GÖTEBORGS UNIVERSITET

REGULATIONS AND MARINE AQUACULTURE

An experimental investigation of the effect of trust and bureaucratic capacity

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Abstract

What explains the demand for regulation when institutions are considered ineffective, corrupt or incompetent? This thesis presents a novel study of the public's attitudes towards marine aquaculture and regulation of a new group of actors, fish farmers, that both generate public goods, but also make use of a common good. While previous explanations have shown that the demand for regulation of actors with corrupt institutions can be explained by social distrust and a will to punish and restrain market actors, this study builds on the suggested explanation that it is rather lack of political trust. What it is in political trust has however not yet been explained. A suggested mechanism is that the perceived capacity of bureaucrats handling marine aquaculture leads to a demand for regulation. The main assumption in this thesis is therefore that when institutions are perceived to be ineffective in protecting common resources, the public wants the bureaucrats to work under very detailed regulations rather than having a lot of freedom in their work, instead of restraining fish farmers. A post-test survey experiment with 3.373 respondents could not confirm this suggested mechanism, nor the explanations found in previous research. The study however still fills a gap in the research. Individuals seem to demand a high degree of regulation of marine aquaculture, and this does not hinge upon the perceived effectiveness of either institutions or fish farmers.

Keywords: trust, bureaucratic capacity, institutions, regulations, subsidies, resource users, marine aquaculture, survey experiment

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1. Introduction

Overfishing of the world's oceans is threatening marine ecosystems and posing serious societal problems worldwide. Illegal, unreported and unregulated fishing has escalated in the past 20 years and around 30 percent of the assessed fish stocks are estimated being overfished. Fish has been recognised as playing a critical role in food security and nutritional needs globally, and as the world's population increases a challenge is to produce nutritious food in an environmentally sustainable way. Fish is further amongst the most traded food commodities worldwide, with the European Union as the largest market for import of fish, and currently growing. At the same time only about 2 percent of food production currently comes from the sea, and a possible solution has therefore emerged in marine aquaculture. Even if disputed, marine aquaculture has been put forward as a "sustainable solution" to the increased demand for fish and seafood, as well as food production in general (FAO 2014; SWEMARC 2015). Marine aquaculture is a growing industry with possible negative externalities, and is in need of new technology as well as successful environmental management, requiring political institutions and regulation. It is a complex matter because it both generates public goods, but can at the same time pose serious negative externalities with environmental degradation in marine areas, which is a common good.

There is an increased interest in the academic society to study explanations of the demand for regulation of actors that either generate negative externalities or fail to sustain and provide public goods. Trust has been highlighted as an important factor, where it is argued that distrust in market actors leads to demand for more coercive policy tools such as regulations. In low trust societies people do not trust market actors in doing the right thing, for instance protect the environment, and authorities also fail to protect the common pool resource. People thus demand more regulation from authorities to punish or prevent new possible free riders. Even when authorities are considered ineffective or corrupt, state control is found to be preferred over uncontrolled market actors (Aghion et al. 2010; Di Tella and MacCulloch 2009; Dimitrova-Grajzl & Guse 2011, Harring 2014a; Harring 2015; Pinotti 2011). This explanation has however been questioned. Studying policy preference for resource users when institutions are considered ineffective, Harring and Rönnerstrand (2016) find that the public demands more regulation regardless of the resource users following the rules or not. It is not the market actors the public wants to regulate and constrain when institutions are considered ineffective or corrupt, but rather the bureaucrats.

Political trust thus challenges the previous explanation for the demand for regulation, namely social trust. Inspired by the research on the welfare state (Dahlström, Lindvall & Rothstein 2013), it is further suggested that perceptions of bureaucratic capacity is the causal mechanism explaining this demand for regulation. Regulation can be perceived as implying less bureaucratic discretion, and therefore preferred when institutions are perceived as ineffective. If bureaucrats handling aquaculture are seen as ineffective, corrupt or incompetent, presumably people cannot trust them protecting the environment, and would want to limit their freedom and make them work under very clear regulations. The assumption in this thesis is therefore that when institutions are seen as ineffective, the demand for regulation can be explained by a wish to restrict the freedom of bureaucrats, rather than the will to punish free-riding market actors. The aim of the thesis is to investigate the whether ineffective institutions makes people demand more regulation, and if this can be explained by a willingness to restrict the bureaucrats rather than the market actors. This will be tested in a post-test survey experiment.

The thesis is unique as it is one of few studies of marine aquaculture from the perspective of political science. It as well takes departure in a theoretically interesting puzzle in what can explain the demand for regulation, and applying it on a suitable and highly relevant case. It makes distinct contributions to the research by filling in two gaps; there is firstly little knowledge about the attitudes and opinions towards marine aquaculture. Secondly, it is a unique possibility to study people's attitudes towards regulation of a new group of actors, that in different manners threatens common goods, but also contributes to a public good. Previous research has for example been concerned with the attitudes towards regulation among resource users themselves (for example Jagers, Berlin & Jentoft 2012; Gezelius 2002), but little research has been concerned with public attitudes towards regulation of actors, not at least in the field of marine aquaculture. We thus know little about what the public thinks of regulation of resource users. This is however important, as the legitimacy of regulations within natural resource governance is important in a liberal democracy (Zannakis, Wallin & Johansson 2015: 425).

The thesis is divided into five main sections and proceeds as follows; section 2 lays out the theoretical background for this thesis; The role of the state in natural resource management, policy instruments and the demand for regulation when institutions are seen as dysfunctional will further be explored, as well as the role of trust as explanatory factor for compliance towards policy regimes. The possible new mechanism for explaining the demand for regulation, bureaucratic capacity, will thereafter be explained. Section 3 presents

the research design and case, before the results are presented and analysed according to hypotheses. In the final section the results are discussed before the conclusion and future research are suggested.

2. Theoretical framework

2.1 The regulatory state and its role natural resource management

Regulations are a central theme within political science and of natural resource management especially. Central in the discussion of its origin and development, is the rise of "the regulatory state" that started accelerating in Europe in the 1970s. It was conditioned by deregulation and privatizations, and replaced the "dirigiste state" of the past (Majone 1994). Privatization and deregulation changed the role of the state from a producer of services and goods to functioning more as an umpire making sure economic actors played by the rules. With privatization or deregulation one did not get a retreat of the state, but rather a redefinition of its functions, such as strengthening the state's regulatory capacities in areas such as competition, environment and consumer protection (Majone 1994: 77, 80; Braithwaite 2009: 217-218). Regulation is introduced with the normative justification of correction of market failures and refers to "sustained and focused control exercised by a public agency, on the basis of a legislative mandate, over activities that are generally regarded as desirable to society" (Selznick 1985: 363-4 in Majone 1996: 9). This implies that regulation is not only achieved by passing a law, but also requires detailed knowledge and involvement with the regulated activity, necessitating the creation of specialised agencies (Majone 1996: 9). Regulations are also referred to as the government's stick, used to define norms, acceptable behaviour and to limit activities. It is argued that regulatory intervention should be introduced when it serves "the common good" or "public interest". Regulations are effective in changing behaviour as long as a social consensus exists around the government policy. The effectiveness of regulatory instruments is also determined by their legitimacy, which also hinges upon policy context and the capacity of a government organization to ensure compliance (Lemaire 1998: 59-71).

The lack of collective action in preserving the environment and common-pool resources calls for this higher levels of state action, where the state inhibits the role of monitoring compliance and sanction defection (Mansbridge 2014: 8). It is argued that "…without some external support of such [higher-level state] institutions, it is unlikely that

reciprocity *alone* completely solves the more challenging common-pool resource problems" (Ostrom 1998: 17). Researchers have been concerned with different policy instruments meant to correct for negative externalities or induce compliance of actors that fail to sustain or provide public goods. Public support is considered to play a major role in whether politicians decide to implement environmental policies aiming at changing behaviour of citizens or market actors (de Groot & Schuitema 2012: 100). Without support policies might not get implemented or have intended effects, since lack of support might affect willingness to comply with policies, and politicians fear loss of electoral support if they implement policies without the support of the public (Harring 2014b: 11; Jagers & Hammar 2009: 219; Jones et al. 2009: 598; Lubell et al. 2006: 149). Opposition from the public is thus the primary barrier to implementation of policies to mitigate or solve environmental problems (Cherry, Kallbekken & Kroll 2012: 95).

Instruments or policies in which the state can exercise control over citizens or market actors can be understood in terms of coerciveness and considered either as pull or push measures. Information is seen as the least coercive and more of a pull measure, market-based instruments (taxes or subsidies) in the middle and regulations are seen as the most coercive instrument, thereby a push measure (de Groot & Schuitema 2012; Harring 2014b: 19). They are also called command and control instruments, or hard policy instruments and implying high levels of state intervention and constraints on behaviour of citizens (Eckerberg 1997 in Jones et al. 2009: 602). In an experimental study it is found that there is an aversion towards regulation, and this is least preferred over taxes and subsidies (Cherry, Kallbekken & Kroll 2012: 95). This is also found studying travel demand management measures, where the coercive measures are the least acceptable to the public than non-coercive, and thus less politically feasible to implement (Eriksson, Garvill & Nordlund 2006: 23; Gärling & Schuitema 2007: 149).

For this thesis and marine aquaculture as a case, regulations are interesting both for how it affects resource users (fish farmers) and bureaucrats within fisheries management. For the fish farmers, regulation implies making them follow stricter regulations ensuring that precautions for environmental sustainability are met, as opposed to letting them work without guidelines or regulations. For bureaucrats, regulations can be argued to imply less bureaucratic capacity and assessments as opposed to for instance handling of subsidies. This can however also be argued to be the opposite, when comparing for instance parental leave benefits and active labour market policies. The first requires no assessment and less capacity by bureaucrats since it is easy to establish who is entitled to the benefit, while the latter

requires more assessment, higher levels of competence as well as a high level of reliability (Dahlström, Lindvall and Rothstein 2013: 527). This thesis assumes regulations as a thorough set of rules and regulations for bureaucrats where they to a lesser degree will be able to exercise discretion, while subsidies are considered as in need of higher assessments and thereby more discretion and capacity from the bureaucrats.

2.2 The demand for regulation with dysfunctional authorities

Different cross-country comparative studies of policy predictors have come to what can be seen as somewhat contradictory findings, where dysfunctional authorities or low quality of public institutions (low Quality of Government, QoG), in the form of ineffective or corrupt institutions, and distrust are linked with a demand for more coercive policy tools and more regulation (Aghion et al. 2010; Di Tella and MacCulloch 2009; Dimitrova-Grajzl & Guse 2011; Harring 2014a; Harring 2015; Pinotti 2011). It can be seen as contradictive because corrupt and ineffective institutions normally do not provide public or common goods, so why would one want to see more government regulation? (Harring 2015: 1). Or "why it is that people in countries with bad governments want more government intervention?" (Aghion et al. 2010: 4). In fact, studies have found that environmental regulations will make bureaucrats engage in more corrupt behaviour, since this type of regulation requires monitoring of compliance, and bureaucrats are considered to be self-interested agents (Acemoglu & Verdier 2000; Damania 2002).

The explanation provided for the demand for more government intervention through regulation is that there is a trade-off between market failure and government failure, which are also found to correlate. Neither government nor market actors are able to provide common or public goods, and trust levels are generally low (Acemoglu & Verdier 2000; Aghion et al. 2010; Harring 2015). In such low trust societies people believe that market actors cheat and thus naturally have little trust in them. To control the free riding market actors, support is given to government regulation, which in turn also can stop possible new cheating market actors to enter the market. Distrust thus influences the demand for regulation, even if regulation might lead to more corruption. People see that "government is bad, but business is worse" and the will to punish the market actors is bigger (Aghion et al. 2010: 18). While this model focuses on individual's perceptions of trustworthiness towards regulation of market actors, Harring (2015) focuses on regulation both towards market actors and individuals. Also here, a preference for coercive regulatory instruments is found.

This is explained by low quality of public institutions (low QoG), which in turn correlates with low social trust. Citizens and market actors both have a preference for regulatory instruments, because they want to punish free riders (Harring 2015). Experimental studies and public good games can further help explain the will to punish free riders, even if punishment is seen as costly. In public goods games, cooperation leads to a group-beneficial outcome, but is jeopardized by selfish incentives to free ride on others contributions (Herrmann, Thöni & Gächter 2008: 1363). Taking this experimental approach, Fehr and Gächter (2002) show that altruistic punishment of defectors is key in explaining cooperation, as punishment of non-cooperators raise cooperation levels in subsequent rounds of a public goods game. Punishment can be seen as altruistic because it is costly for the punisher, but provides a benefit to other members by making non-cooperators increase their investment. Further, Herrmann, Thöni and Gächter (2008) show that people punish not only free riders, but also cooperators in public goods games. Participants that had been punished in the past for contributing too little might retaliate against cooperators because they do punish free riders. This "antisocial" punishment can lead to strong differences in cooperation levels and that punishment opportunities are beneficial when complemented by strong social norms of cooperation (Herrmann, Thöni & Gächter 2008: 1362-1366). Consequently, one can assume that if both institutions are making small efforts to hinder environmental degradation and fish farmers are considered to cheat with environmental guidelines to increase their profits, the public would want to punish them with stricter regulations to make them comply with the rules and also hinder new defectors in entering the market.

The willingness to punish free riders by demanding more regulation is further found in a series of different studies. Asking why capitalism does not flow to poor countries, Di Tella and MacCulloch (2009) for instance show how perceptions of widespread corruption lead to demands for more regulations to punish corrupt market actors. Corruption reduces the legitimacy of a country's commercial institutions, which makes a capitalist system undesirable for the public. They show that increase in perceived corruption leads to electing more left-wing government that would regulate market actors more stringently (Di Tella & MacCulloch 2009). Concerns about market failures also leads to a demand for stringent regulation, which are enacted as a response to market failures caused by opportunistic behaviour of agents in the economy (Pinotti 2011: 653, 675). Dimitrova-Grajzl, Grajzl and Guse (2011) question whether the trade-off between market and government failure, also leads to citizens' demand for government regulation. They find that trust in market actors

and perceptions of corruption, and their interaction, appear jointly as explanatory variables for the demand for regulation.

Together these studies find that ineffective or corrupt institutions lead to a demand for more government intervention through regulation. The explanation is a co-variation between ineffective institutions and distrust. So, in low trust societies, people do not trust market actors, and to restrain and punish them, support for government control through regulation is fuelled. Applying this line of reasoning to marine aquaculture, if institutions are considered ineffective in preserving natural resources and people do not trust fish farmers to cooperate either, there is a demand for more regulation to restrain the fish farmers. "People want regulation and punishment, not because they trust or believe that the state can solve the problem of environmental degradation, but because they have very low trust in other actors cooperating and acting in an environmentally friendly manner" (Harring 2015: 5). The will to punish free riding fish farmers and hinder entrance of possible new cheating fish farmers is found to be more important than the possible corrupt behaviour or ineffectiveness of institutions. This leads to the following hypothesis:

H_1: Perceptions of ineffective market actors increase the demand for regulation, even if institutions are perceived as corrupt.

2.3 Trust as explanatory factor

2.3.1 Trust in market actors

While some argue that collective action can be achieved without mutual trust (Raymond 2006), trust has been lifted as the explanatory factor for overcoming social dilemmas or collective action problems, in which environmental problems largely can be understood (Ostrom 1998; Uslaner 1999: 31; Yamagishi 1986: 115). Social dilemmas can be defined by two properties: "(a) each individual receives a higher payoff for a socially defecting choice (…) than for a socially cooperative choice, no matter what the other individuals in society do, but (b) all individuals are better off if all cooperate than if all defect" (Dawes 1980: 169). Likewise, a common good like the ocean can be overused by harvesting some of the valued goods produced by it or by treating it as a sink by putting in unwanted by-products. The common resource face two different problems, where the first is subtraction of the resource or destruction of the resource, and the second is the free rider problem which comes from the cost of excluding individuals from benefits generated by the resource in question (Dietz

et al. 2002: 18; Hardin 1968; Olson 1965: 2). This is also what has been termed problems of free riding of the first-order and second-order. The first occurs when people do not cooperate to change behaviour to protect the environment and the second when people do not comply with sanction schemes or policies to overcome the free riding problem of the first-order (Harring 2014a: 22; Ostrom 1998: 8; Yamigishi 1986: 111). In the same way, fish farmers, even if producing public goods, can overuse the common good with for instance pollutants destroying seabed ecosystems, and further not comply with rules and regulations meant to combat such problems. The result being that the ocean gets polluted.

Trust in market actors, the fish farmers, is therefore central for this thesis and is assumed to work in the same manner as generalized trust. Generalized trust is found to be the core link together with components of networks and formal and informal rules important in obtaining collective action and to solve social dilemmas (Ostrom 1998: 1; Ostrom & Ahn 2003: 14-16). Generalized trust refers to the idea that "most people can be trusted" (Uslaner 2002: 5), and is also important when it comes to implementation of environmental policy instruments. The assumption is that citizens will act for a common benefit based on belief that other members act in the same manner. High levels of social capital or generalized trust will make people work for a common interest, as well as support formal rules. Research on acceptance of environmental policy has seen that generalized trust makes people more willing to accept such policies, and that levels of trust consequently affect the influence of free riding behaviours (de Groot and Schuitema 2012; Hammar & Jagers 2006; 614; Harring 2014b: 12, 18; Jones et al. 2009;).

While this thesis is investigating trust in market actors or resource users, it is important to point out that generalized trust and trust in market actors or resource users, may not be quite the same. Generalized trust gives an indication of whether people consider people they do not know to be working for a common good, such as not polluting the ocean. Both Aghion et al (2010) and Pinotti (2011) use trust in others as a proxy for market failures or "individual concerns about opportunistic behaviour of entrepreneurs" (Pinotti 2011: 651). Aghion et al (2010) further argues that social trust also works for perceptions of market actors, where low trust correlates with the demand for regulation explained by perceptions of others, and not through the perceptions of institutions. It has also been argued that the mechanisms that explain the preference for steering instruments targeting business actors and individuals are the same. "People prefer to punish actors independently of whether they are citizens of business actors" (Harring 2015: 16). An assumption in this thesis is that trust in market actors follows the same line of reasoning as for generalized trust. The next section

will also explain how Quality of Government affects social trust, as well as being highly correlated with political trust.

2.3.2 Political trust

Social trust or generalized trust is argued to derive from Quality of Government or the quality of public institutions (Herreros & Criado 2008; Levi 1998, Rothstein 2003; Rothstein & Stolle 2008). Another line of reasoning sees it the other way around, namely that social or generalized trust coming from "civic engagement" has caused effective and democratic institutions (Putnam 1993: 101-103). Following the first causal order, governments may function as an establisher of trust among citizens, with democratic institutions being better than undemocratic in fostering such trust. It is argued that critical for this task is rightly understood and used coercion, through the capacity to monitor laws and sanction lawbreakers. If there is doubt that the state will enforce these tasks and function as a credible enforcer, people will not trust the state (Levi 1998: 5,7). This is confirmed empirically, where in countries with a more efficient state there is a probability that people trust their fellow citizens to a higher degree, the mechanism being that the state functions as a third-party enforcer of agreements (Herreros & Criado 2008: 63-66). Trust in political institutions means that individuals perceive that the institutions are impartial, effective and fair in doing what they are supposed to (Rothstein & Stolle 2008: 12). In relation to public policies such as taxes or social spending, it is found that the perception of the level of QoG (measured by impartiality and efficiency) is important in relation to public support for such policies (Svallfors 2013: 377). Likewise, people with perceptions of trustworthy institutions tend to also support environmental policy efforts, such as environmental taxes, subsidies and other market based tools meant to internalise environmental costs or punish non-environmental friendly behaviour. Simply put, "why would I support an increased tax burden imposed on me by someone I do not trust? (Hammar & Jagers 2006: 615). Political trust is found to have a significant effect on attitudes towards increased tax on carbon dioxide in Sweden (Hammar & Jagers 2006; Hammar, Jagers & Norblom 2008; Harring 2014a: 119-120; Harring 2014b: 1; Harring 2015: 16; Harring & Jagers 2013), being an important factor for support for a fuel- and transport tax in Norway (Kallbekken & Sælen 2011; Kallbekken, Garcia & Korneliussen 2013), as well as explaining success for air policy activism (Lubell et al. 2006: 158). A problem with green tax reform is a lack of trust that the government will use the tax revenues as promised (Dresner et al. 2006).

When it comes to environmental policies such as government regulations within environmental issues, trust in particular authorities and perceptions of quality of institutional arrangements are important factors explaining acceptability of these governmental regulations. This in turn also influences perceptions of authorities being environmentally effective and impartial when enforcing rules. It is argued that public willingness to accept and follow rules is an indication of legitimacy as well as trust in the regulatory system. Without it, there may be that "enforcement measures will fail in the long run" (Zannakis, Wallin & Johansson 2015: 424-425). Trust in public institutions is thus important, when they are considered effective, competent, impartial and trustworthy, people see efforts from implementing policies or government intervention through regulations as something legitimate, necessary and well-functioning. Likewise, with perceptions of ineffective, corrupt, untrustworthy and incompetent public institutions, people might find efforts and regulations to be wasteful.

While both generalized trust and political trust is found to be important for acceptance of environmental policies (Harring & Jagers 2013), institutional trust (political trust) is regarded as the most important component when it comes to successful implementation of command and control types of instruments, such as regulations. Institutional trust refers both to political institutions and institutions of law and order. The first affects level of compliance because it is linked to the belief of effectiveness, and the second because these institutions are responsible for external control mechanisms (Jones et al. 2009: 602). Political trust is thus vital to this thesis, as it says something about how people perceive the effectiveness of institutions managing regulations and policies towards aquaculture, as well as acceptance towards the policies such as regulations. When authorities are considered effective in protecting common resources when it comes to marine aquaculture, people will find policies and regulations legitimate. People will also perceive that the authorities are effective in catching free riding market actors and hinder possible new defectors from entering the market. Regulations are something legitimate, well-functioning and necessary to preserve common resources, regardless of how compliant or not the market actors might be. This leads to the following hypothesis:

H_2: Perceptions of effective institutions increase the demand for regulation, regardless of compliance of market actors.

Further, marine aquaculture is an industry that typically receives subsidies, and if people have confidence in the public institutions doing what they should in an impartial, fair and trustworthy manner, they will not fear money will disappear into the hands of corrupt or incompetent bureaucrats. Individuals will therefore entrust them with policies that require more assessments and discretionary decision-making than regulations. One can therefore hypothesise:

H_3: Perceptions of effective institutions increase the demand for subsidies to aquaculture, regardless of compliance of market actors.

2.3.3 Vertical and horizontal trust explaining compliance among resource users

When it comes to natural resource management and resource users in particular, the horizontal trust between resource users as well as the vertical trust towards institutions have been explored by researchers and can explain difference in compliance towards policy regimes. It is for instance found that lobster fishers in Maine use informal norms about territoriality and ownership, which has substantial and ecological and economic impact (Acheson 1975: 184). The importance of social capital embedded in participatory groups within rural communities, is found to be central in natural resource management and to achieve sustainable and equitable solutions to local development problems (Cramb 2006; Pretty & Ward 2001; Pretty 2003). Lubell (2004) also argues that cooperation between stakeholders at the grass-root (fishers and farmers that actually consume natural resources) is necessary for successive collaborative management, found in watershed management in Florida. Participation in collaborative management is linked to social capital, where participation is driven by expectations of reciprocity from other farmers as well as trust in local government (Lubell 2004: 22). On the other hand, Lundqvist (2001) finds that, even with given advantageous options for collective action, farmers in an actor game aimed at finding ways to institutionalize cooperation of farmers in water catchment threatened by eutrophication from fertilizer-use, did not cooperate. Even with harsh measures from central authorities, the farmers stuck to their preference for individual management (2001: 407). Sjöstedt (2013) finds that the variation in the stability of marine ecosystems across countries in sub-Saharan Africa can be explained by differences in both the horizontal relationship between resource users and the vertical relationship between the resource users and the government.

Together, the research on trust, both generalized and political (institutional) trust show that it is an important explanatory factor for compliance towards policy regimes as well as towards policy instruments meant to protect the environment. For this thesis it is vital to determine what kind of trust that is the important one. Stern and Coleman (2015) distinguish between four different kinds of trust; dispositional is the general tendency for an individual to trust or distrust another individual in a specific context, rational is based on perceptions of utility of the expected outcome, affinitive trust is trusting an entity based primarily on emotions and procedural refers to trust in procedures or other systems that decrease vulnerability of potential trustor (Stern & Coleman 2015: 122). When it comes to the case of marine aquaculture, and how corrupt institutions could affect the publics demand for regulation, rational trust is the interesting component, as an expected outcome would be to limit defectors to enter the market or control them to a large enough extent. For this thesis trustworthiness will therefore be measured as perceptions of effectiveness, following Harring and Rönnerstrand (2016), for market actors it implies being effective in protecting the environment and following rules and regulations, whilst for institutions it entails being effective in securing the environment with new fish farming start-ups, as well as hinder possible free riders of entering the market.

2.4 Bureaucratic capacity as causal mechanism

While previous research has linked dysfunctional authorities with low trust and a demand to regulate market actors, Harring and Rönnerstrand (2016) find that it is not the market actors the public wants to regulate, but rather the bureaucrats. Political trust, measured as effectiveness of authorities in preventing defectors from entering the market, is found to have substantial effect on the preference for command and control type of policy measure. By isolating the effect of trust in market actors and trust in authorities in a scenario experiment, it is found that ineffective institutions create a demand for regulatory punishing instruments, regardless of the resource users being compliant to rules or not (Harring & Rönnerstrand 2016). The demand for regulation is thus dependent on political trust, rather than trust in others or market actors. These results question the previous mechanism where the explanation for demand for regulation is the relationship between dysfunctional authorities and low trust in market actors (measured through trust in others). While H_2 intuitively claimed that effective institutions creates the demand for more regulations

because individuals have trust in institutions, the following hypothesis is contrasting this view:

H₄: Perceptions of ineffective institutions increase the demand for regulation, regardless of compliance of market actors.

Inspired by research on the welfare state (Dahlström, Lindvall & Rothstein 2013), it is further suggested that the causal mechanism for demand for regulation with inefficient institutions, is bureaucratic discretion or capacity, which is something that is preferred when authorities are seen as effective. Some types of policies and reforms demand more bureaucratic discretion, which is found to be important for implementation and support for policies together with political trust (Dahlström, Lindvall & Rothstein 2013; Hammar, Jagers & Nordblom 2008). Studying twenty advanced democracies over two decades, perceptions of bureaucratic capacity is for instance found to affect policy choices within welfare state programmes. Public spending on active labour market programmes involves a great deal of bureaucratic discretion because they are complex and involve free riding risks, whereas parental leave benefits involve less bureaucratic discretion. In countries with a corrupt or incompetent bureaucracy, i.e. low bureaucratic capacity, governments spend less on programmes that require bureaucrats to use their discretion to make case-by-case decisions, such as labour market programmes. This is also linked to the public's perceptions of the quality of public institutions, where support will not be given to generous policies if people do not trust the authorities monitoring the programmes (Dahlström, Lindvall & Rothstein 2013: 524). Perceptions of bureaucratic capacity thus affect what policies are implemented.

Likewise, Pierre and Rothstein (2011) see a revival of the rule-based bureaucracy emphasising legality, hierarchy and impartiality (Weberian bureaucracy) in the area of New Public Management reforms. It is argued that market-based reforms are contingent upon already existing Weberian structures, the reason being that it "… directly or indirectly, creates and reproduces trust between the state and its citizenry and also in markets" (Pierre & Rothstein 2011: 406). Regulations can be argued to demand less bureaucratic capacity and case-by-case decisions by bureaucrats, than for instance subsidies or environmental taxes. This is linked to political trust, shown to affect acceptance towards Pigouvian types of environmental taxes (meant to correct for negative externalities), namely because they imply a lot of capacity from the bureaucracy. Political distrust implies that people lack confidence

in the discretion of public institution's ability to set correct tax rates and incentives right. The tax might therefore end up being suboptimal (Hammar, Jagers & Nordblom 2008: 539).

In fisheries management in Sweden, bureaucrats enjoy a great deal of discretion in their line of work, and it is found that they tend to not consider environmental goals to be legitimate and thus disregards them, even if they are a part of the Swedish fisheries policy. At the same time, the bureaucrats' daily tasks involve for instance exemption from regulations within legislation, decisions regarding grants for investments and the right to deploy fish in fish farms. Their bureaucratic discretion is high, which they use to promote commercial rather than environmental interest (Sevä and Jagers 2013: 1065-1068). It might then be plausible that if people also have the perception that authorities are being ineffective in securing the environment and the bureaucrats cannot be trusted, people would want to restrain their discretionary power in form of stricter regulations, rather than regulate the fish farmers. It seems natural that one wants to restrain the actor that is perceived to be corrupted. This leads to the following hypothesis:

> H_5: *The effect of perceived corruption on the demand for regulation can be explained by willingness to restrict the freedom of bureaucrats rather than freedom of resource users.*

2.5 Aim and hypotheses

The aim of the thesis is to investigate the assumption that when institutions are seen as ineffective, individuals demand more regulation, and this demand can be explained by a willingness to restrict the freedom of bureaucrats rather than fish farmers. A post-test survey experiment will try to seek explanatory evidence for what it is in political trust than can explain the demand for regulation when institutions are seen as ineffective, as well as test explanations found in previous research. The assumption is that bureaucratic capacity is the causal mechanism explaining the demand for regulation when institutions are considered ineffective. Therefore, individuals would want to restrict the freedom of bureaucrats, rather than the fish farmers with ineffective institutions. This will be tested through the previous stated hypotheses derived from previous research, presented together below.

Departing from previous cross-country research, the demand for regulation and more coercive policies has been explained with dysfunctional authorities and distrust. In low trust societies with dysfunctional institutions, people do not trust authorities or market actors in

protecting the environment. There is therefore a demand for regulation to punish free riders and also hinder possible new free riders to enter the market. More regulation might lead to more corrupt behaviour by bureaucrats, but this is considered of less importance than the will to punish free riders. Taking this to marine aquaculture, if both institutions and fish farmers are seen as ineffective in protecting the environment, there should be a demand for regulation to punish the fish farmers, even if this might lead to more corrupt behaviour by bureaucrats. Ineffective fish farmers would imply that they have not put in the efforts in securing the environment, either by being inconsiderate or not follow rules and regulations in place for safeguarding marine areas. This leads to the first hypothesis to be tested:

> *H_1: Perceptions of ineffective market actors increase the demand for regulation, even if political institutions are corrupt.*

H_1 is rejected if no effect is found for perceptions of ineffective fish farmers when institutions are also perceived as corrupt or ineffective, on the demand for regulation. A competing explanatory factor for the demand for regulation is political trust. Political trust has shown to be an important factor explaining individuals acceptance towards government regulations within environmental issues. When institutions are seen as trustworthy and effective, regulations are seen as legitimate and necessary for preserving common resources and institutions are believed to for instance catching defecting fish farmers. One can therefore intuitively hypothesise:

> *H_2: Perceptions of effective institutions increase the demand for regulations, regardless of compliance of market actors.*

The perceptions of good institutions can also have a stronger effect, where the public also entrust bureaucrats with policies that require more assessment and discretion than regulations, such as subsidies. When people have confidence in the public institutions doing what they should in an impartial, fair and trustworthy manner, they will not fear that subsidies end up in wrong hands. Thereof the following hypothesis:

> *H_3: Perceptions of effective institutions increase the demand for subsidies to aquaculture, regardless of compliance of market actors.*

On the other hand, recent research finds that ineffective institutions lead to a demand for regulation regardless of market actors being compliant. Thus, if bureaucrats are seen as corrupt or incompetent, people would not trust them with policies that demand them making case-by-case decisions, and want them working under detailed regulations. With regards to marine aquaculture, ineffectiveness of public institutions or bureaucrats might imply that the authorities are not able to protect the environment from degradation and not able to prevent free riding market actors to use the common good. Institutions might be perceived to not handle subsidies in a fair manner, and be perceived to work for commercial interests rather than environmental. Compliance of the fish farmers will not matter if the bureaucrats are perceived to be corrupt, incompetent or ineffective. A hypothesis that stand in contrast to H_2 is therefore presented:

H_4: Perceptions of ineffective institutions increase the demand for regulation, regardless of compliance of market actors.

H_2, H_3 and H_4 are rejected if perceptions of either effectiveness or ineffectiveness of institutions do not increase the demand for regulation of actors or subsidies to aquaculture. The assumption in this thesis is finally that when institutions are perceived as being ineffective, the demand for regulation can be explained by a demand to restrict the freedom of the bureaucrats in fisheries management, rather than restricting the freedom of fish farmers. It only seems natural that when institutions are considered to be ineffective, one would rather try to limit the capacity or discretion of those institutions or bureaucrats, rather than limit the freedom of the market actors that the institutions is meant to control or regulate. This leads to the final hypothesis for this thesis:

H_5: The effect of perceived corruption on the demand for regulation can be explained by willingness to restrict the freedom of bureaucrats rather than the freedom of market actors.

H_5 is rejected if perceptions of ineffective institutions do not lead to a demand for regulation of bureaucrats rather than fish farmers.

3. Method, design, data and measurements

3.1 Case: Marine aquaculture in Sweden

Aquaculture has been recognized as an important factor for the strategy of Blue Growth aimed at unlocking the potential of the blue economy both in Sweden and in the EU (SOU 2009, EC 2012). While research on new and improved fish farming techniques and solutions with closed facilities and land-based fish farming are being conducted, open fish farming at sea today dominates marine aquaculture. This kind of fish farming is associated with different environmental problems, such as nutrient discharges, escaping fish affecting wild stocks, spread of diseases in general as well as the spread of sea lice, a problem for salmon farming especially. Placements of new fish farms in Norway have for instance lead to problems with effects on special and red listed natural habitats and species. It has been recognised that there is a lack of knowledge when it comes to types of habitats that exists in the areas with new fish farming facilities, as well as the effects of discharges on habitats and species (Havforskningsinstituttet 2016; Vattenbrukscentrum Väst 2015). According to the Swedish strategy for aquaculture 2012-2020, the suitability of location of new aquaculture in Sweden is "assessed based on ecological, economic and social interests" (Jordbruksverket 2012a: 19). Municipalities and county boards gives permission to new aquaculture, and different governmental agencies (The Swedish Board of Agriculture, The Swedish Agency for Marin and Water Management, The National Food Agency and The National Veterinary Institute) have different responsibilities when it comes to different regulations in aquaculture (Jordbruksverket 2012b: 8). Subsidies to aquaculture are directed through "The Sea and Fisheries programme 2014-2020" (Havs- och fiskeriprogrammet 2014-2020), compromised of financial support to partly support development of an environmentally, economically and socially sustainable fishery and aquaculture in Sweden, as well as partly to implement the integrated maritime policy and EU-directives. One of six prioritised areas is promotion of "an environmentally sustainable, resource-effective, innovative, competitive and knowledge based aquaculture". The subsidies are handled by The Swedish Board of Agriculture (Jordbruksverket 2015). Since marine aquaculture is relatively new industry in Sweden it has not been publicly debated to the same degree as for instance controversies surrounding cod stocks or shrimp. The survey respondents might therefore not have preconceived opinions or attitudes concerning fish farming, but know to a larger degree what regulations entail. This is advantageous, as one to a larger extent can presume that the design and treatments in the survey experiment can steer the public's preferences to a larger degree than

if the survey text concerned more controversial subjects. The drawback could of course be that survey participants do not understand the topic, but the information in the survey text should suffice in securing an understanding of the subject.

3.2 The design

Experimental studies are considered to be good designs for making causal inferences. Whether perceived trustworthiness of different actors (fish farmers or bureaucrats) has an effect on public demand for more regulation are therefore tested in an post-test experimental survey, followed by comparison of means of different treatment groups and multiple regressions. Experimental designs makes it possible to study one or more explanatory factors on the dependent variable, at the same time as other potential explanatory factors are held constant, through careful randomisation. Exposing the groups of different treatments, and having one control group without any treatment, creates variation in the independent variables. If there is differences in the outcomes of the treatment groups and the control group, one can infer that the treatments have had an effect, assuming the randomization have been done properly. Great care must be taken in how much variation should be given in the independent variables when designing the treatments, as too subtle treatments might not yield effects, whilst too strong might question the results. For the experiment to give meaningful results, randomizations have to be done without exception by chance. This is important so that the treatment groups and the control group are not systematically different, which could affect the outcome. If the compositions of the groups are very different, we cannot be sure that it is the treatments that have an effect (Esaiasson et al. 2012: 327-330).

3.2.1 Post-test survey experiment and measurements

The design of the survey experiment is a post-test 2x2 full factorial design, implying two independent variables or factors with two levels. The between-subject factors are institutions (portrayed as effective or not) and fish farmers (portrayed as effective or not) (see Table 1). The survey experiment itself is made up of a text concerning aquaculture in Sweden and how experts, the business and authorities are discussing how an emerging industry should be managed as both the EU and Sweden are financing expansion of aquaculture as a way of securing endangered species. The importance of the industry, as well as possible

environmental problems it poses is highlighted (see Appendix for the complete text and treatments). The treatments differ firstly with description of the authorities when it comes to securing the environment with new fish farming start-ups. This treatment thus captures whether institutions are effective or not. The second treatment captures whether the fish farmers have made an effort to secure the environment, thus whether they are effective or ineffective. The different treatments are what constitute my independent variables, *effectiveness of institutions* and *ineffectiveness of fish farmers* that plausibly will affect the outcome variables demand for regulation. Finally, some participants will receive no treatment at all, and thus makes up the complete control group (group E).

Table 1   The combination of treatments will render four different scenarios (2x2).

	Effectiveness of fish farmers	Ineffectiveness of fish farmers
Effectiveness of institutions	A	B
Ineffectiveness of institutions	C	D

Subsequently, the respondents will answer questions that ask to what degree actors in aquaculture management should have great freedom, or work under very clear regulations. To measure the dependent variables, the questions are formulated in the following way: "To what degree do you think that the actors within management of fish farming should have great freedom or be forced to work under detailed regulations?" with answers on a scale from 1 ("Great freedom") to 7 ("Very detailed regulations"). The questions are also asked independently regarding both authorities and fish farmers, to make it possible to single out whom the public possibly wants to regulate. They are formulated as follows: "Considering the fish authorities/fish farmers, to what degree do you think that the fish authorities/fish farmers should have great freedom or work under detailed regulations" with answers on a scale from 1 ("Great freedom") to 7 ("Very detailed regulations"). The last question asks to what degree the aquaculture industry should receive subsidies, from 1 ("No subsidies at all") to 7 ("A lot of subsidies"). The latter would demand more bureaucratic discretion than for instance stricter regulations. These questions make up my dependent variables, *regulation of actors, regulation of bureaucrats, regulation of fish farmers* and *subsidies to aquaculture.*

The control group will answer all the same questions, but will not be affected by any treatments.

As a member of the Citizen Panel where the data are collected (see next paragraph), the respondents are also inquired about where they stand politically on a left-right scale, as well as gender, age and education. Where the respondents place themselves on a "green environmental dimension" in Swedish politics were also added for this particular survey experiment. The latter, together with left-right position and education will be added as control variables for the regressions. Individuals placing themselves at the upper end of the green scale are assumed to be more open to regulations as means of preserving the environment. A left-leaning person presumably accepts regulations to a larger degree than a politically right-leaning person. More education is assumed to make you more inclined to know about negative side effects of fish farming, environmental problems in general as well as be more environmentally concerned. Well-educated and political liberals have been shown to be more supportive of environmental protection than their counterparts (Jones & Dunlap 1992).

3.2.2 Data and sample characteristics

Data for this study was gathered by The Laboratory of Opinion Research (LORE), an organization conducting data collections through web questionnaires focusing particularly on experiments and panel data collections, run by the Department of Political Science at the University of Gothenburg. The survey experiment was sent out as an e-mail survey to participants in the Citizen Panel at the end of April and start of May 2016. The Citizen Panel is LORE's biggest panel with approximately 50.000 self-recruited respondents and 10.000 respondents recruited from probability based population samples. The respondents regularly receive questionnaires concerning politics and society. When signing up for the panel, participants are required to answer questions on gender, education, age, labour market position, county and municipality, as well as variables on political attitudes, such as left-right scale and political trust (LORE 2016a; LORE 2016b). Since the panel is based on self-recruitment, one can discuss whether meaningful conclusions can be drawn from such populations, but when the aim of a study is to develop theories, test hypotheses about cause and effect, can self-recruited panels be effective (Esaiasson et al. 2012: 189). A benefit of the panel is also that members are recruited from probability based population samples. A randomization control will also be conducted to ensure no systematic differences.

5.000 were given the possibility to partake in the survey experiment and 3.337 chose to participate, making the participation rate for the survey experiment 67,5 %. Of the 3.337 participants, the majority were men (61,8 %), about half of the respondents have a higher education of three years of more (49,9 %), and counting in all higher education the percentage is 69,2. Most of the participants place themselves at the upper end of a green environmental dimension in Swedish politics. When it comes to placement on a left-right scale (0=”Far to the left”, 5= “Neither left nor right”, 10=”Far to the right”), 43,5 % place themselves on the left side of the scale, 13,7 % in the centre and 42,8 % to the right, thus quite evenly distributed. Table 2 portrays the groups in comparable characteristics.

Table 2 Randomization controls of the experimental groups and the control group in comparable characteristics.

	Group A	Group B	Group C	Group D	Control	Total
Gender:						
Female	37,5 % (250)	37,1 % (254)	39,2 % (262)	35,7 % (237)	39,8% (258)	37,5 % (1261)
Male	61,8 % (412)	62,3 % (427)	60,6 % (405)	64 % (425)	60 % (389)	61,8 % (2058)
Other	0.7 % (5)	0, 6% (4)	0,1 % (1)	0,3 % (2)	0,2 % (1)	0,4 % (13)
Age						
Young age (15-29)	7,8 % (52)	6 % (41)	4 % (36)	7,1 % (47)	4,9 % (32)	6,2 % (208)
Middle age (30-49)	34,2 % (228)	35 % (240)	37,1 % (248)	31,5 % (210)	35 % (227)	34,6 % (1153)
Upper middle age (50-65)	32,1 % (214)	34,3 % (235)	32,3 % (216)	31,5 % (210)	34,4 % (223)	32,9 % (1098)
Old age (66-87)	25,9 % (173)	24,8 % (170)	25,1 % (168)	29,9 % (199)	25,7 % (167)	26,3 % (877)
Green dimension						
Not green	20,9 % (134)	20,9 % (138)	20,2 % (131)	23,9 % (155)	21,8 % (138)	21,6 % (696)
In the middle	23,9 % (153)	23,8 % (157)	23,2 % (150)	23,3 % (151)	22,3 % (141)	23,3 % (752)
Green	55,2 % (353)	55,2 % (364)	56,6 % (366)	52,9 % (343)	55,9 % (354)	55,1 % (1780)
Political placement						
Left	43,9% (249)	43,9% (256)	47,9 % (268)	42,2 % (238)	39,1 % (216)	43,4 % (1227)
Centre	13,2 % (75)	13,6 % (79)	14,5 % (81)	13,5 % (76)	13% (72)	13,5 % (383)
Right	42,9 % (243)	42,5 % (248)	37,7 % (211)	44,3 % (250)	47,9% (265)	43 % (1217)
Education						
Basic education	3,9 % (25)	3,9 % (26)	3,4 % (22)	4,5 % (29)	4 % (25)	3,9 % (127)
High school	20 % (129)	15,1 % (100)	15,6 % (100)	16,7 % (107)	15,4 % (97)	16,6 % (533)
Other than college/university	9,8 % (63)	10 % (66)	9,3 % (60)	10,4 % (67)	11,9 % (75)	10,3 % (331)
College/University	66,3 % (427)	71 % (470)	71,7 % (461)	68,4 % (439)	68,6 % (431)	69,2 % (2228)
Member of or support an environmental NGO	19 % (121)	18,9 % (123)	20 % (128)	19 % (122)	22,1 % (139)	19,8 (633)

Comment: Distribution of percentages in the experimental groups and control group on background characteristics of the survey participants. Number of participants in parentheses.
**Source:** Laboratory of Opinion Research 2016 (LORE 2016)

Table 2 portrays the groups in comparable characteristics, and the treatment groups and the control group are quite similar in these comparable characteristics. The randomization has

therefore worked well. Independent sample t-tests between the groups are however performed on the main control variables (*green dimension, left-right placement* and *education*) used for later analysis, to check whether the groups are statistically different in these key controls. The comparisons show no statistically significant differences between the groups in these variables (see Table 1 over t-tests in Appendix). This means that the groups are similar in these characteristics, and the randomization of the groups in the experiment has been successful.

Turning to the dependent variables in the study, *regulation of actors*, *regulation of bureaucrats* and *regulation of fish farmers* are all quite negatively skewed, meaning that many of the participants have answered that they want the actors, bureaucrats and fish farmers to work under very detailed regulations rather than have great freedom in their work (see Graph 1 for *regulation of fish farmers)*. The dependent variables therefore do not have normal distribution, which is important to have in mind for further analysis. The dependent variable *subsidies to aquaculture*, answers are in the middle and towards not receiving subsidies at all (see Graphs in Appendix).

Graph 1   Distribution of answers on the dependent variable *regulation of actors* for the treatment groups and control group in the survey experiment.
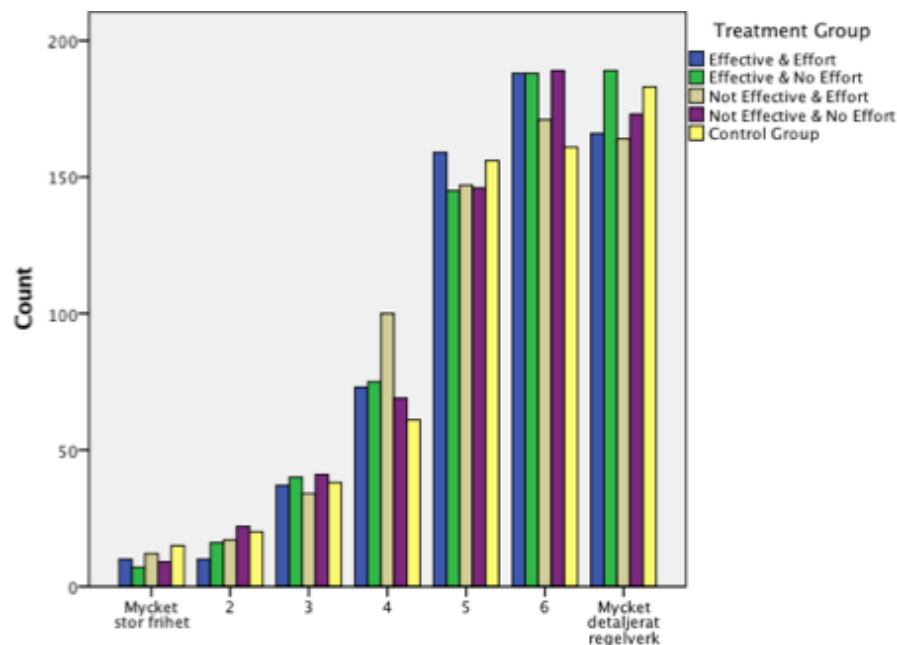
Comment: Distribution of answers between the groups in the question "Considering fish farmers, to what degree do you think fish farmers should have great freedom or work under very detailed regulations", ranging from 1 (Great freedom) to 7 (Very detailed framework). Effective & Effort represents group A, Effective & No Effort represents group B, Not Effective & Effort represents group C and Not Effective & No Effort represents group D. The control group is the control group (group E).
Source: Laboratory of Opinion Research (LORE 2016).

4. Results

4.1 Comparisons of group means

To study whether there are any differences in the demand for regulation of actors in general, bureaucrats or fish farmers, as well as to what degree aquaculture should receive subsidies, between the treatment groups and the control group, it is useful to investigate the group means (see Table 3).

Table 3 The mean values of different forms of treatments on dependent variables, demand for regulation of actors, bureaucrats and fish farmers, and subsidies to aquaculture.

Groups in the survey experiment	Regulation of actors	Regulation of bureaucrats	Regulation of fish farmers	Subsidies to aqua-culture
Effective institutions/effective fish farmers (A)	5,45 (643)	5,28 (643)	5,47 (643)	3,26 (640)
Effective institutions/ineffective fish farmers (B)	5,40 (660)	5,38 (660)	5,51 (660)	3,24 (660)
Effective institutions (Group A + B)	5,42 (1303)	5,33 (1303)	5,49 (1303)	3,25 (1300)
Ineffective institutions/effective fish farmers (C)	5,31 (647)	5,25 (645)	5,36 (645)	3,16 (644)
Ineffective institutions/ineffective fish farmers (D)	5,42 (650)	5,38 (647)	5,43 (649)	3,20 (644)
Ineffective institutions (Group C + D)	5,36 (1297)	5,31 (1292)	5,39 (1294)	3,18 (1288)
Control group (E)	5,34 (634)	5,24 (634)	5,43 (634)	3,18 (628)
Total	5,39 (3234)	5,31 (3229)	5,44 (3231)	3,21 (3216)

Comment: The means of the responses to the questions "To what degree do you think the actors within aquaculture should have great freedom or work under very detailed regulations?" and "Considering the fish authorities/fish farmers, to what degree do you think that the fish authorities/fish farmers should have great freedom or be forced to work under very detailed regulations?" with answers on a scale from 1 (Great freedom) to 7 (Very detailed regulations). Regarding subsidies, the question is formulated: "To what degree do you think that aquaculture should receive subsidies, with answers on a scale from 1 (No subsidies at all) to 7 (A lot of subsidies). Number of survey experiment participants in parentheses.

Source: Laboratory of Opinion Research (LORE 2016)

The group means do not differ to a large extent, as can be seen from the table. In scenario A where both authorities and fish farmers are proclaimed to be effective, people want to have more regulation of fish farmers than of bureaucrats. Scenario B proclaims that the institutions are effective, but the fish farmers have not made an effort, and not surprisingly this group people want more regulation of fish farmers as compared to bureaucrats. Scenario C however gives the perception of ineffective authorities and effective fish farmers, and in this group people still want fish farmers to be regulated to a larger degree than bureaucrats. In the scenario where both the authorities and the fish farmers are proclaimed to be

ineffective, people want to regulate the fish farmers to a larger degree than the bureaucrats. Making a new variable, grouping together group A and B, where institutions are portrayed as effective, does not change the mean much, neither does merging together group C and D, where institutions are seen as ineffective. All groups, irrespective of what treatment given wants to regulate the fish farmers to a larger degree than the bureaucrats and this also includes the control group. Regarding subsidies to aquaculture, people want more subsidies in the group where both institutions and fish farmers are proclaimed to be effective (A), and least where the institutions are portrayed as ineffective but fish farmers effective (C).

Since my dependent variables do not have normal distribution, the Mann-Whitney U tests, the non-parametric equivalent of the t-test, is used to test if differences between the independent groups are significant or not (Field 2014: 878).[1] A series of tests show that the groups are not statistically significantly different, meaning that the demand for regulation of actors, bureaucrats and fish farmers is not statistically higher in any of the groups. The question of subsidies to aquaculture are neither statistically significantly different between the groups (see Table 2 in Appendix).

4.2 Regressions

To formally test the hypotheses and to see the effects of the control variables on the relationships, the analysis proceeds with multiple regressions. Regression diagnostics according to the Best Linear Unbiased Estimate (BLUE) are performed and no problems with multicollinearity (correlations between the independent variables), error terms or outliers were encountered.[2] Regressions in Table 4 show the effect from each independent variable (*effectiveness of institutions* and *ineffectiveness of fish farmers*) on the dependent variables *demand for regulation of actors, demand for regulation of bureaucrats, demand for regulation of fish farmers,* and *subsidies to aquaculture* all in the same table.

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[1] T-tests are also performed, and the tests did not show contrasting results to the Mann-Whitney U tests.

[2] Figure 1 and 2 in Appendix show the observed linearity to the dependent variable *regulation of actors*. No problem of multicollinearity is found as the lowest tolerance value is .831 and the highest VIF value is 1.187. Checking if the error term is well behaved, a histogram and normal probability plot is made, showing approximately normal distribution around the mean (Figure 3 and 4 in Appendix). The Durbin-Watson shows a value of 1.981 and there is therefore no autocorrelation. The error term is found to be homoscedastic (Figure 5 in Appendix). The df-beta values and central leverage values are within acceptable ranges, and there is therefore no outliers affecting the values.

Table 4   **Regressions: The effect of effectiveness of institutions and ineffectiveness of fish farmers on the demand for regulation of actors, bureaucrats, fish farmers and subsidies to aquaculture in single models.**

	Demand for regulation of actors	Demand for regulation of bureaucrats	Demand for regulation of fish farmers	Subsidies to aquaculture
	Model 1 - effectiveness of institutions and ineffectiveness of fish farmers	Model 1 - effectiveness of institutions and ineffectiveness of fish farmers	Model 1 - effectiveness of institutions and ineffectiveness of fish farmers	Model 1 - effectiveness of institutions and ineffectiveness of fish farmers
Effectiveness of institutions	.059 (.052)	.017 (.054)	.092 (.055)	.071 (.060)
Ineffectiveness of fish farmers	.031 (.052)	.112 *(.054)	.056 (.055)	.012 (.060)
Intercept	5.351	5.259	5.369	3.176
Adjusted R^2	.000	.001	.001	.000
N	2600	2595	2597	2588

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$
Comment: The dependent variables demand for regulation of actors, bureaucrats and fish farmers is operationalized through the question "To what degree do you think actors within management of fish farming should have great freedom or be forced to work under detailed regulations?" and "Considering the fish authorities/fish farmers especially, to what degree do you think the fish authorities/fish farmers should have great freedom or work under detailed regulations?" ranging from 1 (Great freedom) to 7 (Very detailed regulations). Subsidies to aquaculture is operationalized through "To what degree do you think marine aquaculture should receive subsidies?" ranging from 1 (Not subsidies at all) to 7 (A lot of subsidies). Effectiveness of institutions is a dichotomous variable where 1=effective institutions (consisting of treatment group A and B) and 0=ineffective (consisting of treatment groups C and D). Ineffectiveness of fish farmers is a dichotomous variable where 1=ineffective fish farmers (group B and D) and 0= effective (group A and C).
Source: Laboratory of Opinion Research (LORE 2016)

The regressions show that the *effectiveness of institutions* has a positive weak effect on the demand for *regulation of actors* (.059), of bureaucrats in particular (.017), fish farmers in particular (.092) and as well a positive effect on *subsidies to aquaculture* (.071). The effect is however not statistically significant. This means that we can already reject hypotheses claiming that the *effectiveness of institutions* will have an effect on the demand for regulation (H_2) and to what degree aquaculture should receive subsidies (H_3). Since the variable *effectiveness of institutions* is coded as a dichotomous variable where 1= effective institutions and 0= ineffective institutions, we can from this result draw the conclusion that ineffectiveness of institutions does not have an impact on the dependents. Hypothesis H_4, saying that perceptions of ineffective institutions increase the demand for regulation, regardless of compliance of market actors, is therefore also rejected.

H_1 says that perceptions of ineffective market actors increase the demand for regulation, regardless of corrupt institutions. The effect of *ineffective fish farmers* only has a

statistically significant effect on the demand for *regulation of bureaucrats* (.112*), but not for actors in general (.031) or fish farmers (.056). The theoretical assumption was that ineffective market actors would increase the demand for regulation, the mechanism being a will to punish free riding market actors. Effect is only found for regulation of bureaucrats, and the hypothesis is therefore rejected. Finally, H_5 claims that the effect of perceived corruption on the demand for regulation can be explained by a willingness to restrict the freedom of bureaucrats rather than the freedom of market actors. This can also be rejected, since perceived effectiveness of institutions does not have a significant effect on either regulation of bureaucrats or regulation of fish farmers.

While being aware of that the randomizations of the groups in the experiment have worked well, regressions with the control variables *green dimension, left-right placement* and *education* are still performed to see their effect on the dependents (Table 5).

Table 5   **Regression: The effect of effectiveness of institutions and ineffectiveness of fish farmers on the demand for regulation of actors, bureaucrats, fish farmers and subsidies to aquaculture in single models, under control for green dimension, left-right position and education.**

	Demand for regulation of actors	Demand for regulation of bureaucrats	Demand for regulation of fish farmers	Subsidies to aquaculture
	Model 1 - effectiveness of institutions and ineffectiveness of fish farmers, and control variables green dimension, left-right placement and education	Model 1 - effectiveness of institutions and ineffectiveness of fish farmers, and control variables green dimension, left-right placement and education	Model 1 - effectiveness of institutions and ineffectiveness of fish farmers, and control variables green dimension, left-right placement and education	Model 1 - effectiveness of institutions and ineffectiveness of fish farmers, and control variables green dimension, left-right placement and education
Effectiveness of institutions	.055 (.054)	.022 (.058)	.090 (.057)	.076 (.065)
Ineffectiveness of fish farmers	.051 (.054)	.125* (.058)	.092 (.057)	.021 (.065)
Green dimension	.338*** (.037)	.269*** (.039)	.419*** (.038)	.138* (.044)
Left-right placement	-.255*** (.032)	-.158*** (.034)	-.271*** (.033)	-.180*** (.038)
Education	-.056 (.029)	-.045 (.031)	-.076** (.031)	-.107* (.035)
Intercept	5.255	5.097	5.177	3.587
Adjusted R^2	.101	.049	.123	.025
N	2173	2171	2173	2171

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$

Comment: The dependent variables demand for regulation of actors, bureaucrats and fish farmers is operationalized through the question "To what degree do you think actors within management of fish farming should have great freedom or be forced to work under detailed regulations?", and "Considering the fish authorities/fish farmers especially, to what degree do you think the fish authorities/fish farmers should have great freedom or work under detailed regulations?" ranging from 1 (Great freedom) to 7 (Very detailed regulations). Subsidies to aquaculture is operationalized through "To what degree do you think marine aquaculture should receive subsidies?", ranging from 1 (Not subsidies at all) to 7 (A lot of subsidies). Effectiveness of institutions is a dichotomous variable where 1= effective institutions (treatment group A and B) and 0=ineffective (treatment groups C and D). Ineffectiveness of fish farmers is a dichotomous variable where 1=ineffective fish farmers (group B and D) and 0= effective (group A and C). Green dimension concerns placement on a green dimension in Swedish politics, originally ranging from 1 (Not at all green) to 7 (Very much green), but is recoded into categories 1= not green (containing original alternatives 1-3), 2= in the middle (original value 4) and 3 = green (original alternatives 5-6). Left-right position originally ranges from 0= Far to the left to 10=Far to the right with 5= neither left nor right, but is recoded 1=left, 2=centre and 3=right. Education ranges from 1= Basic education to 4= University education.
Source: Laboratory of Opinion Research (LORE 2016)

Table 5 show the models where all the control variables have been entered, which turned out to be the best fit in all cases, explaining the variation in the dependent to a larger degree. The control variables *green dimension* and *left-right placement* have a statistically significant effect for all the dependent variables. This implies, which is also in line with the theoretical assumptions, that individuals considering themselves as more green want more *regulation of actors* (.338***), more *regulation of bureaucrats* (.269***), more *regulation of fish farmers* (.419***), as well as more *subsidies to aquaculture* (.138*). This is interpreted as the effect of moving one scale step in green dimension yields a .338 scale step in the demand for *regulation of actors*, .269 scale step in *regulation of bureaucrats*, and .419 scale step in *regulation of fish farmers*. Regarding *subsidies to aquaculture*, one scale step in the green dimension yields .138 scale step in *subsidies to aquaculture*. *Left-right placement* has a negative effect for all the dependents, implying that the more right-winged you are the less *regulation of actors* (-.255***), *regulation of bureaucrats* (-.158***), *regulation of fish farmers* (-.271***) you want, as well as less *subsidies to aquaculture* (-.180***). *Education* has a weak, but not statistically significant negative effect for regulation of actors and regulation of bureaucrats. For *regulation of fish farmers*, the effect of *education* is statistically significant (-.076**) and also for *subsidies to aquaculture* (-.107*). With the control variables incorporated in the models, the adjusted R square significantly improves compared to the models without the controls (see Adjusted R^2 in Table 4 for comparison), meaning that the models can explain the variation in the dependent variables to a larger degree. For *regulation of actors*, the model with the controls can explain 10,1 percent of the variation, as compared to 0 percent without the controls. For demand for *regulation of actors*, the model explains 4,9 percent, *regulation of fish farmers* 12,3 percent and *subsidies to aquaculture* 2,5 percent. Even if some of the control variables have a significant effect on the dependent variables and improves the models, the effect does not make the original relationships statistically significant.

5. Discussion and concluding remarks

This thesis set out to test different causal mechanisms explaining the demand for regulation when institutions are seen as dysfunctional. The theoretical assumption was that when institutions are seen as ineffective, the demand for regulation could be explained by willingness to restrict the freedom of bureaucrats rather than the market actors, the fish farmers. A post-test survey experiment was designed to study the effect of portraying actors

within marine aquaculture as either effective or ineffective, and see what effect this would have on the demand for regulation and to what degree aquaculture should receive subsidies. The empirical investigation of the survey experiment did not yield significant results, meaning that the (small) differences between the experimental groups could not be assigned to the different treatments in the survey experiment. Ineffective market actors do not increase the demand for regulation, even with ineffective or corrupt institutions (H_1). Neither effective nor ineffective institutions have an effect on the demand of regulation or subsidies to aquaculture, even when fish farmers are seen as making an effort or not (H_2, H_3 and H_4). The final hypothesis and the main theoretical assumption of this thesis, saying that the effect of perceptions of ineffective or corrupt institutions can be explained by the demand to restrict the freedom of bureaucrats rather than fish farmers, are not supported either. The suggested bureaucratic capacity mechanism, proposed by Harring and Rönnerstrand (2016), is thus not applicable in explaining the demand for regulation in this particular case. The theoretical assumption from previous research, saying that ineffective market actors increase the demand for regulation when institutions are considered ineffective (for instance Aghion et al. 2010), does not hold either in this case.

The lack of significant results and effects from the treatments on the demand for regulation may possibly be explained by the strength of the treatments given to the groups being too weak. Portraying either institutions or fish farmers as ineffective or not in one single sentence is perhaps not strong enough to yield significant effect. The survey text also proclaimed the negative effects that marine aquaculture brings with it if necessary precautions are not taken. The positive factors were also incorporated, but the negative might have overshadowed the treatments, making people find regulations necessary. Comparing the present study with the study of Harring and Rönnerstrand (2016), a contributing factor for diverging results might also be the design of the dependent variables. While this study has asked people to what degree they want to see more or less of regulation and subsidies, Harring and Rönnerstrand "force" participants to choose between three different policies in their study. Since individuals have to choose between policy options, one can question the results gained from the study. Perhaps the suggested "bureaucratic discretion effect" would not be present had not the participants been forced to actively choose between policies. And while that study finds an effect with 231 undergraduate students as participants, it can arguably not be generalized to the same degree as the present study, having 3.337 participants with a larger spread in terms of background characteristics, finding no effect.

Even if this study did not find support for the suggested causal mechanism explaining the demand for regulation with dysfunctional institutions, an overall interesting result and the contribution to the research is that the public seem to favour detailed regulations of marine aquaculture over great freedom. There is an overall demand for regulation of marine aquaculture, both of actors in general, of bureaucrats and highest for fish farmers. Several factors can plausibly explain this, the first being context; The survey experiment was conducted in Sweden, a country that can be argued to have well-functioning and impartial public institutions (high Quality of Government) and generally high trust levels. People are also accustomed to large public institutions and presumably see both institutions (with its bureaucrats) and regulations as well-functioning and necessary. This might well also be the explaining factor for the treatments in the survey experiment having no effect. People trust institutions and bureaucrats, and thus see regulations as necessary and legitimate to secure the sustainability of marine resources. Secondly, a large part of the participants in the survey experiment considers themselves as green on an environmental dimension in Swedish politics. Presumably this makes one favour more regulation of common resources, and see it as necessary for securing the sustainability of natural resources. Thirdly, the large part of the respondents in the survey experiment have higher education which probably makes them more aware of environmental problems in general and more environmentally concerned, but also makes them see the need for regulations of natural resources. These explanatory factors also yielded significant effects as control variables in the regressions in the analysis of the gathered data. A task for future research could be to look more into these control variables and their interaction effects.

Future research should give this particular topic more attention. There is still no consensus to why there is a demand for regulation when institutions are considered ineffective, corrupt or incompetent. Future research could therefore delve into explaining what it is in political trust or distrust that makes individuals want more regulation as we still do not know the causal mechanism in political trust that makes individuals demand more regulation when institutions are seen as ineffective or corrupt. While the study by Aghion et al. (2010) is a large cross-country comparative study, the study by Harring and Rönnerstrand (2016) is smaller, and perhaps better for explaining causal mechanisms. The results from the present study however show that individuals seem to want regulation of marine aquaculture no matter how effective or ineffective institutions and resource users are portrayed, and explanations for this may be the high level of trust and confidence in institutions in Sweden doing the right thing. Regulations simply work as they should and work for the better good

of preserving natural resources. The participants are also highly educated and green, implying that they in fact know about the negative sides of aquaculture, are more concerned about the environment and see regulations as a necessary mean of securing the sustainability of the ocean and of the industry. Given these characteristics, it would therefore be interesting to test these theoretical assumptions in a context where institutions generally are seen as ineffective and corrupt and the level of Quality of Government is low.

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Appendix

Survey experiment text:

As a part of the Blue Growth Strategy, EU is financing expansion of aquaculture to species that are endangered because of overfishing. This is also a part of the strategy put forward by the Swedish government to promote sustainable aquaculture. As aquaculture is advancing in Sweden, experts, authorities and the industry are discussing how the industry should be managed. Aquaculture has a range of benefits; one being that it can effectively produce large quantities of healthy fish and seafood to meet increasing market demands, without compromising wild stocks. A problem with the industry is that environmental problems can occur if necessary precautions are not taken.

Treatments:

Scenario A: Experts consider that the authorities with responsibility for fish farming have been **effective** when it comes to securing the environment with new start-ups, and that even the fish farmers **have made an effort** to secure the environment.

Scenario B: Experts consider that the authorities with responsibility for fish farming have been **effective** when it comes to securing the environment with new start-ups, and that the fish farmers **have not made an effort** to secure the environment.

Scenario C: Experts consider that the authorities with responsibility for fish farming have been **ineffective** when it comes to securing the environment with new start-ups, but that the fish farmers **have made an effort** to secure the environment.

Scenario D: Experts consider that the authorities with responsibility for fish farming have been **ineffective** when it comes to securing the environment with new start-ups, and that the fish farmers **have not made an effort either** to secure the environment.

Table 1   **Independent sample t-tests of differences between groups on control variables green dimension, left-right placement and education.**

Groups compared	Green dimension	Left-right placement	Education
A + B	T = -.017, p = .986	T = .057, p= .954	T = -1,889, p = .059
C + D	T = 1,628, p = .104	T = -2,229, p = .026	T = 1,319, p = .187
A + D	T = 1,156, p = .248	T = -.575, p = .565	T = -806, p = .421
B + D	T = 1,181, p = .238	T = -.637, p = .524	T = 1,068, p = .286
A + control	T = .021, p = .983	T = -1,783, p = .075	T = -1,311, p = .190
B + control	T = .038, p = .970	T = -1,854, p = .064	T = .567, p = .571
C + control	T = .488, p = .626	T = -3,435, p= .001	T = .822, p = .411
D + control	T = -1,125, p = .261	T = -1,210, p = .227	T = -.499, p = .618

Comment: T-tests between the treatment groups and control group on control variables green dimension, left-right placement and education.
Source: Laboratory of Opinion Research (LORE 2016)

**Table 2** **Mann-Whitney U tests of the differences between the groups on the dependent variables.**

Groups compared	Regulation of actors	Regulation of authorities	Regulation of fish farmers	Subsidies to aquaculture
A + B	U = 209261, p = .657	U = 203437,5, p = .186	U = 207331, p = .461	U = 208194,5 p = .650
C+ D	U = 200099, p = .121	U = 199760, p = .173	U = 201739,5, p = .247	U = 204619,5, p = .647
A+ D	U = 207684,5, p = .843	U = 202077,5, p = .362	U = 208259, p = .952	U = 199722, p = .329
B + D	U = 212887, p = .808	U = 210851,5, p = .689	U = 208876,5, p = .425	U = 208923,5, p = .589
A + control	U = 196994, p= .285	U = 199639, p = .514	U = 203295,5, p = .933	U = 193004,5, p = .213
B + control	U = 205141,5, p = .532	U = 196472,5, p = .051	U = 205138,5, p = .532	U = 202011,5, p = .424
C+ control	U = 200604,5, p = .485	U = 203139, p = .837	U = 196190,5, p = .198	U = 200986, p = .848
D + control	U = 200497, p = .390	U = 195139, p = .122	U = 204802, p = .885	U = 200690,5, p = .812

Comment: Mann-Whitney U tests of differences between treatment groups and control groups in the dependent variables *regulation of actors, regulation of authorities, regulation of fish farmers* and *subsidies to aquaculture.*
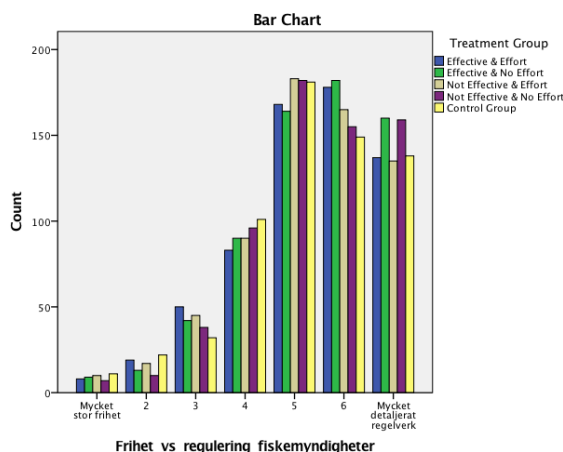**Source:** Laboratory of Opinion Research (LORE 2016)

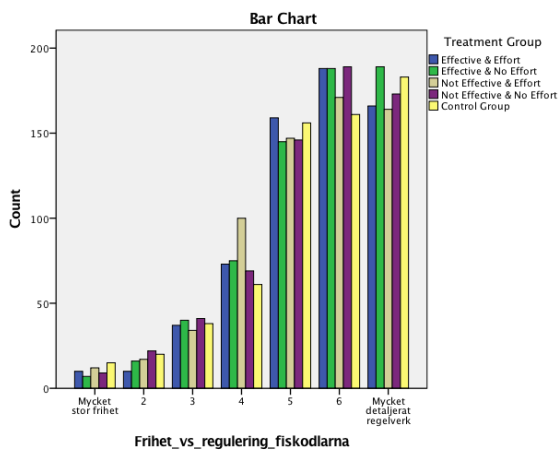**Graphs** **Distribution of dependent variables in the different groups**
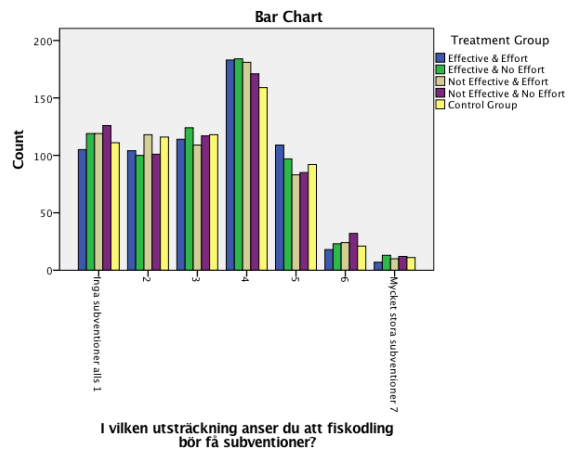
Demand for regulation of actors
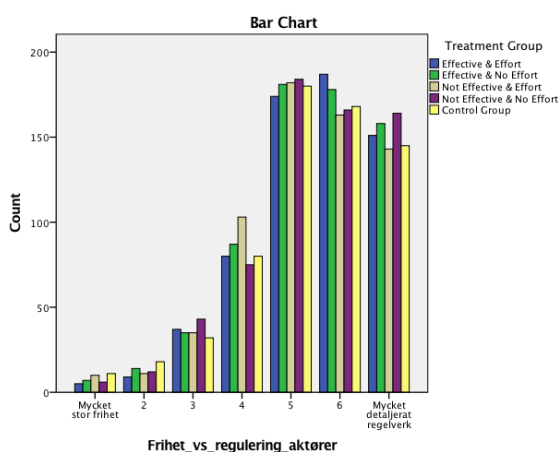
Demand for regulation of bureaucrats

Demand for regulation of fish farmers

Subsidies to aquaculture

BLUE test

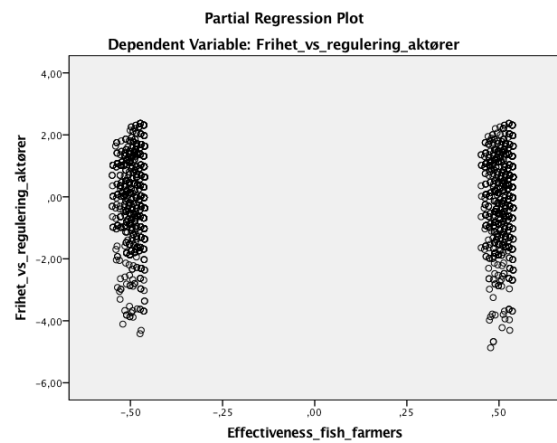### Figure 1 and 2   Linearity of focal independent variables on regulation of actors
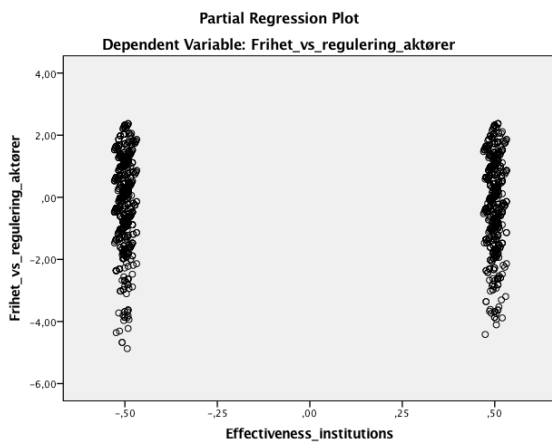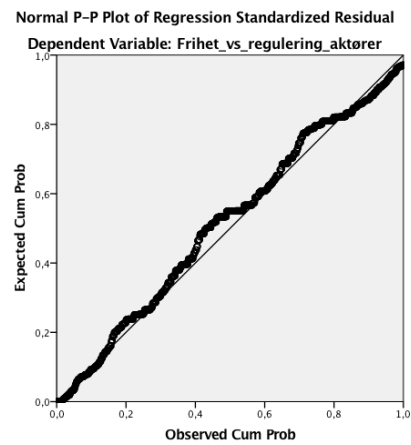

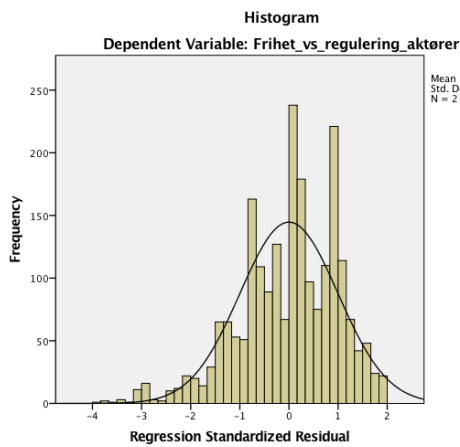### Figure 3 and 4   Error-term well behaved: Distribution around the mean

Figure 5   Error-term well behaved: Homoscedasticy

Scatterplot
Dependent Variable: Frihet_vs_regulering_aktører