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ARTICLE

Examining the impact of institutions on common pool resource problems: the EU's Common Fisheries Policy

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ABSTRACT

Why is there variation in the level of overfishing in European Union member states? The Common Fisheries Policy sets politically-negotiated quotas for fishing, but different states break the quotas at different levels. One answer for this variation lies within the domestic institutions of the member states themselves, in particular the incentives created by various electoral rules. Electoral rules which add more political parties to the decisionmaking process result in greater amounts of overfishing because smaller and smaller blocks of voters are more important in such instances. Evidence in favor of this theory comes from a unique window into fisheries compliance: the 'scorecards' produced by the European Commission from 2001 to 2004.

KEYWORDS

Common Fisheries Policy; environmental policy; compliance; political parties

Overfishing, the practice of taking more fish out of the ocean than is biologically sustainable, is a serious international problem; total fish catches have been in decline in some areas for more than 40 years, and several commercially-important stocks have collapsed. (Pauly and Watson 2001; Smith 2006). But there is a lot of variation in the degree of overfishing by developed-world states.[1] Finland, per-capita, consumes more fish annually than Denmark, yet Denmark overfishes more than Finland. Spain overfishes more than Portugal, though Portugal consumes more fish than Spain per capita. The British consumed more fish in 2004 than they did in 1985, but overfished less. The Dutch consumed less fish but overfished more. Overfishing is an excellent example of a particular type of collective action problem, sometimes known as the 'Tragedy of the Commons,' (Hardin 1968) or the common pool resource problem. When there is a common pool resource without regulation, the incentive for individuals (or states) is to take as much as possible before it runs out. As evidence of this, the supply of Atlantic fish such as cod and haddock has dropped sharply in some areas, and has even collapsed in the Northwest Atlantic. The European Union has attempted to solve the problem of its members' shared fisheries since 1983 with a system of quotas under the Common Fisheries Policy (CFP). Under this policy, each EU member state is given a quota for the number of fish its fleets may catch in a given area. These quotas are determined through intergovernmental bargaining. (Lequesne 2000; Da Conceicao-Heldt 2006).

However, there is historical evidence that most of the EU member states regularly break their quotas; they overfish, but at varying levels. In 2004, for example, Ireland was over its quota by 2050 tons (5 percent), while the United Kingdom only overfished by 184 tons

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(1 percent). Belgium overfished more than the Netherlands. This may be a serious problem for future European integration; the CFP has been given as one reason for the reluctance of Norway and Iceland to join the EU. (Marshall 2016) Given that the level of the quotas themselves are biologically unsustainable (Daw and Gray 2005), further overfishing only hastens the day when Europe's waters become a fish-free zone. What explains this variation in the level of overfishing among EU member states?

Answers remain scarce. Franchino and Rahming (2003) look at why CFP quotas are inefficient biologically (they contribute to the continued drop in fish stocks), and find that fisheries ministers are less concerned with environmental protection than their governments' stated policy. A 2009 Green Paper mentioned five structural failings of the CFP, one of which was 'a lack of political will to ensure compliance by the industry.' (Symes 2012) But why is there a lack of political will? And why would this lack of political will vary?

We argue that the answer to variations in the level of overfishing lies within the domestic institutions of the EU member-states, in particular the incentives created by various electoral rules. If we assume parties that seek to maximize their votes, then party leaders and other politicians will have short time horizons, passing up the long-term good (such as protecting fish stocks for future generations) in favor of policies that will provide immediate vote maximization. The more parties there are in a state, the greater influence niche groups, such as the fisheries industry in Europe, have in the electoral process. Therefore, electoral rules which add political parties to the decisionmaking process will result in greater amounts of overfishing among member states of the European Union; as parties compete for ever-smaller pieces of the electoral pie, smaller and smaller blocks of votes become important, and governing parties will be more inclined to look the other way when fishermen wish to overfish, simply paying the penalty in Brussels.

The paper will proceed as follows: after a discussion of the history of the Common Fisheries Policy, focusing on consistent problems with compliance, the following section offers an explanation rooted in political competition. The next section presents several quantitative tests of this theory, based on a unique window into compliance with the CFP: 'scorecards' compiled by the European Commission between 2001 and 2004.

History of the CFP

Oceanic fish stocks are a classic example of the common pool resource problem. When there is unrestricted access to a common pool resource, each user will consume the resource and subtract from the quantity available to others to an extent which eventually produces diminishing returns to all users and in some cases the exhaustion of the resource (Ostrom 2000). In the case of fish, this means ecological collapse of the stock, as has already happened with North Atlantic cod.

The Treaty of Rome (1957) forming the European Community put fisheries products under the same heading as agricultural products, and a separate Common Fisheries Policy was put into place in 1970 at the behest of France which included structural aid to modernize the fishing industry and free access for fishing vessels into the territorial waters (later, after the negotiation of the UN Convention on the Law of the Sea, exclusive economic zones) of other member states.[2] A separate regulation was adopted in 1983 adding the conservation and management of fisheries to the CFP, and this plank has received the greatest focus in the succeeding three decades.[3] At that time, total

allowable catches (TACs) and quotas came into existence. The European Council first instituted specific limits on catches and licenses in December 1992. (Lequesne 2000) Responding to the continued erosion of fish stocks in EU waters, reforms were initiated in 2002 to increase stakeholder involvement and transparency. (Gray and Hatchard 2003) The Directorate-General for Maritime Affairs and Fisheries (DG-MARE, formerly DG-XIV) is in charge of the CFP.

A major reform of the CFP took place in 2013, prioritizing Maximum Sustainable Yield (MSY) and multi-annual plans, attempting to deal with the practice of bycatch (catching a species one is not authorized to catch, then usually dumping it overboard) and making a slight shift toward regionalization. However, this reform still did not make the wholesale changes sought by some NGOs and member states, and was seen as a victory of short-term economics over long-term planning. Critics have argued that the CFP also still contains perverse incentives (particularly regarding subsidies for boat construction) and still sets quotas that are too high (Symes 2012, Salomon, Markus, and Dross 2014; Pastoors 2014). Sawe and Hultman call it 'a massive environmental, economic, and social failure.' (2014, 508)

Today, the fisheries sector remains one of the smaller components of the European economy. Just over 270,000 people were employed in the EU-15 in the fishing and fisheries industries in 1995, and the number has dropped since then (it has of course gone up since the addition of the 13 Central and Eastern European countries and the fishing fleets of Poland, Estonia, Latvia, and Lithuania in particular); moreover, the value of fish catches is less than 1 percent of gross domestic product in all member states. But fishing remains important for historical and cultural reasons; fish makes up a large part of the diet for meat in many European nations, and the traditional image of the fisherman powerfully hearkens back to previous maritime exploits in a nation's past for many. And empirical work on the EU Council of Ministers has shown that fisheries are one of the more contested areas in Council negotiations, second only to agriculture in 1993–1994 and third to agriculture and internal market issues from 1998 to 2004. (Hayes-Renshaw, Wim Van, and Wallace 2006)

The Agriculture and Fisheries Council has direct control over fishing regulation in the EU and can issue regulations (instead of directives, which must be implemented by member state governments). The European Parliament only gained the right to co-decision under the Treaty of Lisbon.[4] The European Commission has the ability to take offending states to the European Court of Justice, which happens on a regular basis, and impose penalties for overfishing, which happens more rarely. (Lequesne 2000)

The current quota system covers some 120 fish stocks in the North Sea, Baltic Sea, and Atlantic Ocean (a TAC for bluefin tuna has been established in the Mediterranean Sea, but the Mediterranean is not zoned). Each year's total allowable catch is set in December; as a whole, TACs increased about 30 percent since 1985 (Franchino and Rahming 2003)[5] and have not been particularly successful in protecting fish stocks from overharvesting (Villasante et al. 2011). The quota system is implemented at the national level in different ways: the UK leaves TAC management to producer organizations, France allocates quotas to producer organizations by geographical criteria and those organizations then manage the TAC, while the Netherlands uses a system of individual transferable quotas (similar to the cap-and-trade system for greenhouse gas emissions), making total allowable catch a property right. None of these implementation techniques, however, have affected overfishing noticeably; all three countries overfish, in varying amounts.

Overfishing is probably worse than makes it onto the EU books; illegal landings and 'black fish' are known to occur. EU inspectors must be accompanied by national authorities, and cannot undertake independent inspections; in addition, national inspectorates rarely cooperate, and have not formed a transnational network. And national inspectorates are more likely to catch and fine a non-national caught in their waters than a national; one reason given for Spain's consistent overfishing performance is that Spanish deep-sea fishermen are quite active in other EU member states' territorial seas.

The CFP and the social sciences

Lequesne (2000) notes that there is very little on the Common Fisheries Policy in the social science literature, and the same could be said today (Franchino and Rahming 2003; Daw and Gray 2005 being notable exceptions). However, a comparatively large number of interest groups take part in policymaking, from biologists and economists to representatives of the fishing industry and governments. A rising number of cases at the European Court of Justice concern CFP violations. Franchino (2005) cites fisheries policy as one of the major understudied areas in the European Union, along with public procurement.

One of the major existing CFP studies, Franchino and Rahming (2003), focuses on explaining why the Council on Fisheries regularly passes inefficient (in terms of preserving the fish stocks) TACs and quotas unanimously, something the literature on coalition behavior would not predict. They find that because the Fisheries Council is composed of members with policy preferences biased in favor of the fishing industry, they produce inefficient decisions and then impose constraints on national authorities by delegating to the Commission. These preference outliers generally show more support for fishermen and less support for environmental protection than their governments as a whole do. Their dependent variable is the difference between the agreed TAC and the proposed TAC for each species and fishing zone, and statistical analysis finds that the Fisheries Council increases TACs to a lesser extent when they are more concerned with protecting the environment. They do not look at overfishing, citing a lack of data at the time.

Since the early 1980s, the Council has worked to strengthen conservation rules and expand data collection. A 1992 amendment gave the Commission the power to close fishery resources, and established a transnational system to monitor conservation. From 2001 to 2004, DG-MARE (at that time, DG-XIV) published compliance scorecards detailing the amount of overfishing occurring, and member states' compliance with EU regulations concerning fisheries. Those scorecards are a unique window into compliance with the Common Fisheries Policy; unfortunately, they were discontinued beginning in 2005, and are not expected to resume (source: e-mail from Commission). We can see a 'ratcheting-up' of regulation and compliance efforts at the Commission level. Franchino and Rahming hypothesize two strategies at work here: mutual constraint and reliance on the Commission.

Daw and Gray (2005) discuss the reasons why scientific advice on reducing fish quotas has not been put into practice at the EU level. They find that the advice of scientists is not adopted, technical and structural measures are stalled, and CFP regulations are poorly enforced. Daw and Gray's analysis, however, only concerns the reason why quotas are inefficient and still larger than is environmentally sustainable, not why there is substantial variation among the member states when it comes to overfishing; like Franchino and Rahming, they are looking at inefficiency in the setting of policy, not

inefficiency in its implementation. As Alcock (2002) notes, the basic distributive politics of who gets what are key to understanding fisheries policies in coastal states. As the EU has taken on fisheries policy at the supranational level, distributive battles are waged in Brussels at the same time enforcement battles are waged at the national and local levels (Payne 2000; Da Rocha et al. 2012). It is the second of Payne's nested games that this paper focuses on: that between member-state governments and their fishermen.

Theory

Government regulation is one common way to solve common-pool resource problems such as overfishing: by restricting the amount of fish that can be caught, the regulator (in this case, the EU) ensures that there will still be fish for future generations to catch. However, such regulation causes both producers and consumers to lose: producers lose by not catching as many fish as they would prefer, while consumers lose by paying higher prices for fish. Therefore, neither producers nor consumers are inclined to obey regulations[6], and if regulations such as the Common Fisheries Policy are not rigorously enforced, it is unlikely that producers will obey or that consumers will punish producers by refusing to buy their products.

The fact that both producers and consumers have similar interests when it comes to fishing in Europe is a challenge for understanding regulation in this case. If one thinks of the curves in Peltzman's model of regulation (Peltzman 1976), both producers and consumers in each member state want to move closer to the point of full monopoly (regulation causes transfers away from both producers and consumers), because both profits and demand would then rise, as the supply of fish in markets is kept artificially low by regulation. Both producers and consumers have an incentive to support overfishing in the short-term, while the long-term interest, represented by fisheries scientists and the European Union, prefers no overfishing (Rockmann et al. 2012). From the perspective of member-state governments, however, since producers and consumers make up the majority of the voting pool, one would expect the government to support overfishing as well. However, given basic collective-action theory, we would expect producers to exert more of an impact.

At the European level, moreover, there is a second common pool resource problem: each member is concerned with itself, and does not consider the implications of overfishing on fish stocks as a whole in the region. Hallerberg (2004) addresses this when he discusses fiscal governance as a form of common pool resource problem.[7] There are two ways to deal with this in an efficient manner: delegation (vesting a certain minister with decisionmaking power) and commitment (contracts, with formal rules and targets). The Common Fisheries Policy is an example of commitment, which is to be expected if one thinks of the EU as a government with a coalition containing many ideological differences (the European Council). Evidence of this can be found in Franchino and Rahming, who posited both reliance on the Commission and mutual constraint in successive iterations of the CFP.

Therefore, if we assume parties that seek to maximize their votes in regular elections, then party leaders and other politicians will have short time horizons (Olson 1993), passing up the long-term good (such as protecting fish stocks for future generations) in favor of policies that will provide immediate vote maximization. However, the amount of

seats that can be gained in a legislature from appeasing these groups varies depending on the electoral rule. The problems of regulation are even more evident in proportional-representation systems; Przeworski (2003, 106) notes that in proportional representation systems, regulation is likely to be 'extensive, detailed, and not credible.'

There are two different ways of looking at electoral rules: examining the role multiparty systems have versus single-party systems, and examining the role veto players play.[8] Numerous scholars (Rosenbluth and Schaap 2003, Bawn and Rosenbluth 2006, Rogowski and Kayser 2002, and Linzer and Rogowski 2008, among others) argue that the key difference is between proportional-representation systems on the one hand and single-member-district-plurality, or SMDP, systems on the other. Tsebelis (2002), however, theorizes that it is more important to understand the number of veto players (defined as any actor or collective body that can block change from the status quo) and measure the distance between relevant veto players in the system. In proportional representation systems, the Tsebelis conceptualization generally means the average normalized ideological distance of the leftmost and rightmost parties in the coalition government. In either case, the idea is that more parties or veto players produce more access points for interest groups, and chances for groups to block change. This paper will argue that because producers actively want overfishing and consumers passively want overfishing, more parties or more veto players should produce more actors who seek to appease their constituents and have the power to do so, and more overfishing should result regardless of the ideological distance between coalition partners. Therefore, this paper concentrates on the number of parties. A number of scholars have examined the relationship between electoral rules and policy outcomes in a variety of contexts, including environmental policy (Underdal and Hanf 2000), international investment (Kerner and Kucik 2010), inflation (Rogowski and Kayser 2002), and public spending (Milesi-Ferretti, Maria, and Rostagno 2002).

Daw and Gray (2005) note that fisheries ministers face pressure from domestic fishing lobbies, and that unemployment and economic loss caused by the CFP are regularly reported by the national press. In addition, the diminishing resource pool can be blamed on foreign fleets (the Spanish fleets tend to be a traditional bugaboo in other EU member states), or mismanagement by the previous government. Because of domestic pressure from producers and a lack of domestic pressure from consumers, politicians have a strong incentive to allow some overfishing.

For example, facing a small majority and difficult elections in 1997, the British Conservative government promised to 'stand up for British fishermen.' But the Fisheries Council did not meet until the Labour Party had won a sweeping majority, and Britain supported a policy that was less supportive of British fishing interests. Daw and Gray note they could afford to do so by the size of the Labour majority, as defection of the fishing lobby to another party would not have been critical in the subsequent election.

One reason why parties would wish to pay attention to fishermen in close elections involves the concentration of the industry. The fishing industry is quite concentrated in Europe: western Galicia and the Basque Country in Spain, southern Brittany in France, and the Shetland Islands in the UK are particularly dependent on fishing and fisheries. Scotland, with 8.6 percent of the British population, brings in more than 60 percent of the total British fish catch each year. (Royal Society 2004). Total employment dependent on the fishing industry in Scotland (taking into account indirect effects) is about 48,000, roughly half the employment of the North Sea oil industry in Scotland. This level of regional concentration

has resulted in political action, as might be expected: the Committee for Survival in Brittany committed some violent acts against public buildings, while Save Britain's Fish in the UK has demonstrated regularly since 1990 (Lequesne 2000). While the majority of voters in Scotland voted against Brexit, Scottish fishermen, according to polling and interviews, were strongly in favor, citing the ability to be free of the CFP as one of the primary selling points of exiting the EU (Geoghegan 2016). A concentrated industry willing to engage in political action may be important under certain electoral circumstances, as will be explained further below.

Hypotheses and research design

The main hypothesis, then, based on the comparative political economy literature on electoral rules, is as follows: states with proportional-representation electoral systems will overfish to a greater degree than will states with single-member-district electoral systems. Moreover, PR states with a greater effective number of electoral parties will overfish more than PR states with a smaller effective number of parties.

The mechanism at work here relates to the increased number of access points for special interest groups in proportional-representation systems, which have larger numbers of parties than SMDP systems. (Duverger 1954) Politicians want to reward groups that can, in turn, help politicians. Political institutions whittle down the types of constituencies to which politicians must appeal; the more proportional the electoral system, the narrower the constituency appealed to, as it takes smaller and smaller numbers of votes in order to earn a seat in parliament. This hypothesis will be tested on a dataset created from the European Commission's CFP compliance scorecard, as well as fragmentary data from the European Court of Justice.[9]

The main portion of the data, as compiled by the European Commission from 2001 to 2004, contains three separate indicators of overfishing – numbers of quota over-runs, tons of fish caught above the quota, and percentage over the quota. Thus, each will be treated as the dependent variable in turn. As number of overruns is a count variable, that analysis will involve a negative binomial regression with number of overruns as the dependent variable.

The number of fish and percentage of fish indicators produce extremes of scale, because the quotas are not the same for each country, each area of the sea, or each fish. For example, the Netherlands was 28.13 percent over its quota of anglerfishes in the Irish Sea in 2003. Its quota was 16 tons and its actual catch for that year was 20.5 tons. In the opposite direction, Dutch fishermen caught 1420 more tons of Atlantic herring in the English Channel and southern North Sea than was allowed under the quota in 2003, but because the quota was so large (32,118 tons), this was only 4.42 percent above the quota. In order to compress these extremes of scale, the logarithm of each in two separate ordinary-least-squares regressions will be used.

As stated above, the lion's share of the data comes from the DG-XIV CFP compliance scoreboard, and covers the years 2001 to 2004. Extra data provided by Franchino and Rahming, and based on European Court of Justice cases, is fragmentary, but provides datapoints for overfishing by France in 1988, 1990–1992, and 1994, and the UK in 1985–88 and 1990–1996 (though not all three indicators in all of those years). This results in an unbalanced dataset, with 57 observations for the overruns data, 52 observations for the tons overfished data, and 45 observations for the percentage overfished data. As a robustness

check, all three regressions are rerun with a balanced dataset that does not have the fragmentary British and French data (*n* of 40) to ensure that Britain and France are not driving the results.

The cases selected are all EU member-states with assigned quotas under the CFP. Member states which do not have quotas (Hungary, Slovakia, Czech Republic, Cyprus, Malta, and Luxembourg) are left out, as are member states which have extremely small quotas (Austria and Italy only have quotas for the Atlantic bluefin tuna, while Estonia, Latvia, Lithuania, and Finland were only covered under Baltic Sea quotas beginning in 2005). For the EU-15, the years covered are 2001 to 2004, while for Poland, the only new member with quotas, only 2004 is included.

Three control variables are used in the analysis. Cochrane (2000) argues that overfishing worldwide is affected by the number of people employed in the fisheries industry, and amount of fish consumed per person. Data on these variables is available from the World Resources Institute.[10] To compress extremes of scale, the logarithm of employment is used. These variables should estimate whether or not producers (employment in fisheries) or consumers (fish consumed per person per year), or both, are correlated with overfishing. Third, we control for the length of a state's coastline (again using the logarithm to compress extremes of scale), reasoning that it is harder for governments to prevent overfishing in countries with large coastlines than in countries with small coastlines; Denmark has 700 landing places for fishing boats, while Belgium has three (Long and Curran 2000). See Table 1 for descriptive statistics.

Methods and models

The analysis begins with an ordinary-least-squares regression model, then estimating coefficients from that model using the Clarify program for Stata (Tomz, Wittenberg, and King 2003). Because the EU measured overfishing in three separate ways, there are three separate estimators, one for each method (tons overfished, percentage over quota, and number of overruns), with the same model specification, and the same independent and control variables.

Estimator selection

As stated above, there are two ways to operationalize the size of the party system in this analysis. The method chosen is the Laakso-Taagepera measure of effective number of electoral parties (Taagepera 1999), as increasing the number of parties in the system motivates politicians to appeal to smaller and smaller industries in order to gain more and more marginal numbers of votes. The three estimators all follow the same model: $\alpha + \beta_1$

Table 1. Descriptive statistics.

	Mean	Standard Deviation	Minimum	Max
Tons overfished	1173	3549	−51.3	23,620
Percentage over quota	13.95	34.87	0	193.5
# of overruns	3	2.76	0	14
Effective number of Electoral parties	3.45	1.7	2.09	9.36
Miles of coastline	10,746	9231	41.2	31,119
# of people employed in fishing	18,267	17,663	231	75,434
KGs of fish eaten per person	25.5	13.2	0	59.8

(effective # of parties) + β_2 (logarithm of miles of coastline) + β_3 (logarithm of employment in the fishing industry) + β_4 (kgs of fish eaten per person per year) + ε, and are as follows:

Model 1 (OLS): Logarithm of tons overfished

Model 2 (OLS): Logarithm of percentage over fishing quota

Model 3 (Negative binomial): # of quota overruns

Results

With such a small time-series, the results should not be taken as definitive evidence, but there are several trends to point out. In all three cases, the independent variable, effective number of electoral parties, is statistically significant and in the expected direction. The greater the number of parties in the political system, the greater number of fish taken over the quota (see Table 2), the greater percentage over the quota (see Table 3), and the more quota overruns (see Table 4).

Both coastline and employment have positive effects on the amount of overfishing under the CFP; the larger the coastline, the more overfishing takes place, and the more people employed in fishing, the more overfishing takes place (though coastline is not significant in one of the three analyses). Interestingly, it appears the more fish that is consumed by a given EU member-state, the less overfishing takes place. Taken together with the employment variable, this indicates that consumer demands are not key to overfishing, and that producer demands are. This is consistent with traditional theories of collective action (Olson 1965).

Substantively, the predictions of the hypothesis hold, and the model moves in the predicted direction. If the effective number of electoral parties were to move from two (a system somewhat like mid-1980s Great Britain) to three (a system similar to 2002 Ireland) in a given country (with all three control variables set to their means), that country would be expected to overfish by an additional 28 tons. See Figure 1 for a simulation predicting the amount of overfishing as the effective number of parties increases, using tons overfished as the dependent variable.

Table 2. Statistical results dependent variable: tons of fish over the CFP quota.

	Model 1 unbalanced	Model 2 balanced
Effective # of parties	1.405**	1.201*
	(.53)	(.51)
Fish consumed	−0.1004***	−0.013
	(0.03)	(0.04)
Employment in fishing	2.112***	1.07
	(0.67)	(0.69)
Miles of coastline	0.88**	0.46
	(0.44)	(0.45)
Constant	−25.1***	−14.38
	(9.35)	(9.42)
N	52	40
R^2	0.25	0.170
F	3.91***	1.73

*Two-tail significance at the 0.10 level; **Two-tail significance at 0.05 level; ***Two-tail significance at 0.01 level.

Table 3. Statistical results dependent variable: percentage over the CFP quota.

	Model 1 Unbalanced	Model 2 Balanced
Effective # of parties	0.61**	0.28
	(.3)	(.28)
Fish consumed	−0.35	−0.018
	(0.02)	(0.02)
Employment in fishing	1.205***	0.39
	(0.39)	(0.37)
Miles of coastline	−0.13	−0.22
	(0.28)	(0.24)
Miles of coastline	−0.13	−0.22
	(5.44)	(5.08)
N	45	40
R^2	0.24	0.167
F	3.1**	1.76

*Two-tail significance at the 0.10 level; **Two-tail significance at 0.05 level; ***Two-tail significance at 0.01 level.

Table 4. Statistical results dependent variable: # of quota overruns (negative binomial regression).

	Model 1 unbalanced	Model 2 balanced
Effective # of parties	0.61***	0.34**
	(.15)	(.18)
Fish consumed	−0.025**	−0.011
	(0.01)	(0.13)
Employment in fishing	0.827***	0.435**
	(0.18)	(0.22)
Miles of coastline	0.339**	0.144
	(0.12)	(0.16)
Constant	−11.15***	−5.42*
	(2.35)	(3.21)
N	57	40
Pseudo-R^2	0.08	0.03
Chi^2	20.89***	4.64

*Two-tail significance at the 0.10 level; **Two-tail significance at 0.05 level; ***Two-tail significance at 0.01 level.

Sensitivity tests

Because of the smaller sample size, many of the variables in the analyses using the balanced dataset lose statistical significance, though the key independent variable retains statistical significance in two of the three balanced dataset analyses. It appears this is due primarily to the small sample size; expanding the dataset by a power of 2 (resulting in an *n* of 80) shrinks the standard errors and produces a model which passes basic tests of statistical significance in all three balanced models.[11]

One concern would be measurement error in the dependent variable. For the scorecards, the European Commission relies on self-reporting by member states of overfishing. Austria, Finland, Italy, and Greece, all party to Atlantic Ocean fishing quotas on bluefin tuna, never reported overfishing. The Portuguese government claims its fleets overfished in 2001, 2002, and 2004, but not in 2003. The Spanish government similarly told the Commission that it did not overfish in 2002 (but overfished by large amounts in 2001, 2003, and 2004). In addition, some countries may have traded quotas in order to overfish in certain areas, something which does not show up in the EU's CFP scorecard. Astorkiza, Del Valle, and Astorkiza (n.d.) note that

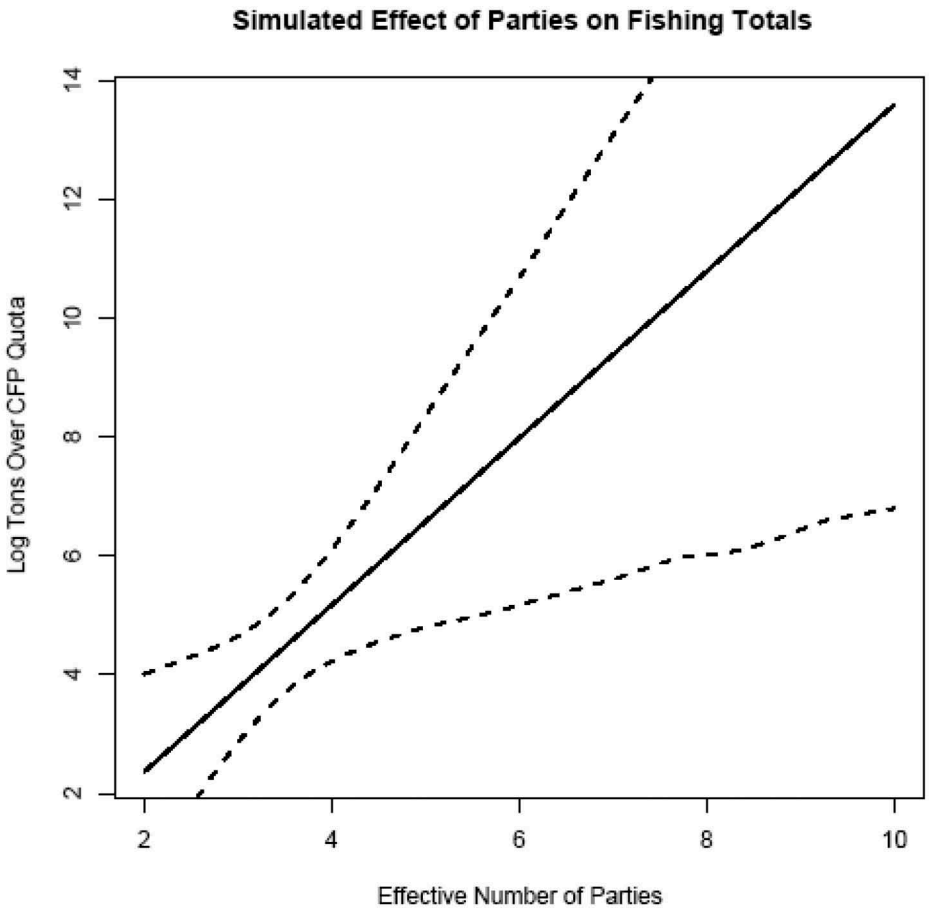

Figure 1. Simulated effect of the effective number of parties on overfishing in the European Union.

Spain has 90 percent of the TAC for anchovies and is generally under quota. Interestingly, however, Spain has ceded part of its quota to France in exchange for exclusivity in the Bay of Biscay in the spring months. Spanish fishing interests have also purchased French boats and operate out of French ports as mixed French-Spanish enterprises in order to take advantage of French quotas in anchovies. In reality, then, Spain is overfishing its quota beyond what is reported, while France is underfishing its quota. There have also been reports of 'quota-hopping,' where Spanish fishing interests purchased British and Irish boats in order to be able to fly British or Irish flags and use the British or Irish quotas. (Payne 2000)

Alternate explanations

Another explanation for overfishing would involve a political business cycle, where governments allow more overfishing immediately before elections. To test this, I re-ran the analysis, adding a new variable measuring time until the next parliamentary election. This variable was insignificant in the models using tons of fish over the quota and percentage over the quota. It was significant in the negative binomial regression, indicating that as states get closer to a parliamentary election, the number of quota overruns goes up.

Federalism should be considered here as well; in Spain, the autonomous communities of Galicia and the Basque Country negotiate directly with Brussels on CFP issues. However, there is not enough variation on federalism in the EU's fishing countries to enable a statistical analysis. It is possible that overfishing varies within federal states; greater overfishing in the Basque Country versus Galicia, for example. Unfortunately, the European Commission does not keep such regional statistics, and there is no extant anecdotal evidence.

Conclusion

States with more proportional electoral systems, and therefore a larger number of electoral parties, do a poorer job of enforcing the quotas under the Common Fisheries Policy, and as a result, fishing fleets in these states overfish to a greater degree than do fleets in states with smaller numbers of parties. This effect holds, no matter which of the three indicators of overfishing is used. In addition, the effect appears to be driven by producer interests, rather than consumer interests; niche groups are more valued in an electoral sense in more proportional electoral systems than in less-proportional systems, which opens new avenues for producer interests to achieve their goals, including benefiting from non-compliance.

Is non-compliance with the CFP as extensive today as it was in 2001–2004? We do not know, as the data is not publicly available. In addition to the 2013 reform, three major actions may have improved compliance: the 2005 creation of the European Fisheries Control Agency, the 2007 Court of Auditors report outlining extensive non-compliance, and a new control regulation in 2009 providing the Commission with greater enforcement power (Belschner 2015; Lado 2016).

The 2013 reforms to the CFP focused on structural problems: reducing fishing capacity, ending bycatch, and prioritizing multi-annual plans. All are steps in the right direction if the goal is sustainability of Europe's fish stocks. Fjelstul and Carrubba (2018) find intentional non-compliance occurs regularly in the EU; using Holland's term, this is forbearance: an intentional failure to enforce the law (Holland 2016). Political problems, as this paper pointed to, may be much more difficult to solve; the analysis presented above indicates that the lack of political will may run to the heart of domestic politics in certain member states.

What lessons can be drawn from this glimpse into compliance with EU fisheries policy? At its core, the European project founders or thrives depending on compliance with EU rules and directives. This analysis is in line with the enforcement school of compliance (Downs, Rocke, and Barsoom 1996), which looks at governments' willingness to comply or defect. In cases where industries are small but concentrated and electoral rules encourage parties to appeal to smaller- and smaller-sized interest groups, governments may choose not to comply if it benefits those interest groups or industries, which can ultimately have an effect on cooperation itself, as the CFP case aptly demonstrates.

Future research should look across time and policy areas for other instances where non-compliance may be driven by the effect described here. The most obvious place would be environmental policy, which has greatly expanded at the EU level since the Treaty of Amsterdam. (Lenschow 2010) One could examine, for example, regulations on hazardous chemicals, river basin management and water quality, air quality, or carbon dioxide emissions for patterns of non-compliance. What appear on first glance to be odd instances of non-compliance may be explainable using the framework introduced above. The persistence of non-tariff barriers in certain industries in the years prior to the Single European Act,

impeding the single market, could potentially be explainable as well. European integration requires compliance to work. Structural elements that are inherent in member-states' domestic politics may be impeding that compliance.

Notes

1. With the exception of Peru, few developing-world states have distant-water fleets fishing in international waters.
2. This provision is one of the reasons Norway voted against accession to the EU in 1972.
3. Many of the EU's fisheries regulations since the 1970s have been at least in part responses to the United Nations Convention on the Law of the Sea (see Bailey 1996).
4. During the time period under discussion in this paper, the Parliament was largely shut out of the policy process. Even after Lisbon, MEPs on the Committee on Fisheries complained that the Council had 'sought to circumvent Parliament's co-legislative powers.' ('20 Years of Codecision' 2013, 8).
5. In addition to the TAC and quota systems, the EU also attempts to restrict fishing by limiting time fleets can spend at sea, controlling the holding capacity of fleets, setting minimum allowable sizes for species, and regulating fishing gear (Daw and Gray 2005).
6. Overfishing is rational on the part of individual fishermen. Economic discount rate theory would argue that the economically efficient strategy regarding a diminishing common pool resource is to take as much of the resource as possible, then invest the profits (the discount rate is even higher when one considers mortgaged boats and equipment). (Daw and Gray 2005) Moreover, the penalty for overfishing is not stringent enough to discourage individual overfishing.
7. See also Hallerberg and Marier (2004) for an example from Latin America and the Caribbean.
8. A third approach, such as outlined in Cheibub 2006, would involve presidential versus parliamentary systems. Such an approach cannot be tested in the E.U., which lacks true presidential systems.
9. The unit of analysis is the country-year.
10. I do not control for exports of fish from EU countries, for fear of endogeneity with the other two control variables.
11. Some may argue that fixed effects need to be added to the regression to actually model the processes described above. However, fixed effects 'black box' what is actually going on inside a given country; miles of coastline, as a country-specific, time-invariant variable, is both empirically and theoretically appropriate, and would run collinear with the fixed effect. Running a linear regression with panel-corrected standard errors produces no differences in the statistical significance of the coefficients in either model.

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