Asset Specificity and the Political Behavior of Firms: Lobbying for Subsidies in Norway

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In this article we provide empirical evidence that under pressure from international competition firms whose assets are more specific (or less mobile) are indeed more likely to lobby for subsidies, other things equal. Applying insights from transaction cost economics and trade policy studies to a survey of firms in Norway, we show that joint contacting of Parliament and other government bodies by management and labor on behalf of the firm is over twice as likely when the firm's assets (physical and human capital) are highly specific than when they are highly mobile, controlling for other relevant variables. These results show the value of not treating mobility of factors as all-or-nothing (as in many textbook models), but rather as something that varies across firms and industries. Moreover, the analysis demonstrates that asset specificity can predict political behavior as well as industrial organization.

In doing so, we synthesize elements of political science, industrial organization, and trade theory. Like Kevin Grier, Michael Munger, and Brian Roberts, we believe that firms "respond systematically and predictably to political incentives in choosing their levels of political activity," but political scientists may find something new and valuable in our way of measuring the firms' "stake," namely, the specificity of assets.[1] At the same time, many industrial organization scholars regard asset specificity as centrally important in determining the form of long-term contracts and firm organization, and we believe that using their theory to predict political behavior is a valuable extension. Finally, scholars interested in trade policy coalitions have clashed over whether factor mobility or specificity is the "better" way to characterize the underlying model of economic exchange[2] but have not treated mobility itself as a quantitative, measurable variable. In this article the economy is composed of units

whose assets vary in their mobility. Moreover, the units are a cross-section of individual firms rather than larger aggregations like industries or sectors. Thus, we are able to analyze within one economy how the political behavior of firms with more mobile assets differs from that of firms with more specific assets.

Our evidence relates to lobbying for subsidies in Norway in the years after the oil boom of the 1970s. This limits how general our results are, and we take great care to point out the institutional features that might make this a special case and the potentially relevant factors that we are forced to omit. However, we believe the main argument about specificity and political action has more general applicability, even though we cannot offer a complete explanation of the political economy of lobbying in Norway nor provide estimates whose magnitudes can automatically be transported across national frontiers. A helpful feature of the Norwegian case is that the availability of extensive subsidies financed by oil revenue was largely an exogenous development to which the firms responded.[3]

We proceed in three steps. First, we provide a short history of the Norwegian case and an overview of the theoretical controversies and advances on which we build our argument. We review the specific factors–mobile factors debate in trade theory to show why joint contacting is the key behavior to analyze and explain and look briefly at theories of lobbying and industrial organization on which our work is based. The next part of the article deals with data and measurement. We describe the survey-based measures of contacting behavior and explain our construction of several measures of specificity along with controls for firm size and export orientation. Finally, we provide a series of probit regressions predicting the propensity of firms to engage in joint contacting, using several alternative specifications. We conclude with some possibilities for further research.

Historical and Theoretical Background

The Norwegian Context

In Norway, the 1970s brought an increase in the level of selective subsidies targeted at particular industries and firms as well as an increase in lobbying activities. These developments were spurred by expectations of huge revenues resulting from Norway's decision to take royalties from a state-owned oil company after petroleum discoveries in the North Sea and increases in the price of oil. The historian Harald Espeli argues that the steady increase in the volume of selective subsidies and lobbying activities came about for two reasons.[4] First, he writes, a more radical post-1968 Labor party, pressed by successful Left Socialists, launched a policy of "restructuring" by which the government would use public funds to help "future" industries. Second, the government expected future oil revenues to "crowd out" traditional

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3. The dependent variable was taken from a survey of management conducted by the Norwegian School of Economics and Business Administration. Some explanatory variables were provided with the cooperation of the Central Statistical Bureau, for which we are grateful. Both bodies operated carefully within the requirements of preserving the confidentiality of data relating to individual firms.

4. Espeli 1992.

manufacturing through expansion of public and private services and wage contagion from the petroleum sector. By spending (forthcoming) oil revenues, the government hoped to affect the adjustment process in order to protect particularly vulnerable labor market segments and avoid a rapid depreciation of firm-specific competence and competitiveness in manufacturing industries.

By the late 1970s or early 1980s, disappointing economic results and the spread of pro-market attitudes led governments to shift policy toward broader measures like investment in infrastructure, R&D, and tax cuts.[5] Though he provides no *systematic* evidence, Espeli claims that the change of policy direction occurred because firms learned that lobbying could be a substitute for adjustment while politicians, particularly members of Parliament, were inclined to intervene to save any jobs independent of whether those jobs were in lame duck industries or in those which constituted the "future." We show that firms with a bigger stake in avoiding adjustment costs were indeed more likely to lobby for government support.

Theory.   We draw on an active debate in both economics and political science over how best to characterize the economic exchanges that underlie the production of goods and services in models of international trade and trade policymaking. Leaving aside recent discussions of intra-industry trade, the main debate has been between proponents of the view that factors of production are perfectly mobile, as in the Heckscher–Ohlin model and the Stolper–Samuelson theorem, or imperfectly mobile across sectors, as in the Ricardo–Viner model and numerous papers on endogenous protection.[6] As is well known, the stakes and interests of owners of factors of production depend on the intensity with which these factors are used, the availability and cost of substitutes, and the mobility of these factors, that is, the ease with which they can be converted to production of other goods.

With a few extra assumptions about the costs of collective action and political institutions in which decisions are taken, it can be shown that if factors are perfectly mobile across sectors, then economic stakes will differ between owners of different factors (such as capital and labor, or land), and thus coalitions should form among owners of a common factor. In this case, Ronald L. Rogowski proposes, any coalitions that arise follow broad class lines, leaving, for instance, capital and labor squared off against each other.[7] By contrast, if factors are imperfectly mobile across sectors, coalitions will only form across factors and along industry lines, so that within any industry capital and labor should find themselves on the same side of a trade policy issue. In a well-known test, Stephen P. Magee found that nineteen times in twenty-one, trade unions and management took the same position when testifying before the U.S. Congress on the 1973 Trade Reform Act, with their actual stance (protectionist

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5. Perhaps another factor contributing to this change of direction was the expansion of the single European market. International integration in general and Norwegian membership in the European Economic Space, in particular, implied limits on the range of feasible options that the government faced.

6. On intra-industry trade, see Gilligan 1997. A recent review of the debate is Alt and Gilligan 1994.

7. Rogowski 1989.

versus liberalizing) usually consistent with the predictions of economic theory.[8] Other analyses based on individual voting in British general elections have produced similar results, with divisions according to industry dominating those based on class.[9]

Douglas Irwin's and Magee's analyses are indirect. They provide evidence that a model in which factors are specific fits better with the observed evidence than one in which all factors are mobile. But what if, as seems likely, economies are not all one way but in fact composed of factors of production that vary widely in specificity from firm to firm and industry to industry?[10] Variation in specificity implies that trade policy may not affect broad classes of factors in the same way. Consequently, we might expect coalitions within an economy to vary. For example, labor and capital may be allies in some contexts (firms or sectors) but rivals in others.

In the industrial organization literature factor or asset specificity does take a whole range of values, and it is precisely this variation that provides explanatory power. The more specific the asset (the greater the quasi-rents), the argument goes, the more subject its owner is to being held up by others involved in joint production, and the greater the incentive for owners to carry out economic activity within one economic entity rather than on spot markets at arm's length. Oliver Williamson shows how internalization of exchange within the firm reduces the costs of monitoring and enforcing compliance with contractual or quasi-contractual agreements.[11] Hence, vertical integration and long-term contractual arrangements characterize industries or firms with more specific assets. Such an approach was used, for example, by Erin Anderson and David Schmittlein who predicted from the specificity of the knowledge of sales forces (a form of human capital) whether they would be integrated into the firms they served.[12]

Suppose the greater potential loss facing the owner of a specific asset rationalizes greater expenditure of resources on contractual activities that can avert the loss. As James Alt and his colleagues ask, why would it not also lead to greater effort devoted to political activities? The more specific its assets, the more costly a firm facing competitive pressure to adjust would find "exit" into another product or industry. Then, the greater should be its relative "stake" in lobbying, and the more likely it should be to lobby, other things equal.[13]

The literature on whether U.S. corporations have political action committees and how they choose a level of financial giving shows that other firm characteristics like size are also relevant.[14] Firms make a choice to undertake lobbying, which is a costly

8. Magee 1978.

9. See, for instance, Irwin 1995.

10. See, for instance, Brawley 1996; and Scheve and Slaughter 1998.

11. Williamson 1985.

12. Anderson and Schmittlein 1984.

13. See Alt et al. 1996; and Frieden 1991b. "Other things" that are excluded from the model include alternative uses for the resources invested in lobbying as well as decisions by other firms harmed by one firm's lobbying activities. We assume firms are preexisting as organizations and do not have to solve internal collective action problems.

14. On PACs, see McKeown 1994. Grier, Munger, and Roberts provide and review many results. Grier, Munger, and Roberts 1994. Two other variables are frequently found to be significant: sales to the public sector and whether or not a firm is subject to government regulation. Unfortunately, we were unable to obtain meaningful firm-level data on these variables.

activity. The firm that lobbies must have some probability of affecting the outcome it seeks, and the possibility must exist to exclude others from at least some of the benefits received so that free-riding does not become an important alternative. Moreover, if politicians have subsidies to allocate, firms must also have something to offer that politicians value; we assume it is votes by employees rather than contributions.[15] If the cost of lobbying increases more slowly than the probability of affecting the outcome as firm size increases, larger firms should be more likely to lobby, independent of asset specificity or any other stake or source of demand for subsidy. Moreover, if competitive pressures lead to the demand for assistance, firms located in the tradables sector (exporting or import competing) should also be more likely to lobby, other things equal.

Hypotheses.   This theoretical discussion suggests testing four specific predictions. First, if firms had to adjust, the greater potential loss facing firms with specific assets should have rationalized greater expenditure of resources on political activities that offered the opportunity to avoid the loss. Thus,

1. Other things equal, firms with less mobile assets (defined later) should have been more likely to lobby.

Second, if factors are mobile, any rents flow to all owners of a factor, and trade policy coalitions should follow broad class lines. If factors are specific, coalitions should follow industry or sectoral lines, and rents are confined more narrowly. Magee shows that in the latter case labor and management should appear on the same side of trade policy issues.[16] We assume that if both labor (human capital) and management (human or physical capital) are firm-specific and share in the rents, both labor and management (or owners) can benefit from the same subsidies, and thus both have an incentive to seek them. Then, if we observe joint lobbying by labor and management, we infer that both must be sharing confined rents and both must be specific. In this case,

2. Joint political action by both labor and capital should be more likely in firms where both human and physical capital were characterized by a high degree of specificity.

Third, independent of the effect of specificity, suppose politicians were inclined to save jobs, and competing interests had to offer votes in exchange for facilitation of subsidies. If the cost of contacting is essentially fixed, or if the outcome is excludable and the probability of affecting it increases with firm size, then

3. Larger firms (firms employing more workers) would have anticipated a greater likelihood of success from lobbying and thus been more inclined to pursue these funds, other things equal.

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15. These assumptions are familiar ones that go back to Olson's theory of excludability and interest group activity. See Olson 1965; and Grier, Munger, and Roberts 1994.
16. Magee 1978.

Finally, suppose (as Espeli describes the government's analysis of the situation[17]) that it was wage contagion stemming from oil revenues that created the problems of maintaining competitiveness that in turn created firms' incentives to lobby. Firms in the tradables sector would face greater competitiveness problems and thus have lower opportunity costs of lobbying, so

4. Those firms more dependent on exports (or perhaps facing severe import competition) would have a larger stake in subsidies and be more likely to lobby for them.

In explaining differences in contacting behavior among firms in the tradables sector, we believe export dependence would have stronger effects than facing import competition. Firms that export must lower prices to improve competitiveness, so subsidies are their only political instrument. Firms facing import competition have alternative instruments for protecting themselves. Some instruments, like quota restrictions or narrow product standards, might involve political contacting but, unlike subsidies, would not be temporally tied to the availability of booming oil funds. Others, like advertising, pressure on distributors, and so on, would not involve an increase in contacting at all.

In what follows, we seek to explain patterns of contacting Parliament and other government bodies by both management and labor, using as explanatory variables mainly measures of the specificity and mobility of labor and capital, firm size (number of employees), and firm's export orientation. Much of the argument is indirect: we cannot know, given our measure of contacting, whether it was actually subsidies that the contacting sought, but we infer this from the context of the Norwegian case.

Data and Measurement

In this section we explain the operationalization of the dependent variable, joint contacting, and explanatory variables, asset specificity, firm size, and export orientation. In order to validate our choices, we present alternative measurements of some explanatory variables along with descriptive statistics and item intercorrelations.

Dependent Variable: Contacting

The dependent variable comes from a 1988 survey of 338 Norwegian firms.[18] About half the firms are in some line of manufacturing. The firms vary greatly in size (many have no employees, some employ thousands) and external orientation (many do not export at all, some export nearly all their products). For about 10 percent of the firms surveyed, finding sufficient background data for the explanatory variables was impossible, even by imputing values from the industries in which the firms operate.

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17. Espeli 1992.
18. For details of the survey, see Berrefjord and Heum 1993. Firms were selected as part of a project reexamining an earlier Norwegian power study.

Does a 1988 survey come too late to capture the effect of the oil boom on wages and competitiveness, which we argue motivated exposed firms to seek subsidies? It is true that state oil revenues decreased substantially after 1986, but not until the recession starting in 1989 did the state budget move into a deficit. Moreover, wage growth only *started* to slow down around 1990. The government could still afford to keep grants to industries high in 1988, and state support for industries still constituted a substantial part of state resources. Total state support for industries during 1980–87 (the definition of state support was changed in 1988) increased from about 9 billion kroner in 1980 to 16 billion kroner in 1987. When deflated by the consumer price index, the real value of state industrial support only decreased by 3.5 percent. Although an earlier survey would be helpful, we believe our data are still timely.

The survey contains a set of seven questions that measure management contact with politicians. Although the wording from question to question varies (at least in translation), the standard form was for an executive of each firm to be asked the following: "How often have you or any other executive in your company been in contact, in writing or otherwise, with [name of political body] on behalf of your company or industry during the last year?" The possible choices of political body included (1) any of the Parliament committees; (2) any of the Members of Parliament from [your company's] district; (3) any of the political party's bodies, including parliamentary group, central party boards, and local party boards; (4) any of the government departments; and (5) a state agency.

The response alternatives for the questions we used are shown in Table 1. Government departments, state agencies, and Members of Parliament (MPs) were contacted most frequently and by the most firms, but a substantial number of firms report never having contacted any of these. Over a third of firms also reported that these contacts "had become more frequent during the last five years," and a similar number asserted that the contacts "had become more important for the company" over the same period.

Our understanding of the political process by which subsidies were allocated leads us to be most interested in contacts with Parliament, whether through committees, MPs, or party groups. We define political contacting by management as taking place if either parliamentary committees, MPs, or the parliamentary party group were contacted at all in the last year. Sixty-nine percent of firms reported at least one such contact by management in the past year (and about 50 percent reported contacting one of the parliamentary alternatives at least a few times).[19]

The survey also included a question asking whether "employee representatives promoted the interests of the company or industry by contacting government bodies during the past five years." The disadvantage of this question is the time scale, five years rather than one; the advantage is that it asks directly whether labor representatives promoted the interests of the firm, not of labor only. Thus, an affirmative answer

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19. We experimented with a second, more inclusive measure: if there had been either any contacting of Parliament or at least a few contacts with a government department or state agency in the last year. Eighty-five percent of firms report such contacting—too many to make the variable more informative.

TABLE 1. *Percentage of firms reporting management contacting political bodies*

Type of political body	Reported frequency of contact:					
	Every month	A few times	One time	Never	Not applicable	(100%)
Parliament committees	6	26	24	44	<1	
Members of Parliament	6	34	14	46	0	
Parliamentary party	2	20	9	65	3	
Government department	13	50	15	12	10	
State agency	18	54	11	16	1	

to this question means that labor representatives saw the interests of labor coinciding with those of the firm, which indicates that the costs of moving to other jobs were probably significant, and that labor must have had some significant stake in maintaining the health of the firm.

The response alternatives for labor are shown in Table 2; only information about contacts with government departments, state agencies, and MPs was elicited. Again, if we define labor contacting as taking place if there is any evidence that labor representatives contacted any of these institutions, 36 percent of firms reported at least one such contact by labor in the past five years.

We are principally interested in those cases where firms report political action by *both* labor and management, for the reasons Magee gives; that is, when factors are highly specific to their current uses, both labor and management (capital) can benefit from policies that benefit the firm. In this case, both take the same position and find it worthwhile to express it by contacting political authorities. Our interest is in firms where ''joint action'' is taken (though, of course, the contacts need not have been joint or simultaneous), that is, firms where both labor and management have contacted political authorities.

One way to represent ''joint contacting'' is with a dichotomous variable taking the value 1 where the firm reports that both management and labor have contacted political authorities on the firm's behalf and 0 otherwise. Just over 30 percent of firms report such joint contacting. More information will be preserved if we create a variable that takes on several values, though it is not obvious how to do this. We first experimented with a variable that took on six values, coded 5 through 1: (1) The variable was coded 5 if capital lobbies MPs, committees, or parliamentary groups monthly *and* labor lobbies Parliament, departments, or state agencies several times; (2) 4 if one of the conditions of those coded 5 is satisfied, and the other side lobbies a few times (management) or once (labor) toward [appropriate list of political bodies]; (3) 3 if capital lobbies a few times toward [appropriate list of political bodies], and labor lobbies once toward [appropriate list of political bodies]; (4) 2 if either capital lobbies a few times or labor lobbies once; (5) 1 if capital lobbies once; and (6) 0 if

TABLE 2. *Percentage of firms reporting labor representatives contacting political bodies*

Type of political body	*Frequency of contact in last five years:*				
	Several times	*One time*	*Never*	*Not applicable*	*(100%)*
Parliament	12	8	70	10	
Government department	19	9	65	6	
State agency	13	8	68	11	

there is no evidence of lobbying. This variable had too few observations in some codes. After a good deal of experimentation we are convinced that all important information in this variable is preserved even if categories 0, 1, and 2 (no evidence of *joint* contacting) are collapsed, as are categories 3 and 4 (some joint contacting). That leaves a three-category definition of joint contacting: high frequency (code 5 and above, 10 percent of cases), some joint contacting (codes 3 and 4, 24 percent of cases), and none (66 percent of cases). The determinants of this pattern of joint action by management and labor on behalf of the firm, reported by about a third of firms in the survey, are what we try to find and explain in the following sections.

Explanatory Variables: Asset Specificity

Paul Joskow summarizes Williamson's four types of asset specificity as site specificity (the value of immobile assets depends on location), physical specificity (design characteristics), human specificity (relationship-specific human capital often derived from learning by doing), and dedicated assets (based on the prospect of continuing sales to a particular customer).[20] We have no data that relate to site specificity or dedicated assets but offer a variety of measures for physical and human capital specificity. Each of our measures is industry specific, in that firms are assigned values based on data for the industry or industries in which they operate.

Following the lead of transactions cost economics, our principal measure of specificity is R&D intensity.[21] For instance, Enrico Santarelli writes "R&D investment has been treated as a typical case of asset specificity a la Williamson." [22] Zoltan Acs and Steven Isberg refer to "asset specificity as measured by innovation" for which they have data by industry and which they predict from R&D expenditures, writing that "R&D creates asset specificity because firms that sell products with close substi-

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20. See Joskow 1988; and Williamson 1983.
21. Shelanski and Klein 1995. Papers that offer a variety of perspectives on the measurement and consequences of asset specificity include Jacoby 1990; Norris 1992; Boot 1992; Joskow and Schmalensee 1983; and Williamson 1988.
22. Santarelli 1991, 292.

tutes are likely to do less research and development."[23] Arnoud Boot cites "high tech" industries as an example of those where assets were more specific but presents no data.[24] We assume high R&D spending indicates the ability to capture firm-specific R&D rents and could be associated with either physical or human capital specificity if the R&D produces learning-by-doing effects.

The data source is Statistics Norway, which computes R&D intensity as R&D expenditures divided by value added for a random sample of firms within each industry. Such sample surveys have been conducted every second year since 1989. Our measure of industry R&D intensity is the average over 1989 and 1991. The firms in our sample are assigned scores using an employment-weighted average over the industries in which each firm is active. For 89 of the 291 firms in the sample, we lack employment data and consequently weight each industry equally in the average.[25]

We use job mobility to measure the specificity of human capital. Unfortunately, this is available only for manufacturing industries. Job mobility is calculated as annual gross increase plus annual gross decrease in jobs divided by total jobs,[26] averaged over 1977–86 from data computed by Statistics Norway for twenty-nine manufacturing industries for each year. We reverse the sign of this variable in the analysis that follows, since low mobility implies high specificity. In assigning scores to firms, we use the same employment-weighting described earlier. Alternatively, firms are assigned the lowest job mobility score in the industries in which the firm is active.

An alternative measure of labor specificity is insider power. Assume wages depend on both insider (industry specific) and outsider forces (for instance, national unemployment). Following Stephen Nickell and Paul Kong, time-series wage equations were estimated from annual data 1964–87 for each of twenty-two manufacturing industries. The estimated coefficient of industry value added in such equations is a proxy for insider power.[27]

Control Variables: Size and Export Share

In the statistical analysis that follows, we predict contacting activity from the various measures of specificity, firm size, and export share. As stated earlier, larger firms

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23. Acs and Isberg 1991, 324.

24. Boot 1992. This view is by no means uncontroversial. See Cohen and Levin 1989.

25. Alternatively, we assign each firm the highest R&D intensity in the industries in which the firm is active on the intuition that the group within the firm with the highest stakes will have a strong effect on the firm's lobbying policy. Results using this alternative measure are qualitatively similar to those we describe later.

26. This follows the method of Davis and Haltiwanger 1992.

27. Nickell and Kong 1992. Having obtained industry-specific coefficients, we used both methods, weighting by employment and assigning the highest insider power in the industries in which the firm is active, to assign scores to firms. We also experimented with alternative measures of profit variability (see Grossman and Levinsohn 1989) computed as the average coefficient of variation (CV) of profit per man-hour across firms within each industry and wage variability (constructed the same way using wage costs per man-hour). The measures of profit and wage variability correlate as expected with other measures of specificity, but in no case were we able to obtain coefficients for these variables that passed conventional significance levels.

TABLE 3. *Main explanatory variables*

				Descriptive statistics		
					Percentiles		
Variable	*Mean*	*SD*	*10%*	*50%*	*90%*	*Obs.*
Total R&D—value added	.019	.045	.001	.004	.057	290
Annual job mobility	.144	.027	.115	.149	.169	132
Insider power (wage)	.169	.217	0.0	.12	.39	131
Number of employees	982	3286.3	63	314.5	1598	288
Ratio of exports to sales	.115	.252	0.0	0.0	.537	288

		Inter-item correlations		
	R&D intensity	*Log (no. of employees)*	*Export share*	*Job immobility*
Number of employees (log)	.17			
Export share	.50	.29		
Job immobility	.07	.03	.21	
Insider power	.10	−.06	.22	.52

should lobby more if the cost of contacting does not increase with firm size, or if the outcome is excludable and the probability of affecting it increases with firm size. If political support is exchanged for policy outcomes, the number of employees is a good indicator for firm size, though because of a few extremely large firms in the sample we use the logarithm of number of employees in the statistical analysis (see Table 3).

If the availability of subsidies to alleviate problems of competitiveness in tradables induced contacting, firms exporting more have an incentive to lobby more. We measure export share by the ratio of exports to firm sales. Export share, like number of employees, is a firm-specific variable and refers to 1988. Data are from Norges Største Bedrifter (Norway's largest firms).[28] As an alternative, we classified as export-oriented any firm operating in an industry in which exports comprised at least 35 percent of domestic production.[29] Lastly, since there are no firm-specific data on import competition, we analogously classified as import competing any firms operating

28. Økonomisk Litteratur, Oslo, 1989–90.

29. Statistics Norway publishes (but does not annually update) a classification of industries into sheltered, export-oriented, and import-competing. We arrived at the 35 percent cut-point by reconstructing their classifications for 1988. The correlation between the industry-based and firm-based measures of export share is .42.

in an industry in which imports comprised at least 35 percent of domestic consumption.

Even though large firms tend to export more and have higher R&D intensities, we believe that each of these variables taps a different aspect of the incentive to lobby. The survey also asked executives how serious each of thirty-three possible problems was for their firm. Without spending unnecessary space on the details, it turns out that each variable predicts a different pattern of concerns.[30] Large firm size predicts executives perceiving problems with product development, recruiting managers, wage costs, and profitability. High export share predicts seeing problems with access to energy, exchange rate fluctuations, and competition abroad from foreign companies, and predicts seeing *less* trouble with firm organization and domestic competition from Norwegian firms (naturally enough, since these exporting firms face foreign rather than domestic competition in their markets).

On the other hand, high specificity (measured by R&D intensity) predicts problems with material costs, equipment costs, domestic and foreign competition from foreign firms, price fluctuations, and access to foreign markets. We believe these responses are consistent with our argument that firms with specific assets but facing competitive pressure found lobbying more attractive than adjustment, other things equal. The different meanings of specificity, size, and export share make controlling for the latter two necessary in order to avoid omitted variables biasing estimates of the effect of specificity.

Descriptive statistics and item intercorrelations are shown in Table 3. The correlation between the two labor specificity indicators is above 0.5, and those between labor specificity and R&D intensity are near zero. There is a strong correlation (0.5) between R&D intensity and export share.

Estimation Results

Table 4 confirms that asset specificity does significantly predict the propensity of management and labor to lobby jointly in the way defined earlier, independent of firm size and export concentration, and that this result does not depend qualitatively on which precise operational definition is chosen for contacting. Lobbying frequency is a function of both R&D intensity and measures of labor specificity, including job mobility and insider power. If one compares firms with neither R&D nor labor specificity to those with both, the probability of observing joint contacting is about two-and-a-half times greater in the latter, even after allowing for the effects of firm size and export share.

Model 1 in Table 4 is an ordered probit prediction of the three-category form of the dependent variable, joint contacting. The R&D variable has been dichotomized at about 1.3 percent to avoid the adverse impact of outlying observations. This

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30. Each of the thirty-three items was regressed on R&D intensity, firm size, and export share together. The discussion takes note of significant coefficients.

TABLE 4. *Estimation results for firm lobbying*

			Dependent variable: Joint contacting		
Explanatory variable	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*
R&D intensity	.500	.638	.397	.531	.627
	(.181)	(.199)	(.198)	(.199)	(.218)
Log firm size	.139	.177	.173	.156	.229
	(.051)	(.057)	(.057)	(.052)	(.076)
Export share	.504	.508	.666	.613	
	(.320)	(.359)	(.366)	(.241)	
Import competing				−.287	
				(.211)	
Job immobility					8.19
					(3.89)
Intercept		−1.81	−1.75		
		(.337)	(.335)		
Cut-point$_1$	1.43			1.49	.779
	(.301)			(.302)	(.719)
Cut-point$_2$	2.37			2.45	1.82
	(.319)			(.321)	(.732)
Number of observations	287	287	287	287	130
Log-likelihood	−226.1	−155.2	−158.3	−223.6	−107.7
Pseudo R^2	.07	.11	.10	.08	.10

Note: 291 total observations, 1988 survey, Norwegian School of Economics and Business Administration. Standard errors are shown in parentheses. Models 1, 4, and 5 employ the three-category version of joint contacting and are estimated with Stata's oprobit procedure; models 2 and 3 employ a dichotomy and are estimated with probit. All except model 3 use specificity variables weighted according to firm employment in the industries in which it is active. Model 3 uses specificity variables assigned according to the "highest" score for an industry in which the firm is active. Job mobility has been reversed in sign, so that high values also indicate specificity.

dichotomization yields about one-third of firms treated as "specific," which approximately matches the proportion reporting joint contacts.[31] The coefficient of R&D intensity is positive, as expected, as are the coefficients of (log) firm size and export shares; the estimated coefficients of R&D intensity and firm size are both well over twice their standard errors. Thus, big, exporting firms do tend to contact more. Yet, controlling for these factors, firms with more specific assets and thus more to lose from adjustment also are more likely to undertake joint contacting frequently. If one takes an "average" firm, which from Table 3 would be a firm with about three hun-

31. Among manufacturing firms about two-thirds are treated as having specific assets by this dichotomization. Where R&D is used without dichotomizing, its coefficient is positive but fails to achieve statistical significance. The problem is that for twenty or so firms with the highest R&D, the rate of contacting drops off. Omitting these cases and entering R&D rather than the dummy variable produces a very high *t*-value. Leaving all cases in and entering log (R&D) produces a *t*-value of about 1.7. Thus, most procedures employed to handle outlier problems produce the same (and warranted) conclusion.

dred employees that produces only for the domestic market, being one of the third or so of firms with higher R&D spending raises the probability of engaging in a "high" frequency of joint contacting from 5.7 percent to 14 percent, so the independent effect of R&D intensity, holding size and export share constant, is to more than double the propensity to lobby jointly with high frequency. The cut points, the estimated boundaries between the categories, are also separated clearly by more than two standard errors.

Models 2 and 3 replicate model 1 with alternative estimation procedures and measurements. Model 2 substitutes probit analysis of the dichotomous measure of joint contacting (in which management contacts Parliament while labor contacts either Parliament, departments, or state agencies) while using the same explanatory variables. The results are similar to model 1, and the coefficient of R&D intensity is over three times its standard error. Model 3 substitutes the "highest value" alternative measurement of R&D intensity while using the same estimation technique and dependent variable as model 2. In this case (repeating the calculation for the "average" firm) the independent effect of R&D intensity, holding size and export share constant, is to increase the propensity to lobby jointly overall by about three-fourths.

Model 4 repeats the substance of model 1 but substitutes the export orientation variable measured at the industry level and adds the variable describing those firms that face severe import competition. Measuring export orientation at the industry rather than firm level does not alter the qualitative pattern of results we describe. Firms in import-competing industries, however, are no more likely to lobby, once the firm's export share is taken into account. We do not find a significant positive relationship between import competition and contacting, whether we measure export orientation at the firm or industry level (or indeed omit that variable entirely), even when we examine subsets of cases like those with the very highest R&D scores.

R&D intensity is not the only sort of asset specificity that induces higher political activity. Model 5 reports the results of adding job immobility to model 1. Unfortunately, this variable is unavailable for more than the 132 firms engaged in manufacturing, so adding it produces large amounts of missing data and estimates based on many fewer cases. Moreover, we find that among these manufacturing firms, export share no longer predicts propensity to engage in joint contacting, though firm size has much the same effect as before. Even so, as model 5 confirms, firms characterized by job (human capital) immobility are also far likelier to engage in lobbying, even allowing for the effects of R&D intensity. The different magnitudes of the coefficients are due to the different scales on which the variables are measured. In each case the coefficient is more than twice its estimated standard error. Both aspects of specificity, R&D intensity and job immobility, have independent predictive power for political behavior.[32]

Table 5 summarizes the predictions from the job immobility equation (Table 4, model 5). Among the firms having *neither* job nor R&D specificity, the predicted

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32. The results are weaker when insider power is used instead of job immobility but still go in the expected direction.

TABLE 5. *Predicted probability of joint contact by management and labor representatives*

	Frequency of contact			
Specific assets of firm	High joint contacting	Some joint contacting	No joint contacting	Number of firms
Neither	.05	.20	.75	(48)
R&D, not labor	.11	.30	.59	(27)
Labor, not R&D	.09	.27	.64	(19)
Both	.26	.37	.37	(36)

Note: Numbers are average predicted probabilities calculated from Table 4, model 5, for high, some, and no joint contacting, respectively. Job immobility is dichotomized at its mean, .148, for the purposes of this table.

probability that both management and labor report a high frequency of joint contacting is 5 percent. With one sort of specificity, but not the other, the probability is about one in ten. But when *both* types of specificity are present, the probability of contacting by both management and labor rises to .26, more than one in four and five times the probability where neither sort of specificity is present.[33] The predicted probabilities for some joint contacting reinforce these differences. The result is that firms with *neither* sort of specificity (low R&D spending, above average job mobility) have predicted odds of about three-to-one to engage in *no* joint contacting, whereas firms with *both* sorts of specific assets have predicted odds of nearly two-to-one to engage in at least some, and maybe a lot of, joint contacting.

We have run many other versions of the results we report here, exploratory and confirmatory, and we are confident that the findings we report hold up at least qualitatively. For instance, if one were to interpret R&D as strictly a proxy for capital specificity, then our theoretical model would necessitate including the interaction between R&D intensity and indicators of labor specificity. Though this is not our preferred interpretation, we did explore many models involving such interactions. Further analysis (not shown) reveals that if we replace job immobility in model 5 with the interaction between job immobility and R&D intensity, little predictive power is gained. Moreover, other results involving interactions depend a lot on which measurements and variables are used. We found that including interactions did not substantially or qualitatively alter the predictions of the model about relative propensities toward contacting, probably because the effects estimated by probit regression are already highly nonlinear even without interactions.

33. The standard deviations of these proportions are 2 percent and 12 percent, respectively, so the difference between the two estimates is statistically as well as substantively significant. Job immobility is split at its mean for these qualitative descriptions. Holding firm size constant makes virtually no difference to the difference between these predicted probabilities.

We have used alternative estimation techniques and codings, with little effect other than what we have reported. We have better success predicting labor than management contacting when we separate the two aspects of lobbying. We have tried including other indicators of specificity simultaneously but without achieving very precise results—and, in the case of profit and wage variability, without results even close to statistical significance. However, the overall validity of the measures in terms of intercorrelations and their ubiquitous tendency to give results with expected signs is encouraging. In any case we are comfortable that the results we attribute to asset specificity—which is, after all, the central purpose of the article—are not artifacts of intercorrelations between measures of specificity and either firm size or export orientation or other possibly relevant variables for which we have been able to collect data.

Conclusions

Norway's oil boom and government decisions in the 1970s made subsidy funds available to Norwegian firms. We argued that, given the availability of funds, those firms with more specific assets faced potentially greater losses from adjusting to new activities in the face of competitive pressures and thus had greater incentives to lobby for subsidies to protect themselves. Joint contacting, reported contacting of Parliament and government on behalf of firm interests by representatives of both management and labor, should be particularly likely where firms had specific assets. We showed that asset specificity as indicated by R&D, which could be a form of physical capital specificity, and job immobility and/or insider power, which certainly indicate labor or human capital specificity, were independent predictors of joint contacting, as expected. Moreover, although firm size and export orientation were plausible alternative explanations of greater propensity to lobby and also had the expected effects, our measures of specificity predicted joint contacting independent of other explanatory variables.

Thus, the main contribution of this article is to marry the transactions costs–industrial organization literature, which has measured specificity and its consequences at the individual firm level, with the trade policy literature, which has described the political incentives of firms with specific assets extensively but never (to our knowledge) directly shown that firms actually behave as predicted. And, of course, though political science abounds with studies of lobbying, including lobbying by firms, we believe the application of trade theory and the measurements of firm characteristics we use represent a fruitful extension of a long empirical tradition.

If it is a fruitful extension, it is nevertheless only the beginning. We have identified factors that affect the incentives of the agents who lobby, but whether lobbying actually takes place also depends on the incentives of the targets of the lobbying, the Norwegian government. If this is a matter of trade policy in a small, open economy, the government would be anxious to avoid tariffs and other import restraints on Norwegian exports. Thus, the government would try to avoid industry support that is either against multilateral or bilateral trade agreements or that might mobilize politi-

cal opposition against Norwegian exports. The European Union (EU) is clearly the most important market in this respect—Norway is a member of the European Economic Space—but other larger countries count as well. Thus, the government is less likely to grant heavy subsidies to exporting industries whose products are covered by specific trade agreements or whose products compete with products from politically powerful firms or groups (like the Scottish sea farmers) in the EU and the United States. A complete model explaining lobbying should also include these incentives of the government–Parliament to respond.

The question of the incentives of those who lobby is also more complex. If both capital and labor specificity are high, the pattern of lobbying that prevails clearly depends on the effect of lobbying by one factor on the marginal productivity of lobbying by the other factor and on the extent to which lobbying by the two factors are substitutes. We have assumed that lobbying by capital and labor are complementary, perhaps because capital and labor lobby different targets (different parties, Parliament versus administration, for instance). In principle, classifying firms according to their lobbying "production functions" should be possible: that is, how support that benefits capital and labor, respectively, depends on the two lobbying inputs. Nevertheless, this question lies beyond any data we have been able to collect.

Even leaving aside these strategic issues, we have not completely modeled the institutional supply side of policy. We hasten to remind the reader that the specification we employ presupposes that firms have MPs to contact, and thus probably that there must be at least some geographic basis for representation. For instance, we do not know whether it helps a firm to be from a district whose representative is in the majority, on an important committee, or whether the state of public opinion matters. Indeed, we do not even know how important it is that representation be district-based for contacting to take place in the way we have described. Comparative research will clearly be helpful in explaining how institutions shape lobbying outcomes. Our measurement of characteristics of firms is also incomplete, since (at least) whether a firm has partial or complete public ownership, whether it sells to the public sector, the degree to which a firm is regulated, and whether firms contact directly, or through associations or parties, could all be important omitted variables. Nevertheless, we have made a good start at showing that a firm's "stake"—the alternative use value of ITC capital or the income alternatives for its workers—predicts behavior in ways consistent with both political and economic theory.

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