

Industry segmentation and the market for protection: Evidence from oil*

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Abstract

We use the oil industry to examine empirically the effects of market segmentation on industry policy preferences. The oil industry is a useful case to examine the implications of industry segmentation because there is variation in the characteristics of firms operating across discrete market segments. Oil firms also differ in the degree to which they participate across industry segments. We derive a series of expectations about the position of firms towards different policy instruments. Following Magee (1977), we use congressional hearings to then examine the preferences of firms by market segment. We identify two policy instruments that have different effects in the relative price of oil produced in the U.S., and then examine the position firms took towards these. We find substantial and predictable differences in intra-industry preferences across instruments. We argue this variation is best explained by the position of the firm within its market segment and its degree of integration across segments. By examining two instruments we also show that the extent which which intra-industry differences emerge depends on the distributional effects of the relevant policy instrument. Identifying the policy preferences of firms alone, however, is not enough to explain policy outcomes. In the second part of the paper we analyze roll call votes on two policy instruments with diverse distributional effects: an amendment to the Energy Bill of 1979 to repeal the President's authority to set tariffs and quotas on oil imports, and the Windfall Profits Tax Bill of 1980. In the roll call vote analyses we tabulate the preferences of all market participants, from upstream producers to final consumers, and map those preferences onto the employment structure in electoral districts. This provides a metric of the political demand faced by Congress members.

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Introduction

Empirical studies of the demand for protection commonly assume that the trade preferences of firms are homogeneous within single industries. Yet evidence suggests this assumption is untenable in an increasing number of industries. Feenstra (1998), for example, argues data across a range of countries and industries is consistent with a rise in importance in vertical specialization – defined as the disintegration of productive processes into discrete segments. Given the well-established link between the characteristics of firms and their policy preferences, increasing heterogeneity in firms’ organizational forms implies divergent policy preferences within single market segments.

Despite this, there are few studies that examine empirically how intra-industry segmentation affects the preferences of firms towards tariff and non-tariff measures (NTMs), and policy outcomes. In this paper we use the case of the oil market to examine empirically how the fragmentation or integration of firms’ production processes across market segments and borders affects their policy preferences towards tariff and NTMs, and how this affects policy outcomes. The oil industry is useful because firms operating in the sector differ across several dimensions: firms differ in the degree to which they integrate across upstream and downstream market segments, and whether they operate internationally. The sector also offers a contrast between producers and consumers of inputs and final outputs, which are likely to be pitted against each other in their support for policy interventions that affect the price of traded products. Together, it thus represents a useful opportunity to identify how and to what extent intra-industry firm heterogeneity affects the demands for protection.

We find substantial – but predictable – intra-industry variation in the policy preferences of firms and industry associations. We also find the importance of variation in intra-industry preferences is dependent on the distributive effects of the policy instrument. In particular, we find that in the oil tariff case firm heterogeneity matters more: integrated firms and major oil producers adopted policy preferences that are distinct from those of independent producers that operate in the upstream segment of the industry in the U.S. alone. In the excise tax case, on the other hand, the most important political cleavage occurred along industry lines, with producers of oil and their by-

products pitted against a tax on domestically produced oil.

Identifying the policy preferences of firms alone offers only a partial explanation for policy outcomes. Standard approaches to the political economy of tariff formation propose that the incentives for policymakers to supply benefits to industries also matter. Accordingly, in the second section of the paper we examine the incentives for legislators to provide support to firms operating along different segments of the oil industry. We find these differences are consequential in policy-making: bill sponsorship shows important divisions between legislators, depending on the characteristics of their districts, and oil tariff bills were defeated before reaching a vote on the floor. In the excise tax case, on the other hand, there was less opposition across districts, and independent producers and integrated firms' joint opposition did not prevent the tax from being passed.

Our analysis has two implications for our understanding of the political economy of protection. First, we demonstrate that the heterogeneity of firms within single industries has a substantial and predictable influence on their recorded preferences for policies that affect the relative price of crude. Given that firm-heterogeneity is a common feature of a wide number of industries, this suggests that analyses need to better understand interests group politics *within* industries, in addition to interests group politics between them, of in modeling the political economy of trade.

Second, by analyzing instruments with different distributive effects, we show that the degree to which intra-industry firm heterogeneity affects policy preferences also varies depending on the distributional effects of the relevant policy instrument. The importance of intra-industry firm heterogeneity is thus important, but its effect is conditioned by the distributional effect of the tariff or NTM in question.

We proceed as follows. In the next section we review the literature on endogenous tariff formation. We then summarize the characteristics of the oil industry, and identify our expectations of firms towards two policy instruments with different distributional implications: an oil import tariff, and an excise tax on domestic oil production. We then analyze the policy preferences of firms using data drawn from congressional committees. We then analyze Congressional votes on the repeal of import restrictions on oil and the imposition of the windfall profit tax, before concluding in the fifth and final section.

Intra-Industry Heterogeneity and Firm Preferences: What We Know

The endogenous tariff formation literature is built around a canonical framework where policy outcomes arise from the intersection of political demand and supply.¹ Actors' interests/preferences and their ability to overcome collective action problems figure prominently on the demand-side of politics; on the supply-side of politics politicians' preferences and political institutions are the key analytical constructs. Political actors are construed as having clearly defined objective functions associated with their material well-being. Those actors are assumed to be able to identify the policy outcomes that would benefit them. Actors' whose expected benefits from a policy intervention are above a minimum cost threshold for collective action usually mobilize politically (Grossman and Helpman, 1994; Rodrik, 1995).

In order to derive actors' preferences for a specific policy instrument, scholars rely on models of economic activity. From those models we can assess equilibrium conditions relating quantities and prices of goods and services supplied and demanded in the market place. When policy interventions are added to those models as affecting prices or quantities we are able to theoretically derive the choices that would be optimal for different economic agents depending on their attributes and position in the economic system. For instance, trade theory predicts that under general conditions reducing trade barriers results in changes in the relative price of tradable goods and services, which in turn affects the real income of different groups of economic agents.

In traditional political economy accounts these groups of agents are assumed to have homogeneous preferences, depending on whether they are linked to the industry that expands or contracts in response to the policy change. Yet, this assumption is untenable in industries that are populated by firms who are active in different international markets (Milner, 1988) or vertically integrated across different segments of the industry. Recent findings in international economics also highlight firm- and industry-level heterogeneity in the extent to which firms fragment or integrate their production processes across market segments and countries. Firms weigh differently the tradeoff between integrating or sourcing production at home and abroad (Coase, 1937; Williamson, 1975;

¹The endogenous tariff/policy formation literature in its original form was reductionist: it focused on the correlation of observable characteristics of interest groups to levels of protection, and hence bracketed the role of political actors and institutions. See Caves (1976); Baldwin (1985); Nelson (1988); Rodrik (1995); Gawande and Krishna (2003).

Williamson, 1985; Grossman and Hart, 1986).² The tradeoff varies for firms of different productivity: their marginal cost is a cutoff that sets internationally and domestically integrated firms apart from their counterpart, who only operate domestically and/or participate in one segment of the market. These productivity differentials determine the ability of firms to absorb policy induced changes in relative prices (Melitz, 2003).

Given the well-established link between the characteristics of firms and their policy preferences, increasing heterogeneity in firm organization implies divergent policy preferences within single industries. We should expect, for example, that firms that integrate upstream and downstream production processes differ in their policy preferences from firms that operate in single industry segments. A few studies examine the effects of firm- and industry-level heterogeneity on political preferences, and policy outcomes. Using industry as the unit of analysis, for example, Gawande and Bandyopadhyay (2000) find lobbying expenditures increase as a function of competition between upstream and downstream firms, suggesting a divergence in intra-industry policy preferences. Feenstra (1998) argues vertical specialization has analogous effects to technological innovation by lowering the wages of unskilled workers, with implications for individual preferences over trade – along factor lines. Focusing on policy outcomes, Hummels and Yi (2001) measures the growth in industry specialization using data on trade in intermediate goods, and regresses this against a measure of tariff or NTMs. Yet this “black boxes” the policy process itself, assuming rather than providing evidence demonstrating a relationship between industry and firm-level heterogeneity, preferences, and policy outcomes. Beyond this there remain limited empirical studies on the relationship between industry specialization, preferences, and policy outcomes.

How does intra-industry firm heterogeneity affect firm preferences? How do differences in the distributive effects of policy instruments affect the importance of intra-industry firm heterogeneity? And how do these differences affect policy outcomes? In this paper we use the case of the oil industry to examine the relationship between industry and firm-level heterogeneity, preferences and policy outcomes. The oil industry is useful because firms operating in the sector demonstrate substantial

²This literature points to industry and firm-level variance in the incentives to integrate rather than conduct transactions at arms'-length (Williamson, 1985; Grossman and Hart, 1986; Hart and Moore, 1990; Hart, 1995; Antràs, 2003). Building on property rights theories of the firm Grossman and Hart (1986); Hart and Moore (1990), Antràs (2003) argues that incomplete contracts shape the firm's decision to outsource or integrate stages of the global supply chain. See Pinto and Weymouth (2013).

variation in terms of their characteristics. In particular, firms tend to vary across two dimensions: i) the number of industry segments they operate in; ii) the degree of internationalization. In addition, while the focus on intra-industry firm heterogeneity is a recent phenomenon, in the oil sector there has been substantial debate over the use of tariff and NTMs in the industry historically. This provides a detailed record of the preferences firms and other actors towards different policy instruments, as well as a legislative voting record. The existence of substantial intra-industry firm heterogeneity, combined with data on the revealed preferences of firms, and voting behavior, offers an opportunity to investigate empirically the relationship between industry and firm-level heterogeneity, preferences, and policy outcomes.³

We proceed in five sections, In the next section we describe the characteristics of firms operating in the oil industry in general terms. In the third section we introduce two policy instruments that have been an important part of the politics of trade in the oil industry, and which we examine in the empirical analysis of industry preference: i) an oil import tariff; ii) an excise tax on domestically produced oil. We derive a series of expectations about the policy preferences of firms with different characteristics, based on the different distributive effects of these instruments. We use data drawn from congressional testimony by firms and associations representing them to test these expectations. In section four we then extend the analysis to Congressional behavior. We derive expectations about how industrial composition of the districts in the presence of intra-industry firm heterogeneity affects the incentives to vote for or against two policy instruments with different distributional effects. In the fifth and final section we summarize our findings, and discuss avenues for future research.

Overview of Characteristics of Oil Industry

The oil industry in the United States contains firms with different characteristics. Most broadly, we can distinguish firms involved in the production of crude oil from those that use crude oil as an input into a process that transforms crude oil into refined products, and from those that market or consume refined products. We can also categorize firms according to whether they operate across more than one market segment. (See Table 1). Thus vertically specialized firms operate in single market segments, focusing only on producing, refining, or marketing oil products, or primarily

³We return to discuss the generalizability of these findings in the conclusion.

consuming oil products. Vertically integrated firms, on the other hand, operate across multiple market segments. Firms can also be distinguished by their degree of internationalization. Thus some firms operate only within the United States, while others operate both within the United States and internationally.

While the classification of firms by market segment, and by the degree of vertical integration and internationalization, can lead to a complicated series of corporate forms, in practice only a subset of these recur within the industry, shown in Table One. There are few firms that are pure marketers of oil products that operate both within the United States and internationally, for example. There are also few firms that focus solely on refining oil but that have a domestic and international presence. Below we discuss each market segment, focusing on prevalent forms of industrial organization. We then move on to discuss how these differences in characteristics should effect the policy preferences of firms.

Producers

A first distinction can be made between firms that only explore for and produce crude oil, and those that use crude oil as an input, or market and consume products refined from it. The most important distinction between crude oil producers and other firms is whether oil is an output, or whether it is an input into a productive process that transforms crude oil into refined products. Refined products are sold to marketers and final consumers.

Firms producing crude oil in the United States differ in terms of whether they are integrated vertically, and whether they operate purely domestically or also operate internationally. The Independent Petroleum Association of America (IPAA) is the major association for domestically focused firms operating in the producer segment only. Since 1994 it has surveyed members five times. The mean number of member firms producing internationally between 1994 and 2008 was 12.88 percent, with a standard deviation of 2.59 percent. Median net production for these firms stood at 360 and 350 barrels per day between 1996 and 1998 (Independent Petroleum Association of America, 2009).

The profile of major U.S. energy producers differs substantially. The top ten oil producing firms domestically had a mean production of 462,000 barrels per day, with a standard deviation of 166,000 barrels in 1981, falling to 318,000 barrels per day in 2000, with a standard deviation of 205,000 barrels. The mean production of these firms between 1980 and 2000, when calculated

using five year increments, was 416,000 barrels per day, with a mean standard deviation of 193,000 barrels. The largest producing firms also had an international presence, and were integrated in refining, as described below.

Refiners

Refiners are defined as “establishments primarily engaged in refining petroleum, manufacturing of paving and roofing materials, and compounding lubricating oils and greases from purchased material” under Standard Industry Classification - SIC 29. Refinery ownership is divided between large, integrated majors that both produce and refine oil, medium-sized domestic refiners with a regional focus that also produce some oil, and refiners that are domestically-focused and do not produce crude oil (Committee on Energy and Commerce, 1980). Refinery capacity is clustered regionally, with greater capacity near the Great Lakes and Midwest, the Gulf Coast, and the Pacific Coast. The East Coast, in contrast, has comparatively less refining capacity (Office of Technology Assessment, 1983).

Like crude oil producers, therefore, the industrial organization of refiners can be divided between independent refiners that operate only in that market segment, and those that operate within an integrated major. The structure of industry associations representing the industry reflect these differences. The national association is the American Fuel & Petrochemical Manufacturers (AFPA),⁴ however the Independent Refinery Association of America, and regional chapters such as the Independent Refiners Association of America, represent refiners operating within this market segment alone (Committee on Energy and Commerce, 1980, p. 169).

Marketers and Consumers of Final Products

The final market segment in the oil industry is marketers and consumers of final products. A large number of different products are produced using crude oil, including asphalt, jet fuel, propane, lubricants, and fuel oil. Gasoline is the largest volume of product consumed in the United States, making the transportation sector an important consumer of oil products.⁵

⁴Previously called the National Petroleum Refiners Association and the National Petrochemical & Refiners Association.

⁵In 2011 the transport sector used 13.22 million barrels a day of oil, against 4.45 million barrels in industry, 670,000 barrels in the residential sector, 360,000 in commercial buildings, and 130,000 in

Many oil products do not have perfect substitutes available at competitive prices, and demand is price inelastic. Oil product costs also constitute an important cost in the transportation industry, including trucking, aviation, and others, making it likely to have strong preferences towards the price effects of government intervention on the products. Other uses of crude products are distillate fuel oil (including diesel), and fuel oil, which continues to play a role in the electricity generation mix despite being partially replaced by substitutes such as natural gas and nuclear power.

Multinationality

This summary suggests firms producing oil and oil products can be classified across two dimensions. The first is the degree of *multinationality*. The production of oil is divided between firms that have an international presence and those that do not. Although uncommon, some independent refiners also operate facilities across multiple countries. Valero, for example, operated the majority of its refineries within the United States, but also owned and operated the Pembroke refinery in Wales. In contrast, Marathon Petroleum operates six refineries, but all are located in the United States.

The degree of multinationality varies by firm. Exxon earned 2.31 billion dollars in 1980 from oil and natural gas exploration and production in the United States, against 1.87 billion US dollars internationally. In terms of revenues, it earned 2.11 billion dollars in the United States in 1985, against 2.83 billion dollars internationally.⁶ In terms of capital employed, Exxon employed 7.3 billion dollars in 1980 against 5.1 billion dollars internationally, rising to 12.3 billion dollars in the United States in 1985, against 4.8 billion dollars internationally (Exxon, 1980; Exxon, 1985). Another multinational oil firm – Conoco – was weighted more heavily towards international oil, producing 134 thousand barrels daily domestically, against 241 thousand barrels internationally in 1980 (Conoco, 1980). A third major – Amoco – was more focused on the United States: revenues stood at 1.33 billion dollars within the United States in 1985, against 779 million dollars internationally. Amoco also spent 3.2 billion dollars in capital and exploration expenditures within the United States, compared to 1.35 billion dollars internationally (Amoco, 1985). There are also a small number of multinational pure refiners.

electric power.

⁶Exxon's annual reports do not break earnings out between petroleum and natural gas.

Vertical Integration

A second dimension of variation is the degree of *vertical integration*, defined as the number of market segments in which a firm operates. The industry in the United States remains divided between a small number of vertically integrated firms that are engaged in oil production, refining, and marketing, and a much larger number of firms that are engaged in single market segments, and tend to be wholly domestic in focus. These operate in the oil production segment only, or in refining, or marketing.

We summarize the most important forms of industrial organization in Table 1. In the next section, we discuss the implications of intra-industry firm heterogeneity for policy preferences.

Table 1: Major Forms of Industrial Organization in the US Oil Industry

Integration			Multinationality			
Produce	⇒	Refine	⇒	Market	Domestic	International
Produce					Domestic	
Produce					Domestic	International
		Refine			Domestic	
				Consume	Domestic	

Implications for Policy Preferences

What are the implications of intra-industry firm heterogeneity for policy preferences? Most generally, we can expect firm characteristics to affect their preferences towards policy. In the case of oil, both tariff and non-tariff measures (NTMs) have been used to affect the supply of, and demand for, oil and oil products. Subsidies such as the depletion allowance, for example, reduce production costs (Sherlock, 2011). Regulatory measures such as licensing for drilling rights in federal lands have also affected oil production levels. Quotas and tariffs have shaped the supply and demand for oil and oil products. The legal basis for doing so is the 1953 Trade Agreements Adjustment Act, and in Section 232 of the 1962 Trade Extension Act. Section 232 enables the president to impose limits on imports that threaten national security interests. Between 1962 and 2004, eight of twenty-six investigations conducted by the Department of Commerce under Section 232 focused on the national security implications of oil imports (Department of Commerce, 2004).

In this paper we examine how intra-industry firm heterogeneity affects policy preferences, and

policy outcomes, for two policy instruments with different distributive effects. The first policy is an oil import tariff. The second is an excise tax on the production of domestic oil. We describe each instrument below, and then outline our expectations for the policy preferences of firms. We begin by examining policy preferences for these two cases. We then investigate how these policy preferences are translated into outcomes.

Case 1 - Oil Import Tariff

The first case we consider is a tariff applied against imports of crude oil. U.S. policy currently applies a small tariff on the import of both oil and oil products under the Harmonized Tariff Schedule of the United States (HTSUS): oil with an API gravity of 25 degrees or more has a tariff of 10.5c/barrel applied against it, while oil with an API gravity of under 25 degrees incurs a 5.25c/barrel tariff.⁷ Some oil products also have tariffs applied against them. Napthas, for example, incur a tariff of 10.5c per barrel, while light oil motor fuel incur an import tariff of 52.5c per barrel (Nerurkar, 2011).

The value of these tariffs relative to the final price is small. More costly trade barriers have also been debated. A quota was applied against oil imports from 1959 to 1971, for example, and a five dollar per barrel tariff on crude oil imports – which we examine below – was debated in Congress in the mid-1980s.

Producers

A tariff increases the price of imported oil relative to domestically produced oil. Given this, what are our expectations for the policy preferences of firms? If we focus on the production stage, at one end of a continuum are firms that produce all oil domestically. We expect these firms to have intense preferences in favor of the imposition of an oil import tariff. Industry associations that represent firms with this characteristic should also take this position.⁸ As the ratio of international to domestically-produced oil increases, on the other hand, we expect the intensity of firm support for an import tariff should fall. At the other end of a continuum, we expect firms that have their

⁷API gravity is a measure of the specific gravity of oil. A higher number represents a lighter-quality oil.

⁸Domestically-focused firms also tend to be less productive than multinational firms because of the economies of scale that exist in the oil industry.

production strongly weighted towards international production, or that produce oil wholly outside the United States, to oppose a tariff.

Refiners

The position of independent refiners, on the other hand, should depend on the effect of a tariff on the demand for final products, and their ability of refiners to pass costs onto consumers. If consumer demand is unaffected – a reasonable assumption given short-term inelasticity of demand for many products – and refiners are able to pass the increased cost of inputs through to consumers – then we expect refiners to be relatively indifferent towards a tariff. On the other hand, a tariff on imports represents an increase in input costs. Refineries also consume crude oil in the refining process.⁹ This suggests refiners will bear some of the costs associated with a tariff, and thus should oppose it.

Marketers and Consumers

If we assume that demand is inelastic with respect to the price of final products – a reasonable assumption given the lack of substitutes for oil prod

Table 2: Oil Import Tariff - Expectations

	Domestic	International	Integrated
Producer	Strongly Support	Strongly Oppose	Mixed
Refiner	Oppose		Weakly Oppose
Marketer	Mixed		
Consumer	Strongly Oppose		

Case 2 - Excise Tax

The distributional effects of an excise tax differ from an import tariff. Instead of being applied at the border, an excise tax is imposed on the sale of a good. In the case of oil, an excise tax – called the Windfall Profits Tax – was placed on domestically-produced oil in March 1980.¹⁰ Rather

⁹A simple rule of thumb is that it takes one barrel of oil-equivalent energy in order to refine ten barrels of crude oil (Office of Technology Assessment, 1983).

¹⁰The implementation of the tax was concurrent with the liberalization of oil prices.

than allowing oil producers to profit from the rents caused by high oil prices, the tax redistributed revenues to the government. The tax was terminated in January 1991.¹¹

The basic effect of the tax was to increase the marginal cost of producing oil domestically, however it was not applied evenly. Oil produced in “stripper” wells (wells producing small amounts of oil) were exempted after 1981. The tax was also applied on a differential basis against oil produced by the integrated majors. For firms operating in the domestic oil production segment only, 50 percent of the “excess” profits – as calculated according to a formula linking prices to historical production costs – was taxed for wells that produced oil prior to 1979. The equivalent rate for the integrated majors was 70 percent.

The distributional effects of the tax were substantial. Net revenues flowing to the government between 1980 and 1990 reached almost 38 billion dollars, after deducting 37 billion dollars from gross revenues because the tax was deductible. The tax also reduced the domestic production of oil by cutting investment, thus increasing demand for imported oil. Further, crude oil prices were set in the world market following price liberalization, meaning domestic producers were unable to pass costs along given the ability of refiners to substitute internationally produced oil for domestic oil. The tax is estimated to have reduced domestic production by between 1.2 and 4.8 percent, relative to what it would have been absent the tax. The Congressional Research Service also noted that “since the tax was imposed on oil production – i.e., upon its removal and sale – extraction (and other upstream operations) was penalized and other aspects of the business (refining and marketing), the downstream operations become relatively favored (Lazzari, 2006).

Producers

What are our expectations of the policy positions of firms operating in different market segments towards the excise tax? Most obviously, firms producing within the United States are likely to oppose the imposition of the tax. Firms producing oil both internationally and within the United States, on the other hand, have mixed incentives, but their support for the excise tax should increase as the share of internationally to domestically produced oil increases. Together, this suggests there is a greater likelihood of complementary lobbying behavior between independent producers and firms producing internationally in the excise tax case, when compared to the import tariff.

¹¹This section draws from Lazzari (2006).

Integrated producers, with operations spanning both oil production and refining, should have mixed preferences towards the tax. On the one hand, increases in imports may increase revenues. Refinery operations are unlikely to suffer because the price of inputs will not change. On other other hand, the burden from the tax is designed to fall more heavily on them relative to competitors producing within the United States.

Refiners

Our expectation towards independent refiners, on the other hand, is that they are indifferent towards the tax. This is because the price for oil is set according to the world price, meaning that in the medium-run it is unlikely to lead to an increase in the cost of inputs. There are two caveats, however. First, it is plausible that refiners should support repeal because the administrative burden associated with the tax fell on them. Second, it is also possible that refiners opposed the tax because of short-term transaction costs, given that the need to substitute internationally produced for domestically produced oil is not costless. Thus it is also possible that independent refiners weakly oppose the imposition of the tax.

Marketers and Consumers

Marketers and consumers are unlikely to have intense preferences towards the tax.

Table 3: Excise Tax on Domestically Produced Oil - Expectations

	Domestic	International	Integrated
Producer	Strongly Oppose	Mixed	Mixed
Refiner	Indifferent		Weakly Support
Marketer	Indifferent		
Consumer	Indifferent		

Thus our expectations for firm preferences towards the two instruments suggest that we should observe different coalitional politics. Most notably, in the first case we should observe a split between domestic oil producers, and other market participants, with the latter generally opposing the tariff. Integrated firms with substantial international production, on the other hand, should have mixed preferences. In the excise tax case, on the other hand, we expect a less broad coalition

against the imposition of the tax, with refiners either independent or weakly in support, and only domestic producers strongly in opposition to the tax. Integrated firms, on the other hand, are likely to be only weakly opposed to its imposition.

In the next section we use congressional testimony to examine the revealed preferences of firms and industry associations towards these instruments. Once again, we begin with import tariff case, and then move on to examine industry preferences towards the industry tax.

Data Analysis - Policy Preferences

We use a revealed preferences approach to examine the policy preferences of firms and industry associations towards the two instruments, following Magee (1977). The data used to identify the policy preferences of the relevant actors are drawn from congressional hearings. We begin with the tariff case. We extracted all oil-related hearings, as categorized in the *Policy Agendas* database.¹² We then used hearing titles to identify all hearings focused on oil imports for the years 1979 and 1987. This yielded eight hearings across the House and Senate, for a total of 133 statements by firms or industry associations within these hearings.¹³

We then hand coded two types of data. In the first instance, we identified the characteristics of the firms and industry associations offering testimony, identifying which market segment they operated in, whether they were integrated across market segments, whether they held international assets or were focused domestically, and whether they were representing marketers or consumers of final products. We also coded whether the testimony was offered by an individual firm or an industry association. The second piece of information we coded using the statements was whether the testimony offered support for a quota or tariff on crude oil, and/or a quota or tariff on oil products.

In addition, we used the *Policy Agendas* database to extract hearings from 1979 to 1987 that focused on the excise tax case. This exercise yielded a total of seven hearings across the House of Representatives and the Senate, for a total of 82 statements. Once again, we hand coded the actors giving testimony according to their industry profile, and then identified their position towards the

¹²<http://www.policyagendas.org>, accessed December 4, 2012.

¹³We ignored testimony by actors without a substantive interest in distributive outcomes in the sector. We also did not code the policy positions given by members of the executive branch. See appendix for coding rules.

excise tax.

Results - Oil Import Tariff

Our expectations are that firms that produce oil within the United States alone, and the industry associations that represent them, should strongly support the imposition of an oil import tariff, because the policy increases the price of internationally produced oil relative to domestic oil. Oil producers with international production assets, on the other hand, have mixed incentives. On the one hand, increasing the price of international relative to domestically produced oil reduces the profitability of oil produced internationally and imported into the United States for refining or direct sale to an independent refiner. On the other hand, these firms also produce some oil within the United States, implying the profits associated with this production should be increased by the tax. These firms also have access to international markets, and thus have the opportunity to redirect international production to international markets, while profiting from the increased rents available within the domestic market.

Oil producing firms with an international presence are most commonly also integrated across market segments. This means we expect these firms to weakly oppose the imposition of an oil import tariff, given that it has an effect on refining assets in addition to domestic production. Independent refiners, on the other hand, are likely to oppose the measure as it implies an increase in costs, if we assume transaction costs. Finally, we expect marketers and consumers to oppose the imposition of an oil import tariff. This is for two reasons. First, demand for most oil products is inelastic in the short run, meaning consumers cannot shift to substitute goods. Second, an import tariff implies an increase in the price of oil products consistent with an imposition of a tax.

What do the results show? As expected, domestic producers of crude oil strongly supported the imposition of an oil import tariff. Of the 20 instances of testimony made on this issue between 1979 and 1987, 85 percent supported an import tariff. This understates the degree of support given that a number of organizations offering testimony were industry associations, implying their stated position is representative of a larger number of firms.

Second, the summary of testimony presented in Table 4 suggests that firms with both an international presence, and integrated across the supply chain, had mixed views on the oil import tariff. This is consistent with the mixed incentives they face, although this is tempered by the

Table 4: Oil Import Tariff - Results

Category	Type	Example	Position
Producer	Domestic	Independent Petroleum Association of America	.85 (20)
Producer	Integrated	Chevron Corporation	.50 (4)
Refiner	Domestic	Independent Refiners Coalition	.43 (7)
Marketer and Consumer	Domestic	Coalition of Independent Petroleum Product Marketers	.00 (92)

Note: "Position" records the ratio of total entries supporting the imposition of an import tariff. Number in brackets is total number of entries.

small number of instances of testimony. The position of independent refiners is also mixed, with 3 of 7 instances of testimony supporting the imposition of a tariff, and 4 indifferent or against. One way to interpret this that firms were unsure about their ability to pass the costs of the tariff along to final consumers, with greater confidence associated with indifference towards the tariff. Finally, as expected, independent marketers, and consumers of final products, were also strongly against the imposition of an import tariff, with uniform opposition across the 92 firms and organizations offering testimony.

The lobbying coalitions implied by this are clear. The most important effect of the proposed import tax on the policy preferences of firms was to pit domestic oil producers against final product consumers. Domestically focused producers strongly supported the imposition of a tariff on oil imports, but had limited allies among the independent refiners and the integrated multinational firms, which faced mixed incentives. They were also strongly opposed by the marketers and consumers of final products. If we also consider the incentives of policymakers to provide support, this is likely to pit oil producing states against those with a greater share of industries that use oil products, or for which transport matters.

Results - Excise Tax

The second instrument we examine is an excise tax. As with the oil import tax, we hand coded the position of firms and industry associations towards the instrument. In this case, we recorded those giving testimony in favor of the imposition of tax, as a ratio of the total number of firms

or associations within a particular market segment giving testimony. Where no firms or industry associations of a given type were found to be giving testimony, we recorded “No Entry.” The results are shown in the table below.

Table 5: Excise Tax on Domestically Produced Oil - Results

Category	Type	Example	Position
Producer	Domestic	North Texas Oil and Gas Association	0 (33)
Producer	Integrated	Chevron Corporation	0.3 (10)
Refiner	Domestic	No Entry	No Entry
Marketer and Consumer	Domestic	National Association of Manufacturers	.11 (9)

Note: “Position” records the ratio of total entries supporting the imposition of an excise tax. The number in brackets is total number of entries.

The results show that the lobbying positions of firms and industry associations largely match our expectations, although there are exceptions. Domestic producers uniformly opposed the imposition of the excise tax, which is unsurprising given that the distributive burden of the tax fell largely on them. Once again, while 33 entries were recorded from the hearings in this category, a large number of these entries were from regional and other industry associations representing the consensus of member firms.

The integrated majors largely opposed the imposition of the tax. One way to interpret this result is that it is possible that the costs of switching domestic and international production outweighed the potential benefits in terms of increasing imports. This is particularly likely if the firms were segmented operationally (i.e. using domestically produced oil to serve the domestic refining market, and internationally produced oil to serve the non-US refining market), which is plausible if we take transport costs into account.

Examining the content of the testimony suggests a second reason for this opposition. Firms that made their position clear suggested they placed more weight on the importance of the policy’s effect on the profitability of investments already made in domestic production, than on any potential benefit in terms of greater imports. An Exxon representative, for example, emphasized the effect the tax would have on its domestic operations in Alaska, and argued that the tax would affect the firm’s interest in investing in projects within the United States, given the effects of the tax on the profits of a project already invested in: “I think it would be a mistake if we dwelled too long on the question of marginal economics of Prudhoe Bay because there is a more important principle at

stake. Simply put it is the impact on the willingness of investors to undertake high-risk ventures in the energy field if Government policy is to selectively tax the successful ventures with new taxes after the risks have been undertaken.” (Statement of W.T. Slick Jr., Senior Vice President, Exxon Co., USA, p. 221).

Final consumers opposed the imposition of the tax, while our expectation was that consumer organizations would be relatively indifferent. Why does this difference emerge? Once again, testimony offers a suggestion: that the difference emerges not because of the expectation of higher costs, but rather because many feared that it would lead to a greater possibility of spillover effects through similar taxes being imposed on other industries. The representative of the Chamber of Commerce of the United States, for example, which claimed 85,000 members, argued that it “would set a harmful precedent that could lead to similar taxes on other commodities, such as beef, sugar, timber, or wheat.” (Statement of Dr. Jack Carlson, Vice President and Chief Economist, Chamber of Commerce of the United States, 5/14/79 p. 267) The National Association of Manufacturers, which claimed 12,000 member countries representing 75% of manufactured goods produced nationally, made a similar argument: “We oppose the principle of punitive tax measures applied to one sector of the economy...we are very concerned that such taxes would establish a precedent for using tax policy as a club against other industries which are highly visible and have been made politically unpopular.” (Statement of Erskine N. White Jr., and Roland M. Bixler, on Behalf of the National Association of Manufacturers, 5/14/79, p.226)

Thus the opposition of consumers appears not to have been shaped by the distributive effects of the tax itself, which is consistent with our expectations. Instead, it is associated with concern among consuming industries that the imposition of the tax increased the likelihood that other industries could face similar taxes in the future. Lastly, it is worth noting that no testimony was recorded for refiners or marketers. If the frequency of testimony is associated with an understanding of economic interest, then can be interpreted as being consistent with our expectations, given that we expect them to be largely indifferent to the excise tax.

Empirical Analysis of Effect of Heterogeneous Industry Preferences on Voting

In the previous section we examined the policy preferences of industry actors towards an oil import quota and an excise tax on domestic oil, two instruments with substantial distributive implications

for firms operating in the oil industry. We found evidence to support the contention that firm preferences vary across segments within the same industry: actors operating in different stages of the oil supply chain preferred an effective rate of protection that was strictly positive for their own segment, and lower for other segments of the industry. We also found differences within segments among firms with different production and organizational structures. These differences become salient when the policy intervention affected prices between segments of production. While all firms preferred lower prices upstream and higher prices downstream, the evidence suggested integrated firms were less sensitive to policy instruments that affected relative prices of a product that is traded within the firm.

Policy outcomes are a function not only of industry preferences but also of policymakers' incentives to meet the demands from industry and other social actors. In this section we examine the relationship between industry preferences and voting outcomes. Our empirical strategy centers on an econometric study of votes held in the U.S. Senate on measures related to the imposition of an excise tax on domestic oil, and the likelihood of tariff barriers being placed on imports of refined oil products.

The excise tax case involves a vote on the Senate conference report on the Crude Oil Windfall Profit Tax Act in the 96th Congress. The vote occurred on March 27, 1980, and was the final vote before the measure was presented to the president for signing into law (Public Law 96-223). It coincided with the decision by the president to decontrol domestic oil prices. The vote centered on whether to adopt the conference report to the Senate on the Crude Oil Windfall Profit Tax Act. It coincided with an executive decision to relax controls on the price of oil. Lazzari (2006) notes that passage of the tax was negotiated between the Carter Administration and the Congress. Oil prices were controlled in 1971 in order to limit inflation, and had the effect of holding domestic prices for crude oil and oil products below the world price. Price decontrol was expected to lead to a rise in the prices of crude oil and oil products to the world price.

The excise tax introduced was designed to capture the "windfall" profits accruing to oil producing firms as domestic oil prices were decontrolled. These were considered to be a "windfall" because the world price for oil was influenced by the Organization of Oil Producing Countries (OPEC), rather than the marginal cost of oil production. The structure of the excise tax was weighted towards oil produced by integrated oil majors, with heavier tax rates levied on these firms

than on independent producers. It was also able to be considered a cost of business, and thus a deductible expense (Lazzari, 2006).

The second vote focuses on the proposed imposition of an import barrier on petroleum products. Section 232 of the Trade Expansion Act of 1962 gives the president the authority to limit imports of commodities that threaten national security.¹⁴ The vote occurred on October 29, 1977, in the 95th Congress, and failed by a margin of 30–47. The Energy Tax Act became law in 1978 (Public Law 95-618). The law included a wide array of tax measures designed to affect the demand for, and supply of, energy products. These included the tax measures on inefficient automobiles, income tax credits for residential energy costs, and subsidies for solar, wind and geothermal energy equipment purchases. The merits of imposing a tariff on imports of oil products was also proposed during debate over the law. While the final act did not include provisions to force the president to impose a tariff or quote on the import of oil or oil products, a 1977 amendment proposed to withdraw from the president the authority to “impose or adjust tariffs, fees or quotas on the imports of refined petroleum products.” By removing this authority from the president, the amendment would have reduced the likelihood of barriers being placed on the import of oil products.

We utilize the same empirical model for both votes in order to maximize our ability to compare the effects of intra-industry heterogeneity on policy outcomes across the two policy instruments. In general terms, we propose that a legislator’s vote is determined by three factors: i) the ideological position of the legislator; ii) the welfare effects of the legislation on the legislator’s constituency; iii) the preferences of producers and consumers with interests in the oil industry. We thus state our empirical model as:

$$y_i = \mathbf{x}_i\mathbf{B} + \mathbf{z}_i\mathbf{\Gamma} + \mathbf{q}_i\Psi + \epsilon_i \tag{1}$$

The dependent variable y_i is a binary indicator of the support or opposition of legislator i to the measure; x_i is a measure of the ideological characteristics of the legislator; z_i is a vector of constituency characteristics; and q_i is a vector of industry characteristics.

We use party identification to capture the influence of the legislators’ ideological characteristics on the likelihood to support (oppose) the instrument. Ideology and party allegiance have been

¹⁴Proposals to limit imports of crude oil submitted to Congress have failed to be voted on.

identified as important factors affecting the voting behavior of legislators. We proxy for ideology using party identification. In the excise tax case, we expect Democratic Party legislators to be more likely to support adopting the conference report, given that the Democratic Party is considered to be more likely to support government intervention in economic markets, and is less traditionally associated with the oil industry. We expect Republican Party legislators to be less supportive of government intervention, and thus more likely to oppose the measure, holding constituency and industry characteristics constant. By the same intuition, in the case of the amendment proposing to remove from the president the ability to impose tariffs, quotas, or other measures on the import of oil products, we expect Democratic Party to oppose the measure, while we expect Republican legislators to support it, after controlling for constituency characteristics and industry influence.

The second group of independent variables are designed to capture the characteristics of constituency i . Our expectation is that states with a substantial share of oil contributing to the local economy, or in which oil is a significant contributor to domestic employment, should oppose the imposition of the excise tax given its long-term distributional effects, after controlling for ideology and other factors. Although price liberalization occurred at the same time as the Windfall Tax, which is expected to increase the contribution of the sector to the economic wellbeing of the state, this effect is likely to be muted in the short-term given the long time-lag between investing in new wells, and an increase in oil production.

In order to capture the importance of the sector to the economy we measured the total number of employees in the oil industry within state i in the vote-year, calculated as the ratio of state employees working in oil, refining, and pipeline employment to the total number of state employees. As an alternative measure we also calculated oil production in oil production, measured in thousands of barrels of oil production per day.

The third group of independent variables is intended to capture the influence of industry on legislators' voting behavior. Given that the demand is price inelastic due to the the lack of substitutes for many oil products, we propose that the characteristics of both oil producers and consumers of oil products should be politically relevant. Building on the analysis of policy preferences in the previous section, we also expect that legislators' voting behavior reflects differences in the characteristics of producers operating within their districts. We thus include measures intended to capture differences in the most prevalent forms of industry interests. The first measure (*Presence*

of *Independent Producers*) is a dummy variable that captures whether an independent oil producing firm is operating in state i . It is calculated using data compiled from the integrated majors' annual reports, combined with production data from the EIA, and codes oil producing states in which the integrated majors are not active.

The second variable designed to capture variation in producer characteristics on a state basis measures the importance of the state to integrated oil producers (*Integrated Firms Producing in State Ratio*). We used annual reports of the most important integrated oil producing firms, as identified by the U.S. Department of the Commerce, and coded whether they produced oil in the relevant state. Rather than use a dummy variable, which would not differentiate between states in which integrated production was important and those in which was not, we calculated the ratio of total integrated firms producing in the state as a ratio of all integrated firms, with the intuition that more integrated firms producing in the state is likely to suggest an increased importance of the state to integrated firms production, as well as an increased influence of integrated firms on voting behavior. Finally, we measured the refinery capacity of refiners operating in the state that are not affiliated with integrated majors (*Ln Independent Refinery Capacity*), with data drawn from the Mineral Industry Survey of the U.S. Department of the Interior.

Finally, we disaggregate consumer interests into two groups, depending on the likely intensity of preferences towards the policy instrument, and the significance of the collective action problem faced by consumers. Analysis of the demands from industry on members of congress typically focus on the interests of producers, under the assumption that consumers interests are less organized. In the case of oil, however, demand for oil products is price inelastic. Oil products also are a significant share of total costs in the transport sector and a number of industrial sectors. We therefore include measures intended to capture the interests of consumers of oil products.

The first is a composite measure of industrial and transport consumers (*Ln Concentrated Consumption*), which are expected to have more intense preferences towards refined product prices given the importance of oil within their industry. Additionally, these groups are also expected to face fewer collective action problems. The second captures the interests of residential and commercial consumers (*Ln Non-Concentrated Consumption*). In contrast to concentrated consumers of oil products, these groups are expected to face more significant hurdles to engaging in collective, given their less concentrated industry structure. They are also likely to have less intense preferences

towards the policy, given that oil products are a smaller share of costs when compared to industrial and transport users.

In the table below we summarize our expectations across two dimensions for each of these votes:

i) the direction of influence of the variable; ii) its intensity.

Table 6: Expectations - Excise Tax

Industry Segment	Type	Effect	Intensity
Producer	Domestic	-	weak
Producer	Integrated	-	strong
Refiner	Domestic	i	0
Consumer-concentrated	Domestic	-	weak
Consumer-unconcentrated	Domestic	-	weak

Note: + indicates support for the measure, - indicates opposition, i indicates indifference.

Table 7: Expectations - Product Import Quota

Industry Segment	Type	Effect	Intensity
Producer	Domestic	i	0
Producer	Integrated	i	0
Refiner	Domestic	-	strong
Consumer-concentrated	Domestic	+	strong
Consumer-unconcentrated	Domestic	+	weak

Note: + indicates support for the measure, - indicates opposition, i indicates indifference.

Results of Empirical Analysis of Roll Call Votes

Crude Oil Windfall Profit Tax Act of 1980

The Crude Oil Windfall Profit Tax was signed into law after the conference report was adopted in both the Senate and the House of Representatives. There are a number of findings worth highlighting in the analysis of the voting data associated with the adoption of the report in the Senate.¹⁵

First, in terms of ideological predisposition, the coefficient is both positive and significant, suggesting Senators were more likely to vote in favor of the measure after holding other factors constant. This matches the intuition that Democratic Party members were more willing to coun-

¹⁵See appendix for full results.

tenance taxing industry, and were also less likely to be affiliated with the oil industry. It is also unsurprising given that the measure was promoted by a Democratic Party president who had staked political capital on the twin issues of oil price decontrol and the imposition of the excise tax on oil producers.

Next, what does the data suggest about the relative influence of producer firms on voting behavior? The simplest measure of oil production – which does not differentiate between the different forms of industrial organization between firms producing crude – shows that greater oil production was associated with a lower likelihood of voting in favor of the measure. We can interpret this in two ways. First, it is possible that legislators themselves feared the economic impact of the tax on the state economy, and so were less likely to support the measure as oil increased as a share of the local economy. Second, it is also possible that legislators were influenced by producers themselves. In the previous section we saw that domestic producers opposed the measure in congressional testimony, as did the majority of integrated firms. The association of oil production with outcomes may therefore represent the influence of producer interests on voting behavior.

If we decompose the broad measure of producers into integrated producers and non-integrated producers, then the sign is negative in both cases, as expected. However, the presence of integrated producers is significant across each of the specifications, but is not significant in the case of independent producers in any of the specifications, and turns marginally positive in the last model. How can we interpret this result? The evidence from congressional testimony suggests that integrated and independent producers were largely unified in opposing the tax. However, the structure of the tax itself was designed to be weighted more heavily against integrated than against domestic firms. It is thus plausible that the design of the tax reduced the intensity with which domestic producer firms sought to influence the voting behavior of congressional members. This is also plausible because the imposition of the law was concomitant with the liberalization of oil prices. Given the importance of price equalization to domestic oil production, domestic producers accepted the quid-pro-quo of the Windfall Tax – given that it was weighted towards integrated firms – and so opposed it less intensely. For integrated firms, on the other hand, price liberalization was likely to benefit them less given their international presence, and they were also penalized more heavily domestically. Their incentive to lobby members was therefore stronger than domestic firms.

The inclusion of independent refiners find no statistically significant relationship between the capacity of independent refining firms and the voting behavior of congressional members. This matches expectations. Refiners did not offer testimony on the excise tax, which is expected given that the law targeted producers. If demand is relatively inelastic then refiners could also expect to be able to pass any increases in the cost of inputs onto final consumers.

Finally, our expectation was that consumers would oppose the measure, given that it could lead to increased prices for final goods. However if we examine the broad measure of consumers – which does not differentiate between different types of consumer groups – the measure is not significant across the models, and the sign is positive. If we decompose the measure into concentrated and non-concentrated consumers, however, the results suggest that a higher number of non-concentrated consumers in the district were associated with a greater likelihood of voting for the measure. This also stands at odds with the data on congressional testimony, which shows that almost all industrial users and other concentrated consumers opposed the imposition of the excise tax.

How can we understand this outcome? One interpretation focuses on the timing of the vote. Oil prices increased markedly in the wake of the Iranian Revolution of 1978-1979, and there was significant consumer anger at the increase in prices. This anger was also directed at oil firms. It is thus plausible that voting behavior is being affected by policymakers' incentive to respond to consumer unhappiness at the perceived profiteering of oil firms. Further, although the secondary effect of the excise tax may have been to increase consumer prices, gasoline costs were a smaller component of residential users, making it more possible for them to support punishing oil firms without suffering significant costs. This interpretation is consistent with a greater influence of residential consumers on voting behavior.

Amendment to Remove Presidential Authority to Impose Oil Product Tariffs, Fees or Quotas

The proposed amendment to the Energy Tax Act examined here sought to remove from the president the authority to “impose or adjust tariffs, fees or quotas on the imports of refined petroleum products.” Our expectations were that both domestically focused and vertically segmented producers, and international and vertically integrated firms, would be indifferent to the passage of the amendment. This in turn implies that the amount of oil produced within the state should not be

a predictor of vote choices by congressional members.

We expected that domestic firms operating in the refining segment, on the other hand, should have strong preferences against the measure, given that it reduces the likelihood that the president would increase the barriers to imports of refined products, increasing the economic rents for refiners. This suggests that members of congress should oppose withdrawing this presidential authority as a function of the increasing importance of independent refiners within the local economy. Conversely, we expected consumers to favor the amendment, given its distributional implications for final product prices.

If we begin once again by examining the ideological predisposition of congressional members, we can see that – in contrast to the excise tax – membership of the Democratic Party was not significant across any of the models. On the other hand, the results show that a higher weight of producer interests in the state is associated with a lower likelihood of support to the measure. Further, this result is statistically significant in both in aggregate terms, and when we decompose producer interests into vertically segmented and integrated firms.

Apparently more puzzling is the position taken by Senators from states with a higher presence of independent refiners. Our expectation is that these groups should oppose the repeal of the authority to impose import restrictions. The sign is positive, however, although not statistically significant. If we examine the relative importance of refiners within the state economy, however, this outcome becomes more readily understandable. In fact, data from the Bureau of Economic Analysis shows that there were only four states (Louisiana, Mississippi, Texas, and Wyoming) where refining contributed more than 1.1 percent to state output in 1977 –or two standard deviations above the mean. While independent refiners may have had intense preferences in opposition to the proposed amendment, their relative influence over legislators’ voting behavior was dwarfed by the pressure from residential consumers and oil producing firms.

Finally, as expected, the consumption of final products was associated with a greater likelihood of a Senator voting in favor of the measure across most of the models. If we decompose consumers into concentrated and non-concentrated consumers, both once again have the expected sign, however, only non-concentrated consumers are statistically significant.

Conclusion

Changes in the relative price of a good or service resulting from a policy intervention pits producers against consumers. Traditional political economy accounts suggest that producers who organize politically are better able at exerting influence on policy-makers. Their relative political power is lower, on the other hand, when consumers of their output are organized.

In addition to examining divisions between producer and consumer interests, in this paper we examined how patterns of integration across oil market segments and international presence of a firm affect the political demands for protection. We explored the link between the characteristics of firms and their policy preferences. Following that literature we argued that increasing heterogeneity in firms' organizational forms implies divergent policy preferences within single market segments. Integrated firms are more likely to internalize the effects on downstream and upstream activities, for example, since they are present on both ends of the market segment. Thus they are likely to espouse policies that maximize the joint profits of the different units, mitigating their support for instruments that affect the prices of the inputs that are transferred among different units of the firm. US oil producers who sell to unrelated parties, for instance, are more likely to support policies that increase the domestic price of crude. Domestic producers who are also present in refining are likely to espouse weaker preferences towards protecting oil production than domestic producers; they are also likely to mitigate the intensity of demands for and against protection. Refiners – and downstream consumers of oil products – on the other hand, would prefer policies that lower the price of oil, which they consume but do not produce. The political winner in this relative prices tug of war should be the group that has lower collective action costs.

We are also able to assess when and to what extent firm heterogeneity matters. By examining two different instruments, we show that the extent which which intra-industry differences emerge depends on the distributional effects of the relevant policy instrument. As reflected in the testimony-related evidence, firm heterogeneity seems to matter in the crude oil tariff case. Firms operating in production and refining, major international producers and independent producers who only operate domestically have distinctively different positions towards protectionism. Yet they present a more unified front when the the instrument of choice is a tax on domestically produced oil. These differences may have had important implications implications for the ability of these actors to exert

political influence on Congressional activity. All oil tariff bills were defeated before ever reaching a vote, an outcome preferred by the majors and integrated producers. In the Windfall Profit Tax case, on the other hand, independent producers and integrated firms' joint opposition was not enough to prevent the Bill from passing.

Finally, it is worth noting that our empirical analysis is incomplete. We intend to extend the analysis by developing a strategy for better accounting for firm heterogeneity at the state and congressional district levels. The measures we include in the roll call analysis conducted above capture the most important differences between producers and consumers. They do not, however, fully capture the differences between producers. One plausible possibility is to identify the locations and volumes of oil produced by integrated firms and domestic producers within the United States, and use this to build a more precise measure of the relative importance of independent producers and refiners, against integrated firms, on a state-by-state basis. This would allow us to better account for the different demands faced by congressional members as a function of the producers in their districts.

A second step is to extend the analysis of revealed preference drawn from Congressional Testimony to the the repeal of the excise tax in 1988. As noted above, the position of consumers, and members of Congress, may have been influenced in 1980 by the extraordinary conditions faced by consumers given the rapid increase in prices. Extending the analysis to the late 1980s will thus enable us to better understand the positions of consumer organizations, and the political incentives facing Congress members, under normal market conditions. It is also possible to add roll call analysis from this period.

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Table 8: Probit Analysis: Windfall

	(1)	(2)	(3)	(4)	(5)	(6)
Democrat	1.606*** (0.347)	1.399*** (0.325)	1.379*** (0.301)	1.588*** (0.343)	1.386*** (0.301)	1.480*** (0.315)
Ln Oil Production	-0.291*** (0.078)					
Ln Total Consumption	0.282 (0.173)	0.189 (0.163)	0.155 (0.157)	0.321* (0.174)		
Oil Employment Ratio		-0.408*** (0.116)				
Integrated Firms Producing in State Ratio			-2.266** (1.033)	-1.415 (1.016)	-2.144** (1.005)	-2.190** (1.105)
Presence of Independent Producers			-0.074 (0.336)	0.159 (0.378)	-0.042 (0.338)	0.009 (0.355)
Ln Independent Refining Capacity				-0.108** (0.043)		
Ln Concentrated Consumption					0.085 (0.152)	
Ln Non-Concentrated Consumption						0.478*** (0.137)
Constant	-2.754 (1.877)	-2.032 (1.832)	-1.702 (1.726)	-2.966* (1.785)	-0.931 (1.641)	-4.242*** (1.242)
Observations	97	92	97	97	97	97
pseudo-R ²	0.347	0.312	0.249	0.330	0.244	0.317

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Probit Analysis: Remove Oil Product Tariffs, Fees or Quota Authority

	(1)	(2)	(3)	(4)	(5)	(6)
Democrat	-0.073 (0.306)	-0.097 (0.317)	-0.288 (0.329)	-0.286 (0.338)	-0.292 (0.326)	-0.159 (0.374)
Ln Oil Production	-0.113*** (0.027)					
Ln Total Consumption	0.316* (0.170)	0.245 (0.181)	0.369* (0.205)	0.371* (0.223)		
Oil Employment Ratio		-1.457*** (0.489)				
Integrated Firms Producing in State Ratio			-0.071*** (0.026)	-0.071** (0.031)	-0.071*** (0.026)	-0.048** (0.020)
Presence of Independent Producers			-0.977*** (0.365)	-0.975*** (0.373)	-0.867** (0.371)	-1.084** (0.421)
Ln Independent Refining Capacity				-0.001 (0.036)		
Ln Concentrated Consumption					0.214 (0.202)	
Ln Non-Concentrated Consumption						0.783*** (0.192)
Constant	-3.733* (1.923)	-2.981 (2.065)	-4.144* (2.343)	-4.171* (2.497)	-2.378 (2.249)	-4.792 (2.038)
Observations	100	100	100	100	100	100
Pseudo-R ²	0.125	0.146	0.169	0.169	0.146	0.325

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$