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Political Failures in Innovation Policy: A Cautionary Note

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Political failures in innovation policy: a cautionary note

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Abstract

Within the field of innovation studies, researchers have identified several market failures that hamper investment in R&D, innovation and growth in a market economy. Several policies such as government subsidies, tax deductions, soft loans, and public venture capital provided to firms that pursue R&D have therefore been recommended by researchers, in addition to regulations to increase the quality and standards of goods and services. Less attention has been paid to government failures in cases where a policy fails to achieve its stated goal, often due to conflicts between the interests of special interest groups and the public. This paper discusses the concept of government failure within an innovation policy context and why this perspective is important for policy design since it is likely that policies that aim to reduce market failures could suffer from political failures. A text analysis of all papers published in 5 leading innovation journals between 2010 and 2019, a total of 5,526 papers, indicates a lack of research about government failures, which could lead to recommendations from researchers to policymakers not being successful due to political failures.

Keywords: Innovation policy, Political economy, Political failure, Market failure, Public choice

JEL: L52, O38, H81, L26, G28, P16

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1 Introduction

“It does not follow that whenever laissez-faire falls short government interference is expedient; since the inevitable drawbacks of the latter may, in any particular case, be worse than the shortcomings of private enterprise.”

Henry Sidgwick - Principles of Political Economy (1887)

Research that generates new ideas is considered to be of utmost importance for increasing and sustaining economic growth (Schumpeter, 1934; Romer, 1990; Aghion and Howitt, 1992, 1997). Both exogenous and endogenous growth theory identify investment in research and development (R&D), both public and private, as the main source of new ideas that, in turn, generate new and improved technology. Innovation is a (often the) textbook example of a case of positive externalities. Positive externalities, where technologies benefit not only those who invent them, follow directly from the nonrivalry of new ideas. Indeed, one study finds that only 2 % of the surplus of innovation is captured by the original inventor (Nordhaus, 2004). Based on the notion of positive externalities from R&D, inefficient capital markets and because incentives for private R&D investment might be insufficient, all OECD countries currently spend significant amounts of money subsidizing firms and innovation in the form of direct transfers, subsidized loans, tax reductions, exemptions and government backed venture capital (GVC) (Becker, 2015b). Many countries also use laws and legalization as a way to force firms to increase innovation, e.g., by increasing emission standards to force car producers to develop more fuel-efficient cars.

In the future, private firms are expected to spend less and less on basic research, which could decrease future growth rates, even though the effects might currently not be acute (Arora et al., 2015; Färnstrand Damsgaard et al., 2017). The growth in productivity and innovation has recently been decelerating, sparking an intense debate about the future of innovation and growth (Cowen, 2011; Gordon, 2016; Bloom et al., 2017; Bhattacharya and Packalen, 2020). Indeed, some scholars describe the current lack of growth as a form of secular stagnation, predicting low levels of long-run growth (Summers, 2015). This situation suggests that the role of governments might become more important in the future. If more and more research is needed for a given amount of economic growth or to solve a societal challenge and if firms are less willing than before to spend money on R&D, then the role of

government might become larger than previously thought. An increasing budget for R&D subsidies in turn implies an increasing importance of effective policy design both to avoid wasting resources and to achieve as much innovation and economic growth as possible for a given subsidy.

While previous literature on innovation has tended to ignore the political process when considering policy recommendations, this paper specifically takes a political perspective on innovation policy and suggests that the inclusion of this perspective might alter many of the policy conclusions hitherto produced. A newly proposed policy will be affected by various factors, e.g. behavioral biases, organizational biases, and lobbying of established actors, before it is implemented. Thus, the insights from decades of research in political economy and public choice should be used to better understand the actual innovation policy and its effects. There are numerous reasons, documented in the political economy and public choice literature, why public policies could fail to achieve their intended outcome, often due to conflicts of interest among politicians, voters and special interest groups. Political or government failures occur when the effect of a policy, law, subsidy, etc., does not increase, or even decreases, social welfare compared to the market equilibrium (Le Grand, 1991). These risks must be understood and, if possible, mitigated, if policies are to be efficient in raising social welfare.

Given the importance of political economy for policies that are intended to increase innovation, the aim of this paper is twofold. First, we survey the literature on innovation and political failures to see how the concept of political failure could be incorporated into the innovation literature. Second, we use a text-based analysis of research published in leading innovation journals to determine whether it takes the risk of political failure into account. We analyze all the papers, a total of 5526, published in 5 leading journals between 2010 and 2019 and find that words related to political failure are rare in the innovation literature compared to their occurrence in the literature on market failures. This result implies that there might be a clear bias in the recommendations provided by innovation policy research. Without taking the risk of political failure into account and finding solutions to those problems, there is a risk for implementation of inefficient policies that do not solve market failures since the policies are hampered by political failures. Our conclusion is that recommendations for public policy might have a greater chance of success if the policy solves a market failure while simultaneously minimizing the risk for a political failure.

The remainder of this paper is organized in the following way. Section 2 discusses recommendations in the existing innovation literature, along with the empirical evidence. Section 3 discusses the political economy and public choice theories of government failure and why they matter for innovation policy. Section 4 presents an empirical investigation of how the

current innovation literature discusses political failures. Section 5 concludes and provides suggestions for future research.

2 What policy recommendations does innovation research give?

Innovation policy has grown exponentially in recent decades (see [Edler and Fagerberg \(2017\)](#)), both as a policy field and as an area of science. However, policy often precedes economic theory. The theory helps to expand or limit current policy development and, more importantly, explains why a policy might make sense. After World War II, basic research funding expanded in developed economies. In the US, for example, Vannevar [Bush \(1945\)](#) published the famous paper "The Endless Frontier", exhorting the U.S. government to make investments in research to solve societal issues ¹. It was not until the late 1950s that social scientists explained the market failure of basic research ([Nelson, 1959](#); [Arrow, 1962](#)). In their and their successors' work, market failure led to three policy recommendations: 1) a strong argument for governmental spending on basic science because it is a public good and incentives for firms to invest in basic science are weak, 2) subsidizing R&D in private firms to provide incentives for private investments in R&D, and 3) strengthening the intellectual property regime (IPR) so that private firms will have better incentives to invest in private R&D ([Edler and Fagerberg, 2017](#)). These arguments have provided important guidance to policymakers for many decades.

In the 1980s, evolutionary economics and innovation system research emerged and offered different sets of policy recommendations ([Nelson and Winter, 1982, 2002](#)). Innovation systems theory follows a broad approach to the sources of innovation and diffusion compared to the market failure approach. The innovation systems approach includes institutions known to affect innovation and investigates how these institutions interact. Innovation systems research places a spotlight on different functions in the economy that need to be in place for innovation to flourish, e.g., demand for innovation, access to complementary knowledge and skills, and supply of finance. If some of these functions are not present, a system failure occurs, which opens a path for policy intervention ([Edler and Fagerberg, 2017](#)). This approach clears the way for even more active policy-making in order to optimize the innovation system.

Examples of the most common policy interventions in innovation policy range from fiscal incentives for R&D to cluster policies (cf. [Edler and Fagerberg \(2017\)](#), table 1) and schemes

¹See [Leyden and Menter \(2018\)](#) for a discussion of Bush's legacy and importance today.

to promote collaboration between different organizations. During the 2010s, we have seen increased interest in the idea of using innovation policy to transform the economy in a specific direction. This need for directionality is often based on the notion that the economy needs to reduce its negative impact on the environment. Thus, if solar energy, for example, could out-compete fossil fuels, it would lead to a transformation of the energy sector that would reduce the negative externality of carbon dioxide. New research streams have emerged to assess historical social and technological system transformations, and novel research on the impact of innovation policy on the transformation that has been conducted (see [Geels \(2004\)](#); [Kuhlmann and Rip \(2019\)](#)). These novel innovation policy practices are based on identifying certain societal issues that need to be addressed and then designing and implementing policies that involve different actors to solve an issue. These are highly complex initiatives with multiple actors involved in the invention process, and such policies are accompanied with selection problems, coordination problems, and evaluation issues that policymakers must address.

All the different theoretical arguments for innovation policy require active policymaking to solve market failures, and the definition of market failure is susceptible to criticism. The main argument against the market failure approach is that it is oversimplified and not specific with respect to why and how the market fails. For example, an imperfect capital market is an important assumption for most policies since imperfect capital markets mean that not even all projects with a positive net present value get funded. With positive externalities, the share of projects that receive funding should be even greater. Whether capital markets are efficient, in the sense that they are able to fund all projects with a risk-adjusted net present value above the risk-free interest rate, has been the subject of substantial research without any clear conclusions ([Stiglitz and Weiss, 1981](#); [Petersen and Rajan, 2002](#); [Arnold and Riley, 2009](#)). Subsidized firms should ideally be firms that are credit constrained and also produce innovations with large positive externalities ([Hall, 2002](#)). However, identifying such firms in practice is extremely difficult since none of the requirements are easily, or even at all, observable. While imperfect credit markets are just one of many market failures that are important to understand for innovation policy, they have received considerable attention because of the clear connections between capital markets and firm resources for R&D. Furthermore, the theory does not prescribe the socially optimal point for these subventions ([Edler and Fagerberg, 2017](#)).

Empirical evidence on the success of industrial and innovation policies is mixed. The early literature often suffered from poor identification and, hence, an inability to convincingly separate correlation from causation ([David et al., 2000](#); [Klette et al., 2000](#)). With better data and better research techniques, a myriad of new papers utilizing randomized controlled trials

or quasiexperimental methods, such as matching, regression discontinuity and instrumental variables, have emerged. Some studies find a lack of effect or crowding out of private capital, especially for large firms (Wallsten, 2000; Lach, 2002; Görg and Strobl, 2007; Cumming and MacIntosh, 2006; Bronzini and Iachini, 2014; Gustafsson et al., 2016). However, other studies find more positive effects, where subsidies, government-sponsored venture capital (GVC), and/or tax credits result in increased R&D expenditures and/or innovation compared to the counterfactual outcome (Hussinger, 2008; Hottenrott and Lopes-Bento, 2014; Dechezleprêtre et al., 2016; Howell, 2017). Criscuolo et al. (2019) find positive effects from subsidies in the United Kingdom, but only for investments and employment in small firms. Large firms and total factor productivity did not benefit from the studied subsidy program.

Surveys and summaries also yield a mixed picture. Lerner (2009) argues that many direct public policies to promote innovation and entrepreneurship have failed. Instead, he suggests that the role of government is mainly to ‘set the table’ by providing good institutions and public goods but to leave the details to the market. In a similar way, Karlson et al. (Forthcoming) are sceptical of the role of governments in the innovation process, compared to the role of markets. By contrast, Mazzucato (2015, 2018) argues that public capital has been key for many recent discoveries underlying products such as the smartphone and that private firms are too risk averse to pursue genuine research without help from governments. Governments are therefore needed not only to provide institutions for entrepreneurship but also to take a hands-on approach to innovation. A survey by Zúñiga-Vicente et al. (2014) of 77 papers finds mixed results with respect to efficiency depending on country and sector. However, Becker (2015a) and Bloom et al. (2019) conclude that public innovation grant schemes often have positive effects, but that the effects are heterogeneous between different types of firms. Both papers argue that some of the negative results of the previous studies of effects were because of the difficulty to escape the selection bias.

The latest evidence also points at the policy design being an important factor for the success of the policy, at least for grant schemes Becker (2015a). In the following section, we therefore discuss what political risks there are in the policy design process. What are the political risks and how can they affect innovation policy design?

3 Political economy, public choice and political failures

A short digression on the history of the phrase *political economy* is interesting and informative. In the early formative years of economics as a science, economics was called political economy. The leading works were often specific on this point, e.g., John Stuart Mill’s *Principles of Political Economy*, David Ricardo’s *On the Principles of Political Economy and*

Taxation, and Jean-Baptist Say's *Traité d'économie politique*, to give just a few examples. For these scholars, it appeared to be obvious that economic decisions are taken in a political context, what we today would call an institutional setting (North, 1991). However, with the increasing focus on mathematical rigor and price theory, less attention was paid to political decision making until the birth of the public choice school and later what has become known as the field of political economy. This change marked a resurgence of the view that economic policy is created in an institutional and political setting and that this setting must be taken into account in both research and applied work. This has especially been important in the discussions of market failures².

The public choice school, which originated in the U.S. in the early 1960s, began using economic methodology to address questions that previously had been viewed as belonging to political science³ (Buchanan and Tullock, 1962). In the earlier economic tradition, the state was often modeled with an impartial social welfare function. An important public choice critique of this perspective is that policy is never created by an omnipotent and omniscient actor but rather evolves within a political context (Buchanan, 1959). A social welfare function is therefore not a useful concept, not even as a model, since it gives the wrong impression of how policy evolves.

The main assumption in public choice is that politicians, just like consumers and firms in a market, are interested in maximizing their own utility and not (just) the public welfare. This simple assumption leads to substantial changes in our understanding of how politics works and which models are suitable for explaining political behavior. An especially interesting area of research has been the interaction between private firms and politicians, with a focus on how firms and individuals attempt to influence policy in a way that favors themselves. Currently, public choice is a large and diverse field of study in both economics and political science.

Political economy, by contrast, is often considered to have evolved from the discussion of the importance of rules and stability in macroeconomics (Kydland and Prescott, 1977). For example, politicians often prefer low interest rates and large fiscal deficits before elections in order to create a boom and thus please voters, but this behavior is not consistent with long-

²An early discussion of market and government failure can be found in Williams and Coase (1964): *"Contemplation of an optimal system may suggest ways of improving the system, it may provide techniques of analysis that would otherwise have been missed, and, in certain special cases, it may go far to providing a solution. But in general its influence has been pernicious. It has directed economists' attention away from the main question, which is how alternative arrangements will actually work in practice. It has led economists to derive conclusions for economic policy from a study of an abstract model of a market situation. It is no accident that in the literature (and for that matter in Professor Caves's paper) we find a category 'market failure' but no category 'government failure.'"*

³One early scholar in the public choice tradition was Knut Wicksell, whose work on the fairness of taxation later became an inspiration for James Buchanan's work (Wicksell, 1896; Buchanan, 1987).

run macroeconomic stability (Rogoff, 1990). Both schools have benefited from the research in political science regarding rational choice and game theory (Persson and Tabellini, 2002). This paper does not further discuss the differences between the two approaches and instead refer the interested reader to Blankart and Koester (2006). Here, we present the synthesis of research regarding when and why political action sometimes fails to improve the public good.

3.1 Common forms of political failure

Political failures often arise due to conflict between the general interest of society and the interest of specific individuals, groups and politicians (Keech and Munger, 2015). While politicians, in theory, are supposed to act only in the public interest and maximize aggregate social welfare, this assumption is not realistic. Politicians, after all, are humans, and humans are imperfect and often self-interested (Cowen, 2005). For a politician, self-interest is often modeled as a desire to maximize the probability of being elected and re-elected. The incentive to be elected creates pressure to please the median voter since this voter is pivotal if the electorate's preferences are single peaked and can be ranked on a single scale, e.g., a left-right axis (Hotelling, 1929; Black, 1948; Downs, 1957). This median voter model has been the workhorse in research, both theoretical as well as empirical, for decades. A more complex and realistic set of models are called probabilistic voting models, which allow for more stable sets of equilibria (Lindbeck and Weibull, 1987, 1993). According to these models, politicians should woo marginal voter groups who can easily be convinced to change which block they are voting for. The incentive to win groups of marginal voters leads politicians to pursue policies that are directed to these groups and therefore can swing voters over to their block (Levitt and Snyder Jr, 1997; Elinder et al., 2015). While such policies could, by coincidence, also increase the general welfare of society, there is a high likelihood that so-called pork barrel spending will lead to a waste of resources since it does not target those who benefit most from the spending but rather maximizes the amount of votes for a given sum (Cadot et al., 2006).

In modern states, the state controls vast economic resources, both directly via taxation and public spending and indirectly via public permits, monopoly licensing, etc. This creates incentives for firms and groups of individuals to divert these resources to themselves, which is known as rent-seeking (Tullock, 1967; Krueger, 1974). If a firm can convince the government to grant them subsidies or hinder competition via legislation or tariffs, then this action can ensure that the firm receives profits far larger than would have been possible in an unhindered market. Rent-seeking is pervasive in most societies, with large negative effects on long-run

economic growth (Murphy et al., 1993). In their overview, Acemoglu and Robinson (2012) provide evidence that when narrow interests succeed in capturing the entire political process and bend it to benefit themselves, the consequences for economic growth and development can be devastating.

Special interest groups (SIGs) are often skilled at persuading politicians to implement policies in their favor. Since a small group has less collective action problems than a large group, it is easier, e.g., for farmers to lobby politicians in favor of agricultural subsidies and tariffs (Olson, 1965). The drawbacks of such policies fall on consumers, who, on average, are subjected to slightly higher food prices. This price increase is not sufficiently large for the large and heterogeneous group of consumers to organize and lobby for changes in the opposite direction. Therefore, the economic returns from successful lobbying can be extremely large, much larger than an improvement in a product that slightly raises demand or lowers costs. SIGs can influence politicians either via direct monetary contributions, such as through campaign contributions, by threatening to support political rivals, or by promising to deliver votes from members of the organization (Grossman and Helpman, 2001). The latter is a common strategy of trade unions, who often have a large number of members. Trade unions are often able to raise wages at the expense of unorganized (and often unemployed) workers, with the benefits going to the organized and employed workers (Lindbeck and Snower, 2001). Efficient SIGs can often be skilled in extracting large rents in return for political support to established politicians while making it appear that they are acting in the public interest (Grossman and Helpman, 1994)⁴.

Many industries are regulated and the intention of the regulation is to make the behavior of firms more in line with public welfare. However, it is possible that firms can change the rules in such a way that they favor the incumbent firms, often via reducing pressure from competition. This process is called regulatory capture since firms and SIGs "capture" the rule-making process and influence the rules in their favor rather than in the public interest (Stigler, 1971; Peltzman, 1973; Dal Bó, 2006). Regulatory capture has been strongly debated following the financial crisis in 2008. Large banks were viewed as having been able to bend rules and regulations in their favor in the years leading up to the crisis, with detrimental consequences for society as a whole (Zingales, 2012; Carpenter and Moss, 2013; Manish and

⁴Indeed, inefficient policy design is often the result of the "baptists and bootleggers" phenomenon, that is, poorly informed activists aligned with those who benefit economically from bad policy design. *"The term stems from the southern United States, where in the past and even today Sunday closing laws prevent the legal sale of alcoholic beverages. This is advantageous to bootleggers, who sell alcoholic beverages illegally; they get the market to themselves on Sundays. Baptists and other religious groups support the same laws, but for entirely different reasons. They are opposed to selling alcohol at all, but especially on Sunday. They take the moral high ground, while the bootleggers persuade politicians quietly, behind closed doors."* (Yandle, 1983; Yandle and Buck, 2002).

O'Reilly, 2019).

Incentives that aim to direct firm or individual behavior in a certain way can sometimes backfire, giving rise to unanticipated side effects. This is often called the "cobra effect". In colonial India, the British government gave financial rewards for killing cobras to reduce the number of cobras and therefore reduce the number of venomous bites. Crafty entrepreneurs started breeding cobras on farms to maximize profits. When this behavior was exposed, the financial reward was scrapped and the cobras in the farms were released into the wild. The net result was therefore an increase, not a decrease, in the number of cobras. While this anecdote has been questioned, other examples of such behavior exist (Lucas et al., 2018). Therefore, when a policy is implemented, it must be designed in such a way that it creates incentives for productive rather than unproductive or even destructive entrepreneurship (Baumol, 1990).

Some policies might be too complex to be able to survive intact. For example, Acemoglu et al. (2018) shows that welfare can be increased when governments implements policies that tax production of incumbents and subsidize R&D for both incumbents and new entrants. The idea is to increase the pressure on inefficient firms to accelerate the reallocation of skilled labor to more productive firms. This is an interesting suggestion but an evaluation of the policy has to include an in-depth analysis of how it was implemented and control for the risk of being captured by special interests and distorted. Taxes and subsidies can be designed in such a way that the general public believes them to be supportive for innovation, when they are in fact designed to block entry and protect incumbent firms. The risk of capture is greater when rules and regulations are so complex that the general public, and perhaps even most full-time politicians, struggle to understand them.

Pressure to be "politically correct" might also distort the information that policymakers receive, which can prevent relevant information on policies that are not working, thereby preventing bad projects from being cut off from funding (Morris, 2001). For example, it might appear to be a good idea for politicians to support small business owners since this is a large group of voters, despite small business activity being a poor proxy for entrepreneurship (Henrekson and Sanandaji, 2014) and high-growth firms often being one-hit wonders (Daunfeldt and Halvarsson, 2015). High-value entrepreneurship can create massive gains for founders, and it might therefore be hard for public policy, especially in egalitarian welfare states, to be involved in creating extremely rich individuals (Sanandaji and Leeson, 2013). Policy might therefore focus instead on less successful firms, even though this approach is inefficient, simply to avoid creating large profits and increasing inequality.

In summary, there are numerous ways that policies can fail. Policies that are intended to solve market failures and therefore increase social welfare might very well backfire and

result in less social welfare, if the is affected by a political failure.

3.2 Political failures related to innovation policies

Almost all innovation policies take their theoretical basis in the market failure argument. Due to positive externalities, imperfect credit markets and the nonrivalry of ideas, a laissez-faire market economy cannot be expected to produce the socially optimal amount of innovation and R&D. The tools to solve these problems are, however, likely to be quite susceptible to political failures since they involve targeting the correct firms, technologies and individuals. This process creates a large informational problem for the state actor. Which firms should receive subsidies, grants or similar benefits, and which should not? At the same time, each firm or industry has incentives to use lobbying or other methods to increase their share of the subsidy.

This is a typical recipe for rent-seeking, where small and well-defined groups with superior information can ensure that they receive more public money than what is optimal. The introduction of innovation policies changes the incentives for private and public actors. If there are activities other than the market to earn money in, such as applying for grants, then some firms might change their behavior. Firms with a comparative advantage in seeking subsidies might gain more from subsidies than market activity and focus their effort accordingly. This sorts firms into two types: those that act mainly on the genuine market and those who survive mainly on the political market. Firms specialized in acquiring subsidies, tax breaks, etc., will therefore out-compete other firms in this activity, and in the end, almost all subsidies will be targeted to ‘subsidy entrepreneurs’ (Gustafsson et al., [Forthcoming](#)). This result is problematic since it is unlikely that these firms will produce the most social benefit from their grants. If policymakers do not take the changing of incentives into account, specifically how incentives change over the long run when information is spread on how to bait the system, then the policy may not have the intended effect.

Firms in declining industries with large sunk costs might have incentives to lobby for more public money to their sectors. The high fixed costs of entry and the declining future prospects ensure that any rents will not be competed away by new firms entering the sector (Peck et al., 1987; Baldwin and Robert-Nicoud, 2007). This effect is enhanced by the dynamics of the markets, where yesterday’s winners might be tomorrow’s losers. Since these firms are in a declining industry, removing their subsidies might lead to a violent collapse of the industry, with large political ramifications. One difference that Engberg et al. (2017) finds between government-sponsored and private venture capital is that the former (GVC) is more likely to make follow up investments in stagnating firms. Pulling out of stagnant firms could lead

to these firms going bankrupt, with potential negative political consequences.

Regulation is another policy tool that can be used to influence innovation. For example, tougher fuel economy standards could spur innovation in order to produce more efficient cars. However, regulations could very well be designed and/or enforced in such a way that they actually lower social surplus, for example by erecting barriers to entry for new firms (Chambers, Collins and Krause, 2019; Chambers, McLaughlin and Stanley, 2019). It is difficult for a politician or the public to distinguish between calls for regulations that are driven by genuine concerns over, say, safety, from those that are driven by concerns to eliminate competition (Juma, 2016).

Since environmental problems are considered a pressing concern that require political action, environmental policies are susceptible to government failure. The promotion of biofuels, which feed into a narrative of cutting carbon emissions and reducing reliance on imported fuels, might have had more to do with politics than economic or environmental efficiency (Skidmore et al., 2013). The outcome of ethanol subsidies, as an efficient way to reduce emissions and consumption of fossil fuels, appears to be quite bleak (Pimentel, 2003; Hahn and Cecot, 2009). While the evidence is mixed, it is likely that subsidies to ethanol have, by diverting agricultural resources away from food production to producing crops for ethanol, increased food prices and therefore contributed to a substantial reduction in welfare in developing countries, where food prices are of great importance (Collier, 2008). Thus, it is quite possible that the implementation of ethanol subsidies were driven by lobbying and rent-seeking by special interest groups rather than efficient reduction of carbon emissions.⁵ (Anthoff and Hahn, 2010; Helm, 2010).

One could of course argue that the limited success of ethanol subsidies was not obvious at the time of implementation, but this raises the question of why they have not since been removed. According to Dur (2001), politicians are reluctant to remove inefficient policies since voters might interpret this change of policy as a sign of incompetence. Hence, once an inefficient policy has been implemented, it might be difficult to remove due to the negative effect the removal will have on the individuals and industries that benefit and due to a lack of interest from politicians who care about their re-election chances⁶.

Intellectual property rights, such as patents, are intended to solve the problem that firms

⁵The case of ethanol appears to fit the "baptist and bootleggers" narrative very well, where the interests of individuals concerned with the environment coincide with the financial incentives of farmers and ethanol producers.

⁶In the case of ethanol, an interesting fact is that the first U.S. state to vote in a primary is Iowa, a major corn growing state. A U.S. presidential candidate that would like to remove subsidies to ethanol, and thus corn growers, would face a major challenge in the first primary election. For example, John McCain was strongly opposed to ethanol subsidies, and did not even try to win the primary in Iowa in 2000 and fared poorly in 2008.

cannot recapture the high fixed cost of R&D if the ideas are easy to copy and have low marginal costs. In areas such as pharmaceuticals, the fixed costs of developing a new drug can be enormous, whereas the marginal cost of imitation and production can be quite low. In theory, patents should both provide incentives for large investments into R&D to reap monopoly profits during the patent's duration and simultaneously encourage the diffusion of knowledge when the patent expires. However, patents could also encourage predatory behavior, where patents are used as a tool to reduce competition (Boldrin and Levine, 2013). Indeed, it is unclear whether patents actually increase aggregate innovation (Boldrin and Levine, 2008; Bessen and Maskin, 2009; Moser, 2013). For copyright, the duration of copyrights have expanded significantly during the past century, partly due to lobbying efforts from Disney to prevent Mickey Mouse, first seen in 1928, from falling into the public domain (Schlackman, 2018). It is unclear whether the expenses for lobbying the U.S. Congress or the extended rents that Disney generates from their almost 100-year-old copyright is beneficial to society.

4 Do innovation scholars study political failures?

Given the risk of political failure in policies that are typically recommended to improve innovation, it is of great importance that scholars who study innovation and provide recommendations regarding policy be aware of typical forms of political failures. If recommendations for policy changes also take political failures into account, the chances of success should be greatly improved. At least, recommendations for policy changes should account for the risk of political failure, even if it is impossible to come up with an efficient solution to mitigate these risks. If the risk of political failure is too high, it might be better to recommend no policy at all.

Some scholars take political risk into consideration when giving policy recommendations. For example, Hassler et al. (2016) discusses the political risk of carbon taxes versus cap-and-trade policies for reducing carbon emissions. Since cap-and-trade schemes are easier to manipulate, with some firms with good political connections receiving free permits, carbon taxes might be a more efficient way of reducing emissions. This type of reasoning, where political and market failures are considered simultaneously, have a greater chance of producing efficient policies than when only market failures are considered.

To see to what extent current research in innovation policy takes political failures into account, we conducted a text analysis of leading innovation journals during the period 2010-2019. The aim was to identify discussions on political failure, exemplified by theory from leading textbooks such as Persson and Tabellini (2002) or Mueller (2003). Journals were

selected based on the ranking from [Thongpapanl \(2012\)](#), where we choose to include high-ranking innovation journals that promote the importance of public policy in their aims and scope. This resulted in 4 journals: Research Policy (RP), Technological Forecasting and Social Change (TF&SC), Science and Public Policy (S&PP) and Industrial and Corporate Change (ICC). In addition, we added one leading environmental policy journal, Environmental Innovation and Societal Transitions (EI&ST). The aims and scope for each journal are provided in the Appendix.

All articles in the journals for 2010-2019 were downloaded from their respective homepages, a total of 5526 papers⁷, and the entire text was analyzed using a recent Stata tool ([Dicle and Dicle, 2018](#)). We searched for keywords and phrases related to political failure, as defined above, to see how often such keywords are used within current research. Several keywords related to standard innovation policy and market failure were added to provide a benchmark. Note that it is possible for a single paper to contain multiple words. The results can be found in [Table 1](#).

Bubble graphs for the words and phrases are plotted in [Figure 1](#) and [2](#) for all journals. In comparison to [Table 1](#), the words in the diagrams are not selected as the most common words and phrases in the papers that have been analyzed. In [Figures 3-7](#) in the Appendix, the bubble diagrams are plotted separately for each journal. All words related to political failures are shown in red for increased visibility. The lines show which words are related to other words.

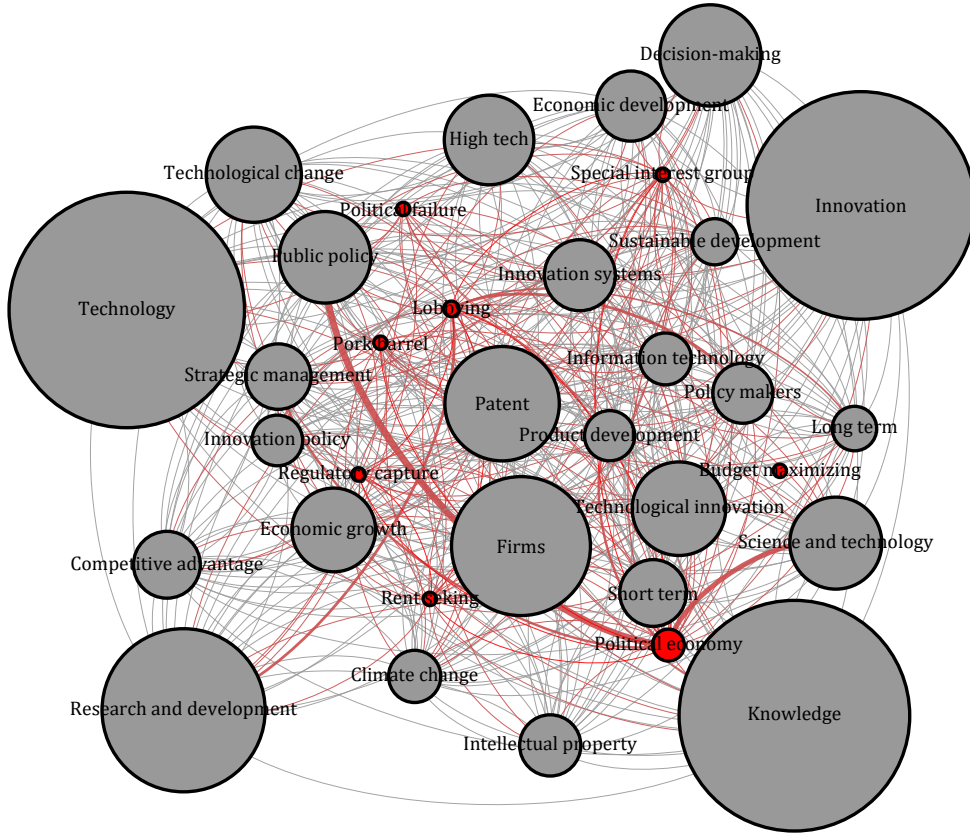
⁷A handful of editorials were included in the analysis.

Table 1: Empirical investigation of political failure in innovation studies

	RP	TF&SC	S&PP	ICC	EI&ST	Total
	(1)	(2)	(3)	(4)	(5)	(6)
Market failure	143	124	73	58	29	427
Percentage	10.3	4.8	11.0	10.6	8.1	
Public policy	439	732	612	160	105	2048
Percentage	31.7	28.4	93.9	29.1	29.4	
Innovation policy	337	431	232	71	62	1133
Percentage	24.3	16.7	35.2	12.9	17.4	
Subsidies	315	393	100	86	133	1027
Percentage	22.7	15.2	15.2	15.7	37.3	
Regulation	557	1086	315	235	244	2437
Percentage	40.2	42.1	47.8	42.8	68.3	
Patents	995	956	258	293	57	2559
Percentage	71.9	37.1	39.2	53.4	15.9	
Cluster policy	19	16	11	8	1	55
Percentage	1.4	0.6	1.7	1.5	0.2	
Rent-seeking	8	7	2	8	2	27
Percentage	0.6	0.3	0.3	1.5	0.5	
Pork barrel	5	3	2	1	0	11
Percentage	0.4	0.1	0.3	0.2	0	
Median voter	0	0	0	0	0	0
Percentage	0	0	0	0	0	
Special interest groups	5	35	7	0	2	49
Percentage	0.4	1.3	1.1	0	0.5	
Regulatory capture	16	4	4	4	1	29
Percentage	1.1	0.1	0.6	0.7	0.3	
Lobbying	75	110	55	31	77	348
Percentage	5.4	4.2	8.3	5.6	21.6	
Budget maximizing	0	0	0	0	1	1
Percentage	0	0	0	0	0.3	
Political failure	0	4	0	0	0	4
Percentage	0	0.1	0	0	0	
Political economy	205	148	105	210	47	715
Percentage	14.8	5.7b	15.9	38.3	13.2	
<i>Total for each journal</i>	1384	2577	659	549	357	5526

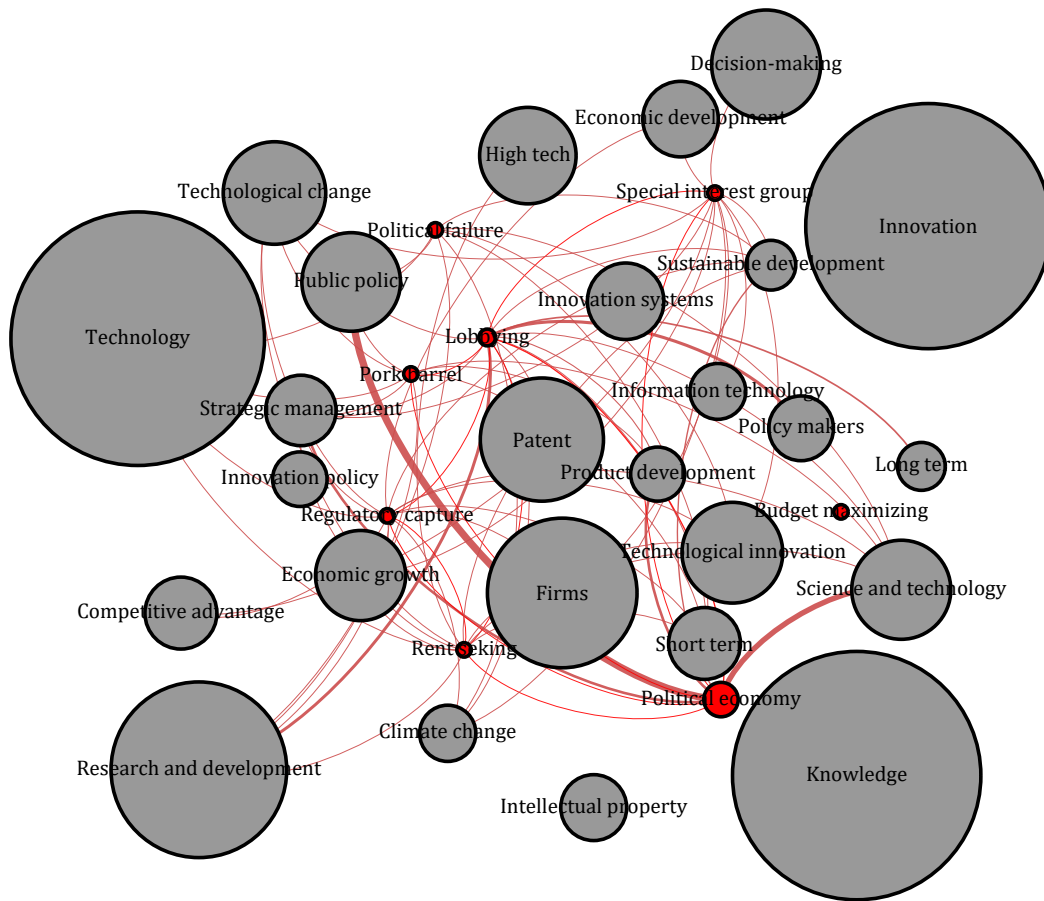
Number of papers in which each keyword or phrase related to market or political failures occurs. The total number of papers represents all the papers published within that journal between 2010-2019. The percentages are calculated by dividing the number of papers with a keyword by the total number of papers in the respective journal.

Figure 1: Aggregate results for all 5 journals



The size of the bubble reflects the relative importance of each phrase. Words related to political failures are shown in red. Grey and red lines indicate which words are associated.

Figure 2: Aggregate results, no gray lines included for increased visibility



See notes on Figure 1.

The results in Table 1 and Figure 1-2 show that terms related to political failures are uncommon within the leading innovation journals. For all journals, the term market failure is discussed in approximately 10 percent of all papers, whereas the term political failure is almost never discussed.

The bubble graphs show the connections (or lack thereof) between terms. For example, there appears to be no discussion at all of various political failures such as rent-seeking in relation to intellectual property, despite these being policies that are likely to be affected by political failures. As shown in the table, extremely few papers discuss rent-seeking or pork barrel spending, despite the large risk that many innovation policies contain elements of both.

Median voters are not mentioned in any paper in the selected journals. While none of the selected journals specialize in political economy or public choice, it is interesting to note the lack of the workhorse model in explaining political equilibria, given how important the political process is for understanding which policy will be selected. Politicians also often craft policy in such a way that it favors median or marginal voters, at the expense of the public good, something that could be useful to take into account when giving policy recommendations.

In terms of the differences between the journals included in the study, EI&ST discusses lobbying much more than the other journals (see figure 7), which makes intuitive sense since many of the problems in environmental policy are due to lobbying efforts by, e.g., firms that want to avoid regulations that constrain their pollution. However, these forms of political failures do not appear to be part of a larger discussion on political failures and instead are treated in isolation.

The term political economy is the most common of all the terms in Table 1. While this is positive, it does not seem like the term is related to political risks or political failures. If politics is viewed only in the positive sense, i.e., policies that improve the general welfare, policies might still fail since they have not taken the darker side of politics into account.

Our interpretation of this result is that many innovation scholars do not discuss literature related to government failures. The small number of articles that mention political failures suggests that political failures are not taken into account to any large extent. It could of course be argued that studying political failures is not the main aim of these journals, and such discussion instead belongs within other fields. Since there is a risk for political failures when the recommendations are implemented, this in turn increases the risk of policy failures. A solid understanding of the most common reasons for government failures could therefore lead to policy recommendations to reduce these risks.

5 Conclusions

Small changes in growth rates produce large effects on long-run GDP levels; therefore, any factor that might increase growth rates is important. Likewise, several large social and environmental problems societies are currently facing will require new innovations and technological progress to solve. Therefore, it is of great importance that policies that aim to promote innovation are efficient.

Thus far, the empirical literature on innovation and industrial policy has produced mixed results on what policies work, highly dependent on sectors and countries. The aim of this study has been to note that a successful policy must not only address market failures but also be robust to potential government failures. Markets respond to incentives to maximize profits and not social welfare, making it difficult to improve incentives. Policies that appear to be beneficial to the public interest might be inefficient but cleverly marketed by a rent-seeking organization. Designing the optimal policy is therefore far from easy when both the dynamics of the markets and the incentives of politicians are taken into consideration.

In short, there are numerous reasons why the political process and public policies may not, in practice, lead to a solution to market failures or an increase in public welfare. Still, careful empirical evaluations clearly show positive results in some cases. According to the so-called robust political economy perspective, in order to succeed, policies must be able to overcome both information and incentive constraints. For policy to be effective, politicians must have access to sufficient information, which can be difficult to achieve without relying on the market (Hayek, 1945). When policies are designed in such a way that they solve both incentive and information constraints, there is a greater chance of success due to the "robustness" of the design (Leeson and Subrick, 2006; Pennington, 2010). Extending this framework into innovation policy is beyond the scope of this paper but could provide useful insights and recommendations for policy design.

It is somewhat surprising that scholars who have written on the importance of creative destruction, the evolutionary nature of technological development and bounded rationality in individuals and organizations have not taken political failures into account when giving policy recommendations. The logic behind government failures and market failures is often similar, with a trade off between what is best for society and what is best for the individual, regardless of whether the individual acts in the commercial or political market. If policy is implemented without addressing the risk of political failure, these policies risk becoming inefficient or even harmful to society. Addressing market failure almost always involves the need to address the risk of political failures since policies evolve within a political context.

It must also be noted that no economic policy can achieve, and perhaps should not

even aim for, total perfection. As the opening quote from Sidgwick suggests, sometimes an inefficient policy might even be worse than the market failure it aims to address, although that scenario is hopefully uncommon. Striving for perfection is simply a case of the nirvana fallacy, a dream too good to be true ([Demsetz, 1969](#)). Individuals have bounded rationality, and imperfections in the political system increase these limitations. We must therefore accept that a policy that is decent might be the best we can hope for and design policies to minimize the risk of political failure.

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A Appendix

A.1 Text analysis

In Figures 3-7 we plot words used in the papers in the respective journal. The size of the bubble represents how often a word is found in a paper within a journal. Keywords related to public choice and political economy are shown in red to increase readability.

Figure 3: Research Policy

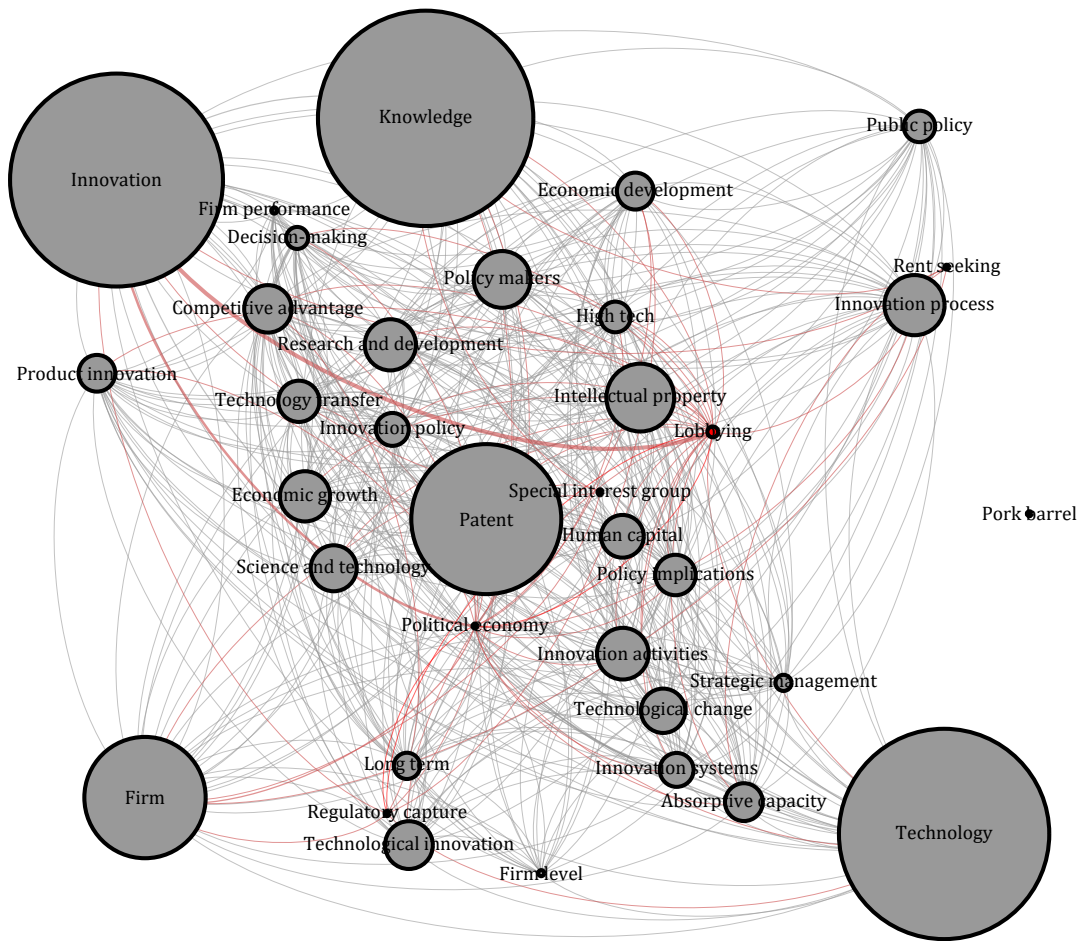


Figure 4: Technological Forecasting and Social Change

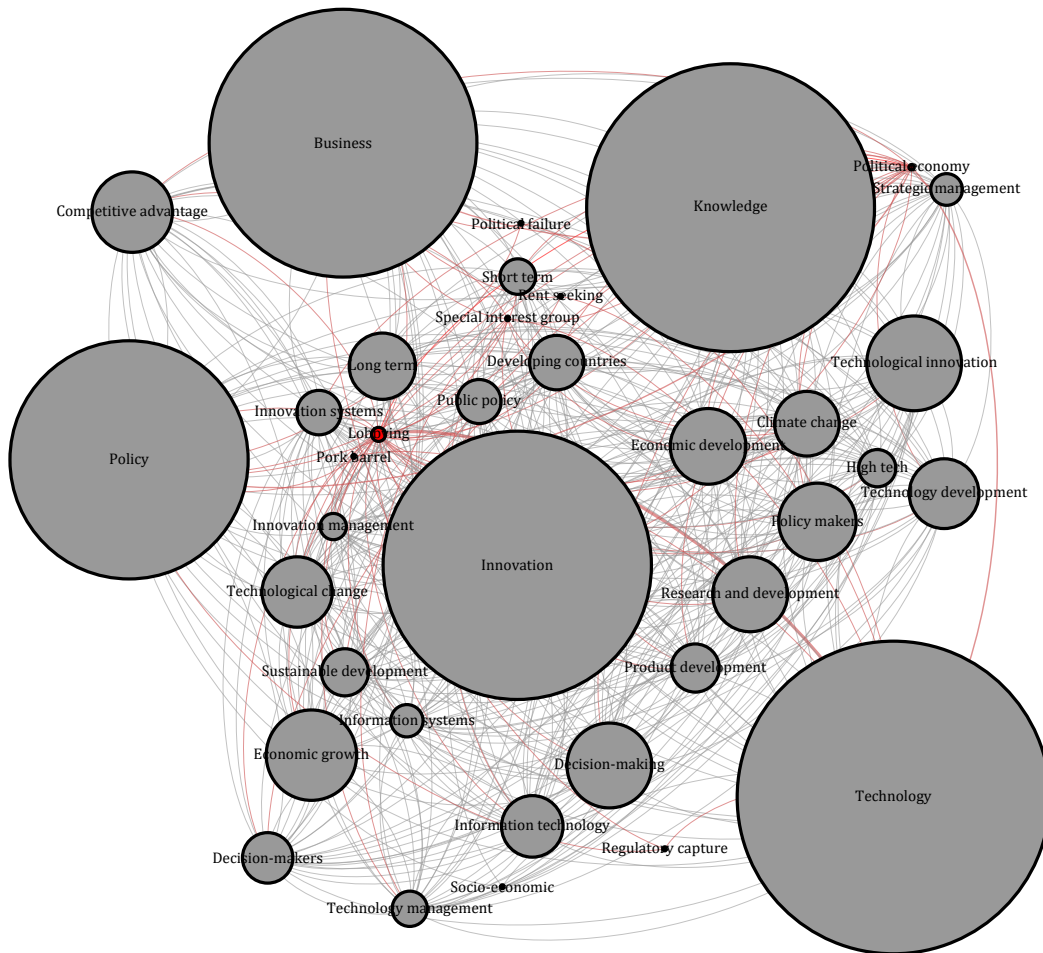


Figure 5: Science and Public Policy

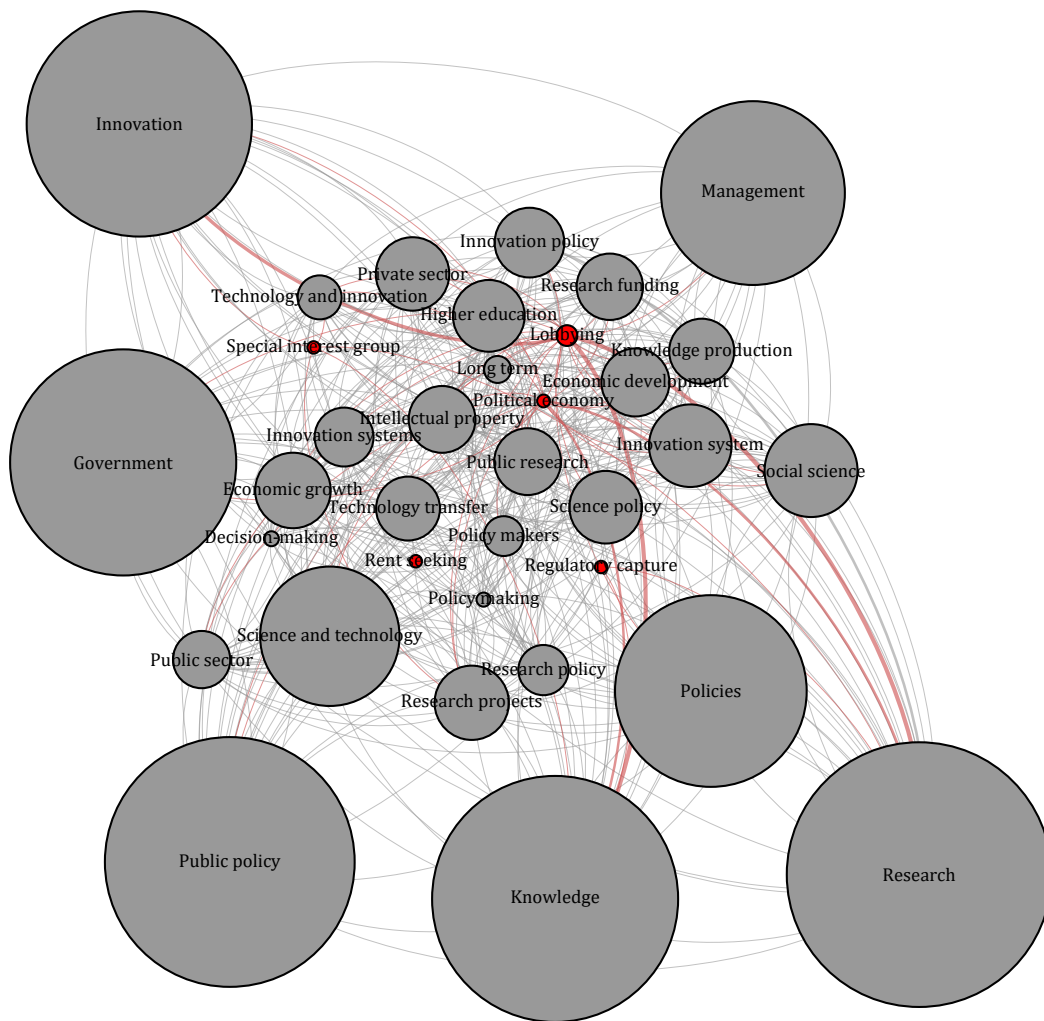


Figure 6: Industrial and Corporate Change

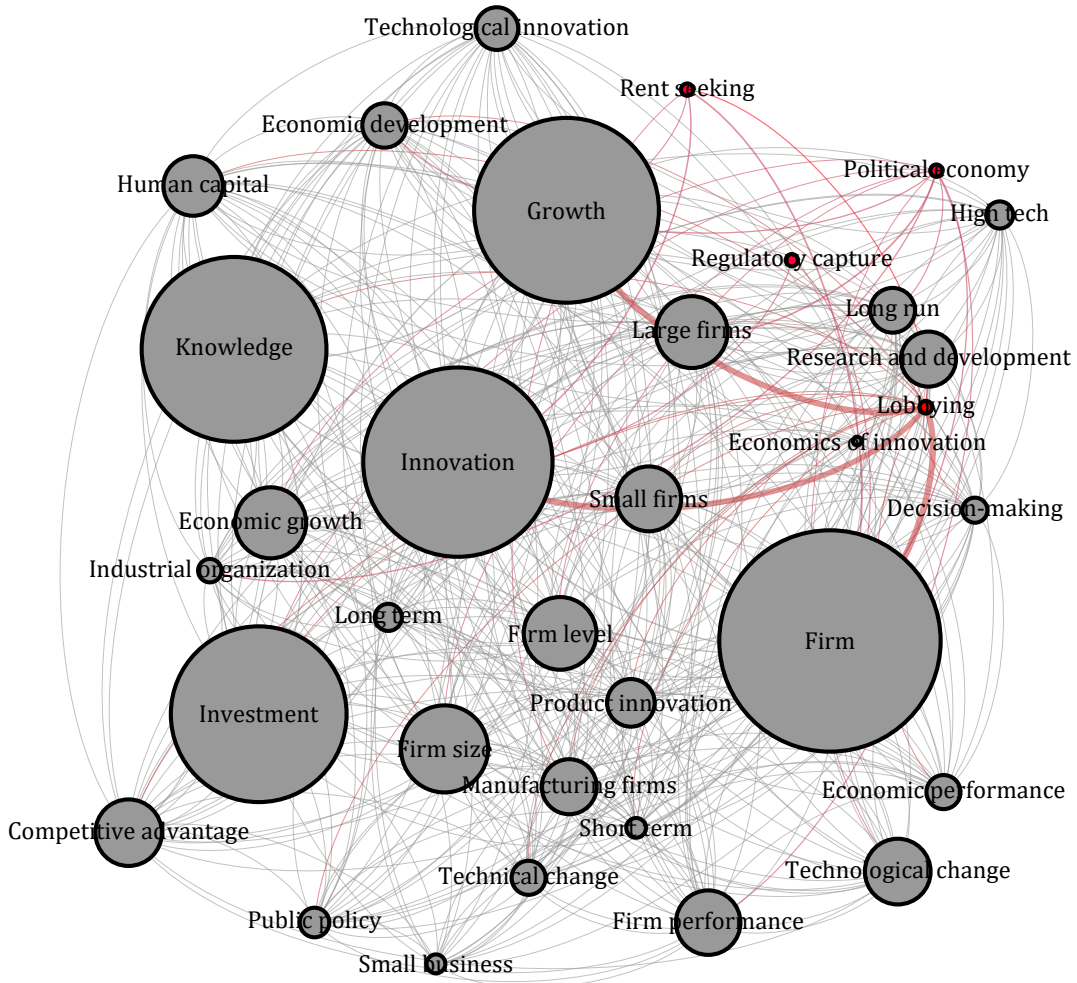
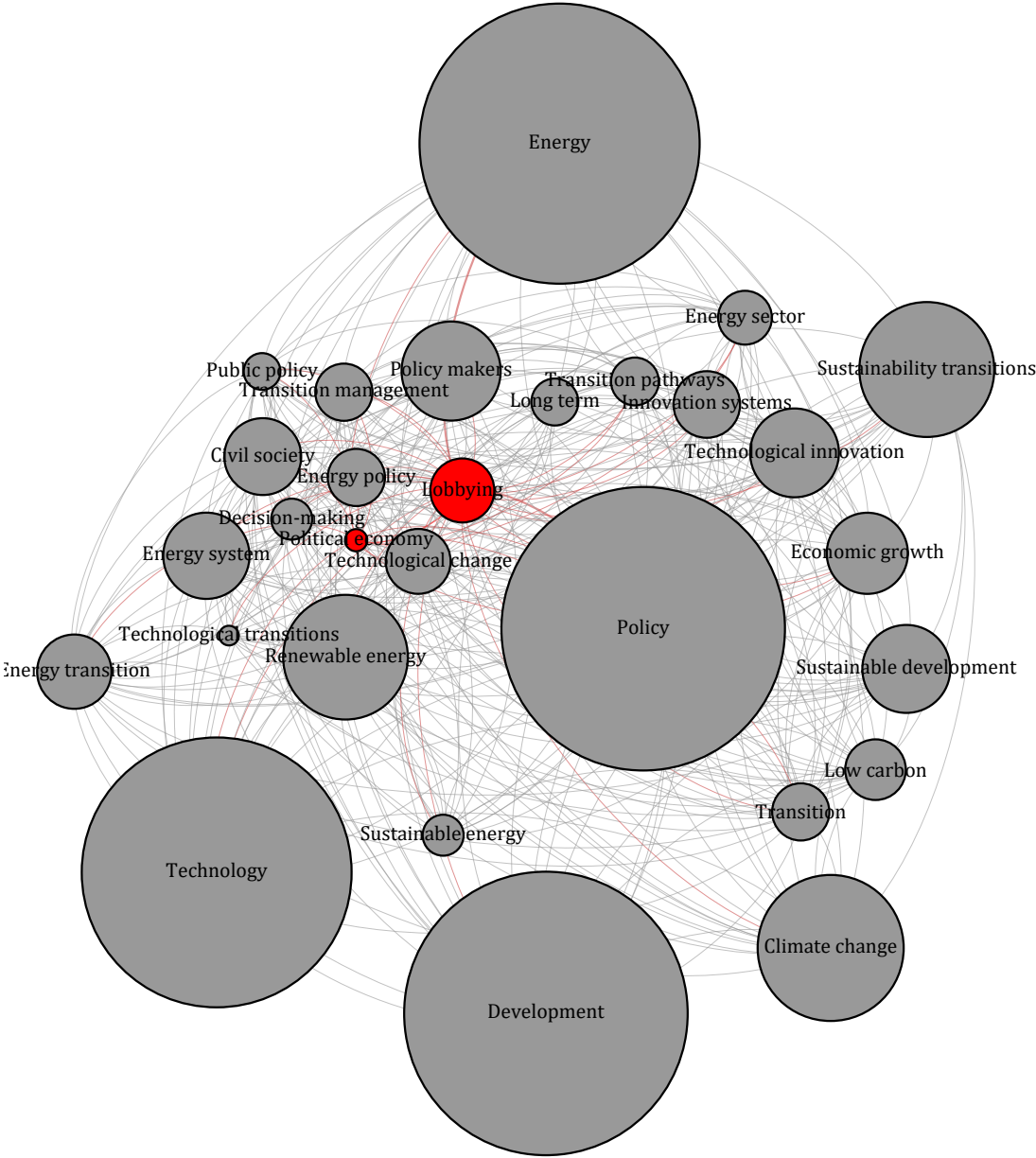


Figure 7: Environmental Innovation and Societal Transitions



A.2 Aims and scopes of relevant journals

The aims and scopes of the journals included in the empirical analysis clearly indicate that these journals are concerned with both innovation and public policy.

Research Policy: is a multi-disciplinary journal devoted to analyzing, understanding and effectively responding to the economic, policy, management, organizational, environmental and other challenges posed by innovation, technology, R&D and science. This includes a number of related activities concerned with the creation of knowledge (through research), the diffusion and acquisition of knowledge (e.g. through organizational learning), and its exploitation in the form of new or improved products, processes or services. RP is generally acknowledged to be the leading journal in the field of innovation studies, with its academic status and influence being reflected in a remarkably high 'Impact Factor' for a multi-disciplinary social science journal.

Technological Forecasting and Social Change: A major forum for those wishing to deal directly with the methodology and practice of technological forecasting and future studies as planning tools as they interrelate social, environmental and technological factors.

Science and Public Policy: is a leading international journal on public policies for science, technology and innovation. It covers all types of science and technology in both developed and developing countries.

Industrial and Corporate Change: is committed to presenting and interpreting corporate organization and change, innovation, industrial structures and dynamics, drawing from a variety of disciplines, including economics, management, history, political science, and sociology. The ICC Editors strive to publish papers that have sound theory and appropriate methods, whatever the method may be, and that are relevant with clear implications for the economy, organizations, management, public policy, or society.

Environmental Innovation and Societal Transitions: The journal offers a platform for reporting studies of innovations and socio-economic transitions to enhance an environmentally sustainable economy and thus solve structural resource scarcity and environmental problems, notably related to fossil energy use and climate change. This involves attention for technological, organizational, economic, institutional and political innovations as well as economy-wide and sector changes, such as in the areas of energy, transport, agriculture and water management. The journal aims to tackle the most difficult questions, dealing with social, economic, behavioral-psychological and political barriers and opportunities as well as their complex interaction. The journal is multidisciplinary in spirit and methodologically open, and invites contributions from a broad range of disciplines within the social, environmental and innovation sciences.