Organizing for efficiency
To my family and Johan
ANH MAI

Organizing for efficiency
Essays on merger policies, independence of authorities, and technology diffusion
Abstract


Institutions are fundamentally sets of rules in a society that help create stability. Organizations are groups of people who may share the same goal. Changes in organizations and institutions will have large effects on the performance of economies. This thesis explores empirical aspects concerning two elements of institutional and organizational design: economic regulations and independent regulatory authorities (IRAs).

Essay 1 studies the impact of the 2004 EU merger policy reform on how mergers are reviewed by the European Commission. The EU policy appears to have softened after the reform for unilateral mergers and this may suggest an improvement of merger policy efficiency.

Essay 2 compares the merger enforcements in the EU and the US. Our approach is to decompose the differences into policy effects and case-mix effects. The EU policy has significantly changed after its 2004 reform. Overall, the results show a convergence between the two policies for dominance mergers after the EU policy reform.

Essay 3 constructs an independence index for 109 European IRAs in six different sectors: competition, energy, financial markets, pharmaceuticals, food safety, and telecom. Factor analysis suggests that the heads of the agencies are mostly constrained by four factors: collegial bodies, the judicial system, politics and scope of tasks, and resources.

Essay 4 explores a correlation between independence of regulatory authorities and corruption. We find that the authorities in corrupt countries to a large extent rely on collegial bodies but are less tightly controlled by the judicial system, compared with those in “clean” countries.

Essay 5 studies the impact of regulation on broadband diffusion speed. The results imply that a strict local loop unbundling policy appears to slow the diffusion speed of fixed broadband. In contrast, a pro-competition policy that aims to promote entry has a significant positive impact on the diffusion speed of mobile broadband.

Keywords: merger, regulation, reform, authority, corruption, broadband, diffusion, policy, industrial organization, accountability

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Table of Contents

INTRODUCTION .................................................................................................................. 9

ESSAYS ............................................................................................................................. 11
Essay 2: Does Merger Policy Converge After the 2004 European Union Reform? .................................................................................................................. 12
Essay 4: Regulatory Accountability, Power Sharing and Corruption ................. 14
Essay 5: The Impact of Regulation on Broadband Diffusion in Europe ... 16

REFERENCES .................................................................................................................. 18

ESSAY 1: Is EU Merger Policy Less Stringent After its 2004 reform?
ESSAY 2: Does Merger Policy Converge After the 2004 European Union Reform?
ESSAY 3: Accountable Regulators – To Whom? A Survey-Based Analysis of National Regulatory Authorities’ Governance
ESSAY 4: Regulatory Accountability, Power Sharing and Corruption
ESSAY 5: The Impact of Regulation on Broadband Diffusion in Europe
Introduction

The emergence of the European Union (EU), one of the most varied, complex and differentiated governance system, has required dramatic changes in trans-national governance schemes (Majone, 1997). In the strand of research on the EU, existing works have mostly dealt with institutional and organizational changes in European governance (e.g. Majone, 1997; Kohler-Koch and Eising, 1999; Katsikas, 2011). In the past four decades, we have seen a dramatic increase of European interventions into different industries, such as electricity, telecom, banking etc., along with a rise in the number of European independent regulatory authorities (IRAs) (Majone, 1997).

Institutions are defined as “rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction” (North, 1990, p3). Schmid (2004, p1) views institutions as “human relationships that structure opportunities via constraints and enablement”. Generally, institutions are both informal and formal sets of rules.\(^1\) Changes in institutions are key drivers of social and economic change”, according to North (1990, p3).

It is difficult to make a clear distinction between institutions and organizations since organizations also involve in human relationships. Ollila (2009, p19) defines organizations as groups of people who share the same goal and there are usually borders between members and non-members in the group. Organizations can take different forms, such as political bodies, economics bodies, social bodies, and educational bodies. Organizations can result in changes in institutions and vice versa. (North, 1990, p5).

Good institutional and organizational design will reduce uncertainty and transaction costs in an economy (North, 1990, p6). In this thesis, I aim to explore different aspects of two main elements in institutional and organizational design: economic regulations and IRAs.

Kay and Vickers (1990) distinguish between two types of economic regulations: structural regulation involving the regulation of the market structure\(^2\) and conduct regulation concerning the behavior of producers and consumers in the market\(^3\). Under circumstances of imperfect competi-

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1 Institutions can formal, such as government laws, or informal, such as cultural behaviours.
2 Policies that remove entry barriers, restrictions on market concentration, etc.
3 Policies controlling pricing, product labelling, etc.
tion, economic regulation is exercised to protect firms and consumers from the market power of dominant firms as well as to reduce uncertainty and transaction costs in the market processes (Hertog, 2010).

One of the most fast-spreading type of political body in Europe since the 1980s has been the IRA, which has been seen as a prerequisite for market liberalization (OECD, 2002, p91). A popular type of IRA is the sectoral regulator of an industry, such as telecom, energy, finance, etc., and, parallel to them, competition authorities. Majone (1997) firstly uses the notion of the *regulatory state* to characterize a shift in the role of the government from positive interventions via taxing and spending policies to a regulatory role via rule-making. The delegation of power to IRAs is an essential element of the rise of the *regulatory state* (Majone, 1997; Thatcher, 2005; Gilardi, 2008; Levi-Faur, 2013). The existences of IRAs have raised many questions to scholars regarding, for example, the benefits of delegation of powers to IRAs, how governments hold IRAs accountable, efficiency and effectiveness in IRAs’ activities, etc. However, delegation and organizational design within central government, from the ministries to the authorities, have been little studied, despite the obvious applicability of the principal-agent perspective.

Within the scope of this thesis, I specifically focus on the efficiency of the European Commission’s merger control, on the impact of structural regulation in broadband markets in the EU’s member states, and on the independence of IRAs.

This thesis contains five essays. More specifically, two essays study merger control in the EU and the US, two essays are about independence and accountability of IRAs, and one essay investigates the impact of regulation on broadband diffusion.

Data used in the thesis come from different sources and different periods. One of the most important contributions of this thesis is that we have access to more up-to-date data, compared with existing literature. Merger data are collected from the European Commission from 1990 to 2013, broadband market data are mainly from the ITU from 2000 to 2012 while data for the papers on IRAs’ governance dimensions come from a survey conducted in 2015. A summary of each essay is provided below.
Essays

Essay 1: Is EU Merger Policy Less Stringent After its 2004 Reform?

The EU merger policy was reformed in May 2004. Besides many changes in merger investigation procedures, the reform replaced a “dominance” standard with a “significant impediment to effective competition” standard. The reform was expected to improve the efficiency of merger control and to shift the EU policy closer to that of the US. This essay identifies key factors driving merger decisions and investigates the differences in how the European Commission (EC) challenge mergers before and after the reform.

There are relatively few empirical studies on the merger reform due to insufficient data after 2004 (Szücs, 2012, Duso et al., 2013). Moreover, it is still a challenge to measure efficiency in merger controls. Before the reform, efficiency gains from dominance mergers were not considered, and mergers without clear evidence of dominance were likely to be cleared by the European Commission (EC) (Vicker, 2004). Therefore, if the policy become softer for dominance cases and stricter for non-dominance cases after the reform, this would likely reflect an improvement in the EC’s merger policy.

This analysis is based on 341 horizontal mergers under both Phase 1 and Phase 2 investigations notified to the EC from 1990 to 2012. Firstly, I run a single probit model to estimate the impact of reform for unilateral- and coordinated-effects mergers. To do that, an indicator of reform interacted with an indicator of theory of harm is included in the regressions. Secondly, following Bergman et al. (2010), I separately run a pre-reform and a post-reform model and then compare how challenges of decisions hypothetically would have been made if mergers had been evaluated under the same policy.

The hypothetical method estimates an overall decrease in the challenge probability of between 5 and 11 percentage points. This reduction is the sum of changes in the probability of challenge of unilateral-effects mergers, changes in the probability of challenge of coordinated-effects mergers, changes in the number of high-market-share mergers that could be notified if the policy becomes softer or vice versa, changes in probabilities of moving a case from Phase 1 to Phase 2, and changes in the authority’s choices of theories of harm.
The marginal effects from the single logit model show that the reform reduces the average probability of challenge by 4 to 12 percentage points for unilateral-effects mergers. When limiting the analysis to dominance cases, the pre-reform policy is 8 to 10 percentage points stricter than the post-reform policy. The results may suggest an improvement in the merger control thanks to the introduction of the efficiency defense after the reform.

Finally, in line with previous studies, other key variables, such as market share and entry barriers, remain key factors driving the EC’s merger decisions.

**Essay 2: Does Merger Policy Converge After the 2004 European Union Reform?**

The EU and the US, the two most important merger enforcement regimes in the world, have shown important similarities and substantial differences, especially for high-profile cases⁴ (Bergman et al., 2010). This essay studies if and to what level the EU and the US merger policies converge, taking the impact of the EU merger reform in 2004 into account.

Since both of the regimes have pursued a similar economic theory of consumer welfare, the convergence is a way to cross-check the welfare maximization hypothesis. The authorities should allow pro-competition mergers, which benefit consumers through higher-quality goods at lower prices. In contrast, anti-competitive mergers, which create or increase market power and make consumers suffer from lower-quality goods, higher prices, reduced choice or less innovation, should be intervened (Davies and Lyons, 2008). Therefore, we would expect that the authorities should reach the same conclusion when assessing the same merger or mergers with similar characteristics. Additionally, the convergence hypothesis makes it easier for firms to merge, increases predictability and reduces transaction costs. Conversely, divergence increases the risks of inconsistent outcomes when large mergers can be reviewed under both the EU and the US policies.

Even though the topic of convergence of the EU and the US mergers policies has been discussed before, very few studies have investigated convergence after the EU merger standard was substantially revised in May 2004 (Szücs, 2012). A main limitation for doing empirical studies in mer-

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⁴ See, for example, Boeing/McDonnell Douglas (M.877) and Oracle/PeopleSoft (M.3216) at http://ec.europa.eu/competition/mergers/.
ger policy convergence is the limited amount of EU data after the 2004 reform.

We construct a dataset consisting of 151 horizontal mergers notified to the EC and 260 cases notified to the FTC from 1990 to 2013. We limit the study to Phase 2 mergers because they contain substantial information regarding the transactions in both the EU and the US. Methodologically, we apply Oaxaca decomposition after estimating logit models, in order to separate differences in merger policies due to case mix (different structural variables) from those due to policy differences. Finally, a propensity score matching (PSM) is used as a robustness check.

Consistently with Essay 1, we find a softer EU policy for dominance mergers after the reform. The US policy remains stable over time since other structural variables, such as Herfindahl-Hirschman index and number of rivals, remains significant as in the previous studies (Coate, 2005; Bergman et al, 2010). The results suggest a convergence in policies for unilateral-effects mergers, especially for dominance mergers. However, there is a divergence for collusion cases as the EU policy appears to become tougher. Finally, the matching method fails to obtain significant results since the two samples are not sufficiently balanced. Although it is impossible to draw any conclusions about the convergence from the PSM, it still provides insights regarding differences in the effect of structural variables between the EU and the US models.

**Essay 3: Accountable Regulators – To Whom? A Survey-Based Analysis of National Regulatory Authorities’ Governance**

Independent regulatory agencies (IRAs) are “one of the most widespread institutions of modern regulatory governance” (OECD, 2002, p91). The number of IRAs has dramatically increased in Europe since the 1990s as they have come to be seen as a prerequisite of market liberalisations across different industries, such as telecom and energy (Majone, 1997; Stern and Trillas, 2003; Thatcher, 2005).

The establishments of IRAs have attracted a lot of scholarly attention. Gilardi (2002, 2005, 2008) is a pioneer in measuring the level of formal independence\(^5\) that governments have given to IRAs. However, independ-

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\(^5\) Formal independence measures the degree of agencies' formal independence from politics (Gilardi, 2002). Informal, or actual, or de facto independence concerns the independence from the political decision-makers and from the regulatees (Maggetti, 2007).
ence is not only a measure of freedom from political control, but also from other controlling factors, such as judicial control measured e.g. by whether the IRAs can make judicially binding decisions and whether it is under control from semi-independent collegial bodies, e.g. boards of governors.

The purpose of this essay is to analyse the determinants of governance dimensions of IRAs in 6 policy areas, and to discuss and compare variations in how IRAs stay accountable within their governance constraints. It will add to and deepen an existing line of research that previously has focused mainly on formal and de facto independence of regulatory authority from politicians.

Is it crucial for government and legislators to delegate decision-making power to IRAs? From a social point of view, the delegation of power to IRAs can benefit from their competencies in specified policy areas. From a political point of view, the delegation to IRAs can be used as a tool for politicians to increase their commitment to policy.

Concerning methodology, we sent surveys to 109 IRAs in Europe regulating telecom, energy, food safety, competition, pharmaceuticals, and financial market. We asked various questions on their background, decision-making methods, legal decision structures, and checks and balances system. We apply factor analysis to identify four controlling factors of IRAs’ independence: internal governance, resources, legal governance, and politicians and scopes. Then, we categorize the IRAs participating in the survey into four groups with similar characteristics in governance dimensions by using cluster analysis.

We find that there is no strong variations in the governance structure neither between Eastern and Western authorities nor between the six policy areas. The results do, however, suggest that legal origins is associated with the choices of internal and legal institutional designs.

**Essay 4: Regulatory Accountability, Power Sharing and Corruption**

Generally, corruption is “the abuse of entrusted power for private gain” (Transparency International). Different forms of corruption can be distinguished. In this essay, we mainly discuss two types of corruption in the public sector: extractive and subversive corruption. Extractive corruption occurs where veto-players are bribed to, for example, speed up the investigation process or to provide special services. That is, a bribe is extracted from a party that is entitled to a service. Subversive corruption takes place in the judiciary to either lower the costs of legal penalties or to lift a legal
obligation (Jain, 2001). That is, a bribe is received from the party that is subsequently given a service that the party is not entitled to, such as acquittal.

This essay is linked to Essay 3. Our main aim is to provide empirical evidence on correlation between governance design and the level of corruption. To the best of our knowledge, this had not been studied previously in the literature. Even though we cannot say anything about a causal effect of corruption on the governance structures, it is still valuable to broaden our understanding of variations in institutional and organizational designs of IRAs among the countries in Europe, and how this is associated with corruption. A corruption index reported by Transparency International\(^6\) is one of our key independent variables.

Essay 3 reveals four governance dimensions: internal governance, resources, legal governance, and politics and scopes that constrain the independence of heads of authorities. From that, we ask whether and how the decision-making power will be shared among collegial bodies, courts and politicians when the level of corruption is high. The final question is whether there is a trade-off between internal governance and legal governance.

We have 120 observations from 109 IRAs since many of them regulate more than one policy areas. OLS with robust standard errors is used to study how the IRAs’ four governance dimensions and the level of power sharing are associated with the level of corruption. For the remaining question on the interdependence between the internal and legal governance dimensions, we use a simultaneous-equation model under the assumption that the choice of judicial structure can be explained by macro variables, such as corruption and GDP, while the choice of internal decision-making bodies are driven by internal factors, such as scopes, staff, etc.

Countries with higher level of corruption are found to be more restrained by internal collegial bodies, such as a board or a commission. In other words, “clean” countries tend to give more power to a single decision maker than corrupt countries do, which is in line with many theoretical studies, e.g. Laffont and Martimort, 1998. In contrast, IRAs in corrupt countries seem to be less controlled by the judiciary system. This finding

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\(^6\) The Transparency International measures the level of corruption in public sectors, specifically, the government and its decentralised non-profitable organizations that use public funds to provide services for the citizens.
appears to run counter with most of standard theory. However, Glaeser and Shleifer (2002) suggest that it would be beneficial to move the power of the court regarding low-stake decisions to IRAs if corruption is high. Those with large assets in corrupt countries may be able to subvert legal institutions that impose damages for e.g., negligence, while they may not find it worthwhile to disrupt systems regulated by IRAs, since IRAs’ regulation is typically low-stake decisions about behaviour. We also find that when corruption is high, power in decision making is shared between internal collegial bodies, courts and politicians. Finally, we find that internal governance and legal governance are substitutes, which indicates that the more controlled by collegial bodies a head of an authority is, the less controlled by courts he or she is.

**Essay 5: The Impact of Regulation on Broadband Diffusion in Europe**

Since the 1960s, liberalization in network utilities has required institutional reforms involving a move from state ownership to private ownership together with the establishment of regulatory agencies (Majone, 1997; Levi-Faur, 2013). Indeed, retail prices for telecom services have decreased dramatically as a result of technological innovation as well as intensified competition and improved regulation in the telecom industry. This paper addresses the impacts of regulation on broadband markets in 27 European countries.

Broadband provides faster speeds for transmitting information than older forms of internet access, such as dial-up. The adoption rates of broadband vary significantly across EU member states. For example, countries with more sparsely populated rural areas have lower coverage rates. Also, evidences suggest that policy-makers can improve the market performance through regulations, for example, licensing, access prices, treatment of radio spectrum, etc. However, a heavy-handed regulation may also hamper investment.

Since 2000, many EU countries have adopted a local-loop unbundling (LLU) policy for fixed broadband, which has promoted service-based competition and protected consumers from abuse of incumbents’ market power. However, the LLU regulation has been criticized since it blocks or dampens investment incentives not only for the next generations networks access (NGAs) but also for upgrading the existing networks. Indeed, for mobile broadband, the European regulators have applied infrastructure-
based competition because it is typical for mobile network operators (MNOs) to build their own infrastructures and provided services.

Fixed and mobile broadband rely on different technologies and their economic costs and benefits differ. There are relatively few empirical studies that have analyzed the impact of regulation on fixed and mobile broadband separately (Lee at al., 2011). This essay also proposes various measurements to capture the impact of regulation. To contribute to the existing literature, I also investigate the correlation between independence of IRAs and broadband diffusion speed.

This essay mainly aims to identify the factors driving broadband diffusion speed and, hopefully, to provide some insights for the policy discussion, using a panel sample of 27 EU countries from 2000 to 2012. The methodology relies on logistic models with fixed effects under the assumption that diffusion of broadband follows an S-curve pattern.

I find that the existence of IRAs is likely to increase the diffusion speed of each fixed-broadband technology. However, the use of a strict LLU policy that allows new entrants to lease incumbents’ infrastructures at low access charges appears to slow the fixed broadband diffusion speed down. New entrants may lose incentives to build their own networks while incumbents may also lose incentives to upgrade their existing technologies and/or become reluctant to transit to new technologies, such as fiber. In contrast, a policy that aims to favor new entry and to mandate infrastructure sharing among operators is found to increase the diffusion rate of mobile broadband. This finding is logical since mobile networks operators have typically been willing to build their own networks. The results also show that fixed broadband is more quickly adopted in countries with less independent authorities while mobile broadband diffusion speed is faster in countries with more independent authorities. In line with previous literature, other demand and cost factors, such as GDP per capita, education, population density, etc. have significant impacts on both fixed and mobile broadband diffusion speed.

With respect to policy implications, a large body of economic research suggests that regulatory interventions on fixed broadband should be modified to promote widespread availability of NGAs while still maintaining innovation and investment incentives of existing networks’ upgrades. For mobile broadband, network sharing among MNOs has been encouraged to reduce costs to operators and prices to consumers in the European member states. For example, sites or towers or spectrums may be used more efficiently to decrease the duplication of investment.
References


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