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Estimating Trade Policy Models:
An Empirical Study of Protection Policy in Turkey

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Abstract

This paper has two aims. A specific goal is to examine the determinants of protection policy in Turkey. A second, broader goal is to test the recent insights of the political economy models of trade policy and assess their contribution to the empirical investigation of associations between protection rate and industry characteristics. The paper develops a stylized model with the broad common features of trade policy models. Estimation of the model with Turkish data from the 1980s lends support to the framework and confirms a number of key theoretical insights. The results are also useful from a policy perspective because they shed light on key factors that underlie policymakers' choices. In particular, we find that the risk-mitigating role of trade barriers is an important factor driving government policy. The finding implies that continued move toward openness to international trade require progress in fiscal systems or domestic and international institutions that can deal with the economic insecurities generated by globalization.

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1. Introduction

This paper has two aims. A specific goal is to examine the determinants of protection policy in Turkey. A second, broader goal is to test the recent insights of the political economy models of trade policy and assess their contribution to the empirical investigation of associations between protection rate and industry characteristics. The paper develops a stylized model with the broad common features of trade policy models. Estimation of the model with Turkish data from the 1980s lends support to the framework and confirms a number of key theoretical insights. The results are also useful from a policy perspective because they shed light on key factors that underlie policymakers' choices.

A key common result of the new political economy models of trade policy is that import penetration and price elasticity of import demand act as weights in the relationship between an industry's protection rate and its political characteristics (Helpman, 1995; Esfahani and Mahmud, 1999).[1] To be specific, in equations determining protection rates, the factors that influence policymakers' preferences over industry rents should enter as interactive terms with inverse import penetration and inverse import demand elasticity with respect to price. The reasons for this pattern are simple: Higher import penetration rates indicate smaller shares of domestic output relative to demand, hence smaller total rents received by the industry for any given rise in trade barriers. Higher import elasticities mean that the deadweight losses of trade distortions are larger and the value of rents generated through policy must be weighed against larger aggregate losses. We find that adhering to the specification prescribed by theory substantially improves the explanatory power of industry characteristics in our econometric work on Turkish data.

Studies of trade policy have also offered a variety of ideas about the connection between and industry's economic and political characteristics and the politicians' eagerness to grant protection to the industry. In cases of most industry characteristics, there is no unanimity about the mechanisms at work or even about the direction of the effect (see the discussion in section 3 below). Empirical work has also produced mixed results in many cases, making it difficult to discriminate among theories (Rodrik, 1995). The improved specification of the trade policy model that we offer in this paper guides us toward more specific ideas. While we consider a wide range of views about the role of industry characteristics, the results that emerge suggest that the risk-mitigating role of trade barriers is an important factor driving government policy. This finding is particularly supported by evidence that the politicians' preference for creating rents through trade policy declines when they have access to more direct channels of providing

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[1] For surveys of the literature on the political economy of trade policy, see Hillman (1989), Magee (1994), Helpman (1995), and Rodrik (1995).

insurance to firms and workers, such as state ownership of enterprises. The evidence may seem to go against the common perception that interventionist governments tend to impose greater controls on both trade and domestic firms. But, there would be no contradiction if social insurance as a concern of policymakers becomes more central when private markets and institutions of risk management are weaker. Governments perceiving major imperfections in the risk market have an incentive to both build higher trade walls and intervene in domestic production, relying more on one in some industry and on the other in the rest. In other words, the two mechanisms may be imperfect substitutes. Indeed, this idea has been convincingly demonstrated by Rodrik (1998) who shows that more open economies build larger governments as a means of insurance against external risk.

In terms of methodology, our study builds on two recent attempts to apply the seminal theoretical contribution of Grossman and Helpman (1994) to a cross-industry analysis of non-tariff barrier (NTB) coverage ratio in the US. Both studies—Goldberg and Maggi (forthcoming) and Gawande and Bandyopadhyay (forthcoming), henceforth GM and GB, respectively—focus on the role of organized lobbies on trade policy formation and show that the impact of import penetration on protection rate is conditioned on whether the industry is a major contributor to political campaigns or not. Both studies use the four-digit industry data set developed by Trefler (1993) and complement it with import demand elasticity estimates from Shiells, Stern, and Deardorff (1986) and lobby contribution data from Gawande (1995). Our study is based on a more aggregate data set (23 two-digit industries). But, in addition to the NTB measure, it relies heavily on the effective rate of protection that gauges the height of trade barriers in Turkey more closely. The study also benefits from import price elasticity estimates based on longer time-series and more recent econometric techniques that raise the precision of the estimates. Indeed, in contrast to the studies of the US trade policy, we find that import demand elasticity substantially contributes to the explanatory power of the model. Another aspect of our study is that it considers a country with a different institutional environment, which raises new issues and helps broaden the perspective on the theory and empirics of trade policy.

Our methodology departs from those of GM and GB in an important way. Rather than focusing on lobby presence, we use a variety of factors to measure the value of an industry's rent to the politicians. As we argue below, while an organized lobby is an important element among these factors, politicians can benefit from policy-induced rents through other mechanisms as well—e.g., taxation, regulatory redistribution, and provision of social insurance. This generalization is important because it helps integrate the Grossman-Helpman model of lobby-driven trade policy with earlier empirical studies that have found correlation between trade restrictions and a host of industry characteristics.[2] Grossman and Helpman (1994) focus on the role of lobbies and abstract from other factors that affect the politicians' valuation of industry rents. Accordingly, in their regressions, GM and GB make the coefficient of output-import ratio a function of an indicator of lobby presence. They use the estimated coefficient to derive the value that politicians place on lobby contributions and find it to be surprisingly small.[3] The results are difficult to reconcile with the levels of protectionism one observes. Part of the problem may lie in the difficulty of constructing lobby indicators because all industries have some form of organization and contribute to politicians. So, determining whether some industries can be considered "unorganized" and whether the contributions of the organized ones are targeted toward trade policy are cumbersome matters.[4] The task is further complicated by the fact that lobby formation and the extent of contribution are typically endogenous.

Taking account of channels other than lobbying that make policy-induced rents valuable to the politicians can help resolve these issues. The value of industry rents would no longer be confined to political contributions, which may indeed have a small weight in policy decisions. Moreover, to the extent that variation in lobby influence on policy comes from other underlying characteristics, one may be able to carry out reasonable estimations of trade policy equation without a lobby indicator, which is difficult to define for most countries in any case. GM and GB do incorporate other factors in some of their regressions. But, they treat those factors differently from the lobby indicator and include them as linear, rather than interactive, terms. They find some of those factors to be significant, but the interpretation of the results proves difficult because the variables have no explicit role in the theoretical model that guides their econometric work.

This paper is organized as follows. Section 2 below develops the theoretical model that specifies the equations to be estimated. Section 3 describes the empirical model and the data. Section 4 presents and discusses the estimation results. Section 4 concludes.

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[2] Prominent examples of empirical work on trade policy include: Caves (1976), Ray (1981a, 1981b), Finger, Hall, and Nelson (1982), Marvel and Ray (1983, 1985), Baldwin (1985), Anderson and Baldwin (1987), Leamer (1990), Trefler (1993), Pack (1994), and Lee and Swagel, (1997).

[3] GM find that politicians value a dollar of lobby contributions less than 1/50 of a dollar of aggregate welfare. In GB, the corresponding estimate is less than 1/1751.

[4] In both studies, the estimation results imply that almost all the population must be politically organized, while the lobby dummy variables that they construct assume that about two-thirds of industries are organized.

2. A Model of Trade and Industrial Policy[5]

In this section, we build a model of trade and industrial policy in which the politicians in charge of the government use various policy instruments to influence the resource and rent allocation in an industry that produces tradables. The industry faces a given world price, p_w, for its product. The government controls the extent of competition the industry faces from abroad by setting tariff and non-tariff trade barriers whose tariff-equivalent is t, so that the domestic price reaches $p = p_w + t$ and the industry's *rate of protection* is t/p_w. A negative value of t represents an import subsidy. We will refer to t as a "tariff," although it may be a tax, a subsidy, a quota premium, an anti-dumping "injury payment," or a bribe or political contribution paid by traders to the politicians in charge of the government. To keep things simple, we abstract from the choice between various forms of transfer between the traders and the government and assume that all tariff dollars have the same composition.

Let the number of firm in the industry be N and, for simplicity, assume they are identical. Also, assume that N is exogenously given, although this assumption has no impact on the form of the trade policy equation to be estimated (see below).[6] In order to produce, each firm needs one unit of a sector-specific capital and labor (which represents other general factors as well). The production function of a firm is summarized as $\underline{x}(\ell) = A\ell^{1-\alpha}$, where A is a productivity factor, ℓ is the amount labor employed by the firm, and $\alpha \in (0,1)$ is a parameter. As in Grossman and Helpman (1994), we assume that there is a constant-returns-to-scale activity in the economy that requires labor alone with an input-output coefficient equal to 1. Letting the price of the output from this activity be the numeraire, the labor supply will be perfectly elastic at a wage rate equal to 1. This allows us to write the profit of a firm as

$$(2.1) \qquad \pi = p\underline{x} - \ell,$$

which yields the following supply function for each firm:

$$(2.2) \qquad x(p) = (A)^{1/\alpha}[(1-\alpha)p]^{(1-\alpha)/\alpha}.$$

A firm's profit then becomes $\pi = \alpha px$, which implies that α can be interpreted as the share of capital of in output.

Let the domestic demand for the product be denoted by $D(p)$, which is unbounded at $p = 0$, remains bounded and continuously declines with p in the range $(0, t_0 + p_w)$, $t_0 > 0$, and equals zero for all

[5] The model developed here builds on Esfahani and Mahmud (1999) who examine various assumptions and aspects of such models. Some of the details are left out here to keep the paper short.

[6] See Esfahani and Mahmud (1999) for an analysis of this claim.

$p \geq t_0 + p_w$. The difference between the domestic demand and the total domestic supply, Nx, is imports: $M = D - Nx$. The consumer surplus, $\int_p^\infty D(u)du$, together with industry profits, $N\pi$, and tariff revenues (including NTB premia), tM, comprise the aggregate social welfare:

$$(2.3) \qquad W = \int_p^\infty D(u)du + N\pi + tM.$$

The politicians are interested in aggregate social welfare because it brings them broad political support and holds back opposition. However, tariff revenues and industry profits that can be generated and controlled through trade policy may be more valuable to them because such rents can be directed toward more specific goals that offer them additional political or economic benefits. These additional benefits could be purely social. For example, in the absence of perfect insurance markets, increased profits may mitigate the risks faced by small and vulnerable firms. Profits also contribute to tax proceeds, which together with tariff revenues, augment budgetary resources that can be allocated to valuable public goods or can provide an opportunity to reduce other socially more costly taxes.[7] The benefits may also be more particularistic. This includes receiving part of the industry rents in the form of political contributions, collecting taxes that can be spent on politically rewarding projects, and redistributing industry rents through regulatory mechanisms to buy political support. Politicians may also have more direct interests in the generated rents through personal transfers and bribes (to the extent that such practices are feasible). Personal benefits may also be gained indirectly by first shifting rents to the government treasury through taxes and tariffs and then using the public funds for patronage or corruption. Note that it is not just industry rents and tariff that are valuable for the politicians in these ways. NTB premia can also perform the same functions: politicians may find the redistribution of NTB premia a useful tool for political or economic gain.

We normalize the politicians' utility unit to one dollar of consumer welfare and let their valuations of industry profit and tariff revenue dollars be $\tau > 1$ and $\theta > 1$, respectively. We differentiate between the valuations of these two sources of rent because the costs of controlling and targeting those rents may be different for profits and tariff revenues. Given this parameterization, the government's objective function can be written as:

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[7] Note that we are abstracting from the impact of tax and regulatory redistribution on the production decision. In other words, we are treating such redistributions as lump-sum transfers. However, complicating the model by taking account of marginal effects of redistribution does not have any substantial impact on the equation to be estimates. In

(2.4) $G = \int_p^{\infty} D(u)du + \tau N\pi + \theta tM.$

The first-order condition for the government's choice of t yields:

(2.5) $G_t = -D + \theta M + \tau Nx - \theta\mu Mt/p_w = 0,$

where $\mu = -(p_w/M)(\partial M/\partial p_w)$ is the elasticity of import demand with respect to world price. When a solution to the government's problem exists and there are positive imports, the conditions can be rewritten as:

(2.6) $\mu \dfrac{t}{p_w} = 1 - \dfrac{1}{\theta} + \dfrac{1}{\theta}(\tau - 1)z,$

where $z = Nx/M$ is the ratio of domestic output to competing imports and is inversely related to the import penetration ratio, commonly defined as $m = M/D$. We will refer to z simply as "output-import ratio."

Equation (2.6) can be seen as a generalization of the tariff equation derived in Grossman and Helpman (1994). If we set $\theta = 1$, we find $\mu t/p_w = (\tau - 1)z$, which in essence captures the Grossman-Helpman result with $\tau - 1$ corresponding to a term in their equation that reflects the value that politicians attach to lobby contributions adjusted by the presence of a lobby and the share of population that it represents. In their model, when a lobby exists, $\tau > 1$ and output-import ratio is positively related to $\mu t/p_w$, while in absence of a lobby, $\tau < 1$ and the association between z and $\mu t/p_w$ is positive. This is indeed the property that GM and GB test. Our interpretation of τ is broader and includes the political value attached to all forms of benefits that politicians may derive from industry rents (taxation, regulatory redistribution, bribes, etc.). We posit that variations in τ stem from industry characteristics that determine the structure of benefits that can be derived from its rents. Accordingly, we specify τ as a function of such characteristics. We also let θ be different from 1.

Note that (2.6) seems to contradict the repeated empirical observation that the rate of protection, t/p_w, is positively related to import penetration because $z = (1-m)/m$ (Rodrik, 1995). However, this is not necessarily the case since the import price elasticity, μ, is not exogenous and varies along with other variables:

(2.7) $\mu = \left(\dfrac{p_w}{p}\right)[(1+z)\varepsilon_{Dp} + z\varepsilon_{xp}],$

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fact, given the exogeneity assumption about the industry-specific capital, simple schemes such as proportional taxation of profits do not have any impact on production in our model.

where ε_{Dp} is the price elasticity of demand and $\varepsilon_{xp} = (1-\alpha)/\alpha$ is the elasticity of supply. Indeed, one can show that as long as τ is sufficiently large relative to θ, z and t/p_w have a negative relationship, which means a positive correlation between m and t/p_w (Esfahani and Mahmud, 1999). For example, if $\theta = \tau$, after substituting for μ, (2.7) simply becomes

$$(2.8) \qquad \frac{t}{t+p_w} = \frac{1-1/\theta}{\varepsilon_{Dp} + \varepsilon_{xp} z/(1+z)}.$$

This equation implies that after controlling for demand and supply elasticities, the rate of protection is inversely associated with z. Such a relationship exists as long as τ is not too small relative to θ.

The focus of our empirical work is the estimation of equation (2.6). The next section discusses the empirical specification of the model and the relationship of θ and τ with industry characteristics.

3. Industry Characteristics and Political Preferences: Empirical Specification

The variable that we want to explain is the protection rate, t/p_w. The left-hand side of equation (2.6) is the interaction of t/p_w with μ. We keep $\mu t/p_w$ as the dependent variable, rather than dividing both sides by μ, because this keeps the right hand-side simpler and avoids the endogeneity problem of μ, pointed out above. On the right-hand side, we have a non-linear expression in z and the determinants of τ and θ. The extent of this non-linearity may be reduced by noting that parameter θ is likely to be relatively similar across industries because a dollar of tariff revenue or quota premium *per se* should have the same value to the politicians irrespective of the commodity import that generates it. There may, of course, be some differences in the ease of collecting tariffs or generating quota premia across products, but these differences are likely to be small and unrelated to the characteristics of industries, which typically show up as the main determinants of protection. We test this assumption by exploiting the fact that in (2.6), $1/\theta$ appears by itself as an interaction with the output-import ratio, z. We examine whether the variables that interact with z show any significance when entered directly along with the interactive term. If they do not, then our assumption that θ does not vary much across industries remains reasonable and does not bias the results.

To prepare for the estimation of the model, we need to address two other issues. First, we must deal with the endogeneity of z. For this purpose, we follow the rest of the literature by viewing z as a function of factor shares (specifically, the shares of capital and labor in output) among others, including the protection rate. Factor shares are correlated with the output-import ratio because they indicate how well an industry matches the country's comparative advantage and, therefore, how well it can compete against imports independent of the policies applied to it.[8] There is, of course, some concern that protection rate may affect factor shares. But, that effect is generally considered to be secondary. Certainly, no such concern would exist if the production processes can be closely approximated by the Cobb-Douglas functional form. Assuming that this is the case, we use the 2SLS method to estimate (2.6). Because z enters non-linearly on the right-hand side of (2.6), we use capital and labor shares and their interaction with the determinants of τ as instruments of the 2SLS estimation.

The second issue is the specification of τ, which measures the value of industry rents relative to consumer surplus from the policymakers' point of view. The observable industry variables that may shape the relative value of industry rents to the politicians and for which we have data are: number of firms, sales, production, value added, employment, four-firm concentration ratio, values of exports and competing imports, wage bill, value of work subcontracted, raw materials cost, and other input costs. The values of these variables except concentration ratio and exports and imports are available separately for private and state-owned enterprises. To this list, we add a dummy indicator of industries whose product is mostly consumer goods (see Appendix Table A1). Our data set does not include an indicator of lobby presence because business associations in Turkey span across industries and firms typically find it more beneficial to engage in individualized rent-seeking (Bugra, 1994). Variation in the success of such activities across industries is either idiosyncratic, which must be left to the error term, or systematic, which must be captured in industry characteristics such as those that we include in our empirical study.

To begin with, we expect the consumer-good dummy to have a positive impact on τ and, therefore, display a positive coefficient in its interaction with z in the estimated equation. The reason is that rents generated in intermediate goods industries through protection come at the cost of lower rents in downstream industries and, therefore, are likely to be less valuable (have lower τ) than the rents in consumer-good industries that are paid by consumers, who are rarely organized to impose a similar cost on policymakers. Indeed, studies that examine the effect of consumer-goods share on protection often find it to be positive (Ray, 1981a; Marvel and Ray, 1983).

Export-orientation of an industry (measured by export share in sales) acts in the opposite direction of the consumer-good dummy. Protecting export-oriented industries tends to benefit only part of the production units in the industry and may require subsidies that impose a cost on the government budget, rather than generating revenues. In addition, such industries tend to have a larger intra-industry trade component and face a stronger threat of foreign retaliation (Finger, Hall, and Nelson, 1982; Lee and

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[8] In our model, the effects of comparative advantage are captured in the productivity factor, *A*.

Swagel, 1997; Treffler, 1993). All these effects work in the direction of lowering τ for the rents generated in industries with larger export share in sales.

Industry size, measured in various ways, has been viewed as another important determinant of protection rate. But, the direction of the theoretical effects and the reasoning behind them have varied. Some have argued that larger industries with more firms and workers face more challenging collective action problems; hence industry influence on policymakers and protection should decline with industry size (Trefler, 1993). Others have suggested that larger industries are politically more important and receive more protection (Finger, Hall, and Nelson, 1982; Lee and Swagel, 1997). The empirical evidence on the issue has accordingly been mixed, with each study finding results matching its claim. It should be noted that some of the earlier empirical findings might have been biased due to the potential endogeneity of industry size, especially when size is measured by the share of domestic value added, which is directly affected by variations in import restrictions. Another source of bias is lack of control for the import price elasticity, μ. As the discussion at the end of section 2 makes it clear, an increase in N is likely to decrease import penetration and raise μ, hence lowering t. Once one controls for μ and z, industry size can affect protection rate only if it influences the political value of a dollar of industry rent. This is the effect that we examine by experimenting with various measures of industry size (share in total number of firms, employment, and value added) included in the expression for τ. We use interactions of factor shares with other industry characteristics are less likely to be affect by the protection rate to instrument for the size measures.

In the literature on collective action, it is often suggested that the presence of a few players with large stakes may help facilitate coordination and generate results favorable to the interest group. In the context of trade models, this has been taken to imply that more concentrated industries are politically more influential and, therefore, enjoy higher protection. However, as Caves (1976) has suggested, concentration of the policy-induced rents in the hands of few firms may reduce the value of industry rents to politicians, who are interested in broader political support. In addition, concentrated industries may be more effective in defending their rents against political redistribution and, thus, reduce the politicians' interest in generating rents for such industries in the first place. These theoretical ambiguities have their counterpart in the empirical record. While Trefler (1993) observes a positive relationship, Caves (1976), Ray (1981a, 1981b), Finger, Hall, and Nelson (1982) and Anderson and Baldwin (1987) find the opposite. On the other hand, in Pack's (1994) study of Indonesian trade policy, concentration shows little significance. We consider the four-firm concentration ratio in our regressions to see whether the theory-based specification and Turkish data generate support for either side of this controversy.

Average firm size and capital intensity may also be viewed as indicators of political importance of firms and their rents for the politicians. However, these measures have frequently produced negative coefficients in studies of US trade policy. As a result, some scholars have suggested that firm size and capital intensity reflect barriers to entry, which may reduce the need for protection (Trefler, 1993). But, this view overlooks the fact that protection from foreign competition may be even more valuable to the existing firms in an industry if they do not have to worry about rent erosion due to domestic entry. We feel that the bias of protection in favor of smaller and less capital-intensive firms may be better explained by the concern of politicians over the vulnerability of such firms to external shocks. In the absence of perfect insurance markets, larger firms with more capital can weather fluctuations in foreign competition much more easily than smaller firms with less capital. As a result, there may be an unmet demand for insurance among the latter group of firms that politicians can partially address through protectionist policies in exchange for political support. We find support for this view, especially when we differentiate between state-owned and private enterprises. Since politicians can more easily deal with the vulnerability of SOEs through budgetary means, firm size and capital intensity should matter less in an industry where the smaller and less capital-intensive firms are state owned.[9] Confirmation of this effect strengthens the case for the risk-mitigating role of trade barriers. We use output, value added, and employment per firm as measures of firm size and share of capital in output as the measure of capital intensity. (Unfortunately, we do not have reliable measures of capital stock to use capital-labor or capital output ratios for measuring capital intensity.)

Many empirical studies have found the protection rate to be inversely related to the average wage rate (Finger, Hall, and Nelson, 1982; Marvel and Ray, 1983; Pack, 1994; Lee and Swagel, 1997). These studies recognize that there may be some simultaneity between wages and protection. But, one expects any feedback from protection to wages to be positive. As a result, the negative impact of the wage rate on protection is likely to be even larger than the estimates indicate. The finding has often been viewed as evidence that protection is applied in favor of industries that suffer from inefficiency and comparative disadvantage. But, there is no robust theoretical reason as to why this should be the case (Rodrik, 1995). The view also faces a challenge when confronted with Lee and Swagel's (1997) observation that when

[9] There is an interesting connection between this view of protection and the strong evidence that more open economies have larger governments. As Rodrik (1998) shows, governments of more open economies tend to increase their expenditure as a way of providing insurance for their producers. Our claim is that part of the insurance can be provided through trade barriers, which are used less for this purpose when there are more direct channels available for serving the same purpose. State ownership is an obvious channel of this kind that allows the government to use its expenditure for insurance purposes instead of applying protection.

one controls for the wage effect, protection tends to be higher in industries with higher value added per worker. An explanation for the wage-protection relationship may be found in the median voter model or the Peltzman-Becker theory of regulation, both of which suggest that redistribution from workers who are in rent-earning positions to the less fortunate ones may be rewarding for the politicians. In particular, Peltzman's (1976) analysis implies that when workers in an industry are well organized and manage to maximize their wage premia, a small reduction in their wage rate should have a second-order effect on their rents. On the other hand, raising the wage rate of workers who do not earn such premia can lead to a first-order rise in their welfare. Politicians may not be able to exploit this arbitrage directly, so they may opt to use trade policy for this purpose and favor industries with lower wage rates relative to worker productivity. The risk-mitigating view of trade policy discussed above can also offer a coherent explanation of the observed facts complementary to Peltzman's theory. Politicians may be using trade policy to protect the workers whose incomes fall relative to their productivity. Given our earlier argument that state ownership tends to reduce the need for redistribution through trade policy, both views suggest that the effect of low relative wage must diminish when it is SOEs that are paying such wages. We test these claims by including two variables in the expression for τ: (1) the ratio of wage rate to value added per worker in the industry as a whole and (2) the wage-productivity ratio among the SOEs in the industry relative to the industry average. The risk-mitigating and Peltzman-Becker theories predict the first variable to carry a negative sign and the second one, a positive sign.

Since endogeneity is a concern about the wage rate and some other variables included in the τ expression, as pointed out earlier we use interactions of factor shares with industry characteristics that are more likely to be independent as instruments. We also use a version of the Hausman test proposed by Davidson and MacKinnon (1993) to examine the significance of endogeneity for various variables. The following section describes the data and the next one discusses the estimation results.

4. Data

The data for the variables of the 23 two-digit industries included in our estimation are provided in the Appendix Table A1.[10] Table 1 provides the descriptive statistics. The data represents the situation in 1988 after Turkey had gone through a major trade policy change. The imports competing with these

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[10] We also have data for an additional industry, "beverages." But, there seems to be some problems with that data. Among other peculiarities, the price elasticity of imports turns out to have the wrong sign and the effective rate of protection is −169.21, which far away from the 0 to 6.6 range for other industries. Because of these problems, we decided to discard that observation.

industries are close to 90% of Turkey's total imports; hence the sample covers a wide range of industries directly affected by trade policy. The sources and the nature of measures used in this data set are as follows.

To measure protection rates, we use the effective rates of protection (ERP) provided by Togan (1996) and NTB coverage ratios available from the data set of Lee and Swagel (1997). NTB coverage ratio represents the share of an industry's competing imports that are subject to some form of non-tariff trade barrier. As a result, the ratio ranges between 0 and 1. Although to some extent this variable indicates the height of the protection wall, it is an imperfect measure. Moreover, as Table A1 shows, practically there are only three industries in our sample that have an NTB coverage ratio less than one. As a result, the NTB coverage ratio is not very informative about trade policy in Turkey and we rely mostly on ERP to gauge variations in trade policy across industries. Nevertheless, there may be some useful information in NTB coverage ratios. To exploit that information, we formed weighted averages of ERP and NTB by first multiplying NTB by 1.5, which makes its sample average equal to that of ERP and then applying weights to them that add up to one. In the next section, we report the results for case where the applied weights are equal (which means that the protection rate measure is calculated as 0.5ERP+0.75NTB). As it will become clear, varying the weight does not have much effect on the results. Although NTB is a censored variable, we do not apply the limited dependent variable techniques to the regressions that include NTB because overwhelming share of variation comes from ERP, which is an unlimited variable. We also experiment with the nominal tariff rates from Togan (1996) and Krueger and Aktan (1992).[11]

Data on the values of merchandise imports and exports in terms of current U.S. dollars were obtained from United Nations Trade SITC Revision 1 Database for 3-digit SITC commodity groupings. We used the parallel exchange rate from IMF's *Financial Statistics Yearbook* to convert domestic import and export values into domestic currency. The export share variable was formed by dividing the value of exports by the total sales of each industry. The measure for the output import ratio, z, was created as the ratio of the value of domestic production to imports competing with each industry. The data for industry sales, employment, number of firms per industry, input, output, value added, and input and factor costs all came from Turkey’s State Institute of Statistics (*Annual Statistical Compendiums*, various years).

[11] Tariff rates are reported inclusive of customs duties, municipality, wharf and production taxes, stamp duties, guarantee deposits and charges for Turkey's Support Price and Stabilization Fund.

These data distinguish between private and public firms.[12] Four-firm concentration ratios were obtained from the State Planning Organization, Republic of Turkey.

Finally, the data for price elasticity of import demand, μ, is based on Esfahani and Leaphart (1999). We use the short-run (one-year) price elasticity estimates offered by that study because in the model, μ is defined as the import price elasticity for a given level of specific assets and such assets can be reasonably assumed fixed for periods of one year or so.[13] All the elasticity estimates have the correct sign (positive according to our definition) except the one for petroleum and coal products, which is an insignificant number with the wrong sign. Since Turkey does not have much oil and coal resources of its own, its demand for energy imports is almost the same as the domestic demand, which tends to be relatively inelastic in the short run. Therefore, it is seems reasonable to assume that the true import price elasticity for oil and coal products is very small. We replaced that elasticity estimate with a positive number very close to zero. We experimented with different small values and with dropping the observation altogether. None of the experiment showed any major change in the results. Here we only report the estimates that include the petroleum and coal industry with $\mu = 0.01$.

[12] In three industries (namely, furniture and fixtures, fur and leather, and rubber products), the data does not distinguish between public and private firms. In order to retain these industries in regressions that involved public firms variables, we replaced missing values of those variables with sample averages.

[13] Fixed specific assets is assumed in the model of section 2. But, the result applies when asset formation is endogenous but subject to government interventions through industrial policies (Esfahani and Mahmud, 1999).

Table 1
Summary Statistics of Variables Included in Estimation

Variable	Mean	Standard Deviation	Minimum	Maximum
μ	1.1201	0.7552	-0.0760	3.2190
ERP	1.3871	1.5354	0.0002	6.5791
Nominal Tariff Rate	0.5726	0.2290	0.2310	1.0100
NTB	0.9161	0.2523	0.0250	1.0000
z	85.0366	371.8901	0.1412	1790.4890
Consumer Good Dummy	0.3043	0.4705	0.0000	1.0000
Export Share in Sales	0.1840	0.1535	0.0149	0.5767
Log(Share of Employment)	-3.7659	1.1906	-5.4771	-1.5575
Concentration Ratio	0.4381	0.1627	0.2010	0.9508
Log(VA per Firm)	-0.2539	0.8702	-1.8249	1.1403
Capital Share in Output	0.2917	0.08.44	0.1271	0.4600
Labor Share in Output	0.0774	0.0312	0.0123	0.1531
Log(Wage Rate Relative to Sample Average)	-0.0159	0.2719	-0.5137	0.4861
Log(VA per Worker)	-0.1005	0.5234	-0.9949	1.1817
Log(Share of SOEs in Employment)	2.9854	0.9438	0.4824	4.0587
Log(Share of SOEs in No. of Firms)	1.6225	0.9464	-0.4005	2.9497
Log(SOE VA per Firm Rel. to Ind. Ave.)	0.8385	0.7569	-0.8825	2.6629
SOE Capital Share in Output Rel. to Ind. Ave.	0.8648	0.2657	0.4004	1.4476
SOE Labor Share in Output Rel. to Ind. Ave.	2.0689	0.7993	0.7832	4.1417
Log(SOE Wage Rate Rel. to Ind. Ave.)	0.0141	0.2100	-0.5845	0.2778
Log(SOE VA per Worker Rel. to Ind. Ave.)	-0.5243	0.4542	-1.5022	0.1594

5. Analysis of the Estimation Results

Tables 2a and 2b summarize the results of estimation with different specifications. Some of the variables discussed in section 3 are not shown in these tables because they either did not display much significance when included among the right-hand side variables or were merely alternative measures for the variables already included. We will discuss the implications of the experiments with such variables below.

We begin the presentation of the results with column (1) of Table 2a where we report the OLS regression of ERP (without the import price elasticity weight) on measures of import penetration (output-import ratio, *z*), consumer-good dummy, export orientation (export share in sales), concentration ratio, firm size (log of value added per firm), capital intensity (capital share in output), and the wage-productivity effect (log of wage-labor productivity ratio). Separating wage and productivity variables produces statistically significant coefficients of almost equal size with opposite signs for the two variables in all regressions. Given the implications of the Peltzman-Becker and risk-mitigation theories and given the need for parsimony in estimation, we focus on the combined form of the two variables. Wald tests for this restriction sanction such a specification. Using alternate measures of firm size (output per firm or employment per firm) does not change the results in any substantial way. Measures of industry size do not show much statistical significance and are not included in the reported regressions.

Although the benchmark model of column (1) accounts for more than 60 percent of the variation in the protection rate, its explanatory power as indicated by the adjusted R^2 is limited. Moreover, among the included variables only three—namely, consumer-good dummy, firm size, and the wage-productivity ratio—reach tangible levels of statistical significance. The regression may also exaggerate the power of the benchmark model because its does not deal with the potential endogeneity problem of some of the variables. In any event, the signs of the coefficient from this preliminary estimation indicate that trade policy tends to protect consumer good producers, smaller firms, and workers with low wages relative to their productivity. These observations agree with many earlier findings in the contexts of other countries. They support the view that insurance concerns and the Peltzman-Becker effects may play central roles in the structure of trade policy. They also indicate that the rent tradeoff in protection of intermediate goods is important.

As a second step, we examine the role played by the presence SOEs in the industry. As discussed in section 3, inclusion of SOE variables can particularly shed light on the relevance of the risk-mitigation view of trade policy. We are also interested to see whether such variables can enhance the explanatory power of the model. To these ends, we extend the benchmark model to include variables that show the relative position of SOEs in each industry: shares of SOEs in output, value added, and employment and the average capital share, size, and wage-productivity ratio of SOEs relative to the corresponding industry averages. Among these variables, only the last three proved resilient and these are the ones that we show at the bottom of Table 2a.[14] Model (2) is again estimated by OLS and does not deal with

[14] We do not have share of SOEs in industry exports or other characteristics to examine the role of SOEs in additional dimensions.

endogeneity problems. It signifies the value of considering the differential roles of SOEs because the new variables improve the fit of the regression. In particular, export share that was previously insignificant now proves more consequential with a negative effect on trade barriers. It is important to keep in mind that any feedback from trade policy to the relative position of SOEs is likely to be smaller than the feedbacks to variables such as wage rate and firm size. As a result, the improvement in fit of the model is unlikely to be caused by reverse causation from protection to SOE variables.

The estimated coefficients of relative firm size, capital share, and wage-productivity ratio of SOEs indicate that state-ownership tends to diminish the Turkish politicians' preference for redistributing rents through trade policy in favor of workers earning lower relative wages and smaller firms with lower capital intensity. This result survives the changes in specification and estimation that we introduce below. The findings support the view that when politicians have more direct control over firms, they may provide insurance to their constituencies more effectively through mechanisms other than trade policy.

We proceed by addressing the endogeneity issue in the regressions. Model (3) is a re-estimation of model (2) with instruments used for *z*, value added per firm, and the wage-productivity ratio. The instrument for *z* is labor share in output and the one for the wage-productivity ratio is the interaction of labor share with the relative SOE wage-productivity ratio. For firm size, we provide instruments by interacting the concentration ratio with labor and capital shares. As pointed out earlier, factor shares are commonly believed to be relatively exogenous to trade policy. Also, the concentration ratio is likely to remain relatively unaffected by feedback effects from trade policy. The independence of the indicators of SOEs' relative position in each industry is reasonable in the context of Turkish economy during the late 1980s because there had been little change in SOE conditions during the decade when trade policy underwent major changes.

The coefficients of the variable for which we are instrumenting in model (3) are likely to be suffering from an upward bias in the OLS estimation because higher trade barriers are likely to raise domestic output-import ratio, value added per firm, and the average wage rate. Since these variables have negative coefficients in model (2), the application of IV method should make the coefficients more negative. This is, indeed, the case for the three variables, whereas the coefficients of the other variables all rise. This observation suggests that the instruments are working in the right direction. Other than this, the estimation results are not very different from what we had in model (2) except that using instruments, naturally, reduces R^2 and the significance levels of the estimated coefficients.

Table 2a

Estimation Results: Linear Model

(*p-Value Given in Italics Below Each Coefficient Estimate*)

Model	(1)	(2)	(3)	(4)
Dependent Variable	ERP	ERP	ERP	μERP
Method	**OLS**	**OLS**	**IV**	**IV**
R^2	0.6231	0.7386	0.6597	0.7996
Adjusted R^2	0.4473	0.5209	0.3761	0.6326
Constant	0.1677	-4.2740	-6.4960	-19.7128
	0.9256	*0.2602*	*0.2538*	*0.1218*
z	-0.0009	-0.0002	-0.0005	0.0007
	0.2538	*0.7706*	*0.7847*	*0.8708*
Consumer-Good Dummy	2.7099	4.4087	4.6599	17.2371
	0.0085	*0.0022*	*0.0120*	*0.0003*
Export Share in Sales	-4.0573	-7.5096	-8.0936	-36.4989
	0.1633	*0.0284*	*0.0493*	*0.0007*
Concentration Ratio	0.3720	1.0664	1.9249	10.4780
	0.8668	*0.6548*	*0.5068*	*0.1139*
Log(VA per Firm)	-1.0204	-1.3168	-2.1014	-6.5140
	0.0342	*0.0102*	*0.0442*	*0.0078*
Capital Share in Output	3.6357	0.6084	2.3872	-5.2205
	0.3679	*0.8801*	*0.6715*	*0.6712*
Log(Wage Rate/VA per Worker)	-3.1721	-4.4270	-5.5215	-21.8381
	0.0148	*0.0196*	*0.0433*	*0.0015*
Log(SOE VA per Firm/Industry VA per Firm)		0.8250	0.9712	4.1982
		0.1158	*0.1296*	*0.0074*
SOE Capital Share in Output/ Industry Capital Share in Output		3.0365	3.8243	10.1405
		0.2531	*0.3731*	*0.2834*
Log[(SOE Wage /Labor Prod.)/ (Industry Wage/Labor Prod.)]		3.3413	4.2143	15.0586
		0.0581	*0.1317*	*0.0214*

Table 2b
Estimation Results: Non-Linear Model
(*p-Value Given in Italics Below Each Coefficient Estimate*)

Model	(5)	(6)	(7)	(8)
Dependent Variable	ERP	μERP	μ(0.5ERP+0.75NTB)	μ(Nom. Tariff)
Method	**2SLS**	**2SLS**	**2SLS**	**2SLS**
R^2	0.7308	0.9598	0.9483	0.6911
Adjusted R^2	0.5064	0.9262	0.9052	0.6616
Constant	1.1503	0.5870	0.7222	0.4412
	0.0416	*0.3685*	*0.1061*	*0.0761*
z	-0.8582	-2.4272	-1.5128	-0.1066
	0.0647	*0.0015*	*0.0024*	*0.6309*
***z**(Consumer-Good Dummy)**	0.6945	2.4211	1.5059	0.3095
	0.0014	*0.0000*	*0.0000*	*0.0010*
***z**(Export Share in Sales)**	-1.6020	-6.0571	-3.9596	-0.8853
	0.0497	*0.0000*	*0.0000*	*0.0138*
***z**(Concentration Ratio)**	-0.0522	2.0366	1.1054	0.3964
	0.9416	*0.0299*	*0.0699*	*0.2145*
***z**Log(VA per Firm)**	-0.2721	-0.9079	-0.4045	-0.0549
	0.0307	*0.0000*	*0.0003*	*0.2449*
***z**(Capital Share in Output)**	-0.1763	-1.6277	-1.1856	-0.4058
	0.8064	*0.0595*	*0.0419*	*0.1791*
***z**Log(Wage Rate/VA per Worker)**	-0.6357	-3.0450	-1.7666	-0.4824
	0.1262	*0.0000*	*0.0001*	*0.0117*
***z**Log(SOE VA per Firm/ Industry VA per Firm)**	0.0526	0.4626	0.3666	0.1150
	0.6142	*0.0066*	*0.0019*	*0.0416*
***z**(SOE Capital Share in Output/ Ind. Capital Share in Output)**	0.7776	1.5654	1.0632	-0.0403
	0.2011	*0.0337*	*0.0314*	*0.8671*
***z**Log[(SOE Wage /Labor Prod.)/ (Industry Wage/Labor Prod.)]**	0.5255	1.7003	1.1719	0.2395
	0.0205	0.0001	0.0001	0.0394

Our next three steps consist of introducing the new elements in the theory of trade policy, namely the interaction of μ with t/p_w and z with the determinants of τ. Column (4) of Table 2a reports the consequence of changing the dependent variable by multiplying it by μ, while keeping the specification of the right-hand side and the instruments the same as in model (3). The purpose is to see whether the import price elasticity plays any role of its own in trade policy. The outcome is an endorsement of this aspect of the theory because the significance levels of coefficient estimates as well as the adjusted R^2 rise sharply. GM and GB also account for import price elasticity, but they rely on elasticity estimates that are very noisy and do not produce as much support for trade policy models.

To examine the consequences interacting the determinants of τ with z, in model (5) of in Table 2b we do so while reverting to ERP (rather than μERP) as the dependent variable. For this estimation, we change the instruments because z, for which we need to use instruments, interacts with all other variables. To deal with this issue, we form an instruments list from interactions of capital and labor shares in output, which are the most significant determinants of z, with the consumer-good dummy, export share, concentration ratio, capital share, log of relative SOE value added per firm, and relative SOE capital share. We leave out the relative SOE wage-productivity ratio from the instrument list because the sample is small and additional variables bring the instruments closer to spanning entire data space. This means that we are also instrumenting for wage-productivity ratio as well with interaction terms of other characteristics. The estimations can be repeated with other SOE characteristics being replaced with the wage-productivity variable. The results for each variable can then be compared with the case when it is in the instrument list to test for endogeneity (conditional on other SOE characteristics being independent). We use this possibility to check whether there is a disproportionate bias in any one of coefficient estimates for SOE variables. The results proved robust to such tests. (Also, see below for further tests.)

The outcome of model (5) is again an improvement over model (3). However, as model (6) of Table 2b shows, it is the inclusion of interactive terms for both μ and z prescribed by the theoretical model that produces a quantum jump in the explanatory power of the model and in the precision of coefficient estimates. This we take as a clear endorsement of the theoretical insights of the new political economy models of trade policy. Model (6) also confirms the earlier observations about the role consumer vs. intermediate goods, export share, firm size, and wage-productivity ratio. However, concentration ratio, industry capital share, and SOE capital share relative to industry average now display significant coefficients as well. Concentration ratio has a positive sign, supporting the hypothesis that the presence of a few large firms makes it easier for politicians to benefit from industry rents. Capital intensity has a negative effect on τ, but only to the extent that it originates outside SOEs. This finding strengthens the case for the risk-mitigation hypothesis already supported by the finding that trade policy tends to redistribute in favor of small firms and low paid workers outside SOEs.

Models (7) and (8) in Table 2a show the result of estimation with 0.5ERP+0.75NTB and nominal tariff as the measures of protection rate. The experiment with the addition of NTB coverage ratio shows no change in the conclusions of the analysis. The nominal tariff model is weaker and its coefficient estimates display lower significance levels, but in most cases the signs remain the same. Using nominal tariffs, of course, poses the problem that the negative effects of protection at the intermediate stages of production are not incorporated into the model.

We carried out three further sensitivity tests. First, we were concerned that because of the small sample and large variations in some of the variables such as z the results may be driven by a few outliers. We dealt with this concern by dropping observations one at a time and watching for substantial changes in model (5) and model (6) estimates. The results proved robust to this test. Second, we conducted further endogeneity tests for SOE characteristics by using the share of raw materials in output, RMS, as a new independent variable. Since RMS is a determinant of z (like capital and labor shares), for each SOE variable s, we regressed sz on the instrument list of model (5) and the interactions of raw materials shares with consumer good, export share, concentration ratio, and industry capital share measures. We then included the residual from this regression in model (5) and tested the significance of its coefficient. This procedure did not reject our assumption that the relative position of SOEs in each industry can be treated as exogenous in the situation prevailing in Turkey during 1980s.

The third test concerned the assumption that that θ is constant across industries, which permitted us to reduce the non-linearity of the model. If θ is a function of industry characteristics, then the term $1-1/\theta$, which is measured by the constant in the models of Table 2b, should vary across industries. A test that can falsify our maintained hypothesis is the inclusion of industry characteristics as additional linear terms in model (5). Because our sample is small, we add such terms one by one and use their t-statistics as the test score. Again, no significant coefficient was produced in these tests.

Finally, it is interesting to examine the values of θ and τ. Unfortunately, the constant is not estimated very accurately in models (5). But its value is close to the estimate from (6), which is somewhat better estimated. Using the point values from models (5) and (6) yields values of 2.4 and 3.6 for θ. This implies that politicians may be valuing a dollar of tariff revenue and quota premia about three times as much as a dollar of consumer welfare. The value of τ is industry specific and depends on the estimate of θ. The point estimate for $(\tau-1)/\theta$ ranges between -0.55 and $+2.93$ in the two regressions. The estimates are mostly clustered in the 0 to 0.5 range and yield cross-industry mean value of 0.242 in model (5) and 0.166 in model (6), which are not significantly different from 0. Using the point estimates of θ, both models yields mean values of about 1.60 for τ. This suggests that in the 1980s tariff revenues may have been valued much more than industry rents. Although our estimates for τ and θ lack accuracy, the average values that we find seem quite realistic. It is notable that our results differ sharply from the almost negligible values that GM and GB find for the valuation of political contributions in the US.

6. Concluding Remarks

We have examined the determinants of protection rates for twenty-three industries in Turkey and tested a political economy model of trade policy. The specification that the model prescribes for the relationship between protection rate, import price elasticity, import penetration, and the determinants of rent valuation by politicians fits the data much better than other specifications common in the empirical trade policy literature. The results also strongly support the view that politicians use trade policy as a mechanism to deal with imperfections in insurance markets. Specifically, they seem to value policy induced rents more when such rents go to industries where workers are paid less relative to their productivity and firms are smaller and less capital intensive. The case is particularly strengthened by our finding that protection is reduced when such characteristics originate in SOEs, which can receive insurance more easily with direct means such as fiscal transfers. Industries with higher concentration, oriented toward domestic markets, and selling mostly to consumers also seem to be in stronger positions to receive protection from foreign competition.

Our evidence from micro data concerning the importance of social insurance in trade and industrial policies in Turkey is closely related to Rodrik's (1998) finding that government expenditure rises with openness. Both studies imply that protectionism is used for mitigating international risks, though it is an imperfect substitute for fiscal tools. Rodrik's empirical analysis shows that governments that find it too costly to keep their economies closed address the insurance problem by increasing their expenditure. Our observations complement that result by showing that when there is an established mechanism for fiscal support of firms in an industry, the government has less incentive to offer protection from imports. These observations imply that the development of fiscal systems and the rise of financial and insurance institutions must have played a key role in the decline of trade barriers around the world during the past few half a century. The view also sheds light on the reasons behind the reluctance of many low-income countries with weak institutional capabilities to dismantle their protectionist walls, while middle-income countries have been showing greater eagerness to liberalize as their markets and institutions have developed. As Rodrik (1998) notes, continued move toward openness of countries to international trade may require progress in fiscal systems or domestic and international institutions that can deal with the economic insecurities generated by globalization.

Appendix: Table A1
Turkish Industry Data, 1988

Industry	SITC Codes	Consumer Good	ERP	Nominal Tariff Rate	NTB	μ	*z*
Chemicals	512 - 571, 599	0	0.6661	0.6040	0.8020	1.2840	3.8394
Elec. Machinery	722 - 729	0	1.0994	1.0100	1	0.6270	2.1668
Food	0 - 100, 411, 421, 422. 431, 221	1	3.4676	0.3200	0.2432	1.7010	12.8267
Furni. & Fixtures	812, 821	1	6.5791	0.7700	1	3.2190	7.1139
Fur & Leather	211, 212, 611 - 613	0	0.5546	0.5600	1	1.0800	0.4218
Fabr. Metal Products	691 - 698	0	3.8868	0.7700	1	0.7900	8.2077
Footwear	851	1	0.7482	0.4390	1	0.6880	34.2661
Glass Products	664, 665	1	2.3868	0.7440	1	0.9120	8.6560
Iron & Steel	281, 282, 671 - 679	0	0.5744	0.4100	1	0.0860	3.5234
Non-Electric Machinery	711 - 719	0	1.0766	0.7100	1	0.9640	1.0402
Non-Ferrous Metals	283, 284, 681 - 689	0	0.5969	0.4700	1	0.4650	1.5625
Non-Met. Minerals	271, 276, 661 - 667	0	0.6451	0.3300	1	1.3770	13.1994
Other Non-Met. Minerals	667	0	0.6451	0.3300	1	1.3180	1790.4886
Other Manufactures	891, 894 - 899	1	0.9244	0.9100	1	0.3930	0.5834
Petroleum & Coal	321, 331, 332	0	0.0002	0.2900	1	–0.0760	0.1412
Plastic Products	581, 893	1	3.1020	0.6350	1	0.9490	1.7314
Paper Products	251, 641, 642	0	0.4005	0.4100	1	1.0860	4.9409
Printing & Publishing	892	0	0.2700	0.3560	0.0250	1.1400	33.7414
Prof. & Scien. Equipment	861, 862, 864	0	1.0994	0.9100	1	0.7660	0.4212
Rubber Products	231, 621, 629	0	0.6807	0.5600	1	1.1130	5.9738
Transport Equipment	731 - 735	0	0.9900	0.8800	0.9999	2.4070	5.7465
Textiles	261, 262, 651 - 657, 263 - 267	1	1.1450	0.5200	1	2.4560	11.2026
Wood and Cork	241 - 244, 631 - 633	0	0.3647	0.2310	1	1.0170	4.0463

Table A1 (continued)
Turkish Industry Data, 1988

Industry	Export Share in Sales	Log(Share of Employment)	Concentration Ratio	Log(VA per Firm)	Capital Share in Output	Labor Share in Output	Log(Relative Wage Rate)	Log(VA per Worker)
Chemicals	0.1081	-2.7858	0.5086	1.1403	0.3662	0.0450	0.3995	0.8796
Elec. Machinery	0.1840	-3.0720	0.4939	0.0897	0.2743	0.0751	0.2117	0.1429
Food	0.3854	-1.9738	0.3234	-0.5404	0.2187	0.0508	-0.3068	-0.3729
Furni. & Fixtures	0.1251	-5.2202	0.2871	-1.0982	0.3871	0.0760	-0.4615	-0.3854
Fur & Leather	0.0618	-5.4771	0.4341	-1.8249	0.1767	0.0545	-0.5137	-0.7886
Fabr. Metal Products	0.0944	-3.1098	0.3059	-0.7030	0.3226	0.0876	-0.0664	-0.2235
Footwear	0.1908	-5.1241	0.3969	-1.2400	0.1706	0.1531	-0.0581	-0.9949
Glass Products	0.2287	-4.1287	0.5020	1.0640	0.4600	0.1029	0.2864	0.2624
Iron & Steel	0.2450	-2.6898	0.3913	0.8271	0.2623	0.0510	0.2541	0.3426
Non-Electric Machin.	0.1329	-2.8315	0.5602	-0.2709	0.2465	0.0844	0.0792	-0.1523
Non-Ferrous Metals	0.2331	-3.7519	0.5408	0.6807	0.3722	0.0508	0.0299	0.4186
Non-Met. Minerals	0.1403	-2.4537	0.3205	-0.0689	0.4254	0.0877	-0.0187	0.0255
Other Non-Met. Min.	0.0241	-2.8924	0.2283	-0.4473	0.3975	0.0828	-0.0954	-0.0590
Other Manufactures	0.5767	-5.2378	0.4579	-1.6756	0.2481	0.1134	-0.3235	-0.8625
Petroleum & Coal	0.5358	-5.4013	0.9508	1.1293	0.1272	0.0123	0.4861	1.1817
Plastic Products	0.3590	-4.2825	0.3027	-0.9591	0.2153	0.0494	-0.2065	-0.2338
Paper Products	0.0621	-3.7760	0.4805	0.1484	0.3068	0.0652	-0.0952	-0.0896
Printing & Publishing	0.0149	-4.2170	0.4361	-0.4903	0.3089	0.0949	0.1792	-0.0536
Prof. & Scien. Equip.	0.0976	-5.4768	0.6916	-1.0093	0.3109	0.1398	-0.0056	-0.5169
Rubber	0.0833	-4.2169	0.3851	0.0503	0.3322	0.0680	0.2527	0.2944
Transport Equip	0.0334	-2.7371	0.5462	0.3927	0.2766	0.0789	0.1485	-0.0721
Textiles	0.2415	-1.5575	0.2010	-0.0480	0.2651	0.0917	-0.1539	-0.4735
Wood and Cork	0.0745	-4.2023	0.3311	-0.9869	0.2400	0.0657	-0.3888	-0.5817

Table A1 (continued)
Turkish Industry Data, 1988

Industry	Share of SOEs in Employment	Share of SOEs in No. of Firms	Log(Rel. SOE VA per Firm)	Rel. SOE Capital Share in Output	Rel. SOE Labor Share in Output	Log(Rel. SOE Wage Rate)	Log(Rel. SOE VA per Worker)
Chemicals	3.4308	2.0281	1.5487	1.2733	0.9264	-0.1420	0.1461
Elec. Machinery	2.2343	0.8459	0.6582	0.8974	2.9402	0.1002	-0.7302
Food	3.6198	2.9497	0.1691	0.8225	1.6841	0.0358	-0.5010
Furni. & Fixtures	3.3131	2.0919	0.9029	0.9656	1.6436	0.0240	-0.3184
Fur & Leather	3.3131	2.0919	0.9029	0.9656	1.6436	0.0240	-0.3184
Fabr. Metal Products	1.9066	0.0583	1.4829	0.8474	2.0540	0.2631	-0.3654
Footwear	3.9827	2.3026	1.4602	0.5537	1.7856	0.2591	-0.2198
Glass Products	1.6677	0.9670	-0.8015	0.7182	2.6818	-0.5845	-1.5022
Iron & Steel	4.0303	1.2920	2.6629	1.3097	1.6482	0.1139	-0.0754
Non-Electric Machin.	3.2873	1.7951	0.5723	0.4932	2.6244	0.0801	-0.9198
Non-Ferrous Metals	4.0335	1.9974	1.4210	1.0539	2.0798	-0.0452	-0.6152
Non-Met. Minerals	1.3244	-0.2231	0.6219	0.8504	2.7559	-0.0724	-0.9256
Other Non-Met. Min.	3.0559	1.9755	1.0903	0.8171	1.1394	0.2778	0.0098
Other Manufactures	2.1983	0.4637	1.0403	0.4004	2.2055	0.1544	-0.6943
Petroleum & Coal	3.2899	2.7726	-0.8825	0.8411	3.3804	-0.2427	-1.3998
Plastic Products	0.4824	-0.4005	1.0423	1.4476	0.7832	-0.3732	0.1594
Paper Products	4.0587	2.4493	1.0908	0.8995	1.5153	-0.1101	-0.5186
Printing & Publishing	2.8338	2.0149	-0.0121	0.6643	2.3822	-0.0075	-0.8310
Prof. & Scien. Equip.	3.4980	1.7156	1.3520	0.7860	2.6927	0.2641	-0.4304
Rubber	3.3131	2.0919	0.9029	0.9656	1.6436	0.0240	-0.3184
Transport Equip	3.3131	1.7246	0.4260	0.5530	4.1417	-0.0326	-1.1625
Textiles	2.7285	1.3888	0.8271	0.6006	1.8731	0.2107	-0.5126
Wood and Cork	3.7481	2.9253	0.8066	1.1643	1.3595	0.1035	-0.0162

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