence, the null hypothesis of no autocorrelation is accepted. Heteroskedasticity is problematic if the residuals do not all have the same variance, which may result in incorrect standard errors. The White heteroskedasticity test fails to reject the null hypothesis of no heteroskedasticity at the significance level of 1 per cent, because the p-value of the F-statistic is 0.26.

We estimated a set of hierarchical regression models examining first the (linear) relationship between rule birth and our control variables (Model 1). We then entered our main effects variables regarding ecological processes (Model 2), ministers' demography (Model 3) and cabinet features (Model 4), respectively. The various fit parameters show that our model increasingly fits the data better. For example, the likelihood ratio (LR) index improves from 7 per cent in Model 1 to 23 per cent in Model 4. Also, the estimates remain robust in terms of signs and significance levels, by and large. For that reason, we mainly focus our discussion on the results with reference to Model 4.

The empirical results provide strong support for our explanation of national rule births. The LR-chi-square statistic of the final model was satisfactory (258.71 with $p < 0.000$), which ensured the improvement of the fit of our model over a model that included only the intercept. The estimated parameters for rule density ($\beta = 0.008$ with $p < 0.001$) and rule density squared ($\beta = -0.003$ with $p < 0.001$) have the expected opposite signs, and both are highly significant. Indeed, the density peak of 1,352,000 is within our observation range, which has a maximum of 29,000,000. Hypothesis 1 is, therefore, confirmed. Note that, as the net entry rate is positive throughout all years in our time window, a negative density-dependence effect is still associated the rule stock growth (van Witteloostuijn and de Jong 2007, 2008). The estimated parameter for civil servant density is positive, as expected, and clearly significant in Models 2 and 3 ($\beta = 0.002$ with $p < 0.001$) but not so in Model 4, implying moderate support for Hypothesis 2.

Hypothesis 3 is partly supported: the experience of the minister with the domain of higher education significantly increases rule births in higher education law ($\beta = 0.035$ with $p < 0.001$ for the linear effect, and $\beta = -0.002$ with $p < 0.01$ for the

squared term). However, the effect is non-monotonic, revealing a reversed U-shape, as the maximum of 89.312 is clearly inside our observation range of [0,100.000]. Moreover, the power position of the cabinet in the Second Chamber does indeed facilitate the introduction of new national rules for higher education ($\beta = 0.121$ with $p < 0.001$), implying that Hypothesis 5 is accepted. Cabinet homogeneity is non-linearly associated with the introduction of new national rules ($\beta = 0.291$ with $p < 0.01$ for the linear term, and $\beta = -0.005$ with $p < 0.05$ for the squared term). Hence, Hypothesis 6 is partly confirmed. The effect is non-monotonic, revealing a reversed U-shape, as the maximum of 27.320 is clearly inside our observation range of [0,38.080]. The parameter estimate for the 1985 dummy variable is positive and highly significant, which confirmed our expectation as to the unique situation in that year ($\beta = 4.176$ and $p < 0.001$).

The empirical results in Table 2, however, do not support Hypothesis 4. Rather than the expected inverted U-shaped relationship between minister age and rule births, we find a U-shaped relationship. The estimated path coefficients for minister age ($\beta = -3.438$ and $p < 0.001$) and minister age squared ($\beta = 0.038$ and $p < 0.001$) have significant opposite signs, but indicate a convex rather than a concave relationship to rule births. Indeed, the inflexion point of 44.257 is within our observation range, which has a maximum of 53.840. This implies that the productivity of young ministers decreases before, after a certain age, to increases again. We performed different additional analyses to verify the robustness of this result. We first estimated our model in terms of tenure of the minister rather than minister age. This, however, again confirmed a significant convex relationship. Hence, minister age and tenure go together in the explanation of national rule births. Subsequently, we removed the squared term for age in order to test the hypothesis that a negatively linear relationship might well exist between the age of a minister and her or his productivity in terms of the introduction of new rules. We found a positive but insignificant relationship in this regard.

Our interpretation of this unexpected result is three-fold. First, the risk-averse incentive structure, which is a crucial assumption underlying Hypothesis 4, may not hold for ministers in government cabinets, as opposed to managers in for-profit organizations. Young ministers might feel the ambitious and energetic pressure of the young to prove themselves. Hence, initially, they are extremely productive rule-makers, in an attempt to show that they can do the legislative job. This may explain the initial high-end starting point of the age-dependent rule-making curve. Second, the risk of a breakdown in terms of career failure for younger ministers is relatively high. This is particularly an issue for ministers of moderate age, with a career and family at stake. As a result, their rule-making behavior will be more moderate, reflecting their more risk-averse attitude. This would imply the downward slope after the high end of the

age-dependent rule-making curve. Third, older ministers have less to lose, and have a greater incentive to collect their 'trophies' in order to leave their stamp on history. Indeed, new rules of considerable size often receive the name of the minister who introduced these rules. The temporary position of a minister may further amplify this. Also, older ministers usually are financially independent – or, given their wealth of expertise and personal network, have greater opportunities for other civil careers. Prestige is a well-known driver for ministerial behavior at this point of their career. Moreover, the introduction of new rules requires a considerable amount of expertise, which takes a great deal of time to accumulate. In addition to this, the decision-making process at a ministry is extremely complex. Older ministers generally have more experience, managerial capabilities and natural authority over civil servants, both in the department and in the field. Together, these competences might result in greater productivity in terms of the introduction of more and new national rules for higher education at older age. This will generate the upward-sloping part of the rule-production curve.

4.6 Conclusion

This paper intends to empirically unravel the underlying causal mechanisms that determine the rate of national rule births. In the evolution of national law, rule birth is one of the most important events, particularly when birth rates exceed repeal rates. This is often the case because national rules tend to be rarely suspended. A careful inspection of our sample with respect to Dutch post-war higher education shows that more and more regulations are indeed being added to the existing stock at an ever-increasing rate. Today, the doubling rate for the national rule stock in Dutch higher education is less than ten years. To a certain extent, these results confirm the widespread perception in the field of Dutch universities. Our study is one of the first to have empirically tested this general common wisdom. We developed a method of rule counting which – in line with our definition of a national rule – has allowed the construction of time series for rule births, changes and repeals. By doing so, we have resolved some of the complexities that have, to date, hampered a quantitative analysis of the evolution of national legislation. On the basis of this data, we have estimated models that predict linear and non-linear relationships between different covariates and rule birth.

Our findings reveal that ecological, demographic and institutional processes can indeed explain the birth rate of national rules. The stock of rules expands due to a powerful internal dynamic: that is, rules breed rules, following a reversed U-shaped density-dependence pattern. For the 'stock' of rule-producing civil servants, we find moderate support for the hypothesis that rule-makers breed rules. In addition, the minister's experience in the educational domain throughout the entire career prior

to becoming a minister is important: ministers are more 'productive' in proportion to their affinity with the substance of higher education up to a point, after which their rule production starts to decline. Moreover, a stronger power position of the cabinet in the Second Chamber facilitates the introduction of new rules, whereas the effect of cabinet homogeneity reveals a reversed U-shape. All this is as expected, by and large. A somewhat surprising result concerned the effect of the age of the ministers. Following the demographic literature, we predicted a concave relationship with rule birth. Instead, we found a convex relationship. Ministers apparently face age and government-specific risk and career incentives that result in reversed U-shaped age-productivity curve. Overall, our study aligns well with the suggestion that ecological and institutional theories must be merged to develop a better understanding of complex population-level dynamics (Amburgey and Rao 1996; Baum and Powell 1995; Baum and Oliver 1992, 1996).

We envision at least three opportunities for future research, which may help to overcome some of the inevitable limitations of our study. First, because of the size of our sample (that is, forty-five observations), we could only include a limited number of variables in our empirical models. Although these variables reflect key theoretical perspectives, and therefore offer a primary foundation for a demographic institutional ecology of national rules, many more potential drivers of the evolution of law can and need to be considered, such as tenure, political and religious background of ministers, similarity of demographic characteristics with the state secretary (who in the Netherlands is very important in the new legislation process) and team composition features of cabinets (such as mean and spread of age, tenure and educational background). Additionally, in future work we hope to include proxies for rule-making pressures from the demand side, such as the density of lobbying groups. Of course, the more comprehensive models that follow from this can be estimated not only for rule births, but also for rule changes and suspensions. Comparing the underlying causal mechanisms would allow for the identification of similarities or differences in the explanatory mechanisms for these three key events.

Second, to be able to estimate larger models, larger datasets must be compiled. The collection of new data from other countries or from other domains of law would enable to verify the generalizability. For one, particularly Europe offers a natural laboratory for empirical research in the demographic institutional ecology of national rule evolution, since different European countries have produced different evolutionary trajectories in different institutional settings. These differences are associated with differences in the process, organization and 'culture' of national law systems. Moreover, the collection of new data from other domains law offers opportunities to test for cross-population dynamics. For example, it might be that the population of Dutch rules for higher education is a reaction to the dynamics of European legislation created

in Brussels. Similarly, various other domains of national rules, such as company or media law, are interesting alternative settings.

Third, in this paper, we estimated models with main effects only. In future work, research may move forward by including interaction effects between, e.g., ecological variables and demographic and institutional features. Evidence scattered throughout the ecological literature suggests that – alongside the endogenously driven ecological processes within populations – it is the interaction between institutional settings and the evolution of rules that matters. For example, the evolution of the Dutch auditing industry has been heavily influenced by formal law-setting events that regulate the demand for auditing services (Maijoor and van Witteloostuijn 1996; Pennings, Lee, and van Witteloostuijn 1998).

A final remark relates to the potential applicability of our perspective to broader issues of bureaucracy and rule-making. We believe that the ecological perspective as proposed here offers a promising platform to further develop a general theory of bureaucracy and rule-making. As such, ecology is associated with a well-established and rich toolkit for the study of evolutionary processes in communities of social entities. This is not only clear from the ecological study of a wide variety of organizational populations in sociology (e.g., Carroll and Hannan 2000), but also from the ecological approach to the evolution of interest groups in political science (e.g., Gray and Lowery 2001a, b) and of bureaucratic rules in organization studies (e.g., Schultz 1998). Indeed, insights from demographic and institutional theories from the group psychology literature (e.g., Finkelstein and Hambrick 1996) and bureaucracy and legislative theories in public administration (e.g., Ringquist, Worsham, and Eisner 2003) can be easily integrated into such an ecological perspective on the law-making processes, as we hoped to have demonstrated above. In so doing, the three essential building blocks of a theory of the evolution of law (or rules, more generally) are in place: the intrinsic ecological dynamics of any population of social entities, the institutional rules of the game within which the ecological processes evolve, and the key demographic features of the agents and their bodies that, ultimately, have to decide on making, changing or suspending rules.

CHAPTER 5. THEORY OF TOP POLICY TEAMS

Summary

An in-depth and quantitative assessment of underlying causes that drive regulation production is important for our understanding of the evolution of a nation's regulation stock. We present a new theory of top policy teams and hypothesize whether different sets of senior and junior ministers result in different patterns of regulation dynamics. A set of senior and junior ministers heads a department and therefore co-determines the regulation production of their department. Teams of senior and junior ministers are almost by definition demographically diverse. Based on business and social psychology research on group functioning, we posit a non-monotonic hill-shaped relationship between team heterogeneity and regulation production. Team heterogeneity may foster creativity and productivity, but may also trigger miscommunication and conflict. The new theory presented in this chapter enables future research about regulation dynamics in the modern world economy.

Key words: senior ministers, junior ministers, policy team heterogeneity, national rules

5.1 Introduction

In public administration and political science, the mechanisms that lead to extending, reducing or changing regulation received increasing attention (Bozeman 2000; Bozeman and Feeney 2011; Olson 2010; van Witteloostuijn and de Jong 2010). Regulation can be thought of as a set of rules issued by an administrative agency or government body that prescribe conditions or authorizations that must be followed by citizens and organizations. An in-depth understanding of the mechanisms that foster the production of regulation is important for policy-makers that aim to reduce the regulatory burden for firms and citizens, which is exemplified by the growth of so-called "better-regulation programs" (OECD 2010; Radaelli 2010; van Witteloostuijn and de Jong 2012). Starting with Mayhew's (1991) seminal contribution, a series of papers developed models and tests of such issues as legislative change, gridlock and prioritization (Edwards, Barrett, and Peake 1997; Jennings, Schulz, Patient, Gravel, and Yuan 2005; Martin 2004; Martin and Vanberg 2005; Tsebelis 1999). Recently, the role of institutional or political factors like the coalition agreement, ex parte lobbying, ideological distance or the prioritization of bills in the pace of regulation is increasingly highlighted (Houlberg and Knudsen 2011; Laver and Shepsle 2000; Maltzman and Shipan 2008; Timmermans 2003; 't Hart and Wille 2006; van Witteloostuijn and de Jong 2007, 2008; Yackee 2011). We contribute to this literature by focusing on the role of senior and junior ministers in the regulation process. That is, we will theorize whether, and if so, how, different sets or combinations of senior and junior ministers result in different regulation dynamics. Notwithstanding substantial progress in policy research (e.g., König 2007; Nicholson-Crotty and Miller 2011; Oosterwaal and

Torenvlied 2011), a theory of senior-junior minister combinations and regulation production still remains largely unaddressed, to date. Our study aims to fill this research gap.

In modern Western democracies, a cabinet dominates the policy-making process, at least with respect to the production of regulation (Andeweg and Nijzink 1995; Andeweg 2000, 2006; Timmermans 2003). In the Netherlands, for example, approximately 95 percent of all new or amended regulation is a direct cabinet initiative implying that the Parliament does not matter much in the policy-making process (Andeweg, De Winter, and Müller 2008; Andeweg and Irwin 2009; Bräuninger, Debus, and Wüst 2006; de Jong and Herweijer 2004; 't Hart and Wille 2006); a situation that is observed for other countries as well (Kalitowski 2008; Shephard and Cairney 2004; Yesilkagit and Christensen 2010) and one that with the current trend of Europeanization is likely to continue (Bovens and Yesilgakit 2010; Müller, Bovens, and Yesilkagit 2010). In many countries, elections almost never yield a legislative majority for a single party. As a result, multi-party cabinets are formed oftentimes after lengthy and complex processes of bargaining (Huber and McCarthy 2001). These multi-party cabinets need to initiate, facilitate and implement regulation. Cabinets as a whole have limited resources and time, and therefore do not design national laws themselves as a group across the different domains. Rather, they delegate this task to domain-specific senior ministers, implying that senior ministers have the ministerial discretion to design government bills (Gallagher, Laver, and Mair 2006; Laver and Shepsle 1994, 2000).

For long, senior ministers more or less had a monopoly power over their rule domain (Blondel 1985; Chabal 2003). Marsh, Richards, and Smith (2000), for example, argue that ministers have multiple roles – ranging from policy to political, managerial and public relations roles – and have varying impacts but are nonetheless important in the regulation process because civil servants cannot act alone. Civil servants lack the legitimacy to do anything without ministerial authority. Marsh et al. also conclude that over the years the roles and impact of ministers has changed, particularly, ministers have become more pro-active in policy making. During the past decades, however, it has nonetheless been observed that the dominant position of senior ministers in policy-making has been challenged by junior ministers, who have rapidly gained legitimacy in many countries (Laver and Shepsle 2000; Mershon 2002; Thies 2001).

Originally, these positions were created to solve the imbalance between the available cabinet seats (departments) and the "supply" of ministerial candidates. Nowadays, they take responsibility for substantial parts of the senior minister's jurisdiction, supervise sub-departments with delegated responsibilities, and therefore have a role to play in the design and implementation of departmental regulation. Hence, the importance of senior ministers and, more recently, junior ministers in policy making

has been acknowledged making them key in political decisions (Lewis 2008; Moe 2006). To the best of our knowledge, however, relatively little is known as to whether particular combinations of senior and junior ministers matter for regulation dynamics. We will offer a new theory for this hypothesis.

The added value of our new theory is substantial. For example, in the Netherlands, and elsewhere, an official procedure exists (formulated itself in formal laws) that determines the law-making process (Kenniscentrum Wetgeving 2002). Research in public administration, however, increasingly identifies mechanisms (such as ex parte lobbying or gridlock) that are not documented in official procedures but do determine legislative dynamics indicating that regulation output is largely a black box. An important premise here is that the underlying causal processes are manifest in observable regularities that drive the evolution of regulation. Our study is among the first to consider a set of senior and junior ministers as a particular team that heads a department and for that reason to co-determine the output of a department in terms of regulation production.[18] Such departmental teams of senior and junior ministers share three important characteristics, at least, that each independently but in particular in combination explain why junior-senior minister combinations may matter to the dynamics of regulation production.

First, senior and junior ministers usually represent different political parties and for that reason have a strong inclination to monitor each other's activities (Müller and Strøm 2000, 2008). Thies (2001), for example, considers junior ministers or undersecretaries as instruments to "keep tabs on partners" within government coalitions. Large scale empirical studies on junior-senior minister combinations are far and between but the available evidence suggests that some senior and junior ministers collaborate closely whereas other senior-junior minister combinations are hampered by conflicts and distrust. Lipsmeyer and Pierce (2011), for example, refer to several case studies (e.g., Mitchell 2003) that suggest that junior ministers indeed fulfill a monitoring role in Belgium, Germany, Ireland, and the Netherlands. They point to recent cross-country studies (e.g., Martin and Vanberg 2011) that also reports evidence for executive oversight as hypothesized in theories of coalition. [19] Andeweg (2008) shows that in Dutch cabinets between 1948 (when the office of junior minister was first introduced in the Netherlands) and 1967, on average 59.5% of all junior ministers were teamed up with another party's cabinet minister. Between 1967 and 1987 this increased to 65.6%, and to 86.0% between 1987 and 2007 (with an exceptional case of 100% in the Balkenende II cabinet).

18 Essentially, any combination of n persons is a team. Team members to a greater or lesser extent may or may not collaborate. Collaboration, however, neither is a necessary nor a minimum requirement for the definition of a team. It is one of the m potential characteristics of a team. Put differently, there are teams with members that do collaborate and teams with members that do not collaborate.

19 Given the increased importance, the "watch-dog" function may run both ways; with juniors monitoring seniors and vice versa. This in itself does not defy a policy team theory as proposed here but simply is one of the particular features of junior-senior minister combinations.

Second, senior and junior ministers may have separate responsibilities but do not work in isolation. In many countries, they have weekly formal meetings during which policy and regulation issues are discussed in detail next to and on top of many informal discussions (ex parte lobbying, see Yackee 2011) that are characteristic for consociational or consensual democracies like the Netherlands (Andeweg 2000; Andeweg and Irwin 2002).[20] The formal meetings are prepared by senior staff members of the department and include strategic items as well as progress reports on regulation production details. In the Netherlands, for example, the formal procedure for a complete new act starts with an initiative from a senior or junior minister and at least takes 40 different steps prior to enactment (Chorus, Gerver, Hondius and Koekoek 1999; Postma 1995; Zoontjes 1999). The weekly formal meetings co-determine departmental law-making initiatives. During the regulation process, senior and junior ministers consult domain-specific committees and advisory boards from their own and colleague departments, the coalition and the Lower and Upper Houses. Of course, junior and senior ministers very seldom sit together to write the literal text of a new law themselves but they do review legislative proposals apart and in tandem. [21] It is well known that some ministers have a sharp eye for legislative details whereas others "blindly" sign regulation amendments proposed by their civil servants or junior ministers. Moreover, given that a successful head-to-tail introduction of a new act is very time-consuming and therefore difficult to achieve within a cabinet term, senior and junior ministers increasingly use an accumulation of law amendments to show their significance (van Witteloostuijn and de Jong 2008, 2010). The implication thereof is that opportunities for detailed revisions of existing laws have become increasingly important in the regulation process of a department.

Third, different junior-senior minister teams include different capabilities, experiences and personalities, and reflect different degrees of awareness and ambition. Senior and junior minister positions often change with cabinet turnover. New persons in (new) departmental teams have their own personality traits and leadership styles ('t Hart and Wille 2006; van Witteloostuijn and de Jong 2008) that, in turn, have an impact on departmental performance (Bozeman and Feeney 2010; Moynihan and Pandey 2005). The institutional and political processes that select cabinet members typically foster diversity between senior and junior ministers in one department. Apart from the election outcomes and subsequent bargaining processes that determine the

20 Andeweg (2008) concludes that the number of informal meetings strongly increased and that the format changed as well – from bi-weekly dinners with senior ministers only to weekly lunches including junior ministers and other political party senior staff members. Andeweg suggests that the informal meetings eventually overruled the formal cabinet meetings with the latter signing-off decisions that have been taken in the former.
21 In a similar vein, members of private company boards such as chief executive and chief financial officers are not directly involved in the production of products and services but nonetheless are expected to determine the company's performance through their strategic, operational, financial and marketing decisions. The key argument is that strategic behavior and outcome are not the mere result of the combined characteristics of individual team members, but rather of the composition of the team as a whole (Wijbenga and van Witteloostuijn 2007).

distribution of the departments over coalition partners, the demographic characteristics of prospective ministers have a role to play in the selection processes. In fact, diversity is an overarching characteristic of the political leadership of departments in many countries: persons with, for example, substantial tenure are often matched with those who have less working experience. Likewise, ministers of older age are oftentimes coupled with a younger counterpart.[22] Very seldom a perfect match in demographic characteristics is obtained – in other words, demographic heterogeneity is the rule, rather than the exception within senior-junior minister combinations. We therefore propose a theory concerning the impact of senior-junior minister team heterogeneity on the production of national rules.

In the next section, we will explain our theoretical logic, and formulate our propositions as to two particular team determinants of national rule production: age and tenure senior-junior minister heterogeneity. We consider these to be two of the most salient features of senior-junior minister combinations and theoretically the most influential of all demographic characteristics. We will conclude with an appraisal, offering a reflection on opportunities for future research.

5.2 Theory of top policy teams

A Top Policy Team Perspective of Regulation

We theorize that the composition of domain-specific senior and junior ministers in a cabinet can, in part, explain the production volume of a country's legislation in that domain. Our research is grounded in a top management team perspective of organizational performance that is common in business research but for long has experienced less integration and application in public administration studies. van Wart (2003) – referring to Terry (1995) –offers various explanations for this. One possible explanation is that some scholars belief that administrative leadership does not (or should not) exist to an appreciable degree because of a belief in a highly instrumental approach to leadership in the public sector. According to van Wart, this is a legacy of both scientific management, with its technocratic focus, and beliefs in a strong model of overhead democracy. Another argument suggests that bureaucracies may be guided by powerful forces that are largely beyond the control of administrative leaders, making their contributions relatively insignificant. According to van Wart, the stronger these beliefs, the less likely administrative leadership would receive attention.

We perceive departments as organizations that have leadership teams and for that reason are subject to similar forces as in private companies. Our hypotheses build on a stream of relatively recent studies in organization science that focuses on the analysis of the role of the demography of organizational top management teams

22 For our team perspective exactly who is younger (older) in the team is not relevant.

(TMTs), in order to explain inter-organizational differences in behavior and performance (Carpenter 2002; Pitcher and Smith 2001; Horwitz and Horwitz 2007). Since the 1970s, group composition research is well-established in social psychology and this inspired Hambrick and Mason (1985) to link TMT to organizational results (Boone, van Olffen, & van Witteloostuijn, 1998). Unlike human capital theory – that focused on characteristics of individuals (Becker, 1964) – Hambrick and Mason argued that demographic variables such as age and gender, together with functional, educational and socio-economic background features of the executive team had a potency to explain organizational performance. The model of Hambrick and Mason goes much further than human capital theory in many ways. They distinguished two classes of managerial characteristics: one observable, including personal and group demographic variables, and one psychological, including the individual's cognitive base and values. The combination of both determines the (strategic) choices that TMTs make such as administrative structures and innovation that, in turn, impacts organizational growth and survival. Boone et al. (1998) offer examples to explain that TMTs may influence performance direct and indirect. For example, longer tenured teams may have so much industry experience that their response time to an arising strategic problem is condensed compared to that of a shorter tenured team that needs prolonged time to sort things out. Boone et al. explain that although the ultimate strategic choice may be the same, the quicker response of the experienced team may contribute more to organization performance than the relatively inexperienced team's lagged reaction.

Hence, the so-called upper echelon perspective of Hambrick and Mason argues that TMT heterogeneity, which is the extent to which the managers vary with respect to attitudes, backgrounds and competences, determines the behavior and the performance of an organization (Boone, van Olffen, van Witteloostuijn, and De Brabander 2004; Finkelstein and Hambrick 1996). Due to people's bounded rationality – that is, their inability to comprehend all information that is available and relevant for taking decisions in complex environments – their beliefs, knowledge, assumptions and values direct their attention towards certain aspects of the environment, and influences the way they interpret the stimili. Values, attitudes, and perspectives are influenced by all kinds of experiences, such as the era in which the individual has been raised, the school system attended, and the number of years worked in a specific industry. People are molded by their history, and perceive and interpret the world around them through the lenses of their experiences. This also pertains to managers' strategic decisions, which are therefore argued to be influenced by these unobservable personal attributes. Studying observable demographic characteristics of managers is a way to overcome the problem of gaining information about the underlying personal values that are actually held responsible for the way people behave. The upper echelon model underscores the effects of team composition in terms of the diversity of members' attributes. The extent of heterogeneity among

team members is argued to determine group dynamics, which in turn affects team decisions and performance and, ultimately, organizational outcomes. Since personal characteristics (such as age or tenure) are believed to refer to personal backgrounds, values or frames of reference, arguments as to the (dis-)advantages of heterogeneity of team composition are based on the group dynamics resulting from the interactions among individuals with either converging or diverging values and perspectives.

Thus, the key argument is that strategic behavior and organizational performance are not the mere result of the combined characteristics of individual TMT members, but rather of the composition of the TMT as a whole (Carpenter, Geletkanycz, and Sander 2004; Wijbenga and van Witteloostuijn 2007). Indeed, a large number of empirical studies provide support for the explanatory power of a variety of the demographic composition characteristics of teams (see Boone, van Olffen, and van Witteloostuijn 2005, for an overview). When reviewing these studies, two broad conclusions can be drawn, at least. First, although scholars have examined many dimensions of TMT demography, the unevenness or heterogeneity in the age and tenure of team members are the demographic variables of primary interest. In this context, the conclusion is that team diversity must be decomposed to the level of single demographic attributes in order to disentangle their separate effects on behavior and performance.

Second, the empirical results for the impact of heterogeneity on performance are mixed, suggesting that team heterogeneity is a double-edged sword. Cognitive resource diversity theory argues that heterogeneity is an important factor in competitive decision-making, because rich and diverse inputs from heterogeneous team members serve to improve the creative potential as well as the information-processing capacity of the team, resulting in higher decision-making quality. That is, heterogeneity comes with increased adaptability and flexibility in dealing with difficult tasks involving demand for creativity and innovation. According to the notion of requisite variety (Weick 1979), within-team diversity must be matched with the complexity and non-routine nature of the decision environment to perform well (Milliken and Martins 1996). When a group faces a complex and non-routine decision environment, team performance may benefit from having a wide range of viewpoints, which can be discussed and evaluated critically within the group to arrive at appropriate solutions (Krishnan, Miller, and Judge 1997; Naranjo-Gil and Hartman 2007). High team diversity is likely to facilitate the production of such a wide spectrum of perspectives. As people are the carriers of cognitive capacities, and as there are limits to the cognitive complexity any single individual can handle (Cyert and March 1963), every team member can provide only part of the diversity needed to solve the problem. Different individual cognitive resources must therefore be pooled to form diverse teams that are able to deal with complexity. In this respect, Finkelstein and Hambrick (1996) argue that demographic heterogeneity can be regarded as a proxy

for cognitive heterogeneity because it represents innovativeness and openness to change. In a similar vein, signaling theory suggests that a diverse team membership will appeal to the interests of stakeholders. This will generate support and increase the legitimacy of TMT decisions (Gong 2006; Oxelheim and Randoy 2003).

Although a positive relationship between team heterogeneity and performance emerges from this logic, another literature hints at counter-forces. That is, the principle of requisite variety that underpins the benefits of diversity in certain circumstances may well underestimate the process loss disadvantages of team heterogeneity. Social identity or self-categorization theory states that belonging to a group of similar people (e.g., according to age or gender) creates a psychological state that confers to social identity or a collective representation of self-identity (Richard and Shelor 2002). When a group consists of members dissimilar in their demographic attributes, social identity theory predicts that this can have a negative effect on group processes due to stereotyping, in-group/out-group effects, less positive attitudes, less frequent communication, more affective conflict, and higher turnover in team membership, with a resultant negative impact on team outcomes. When people are more alike in their thinking, attitudes, values and beliefs, this will facilitate interpersonal liking and attraction. So, team homogeneity enhances group cohesion and social integration, which in turn facilitates communication frequency and decision effectiveness.

Together, the above set of arguments implies that the team heterogeneity-performance relationship is complex, and may be best represented as curvilinear. On the one hand, at low levels of heterogeneity, teams may not sufficiently exploit the benefits of cognitive diversity, particularly by lacking the creativity associated with such diversity. On the other hand, at high levels of heterogeneity, teams might be trapped in vicious conflict and miscommunication circles, thereby foregoing the opportunity to create an adaptive team. The combination of both forces suggests that moderate levels of heterogeneity will be best for team performance and hence, that there may exist a decreasing marginal return of heterogeneity to team performance. That is, there may be a saturation point above which an increase in heterogeneity does not improve, but rather does deteriorate team performance.

Below, we explore how the aforementioned team demographic theories can be applied and adapted in order to understand the impact of senior-junior minister team heterogeneity in terms of age and tenure on regulation dynamics. Given that our study is one of the first of its kind, we focus on this pair of team-specific drivers of regulation dynamics, as they figure so prominently in the business and social psychology team literature outlined above, and because they will illustrate succinctly what our approach for public administration research entails. Thus, our aim is not so much to study which dimensions of demographic heterogeneity influence regulation

production but rather how heterogeneity influences departmental outcomes in terms of rules.

Heterogeneity of age

Our first demographic characteristic of a junior-senior minister team is age diversity. We focus on age diversity because in our research setting, persons of different age are often selected to head a department. Also, given the make-up of most senior-junior teams, more variation in age exists than racial or educational diversity and the junior-senior age distribution is changing. Both situations occur in politics: relatively young persons are increasingly found in senior positions and vice versa. Junior and senior ministers of various ages and generations that head a department tend to differ in their values and attitudes. Given these realities, we belief that age represents an ideal demographic attribute for the exploration of senior-junior minister team heterogeneity and rule production. Like other prior TMT research, we rely on age as a demographic conception of the junior-minister group because it serves as a proxy for perspectives, belief systems and networks and affiliations (Boone et al. 1998; Richard and Shelor 2002). That is, earlier work dealing with age as a bio-demographic attribute of team diversity revealed that this is one of the most influential and salient demographic features, providing an intra-generational link between individuals (Bates 1990; Hambrick and Fukutomi 1991). Age is an important attribute by determining a person's background and experience outside the employing organization (Wiersema and Bird 1993). Senior and junior ministers of the same generation may share the same perspectives on different aspects of life, have grown up in the same national periods and hence, have experienced the same economic, political and social events. Therefore, it is very well possible that ministers from the same age group share similar attitudes, norms, perceptions and values, and thus are similar in their line of thought and decision-making preferences (Bantel and Jackson 1989; Murray 1989). Members of similar age groups favor and like each other. This suggests a positive effect of team age homogeneity (i.e., low levels of age heterogeneity) on a senior-junior minister team's rule production – albeit that teams with members of the same generation (e.g., 30- and 35-year-old team members) do not benefit much from the positive effects of age heterogeneity as proposed by the resource-diversity theory. Age diversity can encourage the exchange of a wide range of viewpoints and may imply differences in beliefs and values, which can generate a greater acceptance of change (Horwitz 2005). An age-diverse senior-junior minister team (e.g., a team consisting of a 30-, a 35-, and 40-year-old minister) is associated with creativity, and will have fewer difficulties to deal with complexities that emerge during the rule-making process. Older ministers may be more resistant to change, may engage in less risk-taking, and may make more conservative decisions. In contrast, younger ministers might be willing to attempt the novel, and favor riskier decisions. At moderate levels of age heterogeneity, the interplay of cognitive variety, different information sources

and creative decision-making ultimately boosts rule production. As age heterogeneity increases, however, the negative effects of conflicts, miscommunication and de-motivation associated with age dissimilar groups (e.g., generation gaps between a 30- and a 65-year old minister) take over the positive effects of creativity, and eventually may severely hamper junior-senior minister group functioning. Recent studies indicate that large dissimilarities in age between superiors and subordinates tend to have a negative effect on perceived subordinate effectiveness by superiors, resulting in less personal attraction of subordinates to superiors, and increasing role ambiguity (Richard and Shelor 2002). Hence, the arguments above suggest that the relationship between minister team age heterogeneity and rule production is non-linear. We therefore expect to find a non-monotonic hill-shaped relationship between age heterogeneity of a junior-senior minister teams and rule production. So, we formulate:

Proposition 1 (minister team age heterogeneity): Holding all other factors constant, the relationship between junior-senior minister team age heterogeneity and rule production is non-linear, with the slope positive at low and moderate levels of team age heterogeneity but negative at high levels of team age heterogeneity.

Heterogeneity of tenure

Our second demographic characteristic of rule-making teams is departmental tenure diversity. Senior and junior ministers often have different tenure tracks within their departments, implying that the members of a rule-making team may have more or less experience with the legislative domain under their jurisdiction. There exists considerable variation in appointments of senior and junior ministers. Senior ministers are often recruited from the field related to their department, whereas junior ministers usually have less experience in the particular domain. But there are notable exceptions – for instance, when prospective ministers with similar experience need to be rewarded for their party loyalty or when ministers are rewarded with an "advanced" department due to outstanding performance at another department served during a former cabinet. Sometimes, cabinet ministers are in their position for subsequent terms with different cabinets, while their junior ministers are replaced. At other times, the junior minister remains in position and the senior minister is replaced. Thus, rule-making senior-junior minister teams typically consist of persons with different tenures in the ministerial rule domain. Like age, we expect that this heterogeneity in tenure is an important determinant of the rate of (national) rule production.

The hypothesis that relates experience of people to their decision-making behavior is well established in the organizational behavior literature (Finkelstein 1992; Finkelstein and Hambrick 1996). Executives will selectively observe, evaluate and interpret

strategic stimuli in line with their experience, and act accordingly (Boone, van Olffen, and van Witteloostuijn 1997; Keck 1997; Kor 2003). Tenure diversity may be beneficial, because diversity in departmental tenure offers members the opportunity to share experiences, learn interaction patterns and roles, develop cohesion, and absorb information needed to perform particular tasks (Ancona and Caldwell 1992; Michel and Hambrick 1992). As a result, the productivity of task functions increases and group processes improve. Tenure diversity is, for instance, found to be positively associated with firm international diversification (Tihanyi, Ellstrand, Daily, and Dalton 2000), the perceived quality of debate in top management teams (Simons, Pelled, and Smith 1999b), and higher levels of strategic change (Boeker 1997). From the above, we would expect that ministerial teams with members who have low to moderate divergent departmental tenure tracks are associated with more rule production.

As tenure heterogeneity increases, however, conflicts between new and experienced persons increase. High tenure can be associated with greater conservatism, which may derive from risk avoidance (Goll, Sambharya, and Tucci 2001). As managers spend time in an organization, and are successful, they start to believe in the organization's ways of doing things. An action repertoire is built that promotes a relatively high degree of behavioral stability. High-tenure managers are committed to their habitual actions. Senior managers may have tried for years to arrive at the top of the hierarchy. For that reason, they have more to loose than to gain from unnecessary risks (Finkelstein 1992). Concerning team tenure, the same conclusions are likely to hold. As people tend to work together for a long time, social interaction seems to be affected, especially communication (Boone, De Brabander, and van Witteloostuijn 1996; Ferrier and Lyon 2004). Experience tends to form frames of reference that may lead to routines. Therefore, after some point, experience decreases the ability to deal with new upcoming problems. The potential negative effects of tenure diversity are important because these may come with increased emotional conflict, especially in new groups with non-routine tasks (Pelled, Eisenhardt, and Xin 1999), and with decreased commitment to group goals and norms, and justification of past actions (Keck 1997). Hence, heterogeneity in departmental tenure within rule-making teams seems to be positive until a certain point. After that, performance may well start to decrease. While ministers with extensive departmental experience know how the domain operates, ministers with less experience can offer fresh perspectives. When differences in domain experience become too large, common understanding of what is important and what needs to be accommodated in rules is undermined. We therefore suggest:

Proposition 2 (minister team tenure heterogeneity): Holding all other factors constant, the relationship between junior-senior minister team tenure heterogeneity and rule production is non-linear, with the slope positive at low and moderate levels of team tenure heterogeneity but negative at high levels of team tenure heterogeneity.

5.3 Conclusion

Much theoretical and empirical work in the field of political science and public administration focuses on the formation and dissolution of political parties and governments, the allocation of cabinet portfolios, and cabinet duration (Andeweg and Irwin 2009; Diermeier, Eraslan, and Merlo 2002; Gallaghar et al. 2006; Martin and Vanberg 2011). Lowery et al. (2012), for example, study the birth and decline of political parties. Among others, they argue that while party entrepreneurs will look for new issues with which to attract voter attention and mobilize their support, the agenda space is limited and it is difficult to for newcomers to displace older parties even when new issues arise. Based on the seminal work of Bozeman (2000) and his colleagues, another line of research developed theoretical foundations and empirical methods to analyze causes and consequences of so-called dysfunctional rules within public organizations (internal red tape). Recently, an increasing number of studies analyze the causes and consequences of national rules shifting attention to the mechanisms fostering or altering national legislation. By definition, legislation is one of the few tangible instruments cabinets and governments have to foster or change (inter-)national contexts in their preferred direction. This line of research aligns with the renewed attention for the opportunities and limitations of national rules in an increasingly volatile and internationalizing political arena and the impact on the real economy in terms of firm behavior and firm performance (Radaelli 2010; van Witteloostuijn and de Jong 2012).

For long, the production of national legislation has been a black box. Nowadays, the role of institutional factors such as party coalition bargaining, ideological distance or the prioritization of bills in the pace of national legislation is increasingly acknowledged (Martin 2004; Maltzman and Shipan 2008). By the same token, we suggest that combinations of senior and junior ministers play an important role in the production of national rules as well. Notwithstanding substantial progress in public administration and legislative production research, a team perspective still remains an underexplored area of research. We argue that a team-level perspective on national legislation production could be important because a team of senior and junior ministers heads a Department and therefore often a basic unit of rule production. Such teams change in composition due to elections or other reasons that make ministers change positions. Therefore, we focus on senior-junior minister teams as our key unit of analysis. Different combinations of senior and junior ministers include different capabilities, experiences and personalities. In line with team research (Boone et al. 1998, 2004; Hambrick and Mason 1985), we argue that these differences affect the team's decision-making behavior and hence, performance differently. Although the importance of senior ministers (Blondel 1985; Chabal 2003) and, more recently, junior ministers (Thies 2001; Giannetti and Laver 2005) in the legislative process has

been acknowledged, relatively little is known as to whether different combinations of senior and junior ministers generate different production rates of national rules. Our study aims to further this new field of inquiry.

Hence, we offer a theory to analyze whether heterogeneity within senior-junior combinations affects legislative performance. Our focus on heterogeneity of demographic characteristics of rule-making teams complements studies that acknowledge the effects of ideological party divergence on government bills (Andeweg 1988; Huber and Shipan 2002; Fabio 2007). Martin and Vanberg (2004), for example, demonstrate that 'government issue divisiveness' lengthens the legislative process and delays the introduction of bills to the legislature (see also Becker and Saalfeld 2004). Theoretically and empirically, much of this work examines political parties as single actors. For instance, if there is a large policy distance between coalition parties, the legislative process for government bills is argued to slow down. Our emphasis on team heterogeneity also complements legislative studies that focus on the impact of parliamentary institutions on legislative activities (Döring 1995; Martin and Vanberg 2005). The precise form of the relationship between senior-junior minister team heterogeneity and rule production is, however, an open question. Following business and social psychology research on group functioning, we suggest a curvilinear hill-shaped relationship because, on the one hand, cognitive diversity theory predicts that heterogeneity will have a positive effect on team performance, whilst, on the other hand, similarity-attraction theory states the exact opposite, arguing that homogeneous teams are likely to be more productive than their heterogeneous counterparts. As both these beneficial and detrimental effects of diversity (that are not necessarily mutually exclusive) can be expected to play a role at the same time, but with shifting weights, a curvilinear relationship between team heterogeneity and national rule birth can be expected.

Taken together, our study suggests that the relationship between senior and junior ministers in parliamentary government systems is strategically important. Although the parliament is the place for debating and amending new legislation, virtually all rules from a Department pass the parliament because cabinets usually have majority positions in the Chambers that warrant acceptance. In essence, new rules or rule amendments will not be passed without agreement from the original rule-makers, i.e., senior and junior ministers. In our study, we focus on team heterogeneity with respect to age and tenure, as a first step. Following the team diversity literature in organizational behavior and social psychology, we consider these to be the most salient of all demographic characteristics.

We envision various opportunities for future research. First, future research may test our propositions (see van Witteloostuijn and de Jong 2012). Of course, to be able to

estimate models, datasets must be compiled. In this context, the collection of new data from different domains of law would help to test the generalizability of our team perspective. Europe offers a natural laboratory for empirical research in the dynamics of national rule evolution with respect to media and higher education, since different European countries have produced different institutional settings in which media companies and universities operate. Media and media law in the United Kingdom, Italy or France are completely different, and the same yields for higher education. A test of our theory in these countries would enable to study to what extent top policy team heterogeneity, next to and on top of other rule-making antecedents, has a material effect in the evolution of law. Thus, how law evolves may vary across countries and over time as a result of, often large, institutional variety, which may also imply a differential impact of rule-making teams. These differences are associated with differences in the process, organization and 'culture' of national law systems.

Second, new data collection would drive new measurements of top policy team heterogeneity. Top management team studies generally use Euclidean distance measures because these perfectly account for differences in the composition of teams (Pelled, Ledford and Mohrman 1999). Another often-used measure for categorical variables in team heterogeneity studies is the Hirschman-Herfindahl index (HHI). Euclidean distance measures are appropriate for continuous-scaled indicators such as age or tenure. A Euclidean distance measure is an individual-level variable that transforms data into a metric with the purpose to capture degree of membership in a cohort. Following Burt (1982) and others who have used socio-metric measures of centrality or integration, Wagner, Pfeffer, and O'Reilly (1984) argue that the distance between any two individuals can be described in terms of the Euclidean distance between them and every other person in a population of interest. Future research can accommodate these insights to top policy team measures of heterogeneity. Such measures also can control for changes in team compositions for teams in general and small-sized teams in particular. Top policy teams often have a maximum of three persons. The size of the team in itself does not matter to test the propositions of this chapter. The size of teams in private companies, for example, often also is relatively small making them more interdependent than large teams. Boone et al. (2002), for instance, report an average team size of 4.31 executives for companies in newspaper publishing industries.

Third, future research may include other explanations for rule dynamics that relate to the ones explored in this chapter. Although our demographic variables reflect key theoretical perspectives, and therefore offer a primary foundation for a demographic team perspective on national rule production, more characteristics such as educational background of ministers can be considered.

Fourth, the coalition agreement is an important first step in the formation of a multiparty cabinet. Formally, after signing the coalition agreement, the senior and junior ministers are appointed albeit that in practice the selection of ministers is part of the coalition agreement bargaining process. Future research may account whether and how the coalition agreement determines the legislative dynamics for which the study of Andeweg (2008) is informative. In the Dutch setting, Andeweg, for example, shows that the average size of the coalition agreement was 3,475 words before 1967, 11,467 words from 1967 until 1986, and 21,100 words from 1987 to 2007. Andeweg therefore argues that the coalition agreement is an indicator of an increasing trend of politicization in the Dutch political landscape and one that shows an ever-increasing impact of coalition parties on government policy: political parties aim to influence public policy via negotiations during the formation of a new government under the presumption that the coalition agreement is binding for cabinet ministers during the lifetime of the coalition in question. Andeweg, however, also reports that some cabinets (e.g., the Den Uyl governments) do not have coalition agreements. Furthermore, coalition partners cannot foresee all future circumstances when drafting and negotiating a coalition agreement. Coalition agreements are therefore often subject to debate and are often changed during a cabinet period particular when circumstances change such as in periods of economic decline. The Queen's speech may offer another opportunity to determine the impact of agreements on national rule production (Breeman et al. 2009; Lowery et al 2012). The Queen's speech is written by the coalition government and reports the government's achievements of the previous year as well as the government's goals and policy decisions for the year to come.

Fifth and additionally, in future work, intra-team composition as well as inter-team composition features can be included. The former refers to other law-making teams (such as cabinets as a whole and chamber committees, but also political alliances between the chairs of these teams), law-implementing teams (e.g., boards of broadcasting companies) and domain-specific lobby groups. All this would allow testing whether, and if so: how, these teams separately as well as in interaction with each other determine legislative outcomes. In either case, the more comprehensive models that follow from this can be estimated not only for rule production in general, but also for the underlying rule births, changes and suspensions in particular. Comparing the underlying causal mechanisms would allow for the identification of similarities or differences in the explanatory mechanisms for these three key events.

CHAPTER 6. RED TAPE AND FIRM PERFORMANCE

Summary

Regulation may obstruct dynamic adaptation, innovative power and entrepreneurial activity. Alternatively, such regulation could be interpreted as a phenomenon which society just has to learn to live with, and which otherwise does no real economic harm. This paper explores both opposite hypotheses. We study the impact of three dimensions of regulatory red tape on the performance of private companies: regulation cost, regulation change and regulation inconsistency. We analyze unique survey data from 530 Dutch private companies. The results show that regulation cost, inconsistency and change limit sales turnover growth, and that regulation change hampers market competition performance.

Key words: regulatory red tape, private firm performance, regulation cost, regulation change, regulation inconsistency.

6.1 Introduction

Regulation can have positive or negative effect on private firm performance (Bozeman 2000; OECD 2010). The positive performance impact of regulation may run through increased action capability and organizational efficiency. Furthermore, private incumbent firms may benefit from regulation that restricts competition. Similarly, due to regulation, private firms may gain access to markets that previously were only open to government organizations. Many private firms, however, predominantly complain about the negative effects of regulation. For example, firms are often arguing that they need to comply with more and more rules that are frequently changed, and that increasingly require inside and outside legal expertise in order to understand the complex requirements and the implications thereof for a firm's business practices, processes and strategies.

The consequences of regulation are attracting increasing attention in Western democracies. The commonly held view that regulation constrains entrepreneurship and limits welfare (Djankov, La Porta, Lopez de Silanes, and Sleifer 2008) induced policy-makers to review their regulatory practices and regulation stocks. Today, a reduction in regulatory requirements is on the policy agenda in almost all European countries and international organizations, which is exemplified by the growth of so-called "better-regulation programs" (Dunleavy 1986). The case of the Netherlands, our research context, is illustrative, which is often portrayed as a leading nation in this area of better-regulation policies (Linschoten, Nijland, and Sleifer 2009).

In economics, Stigler (1971) was among the first to study the costs and benefits of regulation. Economists acknowledge that regulation is a means by which governments can achieve social benefits that are not directly related to private firms. For example,

governments impose regulation to protect employee health and safety, to stimulate competition or to guarantee access to public goods such as education and health services. This aligns well with Bozeman's (2000) theory of red tape. Most regulation starts out with some implied causal purpose that for someone things will be made better. These potentially positive effects, along with distribution of wealth concerns, are a legitimate basis for regulation irrespective of whether or not regulation makes firms less effective overall. We study the latter dimensions of regulation.

Regulation studies in economics often apply indicators constructed by the OECD or World Bank, typically studying country or industry-level phenomena. Djankov et al. (2008), for example, suggest that the growth of per capita GDP is negatively correlated with an aggregate index of business regulations in areas such as starting a business and getting bank credits, and Alesina, Ardagna, Nicoletti, and Schintarella (2005) find that regulatory reforms are associated with increased investments. However, an ongoing debate questions the usefulness of these indicators for policy design. Muhlerin (2007), for instance, concludes that the two leading regulatory models in economics (i.e., public and special interest theories) have contrasting underpinnings that complicate empirical research, next to and on top of issues related to confounding events and imprecision in data due to the lengthy and noisy nature of the regulatory process.

Our first contribution is that we complement these country and industry-level studies with a firm-level analysis, using new perceptual measures from a sample of private firm managers. As convincingly argued in the business literature (Lang, Calantone, and Gudmundson 1997), managers of private firms form cognitive maps based on perceived information and events, which subsequently impact the firms' strategic decisions. Similarly, the importance of perceptions is emphasized in studies of red tape in public administration (Rainey, Pandey, and Bozeman 1995), as well as in research on political processes (Yackee 2012). For instance, a large number of studies investigate managers' perception of red tape, and how these perceptions are related to organizational commitment, job satisfaction, public service motivation, and performance (Bozeman and Feeney 2011; Feeney 2008), building on the National Administrative Studies Projects in the US.

The value of reliance on perceptions for studying red tape is highlighted in recent work by Moynihan, Wright, and Pandey (2012). The crux of their argument is that perceptions of red tape make a difference because "the experience and effects of red tape may be somewhat mutable […] Even if the rules that give rise to red tape cannot be changed, managerial actions can alter the organizational context in ways that change how employees experience red tape, and how they subsequently respond" (Moynihan et al., 2012: 316). Although private firms are included in the NASP projects,

the majority of the NASP respondents work in public organizations. We complement this literature by focusing on private firms in another country than the US.

Our second contribution concerns the conceptualization and measurement of regulation. Most regulation research in public administration relies on the conceptualization introduced by Bozeman (2000), defining red tape as "rules, regulations, and procedures that remain in force and entail a compliance burden but do not serve the legitimate purposes the rules were intended to serve" (2000: 12). Hence, red tape is negative by definition, which is directly reflected in the measures of red tape (DeHart-Davis and Pandey 2005). This approach is increasingly challenged in methodological debates within the red tape research community (Bozeman and Feeney 2011). Our study complements red tape analyses of organizational performance not only by using another source of regulation (that is, rules issued by governments rather than by organizations themselves), but also by applying regression analysis to estimate the effects of a neutral and multi-dimensional conception of regulation on performance. In order to achieve this, we (a) differentiate between regulation cost, change and inconsistency, and (b) use separate measures of these dimensions and firm performance. With recent work in public administration research (e.g., Moynihan et al., 2012), we share the view that perceptions of red tape matter. We focus on red tape that may originate in three aspects of external regulation: perceived red tape due to cost of regulation, inconsistent regulation, and change in regulation. We transfer perception-based red tape concepts from studies of public organizations to the study of regulation of private organizations. Additionally, with this refined conceptualization, we intend to move beyond simple cost-benefit analyses that dominate in economics, as each of these aspects of regulation may have a separate effect on different aspects of private firm performance.

Our third contribution concerns the empirical study. To the best of our knowledge, firm-level studies on the consequences of regulation for private firm performance are far and between, and the available firm-level studies offer mixed evidence at best. Athayde et al. (2008), for instance, suggest that the actual impact of regulation on firm performance is minimal, whereas Carter, Mason, and Tagg (2006) report evidence for negative effects. Carter et al.'s study primarily obtains conclusions from directly asking respondents about the impact of regulation on their firms' innovativeness or productivity, raising methodological concerns similar to those related to red tape research. With the firm as the unit of analysis and starting from the notion that perceptions of red tape are key, we developed and implemented a business survey that offers the opportunity to formally test whether or not perceived red tape due to regulation cost, change or inconsistency has a significant relationship with private firm performance.

6.2 Theory

The identification of fundamental antecedents of regulation has been addressed at length in public policy research (van Witteloostuijn and de Jong 2010; March, Schultz, and Zhou 2000). The next step is to assess the consequences of regulation. Today, a variety of instruments, such as regulatory impact assessments and cost/benefit or cost-effectiveness analyses, are used to assess the effects of regulation (Helm 2006). We review insights from studies of red tape in public administration and public policy. Both adopt the organization as the unit of analysis: the former focus on government organizations, while the latter concentrate on private companies.

Red Tape Research

Research on red tape in public administration started in the 1970s with the seminal publication of Kaufman (1977), and gained momentum in the 1980s (e.g., Rosenfeld 1984; Wilson 1989). Rosenfeld (1984) offered one of the first definitions of red tape as "guidelines, procedures, forms, and government interventions that are perceived as excessive, unwieldy, or pointless in relationship to decision making or implementation of decisions" (1984: 603). The work of the first red tape researchers has been criticized for its conceptual ambiguity – particularly, the lack of an appropriate definition of red tape. Bozeman (2000) argues that Rosenfeld's definition does not distinguish between good and bad rules, and therefore fails to clearly define red tape as a negative phenomenon. Bozeman (2000) defines red tape as rules, regulations and procedures that remain in force, but entail a compliance burden for the organization without having efficacy for the rules' functional object. Bozeman later revised his definition to link red tape specifically to performance rather than the rule's functional object, arguing that red tape essentially involves burdensome administrative rules and procedures that have negative effects on the organization's performance.

Public administration research in the 1990s and 2000s has produced substantial progress in advancing our knowledge of red tape, with the number of empirical administrative tape studies in public administration mushrooming (Coursey and Pandey 2007; Rainey et al. 1995). These empirical studies triggered a need to further refine Bozeman's definition in order to make the concept applicable in empirical research. Pandey and colleagues defined red tape as "impressions on the part of managers that formalization (in the form of burdensome rules and regulations) is detrimental to the organization" (Pandey and Kingsley 2000: 782). This implies that perceptions of respondents take centre stage in red tape research.

Evidence suggests that public sector managers perceive significantly more red tape than those in private and non-profit sectors (Feeney and Bozeman 2009; Rainey et al. 1995), as well as that red tape is related to work alienation, job tenure and

job satisfaction (De-Hart Davis and Pandey 2005; Pandey and Kingsley 2000), and hierarchical position (Brewer and Walker 2010). Red tape can mean different things to different managers, which may hamper construct validity. For that reason, the empirical studies focus on either organizational red tape in the organization at large or domain-specific red tape regarding functional policies such as HRM. While researchers have developed a variety of survey items to capture different types of red tape, they often use the following item as a global measure of organizational red tape: 'If red tape is defined as "burdensome rules and procedures that have negative effects on the organization's effectiveness," how would you assess the level of red tape in your organization?'

Despite all achievements, red tape scholars notice a need to re-conceptualize the definition of red tape to enable researchers and respondents to better understand when a rule is red tape and when it is not (Bozeman and Feeney 2011). Because red tape often has an explicit negative connotation – substituting for all negative aspects of bureaucracy – the way the red tape question is worded may well trigger an overall negative response. For that reason, we will not only seek to develop and apply a neutral conception of regulation, one without any reference to its performance effect in the definition and measure, but also to distinguish different dimensions and measures of regulation that might differ in their effect on firm performance.

Business Impact Studies

Our work relates to studies that aim to quantify the costs of regulation for organizations or nation-states (OECD 2010). A few of these studies estimate the costs of regulatory burden for European countries to be 3 to 4 per cent of GDP, on average. Additionally, these studies reveal significant differences between sectors and across countries. Some of the international variety is due to differences in definitions of regulation costs, sample sizes and estimation techniques. Country-level estimates of regulation costs are typically obtained by multiplying a weighted sample average with the total number of companies in a sector and country. This approach is sensitive to characteristics of the sample and the structure of the economy (Helm 2006). By and large, however, this line of research offers two insights.

A first insight is associated with the classification and definition of costs due to regulation. Business impact studies identify different types of costs. The costs for developing, administering and enforcing regulations are absorbed by the public sector, and are labeled administrative costs. The private sector bears the costs of complying with regulation. The costs of regulation to businesses include direct financial, compliance and long-term structural costs. Moreover, regulation may involve capital costs (when investments in, e.g., ICT systems are needed to comply with regulations), opportunity

costs (in terms of time and money spend on meeting regulations, which hence are not available for performance-enhancing activities such as innovation), and psychological costs (of frustration due to regulatory requirements). Business impact studies focus on administrative compliance costs, measuring these costs ex post and "net" of potential benefits that regulation may bring to the company. Private companies – irrespective of their size, sector or legal identity – will always collect information for day-to-day management purposes. For that reason, self-imposed administrative costs are a natural element of business life. Business impact studies highlight the importance of costs that derive from regulation on top of and above such company-own administrative costs.

A second insight concerns the measure of regulation costs. Two different methods dominate in business impact studies. A first approach applies (a variation of) the Standard Cost Model (SCM). The main idea is to start from single information costs included in regulation, and to subsequently calculate the time (hence costs) of work needed to comply with this obligation. The total costs calculated for each single information obligation of a regulation is regarded as the quantification of the administrative costs of this regulation. The sum of the costs of all regulations is considered to be the overall burden placed by regulation on businesses within a particular domain. The calculation of these costs is based on interviews or actual time measurement (Helm 2006).

A second approach starts from the presumption that companies do not and cannot administer in detail the costs of regulation, as is required in SCM methods (Godwin and Lawson 2009). These studies are applied to different rule domains, but research on tax compliance cost dominates (Evans 2003). It is difficult for firms to disentangle regular administrative activities from those that are specifically carried out for regulation purposes. Therefore, these studies advocate the use of predefined scales (response categories) linked to questions that are intended to measure regulation costs. This line of research provides evidence that perceptual regulation costs correlate strongly with actual regulation costs.

From the empirical evidence, we know that, contrary to conventional wisdom, respondents generally report lower regulation costs than non-respondents (Allers 1994). It sometimes is suggested that business surveys are inadequate to measure regulation costs because respondents may show strategic behavior and, hence, may have an inclination to exaggerate regulation costs for "political" purposes in an attempt to push policy-makers toward reducing regulation costs. A counterargument suggests that respondents may already have a general feeling that they are unreasonably burdened by regulation costs. This makes exaggerations unnecessary (Allers 1994).

Hypotheses

Regulation cost concerns all time and costs for companies to comply with regulation in order to deliver all legally required information to international, national or local government agencies. This includes all actions taken by companies to ensure compliance with formal legal requirements for licenses, monitoring, subsidies, safety, et cetera. Although positive effects of regulation cost may exist – e.g., because legal requirements trigger companies to learn about their administrative organization and improve their efficiency – there are convincing reasons why regulation costs are likely to be an impediment to the performance of companies.

First, regulation cost may be associated with crowding out effects and opportunity costs. Such costs create disincentives for investment in innovation, which limits the potential scale and scope economies as financial and human resources are misallocated and wasted. Second, companies may not have control over the size of the cost of regulation, as regulation cost may be subject to an ecological upward dynamic (van Witteloostuijn and de Jong 2010): regulation cost today breeds extra regulation cost tomorrow. Companies that need to comply with regulation are more likely to be under bureaucratic control, and are therefore more exposed to legal requirements. Once a company is in the legal system, the demand for additional requirements is boosted as officials are triggered to impose more regulation upon businesses, being aware of the potential to regulate. Third, findings in public administration reveal that perceptions of red tape dampen risk-taking among city-level public managers (Feeney and DeHart-Davis 2009) and negatively affect organizational commitment and job satisfaction in public organizations (DeHart-Davis and Pandey 2005), and that burdensome rules lower individual and organizational performance in government (Brewer and Walker 2010).

Hypothesis 1 (H1: regulation cost): Regulation cost is negatively associated with private firm performance.

Many governments aim to increase regulation consistency by improving regulatory design and implementation from the perspective that such consistency aligns with legal certainty, policy effectiveness and compliance (Rodrigo, Allio, and Andres-Amo 2009). Recent studies reveal a direct positive relationship between perceptions of regulation consistency and trade, per capita income, foreign direct investments, and economic growth (Bertelli and Whitford 2009). Regulation consistency is a somewhat elusive concept, being differently defined across studies. Radaelli (2010) suggests that these definitions share the notion that efficient, effective, coherent and simple regulation is high-consistent regulation.

Low regulation consistency is a source of lower performance for companies that have to comply with this regulation. Government officials put regulation on paper. The literature review already revealed that, by its very nature, written text is a source of ambiguity – a conclusion that is grounded in the contract literature (Lyons and Mehta 1997) and transaction cost economics (Williamson 1985). Complex formal contracts or contracts with many clauses that are strictly specified allow for mitigating the risk of opportunistic behavior. This line of work emphasizes contract incompleteness. A complete formal contract is extensive, with all necessary aspects covered, and specific, with clauses formulated such that they are verifiable and enforceable. Additionally, the legal enforceability of contracts depends on the consistency in the terms of the contract and the specificity of the contractual clauses. Transaction cost economics acknowledges that, due to the cognitive limitations of human beings, complete contracts cannot be written.

Nonetheless, business firms are expected to use extensive contracts to mitigate moral hazard, particularly in the context of great uncertainty and asset specificity. In a similar vein, the government applies regulation to enforce behavior, and to mitigate contemporaneous and future risks. The government considers regulation to be a necessary instrument to control firm behavior, but its effectiveness depends on regulation consistency. Some regulations are consistent – that is, they are transparent and easy to interpret by companies; others are inconsistent, requiring much paperwork and including conflicting requirements.

Hypothesis 2 (H2: regulation inconsistency): Low regulation consistency is negatively associated with private firm performance.[23]

Finally, we address regulation change, which is a key feature of legal systems in many nation-states (van Witteloostuijn and de Jong 2008). In the life cycle of national rules – births, changes and repeals – changes are among the most important events. Rule changes tend to transform rule systems incrementally, in a gradual and persistent way. Rule changes are more common than other rule events. One reason for this is that policy-makers often take incremental decisions. They do so not only because there are few opportunities to do otherwise, but also because legislation is often the result of a social interaction process involving negotiations and compromises between policy-makers and stakeholders.

The more frequent regulation changes, the more often companies need to adapt to new circumstances. Firms have to learn about new legal requirements, and new information systems must be developed or existing information systems have to be

23 For the sake of symmetry, we here focus on low regulation consistency, implying a negative association, as in H1 and H3. This facilitates the interpretation of the sign of the associated coefficients in the regression analysis.

adjusted accordingly. The more frequent regulation is changed, (i) the higher the costs that result thereof, (ii) the more the flexibility with which a company can operate will be reduced, and (iii) the more managerial attention is diverted away from other strategic decisions that would foster firm performance.

Hypothesis 3 (H3: regulation change): Regulation change is negatively associated with private firm performance.

6.3 Methodology

Research Context, Design and Sample

Among the advanced nation-states, the Netherlands is one of the most heavily regulated economies of all. Furthermore, the Netherlands is often portrayed as a leading country in the area of better-regulation policies (OECD 2010). The Dutch example is highlighted because of explicit policy targets (a 25 per cent reduction of administrative costs for firms in 2012), methods to measure administrative costs (Standard Cost Model, or SCM), and an institutional infrastructure that includes interdepartmental taskforces and the independent advisory board Actal. Ministries need agreement from Actal for the introduction of new regulation. For this, they have to perform and report regulatory impact assessments. For both reasons, the Netherlands offers a very suitable research context for what we try to do here.

We used a questionnaire that provides insight into managerial perceptions of different dimensions of regulation as well as organizational characteristics, context, performance and strategies. In line with common convention in public administration, regulation impact studies, business performance and strategy research, we employ a convenience sampling approach that is appropriate for studies that primarily aim for hypotheses testing, focusing on small and medium-sized enterprises with 100 employees or less. A mail survey was implemented following well-documented response facilitation approaches (De Leeuw, Hox, and Dillman 2008). We decided in favor of a mail rather than a web survey, anticipating negative experience with other survey methods for business research in general (Dennis 2003; Harzing 2000; Shi and Fan 2009) and those in the Netherlands in particular (Berkenbosch, 2011). This experience indicates that many owners of small and medium-sized businesses are not web-enabled or are not willing to answer questionnaires via the Internet – an issue that was also confirmed in the pilot-testing phase of our questionnaire. The mail method aligns with the results from a meta-analysis of Shih and Fan (2009), showing that the response rates of traditional mail questionnaires are superior to email surveys, regardless of other survey characteristics such as the use of reminders or incentives.

We accounted for personalization, a short and easy to understand questionnaire asking only for relevant information, appropriate business-like (black and white) lay-out and print, a friendly presentation of the research, salience of the topic, feedback incentives, guaranteed anonymity of the results, university sponsorship, business-relevant support, stamped and university-addressed return envelopes, publicity of the research, pre-testing and timing of the survey, and an integral follow-up. The study was framed in terms of the expected demographic changes in the country, inducing a need for more entrepreneurship and public-private collaboration. It was presented as a joint effort of the local university, the chambers of commerce and the leading employer associations.

The population of target firms is located in the three Northern provinces of the Netherlands: Friesland, Groningen, and Drenthe. From the databases of the chambers of commerce, we selected a random sample of 1,800 small and medium-sized companies (with 100 or less employees) stratified over main industry sectors, as defined by the Dutch version of the UN Standard Industrial Classification ('Standaard Bedrijfsindeling'), covering all relevant economic activities in this region. For each of the target companies, we identified the director or senior manager directly responsible for leading the firm. We used this information to personalize the letter and questionnaire. The survey confirmed the accuracy of the database. Only 38 questionnaires were undeliverable, primarily due to a relocation of the company or bankruptcy (2.1 per cent). After the two waves, accounting for occasional cases with missing values or outliers, 530 respondents had replied, yielding a 29.4 per cent response rate.

Of the respondents, 91.3 per cent confirmed that they are the owner or managing director of the addressed company. In total, 28.2 per cent of the respondents had an intermediate vocational education degree, and 42.3 per cent had a polytechnic or university degree. A comparison of responding to non-responding firms indicated no significant differences as to firm size and sector. Additionally, we found no significant differences between early and late respondents on characteristics such as firm age, number of employees and work experience of the respondent. Finally, we used Harman's (1967) single factor test to assess whether or not our data may feature significant common variance (Podsakoff and Organ 1986). Unrotated factor analysis using the Eigenvalue-greater-than-one criterion revealed ten factors, with the first factor explaining only 10 per cent of the variance in the data. A principal component analysis resulted in seven factors. So, in our case, it is unlikely that the findings can be attributed to common-method bias.

Performance

With privately owned firms, precise financial measures are frequently unavailable.

Due to their size and legal status, many companies are not required to publicly or otherwise report financial data. Therefore, organizational performance studies increasingly rely on opinions of managers, following studies that revealed that the correlation between objective and subjective measures of performance tend to be high. Moreover, in the business literature, it has been argued that enterprises form their strategy and competitive maps on the basis of perceived information and events, making subjective performance assessments by key decision-makers essential (Lang et al. 1997). Both arguments imply that subjective perceptions are valid performance measures, being reliable and having material consequences.

We use two assessments of firm performance. The first indicator measures the firm's growth in sales turnover in the past two years on a seven-point scale. The respondents were asked to rate 'Did your sales turnover in the past two years …' on a scale ranging from '1 = increase strongly (more than 10%)', 2 = 'increase moderately (5 to 10%)', 3 = 'increase a little (1 to 5%)', 4 = 'remain constant', to 7 = 'decreased strongly (more than 10%)'. The second indicator measures the firm's performance vis-à-vis the most important competitor on a five-point scale. The respondents were asked to rate 'In comparison to your most important competitors, was the performance of your firm in the past two years …' on a scale ranging from 1 = 'much better' to 5 = 'much worse'. We reverse-coded these items prior to entering them into the regression analysis.

Regulation

We measure regulation cost through the respondent's assessment of the firm's administrative burden. We provided the definition of administrative burden that is used in the SCM approach (OECD 2010) in the introductory paragraph of the questionnaire: "The government (national, province and municipality) defines administrative burden as all time and costs for companies to comply with laws and regulations, and to provide all by the government required information. This may include licenses, control, governance, subsidies, safety at the shop floor and accountability information, but also requirements from Europe for the management of your business." Note that this definition does not explicitly include a reference to tax payments. After providing the definition, we asked the respondent to quantify the administrative burden for their company using eight categories, ranging from 1 = 'less than 5,000 euro' to 8 = 'more than 500,000 euro'.

We added two questions to measure regulation inconsistency. In developing this pair of items, we have been informed by studies examining business perceptions of regulation inconsistency (Rodrigo et al. 2009). Our items are designed to measure two key elements of regulation inconsistency by asking the respondents to evaluate the following two statements: "The legislation of the government contains many

inconsistencies", and "The legislation of the government implies much unnecessary paperwork". Each was measured on a seven-point scale, with categories ranging from 1 = 'strongly agree' to 7 = 'strongly disagree'. A factor analysis confirmed the uni-dimensionality of the two-item scale, with factor loadings for both items of .91. Cronbach's alpha of 0.80 is well above the threshold value of 0.70. We combined the two items into an overall index of regulation inconsistency.

Regulation change was measured through an item that asked the respondents to "Assess the change in regulation compared to a year ago", with categories ranging from 1 = 'decreased', 2 = 'stayed about the same' to 3 = 'increased'. Note that, for the sake of symmetry, we reverse-coded the regulatory inconsistency and regulation change variables, in line with the prediction of a negative association with private firm performance.

Control Variables

We include three sets of control variables. The first set concerns the context of the firms. We asked the respondents to indicate the most important branch or sector in which their company is active. We added four dummy variables to account for industry differences: manufacturing, construction, services, and transport, storage and communication (agriculture and other branches is the base case). The companies are located in municipalities with different local tax regimes. We measure the local tax regime by the property tax that companies are obliged to pay to local governments in their municipality. With this variable, we basically control for geographical heterogeneity.

The second set involves firm characteristics: the size, age, and strategy of the firm. Our sample includes firms with four main legal forms: limited liability companies, single proprietorships, partnerships, and foundations. It turns out that these different legal entities correlate strongly with our firm size measure. Limited liability companies are by definition larger than single proprietorships. We included firm size as control variable rather than the legal entity dummies because of its acknowledged importance in firm performance studies. Firm size was measured with the number of employees on a seven-point scale (ranging from 1 = "1 to 5 employees" to 6 = "51 to 100 employees"). The age of the company was calculated by subtracting the year the firm was founded from the current year.

Following Wijbenga and van Witteloostuijn (2007), we make a difference between an innovation and a cost-control strategy. An innovation strategy entails a firm's differentiation via (incremental) innovation, implying that a firm can command a premium price that exceeds the extra cost of the innovation (Miller 1988). We used

one item to measure an innovation strategy of a firm asking to indicate, on a five-point scale (from 1 = 'very important' to 5 = 'very unimportant'), the importance of frequent innovation of products or services. With a cost-control strategy a firm attempts to become a low-price producer in an industry, which requires much effort to control costs so that above-average returns can be obtained even with low prices (Miller 1988). We used one item to measure a cost-control strategy of a firm asking to assess, on a five-point scale (from 1 = 'very important' to 5 = 'very unimportant'), the importance of the control of costs via detailed allocation of expenditures to departments or products.

The third set relates to the human capital of the respondent. Entrepreneurs may increase their human capital through work experience and formal education. Work experience was measured by a variable that indicated the total number of years the respondent had worked for both the focal firm and at other firms (with seven categories, ranging from 1 = 'less than a year' to 7 = 'more than 15 years'). The level of formal education was defined as having an official degree as a result of full-time or long-term training, so measuring an individual's knowledge or competence base. Formal education was measured by a variable that accounts for the highest level of education (with six categories, ranging from 1 = 'elementary school' to 6 = 'university'). Finally, we controlled for the age of the entrepreneur. We measure age by an eight-point variable (using six categories, ranging from 1 = 'younger than 25 years' to 8 = 'older than 55 years').

6.4 Evidence

Means, standard deviations, and correlations are provided in Table 1. The correlation coefficient for both firm performance items is positive and significant ($r = 0.37$; $p < 0.01$). Cronbach's alpha of 0.38, however, is below regular threshold values, indicating that sales turnover growth and competitive market position are related but separate performance indicators. For that reason, we use LISREL to simultaneously estimate two equations, one for each of our pair of firm performance indicators (Jöreskog and Sörbom 1993, 1996; Athayde et al. 2008; Pandey and Welch 2005). LISREL allows to correlate the errors of the dependent variable items and, in so doing, enables to meet a requirement for seemingly unrelated regression specifications that fit with our type of data, with two imperfectly correlated dependent variables (Hair et al. 2007). In preparation for the regression analyses, we performed the regular tests: neither heteroskedasticity nor non-normality is an issue. We tested for possible biases caused by collinearity among variables by calculating the variance inflation factor (VIF) for each of the regression coefficients. Calculations of VIF ranged from a low of 1.09 to a high of 1.58, well below the cut-off value of 10 (Neter, Wasseman, and Kutner 1985).

Table 1. Correlations, means, and SDs

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Sales Turnover Growth	3.84	1.93	1.00								
2. Market Performance	3.33	0.71	0.37	1.00							
3. Manufacturing	0.07	0.26	0.04	0.08	1.00						
4. Construction	0.15	0.36	0.06	0.04	-0.12	1.00					
5. Transport	0.06	0.24	-0.06	-0.01	-0.07	-0.11	1.00				
6. Services	0.21	0.41	0.02	-0.01	-0.14	-0.22	-0.13	1.00			
7. Local Tax Regime	0.34	0.12	-0.03	0.00	0.01	-0.09	0.05	0.03	1.00		
8. Firm Size	2.58	1.24	0.08	0.18	0.25	0.08	-0.03	0.06	0.04	1.00	
9. Firm Age	24.32	25.94	-0.19	-0.10	-0.01	0.02	0.01	-0.08	0.00	0.12	1.00
10. Innovation Strategy	3.40	1.14	0.11	0.25	0.11	-0.10	-0.12	0.04	0.03	0.15	0.04
11. Cost-Control Strategy	3.22	1.26	-0.06	-0.05	-0.16	0.12	-0.09	0.01	-0.06	-0.02	0.04
12. Work Experience	7.76	0.74	-0.16	-0.05	0.05	-0.01	-0.02	0.05	-0.02	0.03	0.16
13. Entrepreneur Age	6.27	1.64	-0.21	-0.17	0.05	-0.07	0.06	0.04	-0.02	0.03	0.19
14. Formal Education	4.01	1.37	0.11	0.15	0.12	-0.09	-0.08	0.24	0.13	0.19	-0.10
15. Regulation Cost	2.46	1.52	-0.03	0.15	0.18	0.13	-0.01	0.00	0.05	0.35	0.17
16. Regulation Change	1.68	0.52	-0.09	-0.14	-0.02	0.02	0.04	0.05	0.04	-0.05	0.00
17. Regulation Inconsistency	4.81	2.40	-0.03	-0.05	0.00	-0.04	-0.11	0.09	0.05	-0.09	-0.02

Table 1. Correlations, means, and SDs (continued)

	Mean	SD	10	11	12	13	14	15	16	17
10. Innovation Strategy	3.40	1.14	1.00							
11. Cost-Control Strategy	3.22	1.26	0.13	1.00						
12. Work Experience	7.76	0.74	0.04	0.02	1.00					
13. Entrepreneur Age	6.27	1.64	-0.06	0.01	0.43	1.00				
14. Formal Education	4.01	1.37	0.07	-0.13	-0.09	-0.15	1.00			
15. Regulation Cost	2.46	1.52	0.15	0.01	0.00	-0.05	0.17	1.00		
16. Regulation Change	1.68	0.52	-0.04	-0.03	0.02	0.03	0.09	-0.14	1.00	
17. Regulation Inconsistency	4.81	2.40	-0.07	-0.14	-0.10	-0.08	0.10	-0.11	0.20	1.00

For both sets of equations, we ran a two-step hierarchical regression: the three dimensions of regulation were added in Model 2 vis-à-vis Model 1 with control variables only. The advantage of a two-step hierarchical regression method is two-fold (Hair et al. 2007). First, we can now determine whether or not adding main variables to a model with controls only increases explanatory power. A significant increase in model fit is a first indication of the importance of the main variables. Second, we can determine the extra explanatory power of the independent variables.

The various fit parameters show that our full models fit the data better. For the estimates with respect to sales turnover growth, the R2 improves from 9.3 per cent in Model 1 to 11.4 per cent in Model 2 ($F = 4.425$ with $p < .01$ and $F = 4.398$ with $p < .01$ for Models 1 and 2, respectively). For the estimates with respect to market competition performance, the R2 improves from 11.8 per cent in Model 1 to 13.8 per cent in Model 2 ($F = 5.578$ with $p < .01$ and $F = 5.507$ with $p < .01$ for Models 1 and 2, respectively). The estimates remain robust in terms of signs and significance levels. Note that R2-values of 11.4 and 13.8 per cent are good, since an R2 of 15 per cent

is already regarded as excellent in the (large) literature on small firm performance (Carter et al. 2006).

Table 2. Regulation and Private Firm Performance

	Model1 Sales Turnover Growth	Market Competition Performance	Model2 Sales Turnover Growth	Market Competition Performance
Control–Context				
Manufacturing	-0.001	0.002	-0.003	0.001
	(0.046)	(0.045)	(0.046)	(0.045)
Construction	-0.075*	0.032	-0.066*	0.039
	(0.046)	(0.045)	(0.046)	(0.045)
Transport	-0.055	0.023	-0.056*	0.027
	(0.044)	(0.043)	(0.044)	(0.043)
Services	-0.018	-0.034	-0.012	-0.028
	(0.046)	(0.046)	(0.046)	(0.045)
Local Tax Regime	-0.057*	-0.030	-0.051	-0.025
	(0.043)	(0.042)	(0.042)	(0.042)
Control–Firm				
Firm Size	0.065*	0.160***	0.133***	-0.152***
	(0.046)	(0.045)	(0.056)	(0.055)
Firm Age	-0.134***	-0.106***	-0.128***	-0.113***
	(0.044)	(0.043)	(0.044)	(0.043)
Innovation Strategy	0.089**	0.186***	0.089**	0.182***
	(0.044)	(0.043)	(0.044)	(0.043)
Cost-Control Strategy	-0.051	-0.054	-0.057*	-0.060*
	(0.044)	(0.043)	(0.044)	(0.043)
Control–Entrepreneur				
Work Experience	-0.074*	0.024	-0.077**	0.026
	(0.047)	(0.046)	(0.047)	(0.046)
Entrepreneur Age	-0.138***	-0.126***	-0.141***	-0.121***
	(0.048)	(0.047)	(0.048)	(0.447)
Formal Education	0.050	0.088**	0.071*	0.102**
	(0.040)	(0.045)	(0.046)	(0.045)
Regulation				
Regulation Cost			-0.130***	-0.001
			(0.055)	(0.054)
Regulation Change			-0.092**	-0.137***
			(0.043)	(0.043)
Regulation Inconsistency			-0.065*	-0.023
			(0.044)	(0.043)
Fit Indices				
R^2	0.093	0.118	0.114	0.138
Adj. R^2	0.072	0.098	0.088	0.113
F	4.425***	5.578***	4.398***	5.507***
ΔR^2			0.021	0.020
F ΔR^2			3.980***	4.015***

Notes: Standardized coefficients with standard errors in brackets; * p < .10, ** p < .05, and *** p < .01.

The empirical results offer significant support for two of our three hypotheses. Table 2 shows that regulation cost has a negative and significant effect on sales turnover growth (ß = −0.130 with $p < .01$), and a negative but non-significant effect on market competition performance (ß = −0.001 but n.s.). Hence, Hypothesis 1 receives partial support. Regulation inconsistency has a negative and significant effect on sales turnover growth (ß = −0.065, with $p < .10$), and a negative but non-significant effect on market competition performance (ß = −0.023 but n.s.). So, Hypothesis 2 receives partial support, too. Table 2 reveals that regulation change significantly hampers both sales turnover growth (ß = −0.092 with $p < .05$) and market competition performance (ß = −0.137 with $p < .01$). Hypothesis 3 is fully supported. The significant results for the control variables are as expected, which therefore offers further confidence in the validity of the findings.

In robustness tests, we estimated models with non-linear relationships between a selected number of explanatory variables such as firm age, firm size, managerial experience and formal education, and our dimensions of regulation. We did not find significant evidence for non-linear relationships. This may be partly due to data limitations. Adding non-linear relationships for each variable simultaneously to our model may require a number of observations larger than currently available. Also, many of our scales are not continuous, which hampers an appropriate study of non-linear relationships between variables. Additionally, we estimated models with interaction effects between a selected number of explanatory variables and our dimensions of regulation, not finding significant effects for any of these. The lack of significant non-linear relationships and interaction effects does foster confidence in the validity of the linear main relationships.

6.5 Conclusion

Democratic societies cannot do without regulation. Regulation can benefit large parts of society. Government interventions via regulation are key to, for example, protect the economic position of citizens or prevent tacit collusion between companies that may have negative effects on the economy. Regulation, however, is a double-edged sword (Bozeman 2000; van Witteloostuijn and de Jong 2008): It may have benefits for society at large, but negative effects for individual firms. Of course, an evaluation of all benefits and costs of all rules is required in order to estimate the overall net effect of regulation for society. Such an evaluation is needed for the assessment as to whether there is too much or too little regulation overall. Such an assessment is outside the scope of the present study. Nonetheless, we do make an important first step in this direction by studying the impact of different dimensions of regulation on private firm performance from a perception-based perspective.

The content and structure of regulation vary over time and between nation-states. Most regulation starts out with some implied causal purpose that for someone things will be made better. Regulation, however, can also be poorly designed and / or can be outdated. The introduction of new regulation usually is the outcome of lengthy institutional processes. In an analogy of Bozeman's (2000) theory of red tape, some regulation is 'born badly' due to, for example, inadequate understanding of the regulation's aim by regulation-makers. Other good-intended regulation may have gone bad due to misapplication in the implementation phase. Additionally, regulation may well target issues or problems that no longer require intervention (March et al. 2000; van Witteloostuijn 2003). Then, the consequences of regulation may well be predominantly negative by creating unnecessary costs for organizations – for instance, by creating barriers to trade, or frustrating investments or other economic activities (Helm 2006; OECD 2010).

The relationship between regulation and private firm performance largely is an underexplored research area. This is particularly true for small and medium-sized enterprises that dominate in Western economies, and that form the drivers of national wealth by creating employment and income for large parts of society. Our study presents a new interdisciplinary perspective, and solves methodological issues that previously hampered an in-depth understanding of the relationship between regulation and private firm performance. Such an in-depth understanding is important for both economists that value interdisciplinary over monodisciplinary perspectives and public management scholars who seek to understand consequences of red tape due to national regulation, rather than internal rules, for the strategy and performance of private instead of government organizations. We believe that our study has important implications for these audiences.

First, studies of red tape convincingly argue that we need to investigate the antecedents and consequences of internal (dysfunctional) rules using a perception-based perspective (Bozeman and Feeney 2011). We incorporate the perception-based perspective and complement mainstream red tape research by studying external red tape. This is important because external, government-created, regulation can be considered as one of the most important sources of internal red tape (see also Walker and Brewer 2008; Brewer and Walker 2010). We focus on regulation as a source of red tape. If small and medium-sized enterprises are important for economic growth and if regulation is one of the most important characteristic features of modern democratic societies (van Witteloostuijn and de Jong 2010), we need to have an in-depth understanding as to whether – and if so, how – regulatory red tape determines their performance. Strategic decisions taken by these firms are crucial for long-term growth and prosperity, and are not taken in isolation from government regulation. For that reason, it warrants studies that analyze whether – and if so, how – regulation-

based red tape has a relationship with organizational performance.

Second, we have sought to advance research on relationships between private firm-level performance and regulation. We argue that variation in business performance may result from variation in regulation, next to and on top of the effect of other firm antecedents (such as type of strategy or legal status), outside circumstances the company must face (e.g., industry characteristics or local tax regimes), and the characteristics or background of the key decision-maker (like tenure or the type of education). In so doing, we highlight the importance of an interdisciplinary approach. We bring together key elements from four different domains, and complement these fields of research by showing how different dimensions of regulation relate to private firm performance from the perspective of the entrepreneur.

In studies in economics, regulation is related to country and industry performance (Djankov et al. 2008), but not, at least not directly, to firm-level outcomes. In public administration research, burdensome rules (red tape) are aligned with (perceived) organizational performance (Bozeman 2000) but not, at least not explicitly, with outside sources of rules. In the field of public policy, conceptual frameworks or country-level studies are used to examine the implications of regulation for business (OECD 2010), but these generally lack firm-level empirical underpinning. In business and strategic management studies, the importance of aspects of the external environment for firm performance is acknowledged, but regulation tends not to be an explicit part thereof (Wijbenga and van Witteloostuijn 2007). Our study bridges these different traditions by predicting effects from three dimensions of external regulation on individual firm performance: regulation cost, inconsistency and change.

A third implication derives from the data collected and the empirical findings. The current study is based on collecting firm-level information for a substantial number of small and medium-sized private companies. Firm-level data are needed to understand the incidence, nature and consequences of regulation in the world of entrepreneurs. A database like ours is the exception rather than the rule, showing that firm-level information on regulation can be collected by means of a carefully designed questionnaire and data collection strategy. We collected questionnaire data for a sample of 530 private firms in the Northern Netherlands. The Netherlands offers an appropriate research context because this country is well known for its rule-producing institutional framework, as well as for its ongoing attempts to limit negative consequences of regulation. We developed a short series of simple questionnaire items that emerge as valid and consequential measures of regulation cost, inconsistency and change. A major finding is that all three are detrimental to turnover growth of private firms, and that regulation change limits market competition performance.

Fourth, the significant findings have implications for policy-makers. Our study suggests that Dutch deregulation efforts have not been very successful, at least not as much as the various Dutch cabinets have claimed. To a large extent, local administration in the Netherlands has little opportunity to limit the regulation-making forces because they are simply obliged to implement new or change existing national regulation. For that reason, the Dutch government needs to re-assess its current deregulation policy, and introduce more robust measures that limit their own regulation-making activities. For example, the Dutch cabinet may decide to introduce sunset clauses, attaching automatic repeal dates to new rules, or might require that the introduction of a new rule must be associated with the repeal of two existing ones. The results also have implication for managers. Our study suggests that regulation affects the competitive capabilities of companies because they raise costs, and reduce the flexibility with which a company can operate. Regulation diverts management attention away from strategic issues and may distort capital investment decisions. These problems are particularly severe for small and medium-sized enterprises because they are less well equipped to deal with these regulatory issues.

Given that our study is one of the first in its kind, we envision various opportunities for future research that could address its inevitable limitations. The use of cross-sectional data from small and medium-sized private firms in the (Northern) Netherlands limits the generalizability of our results and our ability to make causal attributions. Cross-sectional data may suffer from endogeneity that can be addressed through instrumental variable estimation methods. A cross-country firm-level panel dataset would offer the chance to do better. Our assessment relies on the questionnaire-based personal judgments of one respondent per company. Management research often obtains reliable information from single respondents. Given the size of the companies, our respondents have the knowledge, expertise and management position to answer questions about strategy, performance and regulation. Nonetheless, a multi-respondent replication of our study with more and other questions concerning regulation and firm performance would allow for cross-validation of the findings.

A next logical step would be to test our model in other countries to determine whether the role of regulation in driving private firm performance in other nation-states is similar. In this paper, we focus on the performance of private firms. Regulation may also have consequences for public agencies such as law courts and healthcare organizations. Although our theoretical framework is generic, and is therefore applicable to not-for-profit and public organizations as well, we restrict our study to private for-profit firm performance, leaving an assessment of the relationship between regulation and behavior and performance of other types of organizations for future research.

Future research may also add complexity at the firm level by estimating moderator

effects. In robustness analyses, we have not been able to find significant relationships in models with moderator specifications. Although this seems to suggest that moderator effects have little importance, future research is needed in order to overcome some of the data limitations in the present study that may hamper extensive two-way or three-way moderator specifications. Regulation is nothing new, at least not for companies that are old enough to have overcome liabilities of newness. Still, the variation in regulation cost and change is substantial, as is the relationship between these and private firm performance. Particular characteristics of entrepreneurs or firms other than those included in the present study may "moderate away" the negative effect of regulation on firm performance. Future research should investigate these interactive effects that would help to design firm-level strategies that dampen the negative relationships between regulation and firm performance.

CHAPTER 7. INSTITUTIONS AND BUSINESS REGULATION

Summary

Prior work has established the negative effect of many regulations on business and policy. These negative effects have been a key driver for many of the so-called better regulation programmes. Despite all efforts, however, deregulation programmes have had inconclusive results and their success remains the subject of ongoing debate. We suggest that the public policy efforts have largely overlooked a business perspective of regulation and its institutional determinants. We argue that the institutional determinants of regulation include the regulation stock, the quality of regulation and the predictability of regulation application. This study is among the first to examine the impact of these institutional determinants on regulatory compliance costs for firms using a unique dataset from companies in OECD countries. Our results convincingly support our approach to the study of regulation.

Keywords: Better regulation, compliance costs, regulation stock, regulation quality, regulation predictability, OECD countries

7.1 Introduction

Low economic growth and high levels of national debt have increased the interest of governments in structural reforms to boost competitiveness and reduce unemployment. One aspect that often appears in these discussions is cutting red tape, that is, limit the negative consequences of regulation for business. The drive to reduce red tape actually precedes the current economic difficulties and has received wide attention, especially in Europe (Wegrich, 2009). In the US the passing of the Sarbanes-Oxley Act following the Enron scandal also sparked interest in the costs and benefits of government regulation (e.g. Engel, Hayes & Wang, 2007; and Zhang, 2007). Despite all efforts, however, the success of regulation reducing policies is still the subject of ongoing debate. In this study we delve deeper into the institutional foundations of regulation. We argue that an institutional focus employing a firm-level perspective is a useful approach to the policy debate. We add to existing research by demonstrating that from a business perspective, regulation causes compliance costs due to the institutional setting within which a company operates: the stock, quality and predictability of regulation.

Our study focuses on the firm-level compliance costs of government regulation. Assessing the situation, Wegrich (2009) and Helm (2006) conclude that while the volume of the regulation research stream is substantial and the theories on regulation abundant, current conceptualizations and measures of regulation remain inadequate. Accordingly, the regulation research domain is broad, but it has not yet reached maturity and there is a need to re-examine conventional wisdom about regulation. The commonly held view that regulation constrains entrepreneurship and limits welfare

has induced policymakers to review their regulatory practices. Today, a reduction in regulatory requirements is on the policy agenda of almost all European countries and international organizations, which is exemplified by the growth in so-called 'better-regulation programmes' (Radaelli, 2005). Despite these programmes, concerns remain that regulation is still negatively impacting firm activities significantly and that deregulation programmes have largely failed (Keyworth, 2006).

In line with public administration research (Bozeman 1993; Bozeman & Feeny 2011; Pandey & Scott, 2002), we suggest that firm-level regulation costs are determined by the institutional setting: the stock of existing regulations, its quality and its predictability. As convincingly argued in the business literature, managers of private firms form cognitive maps based on perceived information and events, which subsequently impact on a firm's strategic decisions. We therefore propose that effective policy measures need to account for firms' perspective of regulation costs and its institutional determinants. We test our hypotheses on a large sample of small and medium sized enterprises from OECD countries (OECD, 2001). Our research context is relevant because firms in these countries are increasingly exposed to regulation by governments and international organizations such as the European Union.

The outline of this paper is as follows. We begin by reviewing the research that serves as the foundation for our hypotheses. We discuss definitions, measures and the consequences of red tape in public administration and public policy. Next, building on this theoretical background, we formulate our hypotheses about the institutional drivers of regulatory compliance costs. Then we introduce this paper's research methodology, addressing issues related to our measurement of the variables. Following that, we present our empirical findings. Finally, we conclude by discussing limitations and offering a reflection on opportunities for future research.

7.2 Literature review

The research tradition in public administration and public policy offers useful insights for the development of our hypotheses and the empirical part of our study. Both adopt the organization as the unit of analysis: the former focuses on government organizations, while the latter concentrates on private companies. When reviewing this literature, at least three conclusions emerge.

First, red tape (i.e., the negative consequences of regulation) is best conceptualized from a firm's perspective. Rosenfeld (1984) offered one of the first definitions of red tape as 'guidelines, procedures, forms and government intervention that are perceived as excessive, unwieldy, or pointless in relationship to decision-making or implementation of decisions' (1984: 603). This definition sets out two oft-repeated

important characteristics of red tape: red tape as excessive regulation and red tape as a perception or impression. Public administration research has refined Rosenfeld's definition following substantial progress in the empirical study of red tape (e.g. Pandey and Kingsley, 2000; Brewer and Walker, 2010). With variations, the definitions largely align with Bozeman's (1993) conceptualization of red tape as 'rules, regulations, and procedures that remain in force and entail a compliance burden for the organization but have no efficacy for the rules' functional object' (1993: 283). Red tape is defined as those rules that serve no purpose at all. It is different from formalization and rules that may have benefits ('white tape'). In a similar vein, we argue that the cost of government regulation is best analyzed from a firm's perspective. This offers a better reflection of the regulatory constraints faced by companies, as well as the degree to which these constraints serve no purpose (Baldwin, 1990). This aligns with Feeney and Bozeman's (2009) conclusions, who observe that there is an emerging consensus that red tape matters for organizations and this affects firm decisions and behavior in complicated ways.

Second, firm-level data collected by means of surveys permit managers to respond not just to the number of rules and procedures they face, but also to what degree they are oppressive or frustrating (Baldwin, 1990; Bozeman & Feeney 2011). Business impact studies have generated various measurements for the costs of regulation, enabling the study of the antecedents and consequences of regulation from an international perspective. For example, the World Bank's 'Doing Business' indicators investigate the degree and indirect effects of regulation from a cost accountancy perspective (Arrunada, 2007; Engel et al., 2007; Harrington et al., 2000). The Standard Cost Method (SCM) quantifies the total costs of administrative procedures (Wegrich, 2009). Djankov et al. (2002) show that the differences in regulation costs across countries are substantial and that they hamper the entry of new firms and foreign direct investment. This research tradition is based on the institutional view, which argues that economic growth and wealth ultimately depend on a country's institutional framework (Helpman, 2004). North (1990) defines these institutions as the 'rules of the game' and formal regulation make up a large part of the institutional framework (Scott, 2001).

Third, business impact studies and public administration research also offer insights for the foundations of red tape. If red tape does not serve an organizational purpose and is in effect pointless, then why does red tape exist? Why do organizations and governments not simply eliminate pointless rules and regulations to set the organization or the business community free? Bozeman (2000) offers an initial explanation as to why red tape exists in the first place: rules that are viewed as pointless by some may be treasured by others. Bozeman (2000) also distinguishes two sources of red tape: 'rules born bad' and 'good rules gone bad'. The former result from inadequate

comprehension, self-aggrandizement and over-control. The latter come about through rule drift, rule entropy, change in functional object and misapplication. These explanations all relate to instances where intrinsically good rules are applied in ways not originally intended or to rules whose meaning is lost over time due to inertia or a changing environment.

In a similar vein, Rosenfeld (1984) discusses how political processes can cause rules to be born bad or go bad, with special attention to the influence of the US Congress. One of the causes of red tape is political compromise. The result of political compromise is often vaguely worded regulation intended not to inflame important constituencies or interest groups. It is then left to the bureaucracy to refine the language, often leading to regulation which includes unnecessarily many exceptions and caveats, and which goes beyond its originally intended scope. The political process itself also tends to lead to excessive demand for regulation. Interest groups demand regulation to protect or enhance their interests. These groups obtain the benefits of successfully lobbied regulation and, since the costs are borne by the entire population, the private benefits they obtain exceed their private costs (Helm, 2006). This process causes the level of regulation to exceed what is socially desirable, and the majority of firms will view regulation as excessive and thus as red tape. Finally, excessive regulation is also the result of risk aversion and patronage. Politicians are generally blamed for adverse incidents through a failure to prevent them by means of regulation. They are less often blamed for unnecessary regulation. The result is that risk-averse politicians have an incentive to supply excessive levels of regulation or to require excessive enforcement from the bureaucracy. Politicians also have an incentive to supply regulations that benefit groups that are important during elections. Hence, the political process provides an institutional setting where there is excessive demand for and supply of regulation, resulting in increasing 'external' red tape for private firms and 'internal' red tape for government organizations.

7.3 Hypotheses

Public administration research and business impact studies offer three antecedents of rule production that we will use to explain regulatory compliance costs. The existing stock of regulation is our first institutional determinant. This aligns with the observation that the stock of regulation is ever increasing, resulting in ever-increasing legal requirements and regulation costs for companies to bear. The design of regulation is our second institutional determinant. The inherent characteristics of the political process explain the production of regulation that is of low quality. As Rosenfeld (1984) argues, the result of compromise can be regulation that is vaguely worded or ambiguous. It is then left to the bureaucracy to refine and implement such regulation, the result of which will be regulation with unnecessarily many exceptions

and caveats (Helm, 2006). The predictability of the enforcement of regulation is our third institutional determinant. Regulation aligns with uncertainty, depending on how rules need to be applied by firms. Ambiguous regulation resulting from political processes (Rosenfeld, 1984) can result in different interpretations. As a result, the application of rules can differ across firms and sectors.

The existing stock of regulation

Various studies following Djankov et al. (2002) show that the costs of administrative procedures can be substantial (Harrington, Morgenstern & Nelson, 2000). The average number procedural steps needed to start a business in the sample of Djankov et al. (2002) was 10.48, taking at least 47.40 business days. The costs of these procedures were estimated at an average of 47.08% of per capita GDP. These costs slow the rate of new business entry (Ciccone and Papaioannou, 2007). The existing stock of regulation is a determinant of compliance costs, as the compliance with existing rules is a legal requirement on firms. Feeney and Bozeman (2009), in a study of internal red tape, found that those respondents who felt that the focal organization had too many rules also perceived higher levels of organizational and contractual red tape. There are two explanations for this. First, if the number of rules that need to be complied with is higher, the number of rules felt to be excessive or obsolete and their share of the overall population of rules will also be larger. Second, the more rules a manager needs to comply with, the more likely a manager will be to consider this to be a frustrating process resulting in a general opinion that all rules are pointless or excessive – rules end up being considered as causing red tape even when strictly speaking they do not (Baldwin, 1990). Taking the above into account, we formulate our first hypothesis:

Hypothesis 1 (H1): The larger the existing stock of regulation, the larger the compliance costs of regulation.

The quality of regulation design

The second institutional variable in our study concerns the quality of regulation design. This variable encompasses several dimensions of quality, such as the ease of understanding rules and procedures, whether or not it is clear which agency to contact and whether the rules are designed to achieve their objective as effectively as possible. One of the main criticisms of both the World Bank and the SCM measurements of the costs of regulation is that these treat all regulation as inherently negative and do not account for the design of regulation in the first place (Keyworth, 2006 and Arruñada, 2007). Radaelli (2004: 271) argues that '[t]he concept of quality has now become a fundamental component of regulatory reform and regulatory management in a large number of countries'. Furthermore, DeHart-Davis (2009) found that well-designed rules are less likely to be considered as 'red tape' and more likely as 'green' or 'white' tape. Hence, if regulation is well designed, the firm-level negative effects

of regulation will be lower. Additionally, the discussion of 'rules born bad' (Bozeman, 1993) shows that the design of regulation is a key determinant of red tape. These are all reasons why low-quality regulation increases the company's costs of regulation. Better quality should reduce the costs of regulation for various reasons. First, if rules are easy to understand and it is clear who in government to contact about them, the time spent by business in complying with regulation is reduced. Moreover, rules that are easy to understand reduce the inclination to seek and the need for outside legal expertise. To put it differently: regulation with mediocre design increases the costs of 'transacting' with the government. Since compliance with regulation is a 'transaction' that cannot be legally avoided, it raises the costs of regulation. This leads to the following hypothesis:
Hypothesis 2 (H2): A higher quality of regulation design lowers the compliance costs of regulation.

Predictability of regulation application

The final institutional variable of our study concerns the predictability of the application of existing regulation. Intuitively, if regulation is applied consistently and is therefore predictable, the costs of regulatory compliance for a company should be lower. The consistent application of regulation means that companies, for example, will know what forms to complete and how. This reduces regulatory uncertainty. Lower uncertainty means firms will be less likely to hire outside expertise in complying with regulation. Further, the chance of litigation as a result of not complying with regulation is reduced. Bertelli and Whitford (2009) find that rules to be of better quality in terms of protecting market mechanisms, if an independent regulator enforces them. Independent regulators can apply rules and regulation more consistently and predictably than regulators who are under political pressure. Consistency of application enhances the predictability of enforcement of regulation and is one of the characteristics of green tape identified by DeHart-Davis (2009). As with regulation quality, the costs of 'transacting' with the government decreases if regulation application and enforcement is more predictable. Transaction cost economics argues that a transaction characterized by high uncertainty should either be internalized or there should be unilateral adaptation (Williamson, 1991). By definition, however, a transaction with a regulatory body cannot be internalized. Therefore, the increased transaction costs due to inconsistent and unpredictable adaptation of regulation have to be borne by the firm. This leads to the following hypothesis:
Hypothesis 3 (H3): The more predictably that regulation is enforced, the lower the compliance costs of regulation.

7.4 Research methods

Data and Sample

The data used in this study derives from the OECD (2001) study of regulation. The database presents survey-based information from nearly 8,000 small and medium sized firms in 11 OECD countries. It offers information with respect to three areas of regulation. The first area is employment regulation, which includes hiring and firing employees, complying with health and safety standards, worker's rights, consulting with worker councils or unions, statistical reporting of employment-related data, administering employment-related or payroll taxes, social security and pensions, or other mandatory employee benefits such as maternity leave and sick leave. These second area is environment regulation, which includes licenses, permits, planning and environmental impact assessments; complying with emission/discharge and hazardous substance requirements, process or product quality standards, pollution control and product regulations; environmental reporting and testing, record-keeping and day-to-day administrative requirements related to the environment, such as environmental levies and taxes; and eco-labelling of products or processes. The third area is tax regulation, which includes business profits tax/corporate income tax, other taxes on capital and assets (e.g. dividend tax, property tax), sales taxes (e.g. VAT, general sales taxes), and tax deduction requests such as PAYE income taxes. These areas of regulation cover the most important national and international business rules imposed by governments and international organizations.

The focus of the survey was on firms that employ 500 employees or less. The choice of these firms as the unit of analysis is appropriate for two main reasons. First, it has been argued that small and medium sized firms are more exposed to regulation than their larger counterparts. The performance and strategic decision-making behaviour of small and medium sized firms is more sensitive to regulation than large firms. Second, large firms experience greater difficulty in responding to a regulation survey as no single person or department is responsible for compliance with all regulation to which a large firm is exposed. Large firms also have international activities, further complicating the measurement of regulation.

The survey was distributed by mail in 11 OECD countries: Australia, Austria, Belgium, Finland, Iceland, Mexico, Norway, New Zealand, Portugal, Spain and Sweden. Each firm in the sample received a single questionnaire on either labour, environmental or tax regulation. No single respondent thus provided information on all areas of regulation. The overall response rate of 40% was satisfactory, with response rates ranging from a high of 78% in Australia, to a low of 18% in Mexico and Portugal, respectively. We pooled the firm-level information in one database and used country dummies to control for international differences in costs of regulation. This procedure ensures a

sufficient number of observations to obtain reliable estimates of our hypothesized relationships.

Measurements: Dependent Variable

Our measure of regulation costs aligns with the standard cost method. The SCM measurement of regulation costs accounts for different cost components of regulation. The compliance costs of regulation for a firm are determined by (a) the number of hours spent by staff and management ('Estimate the number of hours spent in an average month by staff and management in your business complying with regulations'), (b) expenditure on computers and software ('Estimate your annual computer or software expenditure which is principally used to comply with regulations'), and (c) the expenditure on hiring outside expertise ('How much money does your business spend during an average month on hiring outside services to comply with regulations'). To obtain yearly estimates and to obtain consistency within the second item, we multiplied the first and the third items by twelve. Further, in line with the SCM method, the first item was multiplied by the hourly labour costs per country (firm-level data for hourly labour costs was not available). The three different components of regulatory compliance costs were aggregated in an overall measurement of regulation costs. We used the logarithm of these costs to obtain a normally distributed measurement of our dependent variable.

Measurements: Independent Variables

We use a composition of two survey items to obtain our measurement of the existing stock of regulation (see Djankov et al. (2002) for a similar approach). The first item is a count of the number of government decisions that the company had to comply with ('During the past year, how many separate decisions or permits did your business request from a government to comply with regulations?'). However, some rules are more complex and thus need more time and attention to comply with than others. A single count of regulations would insufficiently account for differences in complexity per regulation. We therefore used a second item to correct for this. The second item measures the degree to which it is feasible to comply fully with all relevant regulations, despite their number ('Regardless the number of regulations, is it still feasible to comply with them fully?'). The first item is a continuous variable and the responses range between 0 and 300. We multiplied this item by the inverse of the second item and used the resulting weighted scale as our measurement for the stock of regulation that a firm faces. This means that the number of rules and procedures in the stock of regulation will be weighted lower, the more feasible it is to comply with them.

We use respondents' evaluation of three statements to measure the quality of regulatory design: 'regulations are easy to understand', 'regulations achieve their

objectives as simply as possible', and 'regulations are consistent with one another'. Each was measured on a four-point Likert scale, with categories ranging from 1 = 'agree fully' to 4 = 'disagree fully'. These items directly relate to Bozeman's (2000) conceptualization of red tape and to the characteristics of high quality regulation (Radaelli, 2004; Helm, 2006). A factor analysis confirmed the uni-dimensionality of the three-item scale. The Cronbach's alpha of 0.71 is above the threshold value of 0.70 and is therefore satisfactory. We combined the three items into an overall index of regulatory design quality.

We used the respondents' evaluation of the following five statements to measure the consistency and predictability of regulations, introduced by 'thinking about your contacts with government offices to obtain decisions or permissions on regulations, to what extent to you agree or disagree with the following statements': 'officials give definite answers', 'it is clear who is responsible for decisions', 'the process for appeals and complaints is clear', 'decisions are consistent and predictable over time and among similar businesses', 'additional or unexpected payments are not required', and 'you get the same view no matter who you contact'. Each was measured on a four-point Likert scale, with categories ranging from 1 = 'agree fully' to 4 = 'disagree fully'. The items directly relate to the requirements of consistent regulation (Djankov et al., 2002; Arruñada, 2007; Radaelli, 2004). A factor analysis confirmed the uni-dimensionality of the five-item scale. The Cronbach's alpha of 0.72 is above the threshold value of 0.70 and is therefore satisfactory. We combined the five items into an overall index of regulation consistency.

Control variables

We entered various control variables when we tested the hypothesized relationships. The first control variable is the size of the firm. It is known that the compliance cost of regulation is usually a fixed cost, meaning that the burden is smaller for a large firm than for a small firm (Rainey et al., 1995; Engel et al., 2007). In fact, it is suggested that compliance costs are the highest for medium sized firms and the smallest for very small or very large firms. We therefore include firm size and the squared term of firm size in our model to account for the inverted U-shaped relationship between firm size and compliance cost. The number of employees measures firm size. The second control variable is the age of the firm. Compliance costs vary with the age of the company in its overall lifecycle. Older companies will have learned how to deal with bureaucratic procedures. They are therefore less likely to bear the negative effects of regulation and may have developed methods and procedures to efficiently deal with regulation (Pandey & Kingsley, 2000). The age of the company is measured by an ordinal measure ranging from 1 to 3, with 1 indicating firms that are less than two years old, 2 indicating firms between two and five years old, and 3 firms older than five years old. The third control variable is a dummy variable that measures

whether or not a foreign company owns the firm. Foreign ownership could mean that the firm experiences more compliance costs because it has to comply with particular host country regulation that does not apply to the home country. Fourth, we control for the company's sector. Regulation differs across sectors within a country. The firms operate in 16 different sectors. We added 15 dummy variables to account for sector differences. Fifth, the firms offered information for each of the three main regulation areas (i.e., employment, environment and tax regulations). Differences in regulation areas could exist and firms could consider regulatory compliance costs in certain areas to be higher than in others. We include regulation area dummies to control for this. Finally, we include country dummies to control for country-specific differences in regulation costs that are not captured by the independent variables in our model.

7.5 Empirical results

Main Findings

Means, standard deviations and correlations are provided in Table 1. In preparation for the regression analyses, we performed the usual tests to obtain reliable estimates. These tests show that non-normality is not an issue. We tested for possible biases caused by collinearity among variables by calculating the variance inflation factor (VIF) for each of the regression coefficients. Calculations of VIF ranged from a low of 1.1 to a high of 1.5. The VIF values were well below the cut-off value of 10 recommended by Neter, Wasseman and Kutner (1985). The pretests indicate that heteroscedasticity might be present in the data. We therefore estimated our model with robust standard errors, which is the usual solution for this (Neter et al., 1985). Table 2 presents the regression results.

Table 1. Correlations, means and SDs (a)

	Mean	SD	1	2	3	4	5	6	7	8
Regulation Costs (log)	2.66	8.20	1.000							
Regulation Stock	5.02	12.03	0.127	1.000						
Regulation Quality	6.37	1.88	-0.027	-0.143	1.000					
Regulation Predictability	11.10	2.70	-0.035	-0.064	0.473	1.000				
Firm Size	67.18	104.63	0.161	0.101	0.011	0.110	1.000			
Firm Size Squared	2.87	0.39	0.088	0.068	0.002	0.089	0.898	1.000		
Firm Age	2.87	0.39	0.031	0.024	-0.054	-0.054	0.070	0.035	1.000	
Foreign Ownership	0.13	0.33	0.124	0.082	-0.031	0.051	0.226	0.142	0.000	1.000

Notes:
(a) Paired correlations of the main variables

Table 2. The determinants of perceived regulatory compliance costs (a)

	Model 1 Regulatory Compliance Costs	Model 2 Regulatory Compliance Costs
Regulation Stock		0.021***
		(0.005)
Regulation Quality		-0.124***
		(-0.019)
Regulation Predictability		-0.031*
		(-0.013)
Firm Size	0.008***	0.008***
	(0.001)	(0.001)
Firm Size Squared	-0.000***	-0.000***
	(0)	(0)
Firm Age	0.133	0.109
	(0.084)	(0.083)
Foreign Ownership	0.309**	0.284**
	(0.104)	(0.102)
Constant	11.906***	13.025***
	(0.467)	(0.473)
Observations	2990	2990
R-squared	0.47	0.49
Adjusted R-squared	0.46	0.49
F-value	92.48***	93.23***

Notes:
(a) † p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001. Robust standard errors in parentheses. Sector, regulation area and country dummies are included in the model.

We ran a two-step hierarchical regression: that is, the three regulation dimensions were added in Model 2 to Model 1 with control variables. The dependent variable is a logarithm of compliance costs so the coefficients denote percentage changes. The various fit parameters show that our full model fit the data better. The R2 improves from 47 percent in Model 1 to 49 percent in Model 2 ($F = 92.48$ with $p < .001$ and $F = 93.23$ with $p < .001$ for Models 1 and 2, respectively). Taken together, our results offer strong support for two of our three hypotheses and modest support for the other. Table 2 shows that the existing stock of regulation has a positive and strongly

significant effect on compliance costs ($\beta = 0.021$, with $p < 0.001$). Hypothesis 1 is thus confirmed. The magnitude of the coefficient of the regulation stock variable is also significant. Depending on the ease of compliance, on average, each extra rule increases the company's costs of regulatory compliance by between 0.53% and 2.1% (if the number of rules and procedures that a firm has to comply with is not adjusted for the feasibility of compliance, the results are nearly identical). The average firm in our sample faces compliance costs of approximately USD 380,000 per year. One extra rule increases regulatory compliance costs by approximately USD 2,000 if the ease of compliance is at its highest level (a score of 4) and by approximately USD 8,000 if the ease of compliance is at its lowest level (a score of 1).

Hypothesis 2, predicting that a higher quality of regulation design will reduce the company's costs of regulatory compliance, is also confirmed. The coefficient is strongly significant and the sign is negative, as expected ($\beta = -0.124$ with $p < 0.001$). The size of the coefficient also is large, here estimated at 12.4%. The scale of this variable ranges from 3 to 12: everything else being equal, the compliance costs of regulation for a firm that faces the lowest quality of regulation design (a score of 3) is 112 percent higher than that of a firm that faces the highest quality of regulation design (a score of 12). For the average firm this means a difference of almost USD 425,000. Hypothesis 3, predicting that a greater predictability of regulation application will lower the compliance costs of regulation, is also confirmed. The coefficient receives moderate support and is negative, as expected ($\beta = -0.031$ with $p < 0.05$). The size effect of the coefficient is somewhat smaller than that of the quality variable, but at 3.1% it is still substantial. The regulation predictability variable ranges from 5 to 20; everything else being equal, the difference in the cost of regulatory compliance from the lowest to the highest quality is 46.5%. For the average firm, this means a difference of almost USD 177,000.

Our results for regulation hold, whilst controlling for a large number of alternative antecedents that may determine a company's compliance costs. With regard to the control variables, one result is worth mentioning. The size of the firm (measured by the number of employees) is a significant predictor of the compliance costs of regulation. Larger firms face higher costs of compliance than smaller firms. This effect diminishes somewhat as firms grow larger, but not by much (the coefficient for the square of number of employees is relatively small). This aligns with the firms included in this sample, which all have 500 employees or less. Nonetheless, a non-monotic relationship between firm size and regulation costs appears.

Robustness Analysis

We conducted further analyses to assess the robustness of our results. The results were largely consistent with the initial results in each of these supplemental

analyses. First, we disaggregated the data in the three different regulatory areas that are included in our study. These results support the conclusion that the existing regulation stock and the quality of regulation design are important determinants of a company's compliance costs. However, the estimated parameter coefficient for regulation predictability is only significant in the domain of tax regulation. Apparently, unpredictability in the application of regulation is an important matter of concern for tax regulation. Intuitively, this makes sense: for many companies, compliance with taxation rules will be of the utmost importance, given the penalties involved for not meeting regulatory requirements in this area. Firms will be strongly inclined to align with tax regulation. The unpredictability of application is therefore likely to be a greater source of concern with regard to taxation, where unintended violations of rules can have more serious consequences than in other areas of regulation. Second, we disaggregated compliance costs into its underlying cost components. All of our hypotheses were reconfirmed. We also found that the regulatory structure is particularly important to the costs of external support, and less so to ICT expenses. Software or ICT costs are usually incidental investments: it is likely that they are made in response to structural issues rather than in response to issues that can change from year to year. Third, we estimated our models using generalized least squares (GLS). GLS is another method that corrects for heteroskedasticity, by weighting the least squares errors so that they become homoskedastic (Hill, Griffiths and Lim, 2008). This did not affect the results at all. Hence, the regression studies and the robustness analyses are strongly convincing and are consistent with our institutional explanation of regulatory compliance costs for firms.

7.6 Conclusions

Over time, each country has developed its own country-specific regulatory infrastructure. This results in substantial cross-country differences in average compliance costs for firms. For example, firms in Spain and Portugal face regulatory compliance costs 240 times as large as those in New Zealand. Previous research has established that such differences can explain differentials in national economic outcomes (Ciccone and Papaioannou, 2007; Alesina et al., 2005). Large regulatory burdens and restrictive regulation are among the most important causes of the economic under-performance and stagnation of Mediterranean economies compared to other countries.

Our study provides evidence in favour of the hypothesis that an increase in the existing stock of regulation increases the compliance costs of regulation for firms. The increase in regulatory compliance costs is greatest if firms consider the regulatory burden to already be so large that it is no longer feasible to comply with all regulation. However, even when it is feasible to comply with all regulation, an increase in the number of rules and procedures faced by firms leads to an increase in compliance costs of

about 0.5%. Therefore, all regulation leads to costs and each new rule or procedure increases the administrative burden faced by firms. The regulatory compliance costs identified in this study are substantial and potentially underestimated. A firm that makes ICT investments to comply with regulation cannot use these resources for alternative and perhaps more productive processes. Employees spending time on meeting regulatory requirements cannot perform alternative tasks. Our results are an indication to policymakers that any rule they design and implement will involve costs for those they apply to.

The results with regard to the quality of design are also robust. Whereas it is debatable whether a large stock of regulation is beneficial or not, there is less ambiguity with regard to the quality of regulation. An increase in the quality of regulation lowers compliance costs and is of direct benefit to society. The effect is substantial: each point increase on our scale of regulation quality (ranging from 3 to 12) decreases the compliance costs of regulation by 10 to 12%. The benefits to society will perhaps be somewhat smaller than those to individual firms because the process of drafting high quality regulation can be long and costly. However, given the fact that low quality regulation impacts all firms and that the reduction in costs is large, the net effect is likely to be beneficial. The robustness tests have shown that the effects of regulation quality are especially strong for ICT investments. The implication is that an improvement in regulation quality will free resources that firms can use for alternative investments, which in turn can have economic benefits for the firm and for the country.

The results with regard to the predictability of regulation application also lead to interesting conclusions. The results indicate that a reduction in unpredictability leads to a reduction in the compliance costs of regulation for firms. The result of a reduction in unpredictability is thus a gain to business, at the costs of extra legislative resources. On balance, this again is likely to offer net social gains, albeit with beneficial effects that are smaller than those of an increase in regulation quality. The benefits firms accrue are approximately 2 to 3% for each point increase on our regulation predictability scale (ranging from 5 to 20). We found that the effects of regulation predictability mainly materialize in tax regulation. A country with high tax regulation compliance costs should focus on the improvement of regulation application in this domain first.

This study advances the public policy literature by using data to investigate compliance costs at the firm level, in a cross-country setting. The use of firm-level data is well established in public administration research for the study of internal red tape and the effects thereof on organizational outcomes. Regulation in business impact studies is generally studied using country-level data on the number of rules that firms have to comply with (according to the official rule book). This study therefore expands the

latter line of research by examining actual compliance costs and the actual number of rules faced by firms. Not all firms have to comply with all regulations. Compliance and enforcement may be spotty, so that the actual number of rules that need to be complied with differs from what an analysis of existing legislation would suggest. Previous country studies implicitly assume that regulation is the same for all firms in a given country. The data used here show wide variations in regulation costs within countries as well as between countries.

This study adds two qualitative dimensions to the regulation debate: namely, regulation quality and regulation application predictability. These are not included, at least not explicitly, in previous work on regulation (Arruñada, 2007). The present study considers regulation as a multi-dimensional concept. The results show that our dimensions have a significant and substantial impact on the compliance costs faced by firms. Ignoring such factors will thus misinform the policymakers who design measures aimed at reducing the costs of regulation.

Policy recommendations and managerial implications

This study has implications for policymakers and managers. The first implication follows directly from the observation that quality and predictability are determinants of the costs of compliance for companies in addition to the stock of regulation. Policymakers who want to reduce regulation costs for firms are advised to primarily consider the design and application of the rules they implement, for two reasons. First, policymakers who introduce new regulation should be aware that even well-intended regulations with social benefits can result in high costs for firms. New regulations can result in a net social loss if they are poorly designed or inadequately applied. Further, new rules are often created in response to incidents. Policymakers anticipating incidents with new regulation, often only consider the benefits of these new rules inasmuch as they prevent the recurrence of the initial incident. Regulation is often implemented following incidents that never recur. In such cases, the costs of regulation easily exceed the envisioned benefits. The Sarbanes-Oxley Act is an example of such a case. Our results are therefore an appeal to abstain from incident politics. The design of regulation in incident situations is likely to be of poor quality due to the short time horizons of policymakers in such situations. Incident politics will also result in ad hoc regulation without a coherent view of all the regulation already imposed upon firms.

Second, for those policymakers seeking to reduce the compliance costs for firms of existing regulation, the return on political capital is likely to be higher in terms of improving regulation quality or regulation predictability than of reducing the stock of regulation. As Kaufman (1977: 4) has argued: '[o]ne person's red tape may be another's treasured safeguard'. Every rule or procedure that is removed will meet

opposition from one constituency or another. Improvements in quality and predictability will be largely uncontroversial. A policymaker with limited time and resources can therefore have a greater impact on compliance costs for firms by improving quality and predictability rather than by removing rules from the stock of regulation.

For managers, the implications in part parallel those for policymakers. The efforts to influence policymakers could focus on improving regulation quality and regulation predictability alongside and in addition to regular lobbying activity to reduce or prevent new regulation. The implications for managers also mirror those of policymakers in the design and application of internal bureaucracy. Our study focuses on regulatory compliance costs. The constituent parts of this external red tape (regulation costs, stock, quality and predictability) can also apply to internal red tape with similar causal relationships. Finally, our results show that the costs of regulation vary between countries, resulting in different rates of return of foreign direct investment. Our results also indicate that foreign firms face higher compliance costs of regulation than domestic firms. These compliance costs of regulation for foreign firms directly contribute to the so-called liabilities of foreignness. For managers making foreign direct investment decisions, the compliance costs of regulation should be an important criterion in choosing a new host country.

Limitations and future research

Regulation studies have their limitations and our study is no exception. These limitations offer opportunities for future research. A first limitation concerns our measurement of bureaucracy by means of regulatory compliance costs. As Bozeman (1993) has argued, bureaucracy and regulation detail are distinct concepts and should not be confused. Our data does not enable the measurement of 'net' effects of regulation: an ideal measure of 'net' effects of regulation would account for all the costs and benefits of regulation, ultimately measuring only the regulation that is meaningless and unnecessary. Future research could replicate this study using measurements that account for the compliance costs of pointless or useless rules. Another limitation of our empirical study concerns country coverage. The sample is relatively large for a questionnaire-based study of regulation. The observations include countries ranging from Southern Europe and Latin America to Scandinavia and more Anglo-Saxon regions. Nonetheless, we do not know if our results and conclusions also hold for non-OECD countries. Future research could replicate our study with data from Asian countries or for countries with weak institutional infrastructures such as Russia. The final limitation of our empirical study is the cross-sectional nature of the database. A panel dataset would enable longitudinal analyses and in so doing, the study of whether regulatory compliance costs and their institutional determinants vary over time.

New data collection would also enable the study of other institutional determinants of compliance costs, such as the accountability of the agencies responsible for regulation, the degree of regulation enforcement and the speed of regulation introduction. For example, if government agencies were accountable for regulation production or regulation enforcement, this would improve both regulation quality and regulation predictability, reducing the regulatory compliance costs for firms. Stronger regulation enforcement will increase regulatory compliance costs because firms will ensure that they comply with all the regulations they face. The speed at which proposed regulation is introduced could reduce regulatory compliance costs because regulation uncertainty for firms would thereby be reduced, preventing unnecessary investments in ICT or external expertise required to anticipate ambiguous regulation situations. Another avenue for future research concerns the costs of compliance due to industry standards (such as ISO certification) or self-regulation. A study of these compliance costs could be valuable for two reasons. First, self-regulation often substitutes for national regulation, potentially reducing the overall regulatory compliance costs for firms. Second, the determinants and effects of industry standards or self-regulation can differ from government regulation.

In conclusion, regulation dominates world business and a thorough understanding of its determinants remains central to public administration and policy research. With the above limitations acknowledged, we are confident that this study makes an important contribution to this line of research by shedding light on the murky world of the institutional regulatory environment, and adding to our understanding of how the relationships between the various dimensions of the regulatory environment and compliance costs vary.

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