A Theory of Trade Policy Under Dictatorship and Democratization

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Abstract: This paper develops a new model of trade policy under dictatorship and democratization. The paper makes two contributions. One is to provide a deeper understanding of the relationship between political institutions and economic performance by studying the endogenous interaction between the form of government and trade policy. If a ruling elite own a factor that is scarce then democratization goes hand in hand with trade liberalization and an increase in economic efficiency, as argued by classical scholars. But if the elite own an abundant factor then democratization is accompanied by an increase in protectionism and a reduction in efficiency. The paper also characterizes the circumstances under which a dictatorship can use trade policy to forestall democratization. The paper’s second contribution is to show how trade policy can be manipulated to maintain the status quo in the face of world price shocks, thus opening the door to a re-examination of trade policy responses to technology shocks. The model is used to explain an interesting episode of trade policymaking between 1815 and 1846, during which time Britain substantially liberalized trade while Prussia, on the other side of the grain market, significantly increased protectionism. It is also used to shed light on the wide-spread imposition of export restrictions in response to the 2007-08 food crisis.

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1. Introduction

There is a growing consensus that institutions play important roles in the determination of economic performance, where performance is measured by economic efficiency and equity, but our understanding of these roles is far from complete. Following North (1981), the main focus of attention has been on economic institutions that define and enforce contracts and property rights, although the regulation of entry, financial markets and technology are also regarded as important (La Porta, Lopez-de-Silanes, Shleifer and Vishny, e.g. 1997, 1998, Acemoglu, Johnson and Robinson, e.g. 2001, 2002, Rodrik, e.g. 2007). This ‘macroeconomic institutions literature’ has shown that countries with better rule of law and more private property rights have on average grown faster, where faster growth is associated with better allocative efficiency. At the same time, in their literature review Besley and Jayaraman (2010) point out that “... there is clearly a great deal of heterogeneity in institutions as well as in outcomes associated with a given institutional metric.” The literature on the interaction between economic institutions and international trade provides some insight into how such heterogeneity can arise, by arguing that poor institutions can be a source of rent for some groups while institutions can also be a source of comparative advantage. Consequently, the welfare consequences arising from the interaction between economic institutions and international trade are shown to be ambiguous (Levchenko 2007, 2013, Nunn 2007, Costinot 2009).

The first contribution of the present paper is arrived at by shifting the focus away from economic institutions and towards the efficiency and equity implications of an important political institution: Whether the form of government is dictatorship or democracy. We will focus in particular on how the form of government interacts with the endogenous determination of trade policy to determine economic efficiency. Classical scholars recommend that democratization and trade liberalization go hand in hand on efficiency grounds. Building on the point that international trade is efficiency enhancing, Smith (1776) argues that democracy helps to support harmonious international economic relations, of which international trade is a central pillar. Yet more recent work in political science has argued that democracy may also empower distributional coalitions with intense interests, making higher levels of protectionism more likely (Garrett 2000: 973). Both possibilities have found support in empirical research (O’Rourke and Taylor 2006, Decker and Lim
The ambiguity in measured outcomes may be arising, at least in part, from the fact that there is no well-accepted theoretical framework or set of basic results on the relationship between the form of government, trade policy, and economic efficiency. This paper is an attempt to provide such a framework and to analyze its main implications. The key insight that emerges from the analysis is that, like for economic institutions, the outcomes for political institutions are heterogeneous and that comparative advantage plays a decisive role in governing the outcomes.

The paper’s second contribution is to examine the trade-policy responses by dictatorial regimes to price shocks. Throughout history the advent of price shocks, especially food price shocks, has been one of the main triggers of unrest provoking challenges to dictatorships. Yet price shocks cannot be analyzed in most of the models that endogenize the form of government since these tend to be based on single sector macro models and so have been overlooked in the prior literature. Since our model has the underlying structure of an international trade model with two sectors, price shocks can be analyzed in a natural way. Given that price shocks can be triggered by technology shocks, the implication of technology shocks for political stability can and will be analyzed as well. Thus our model makes it possible to consider the implications of price shocks and sector-specific technology shocks for political stability.

The model that we will develop combines a standard $2 \times 2$ Heckscher-Ohlin (H-O) model of international trade and protection with Acemoglu and Robinson’s (2000) model of the form of government (henceforth referred to as AR). The combination of these two models extends each in a non-trivial way to provide a new political-economy model of trade policy-making, which yields new insights that would not be available from either of the original models on their own.

The underlying economic model is of a country at the relatively early stages of development. Initially a ruling elite controls the national government outright, with the focus here being on their control over trade policy. In the stylized setting of a two-factor two-good model, we will assume that the elite own one factor while the rest of society own another. This is a reasonable assumption for a less developed country, where factor ownership tends to be highly polarized and factor markets poorly functioning. Think for concreteness of the elite owning land or capital while the rest of society own only labor.
Since the underlying production structure is given by the H-O model, the standard results of new classical trade theory apply. As predicted by the Stolper-Samuelson theorem, the owners of the abundant factor prefer a relatively open trade regime while the owners of the scarce factor prefer a regime that is more protectionist. We will consider situations where the elite own the scarce factor and the abundant factor respectively.

A natural question regarding the model’s set-up is whether it would be more reasonable to incorporate income taxes as well as trade taxes. In seeking to isolate the relationship between the form of government, trade policy, and economic efficiency in the face of price shocks, it makes sense to assume that no other policies are available. In addition this assumption has firm foundations in the data, since countries at an early stage of development tend not to invest in domestic fiscal capacity. As Besley and Persson (2011: 41-43) state: “Arguably, trade taxes and income taxes are two polar opposite cases. To collect trade taxes requires being able to observe trade flows at major shipping ports. Although such tax allocations may encourage smuggling, it is a much easier proposition than collecting income taxes. The latter requires major investments in enforcement and compliance structures throughout the economy. ... High-income countries tend to depend more on income taxes, whereas middle- and, in particular low-income countries depend more on trade taxes.” Since our focus is on a country at a relatively early stage of development, it seems reasonable to assume in our stylized characterization that there is no domestic fiscal capacity and that only trade taxes are available.

The political economy structure is as follows. While the elite are assumed initially to have control over trade policy, the rest of society do not have sufficient resources or influence to affect trade policy. However, the rest of society may be able to exert influence over trade policy through the periodic opportunity to mount a revolution in which they could topple the ruling elite regime. If successful, a revolution would lead to democracy under which the rest of society assume control of trade policy. But revolution is costly. As a result, the elite may be able to neutralize the threat of revolution by making concessions to the rest of society over trade policy. For example, if the rest of

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3Zolt and Bird (2005) point out that: “Personal income taxes started small. Few were taxed, and tax rates were low.” Even though progressive income taxes were first adopted around the early and mid-1800s, it was not until World War II that they became a major source of tax revenue even in most developed countries.
society own the abundant factor and would prefer a more open trade regime, the elite may be able to defuse the threat of revolution by temporarily liberalizing trade. If on the other hand the elite own the abundant factor then a temporary increase in protection would be required to defuse the threat of revolution. We refer to the price level arising from a concession that defuses a revolutionary threat as the ‘status quo price’. The status quo price may be implemented by import tariffs and/or export taxes that lie between autarky and free trade. The characterization of equilibrium then depends on whether the elite have to extend the franchise in order to defuse a revolutionary threat, or if they can forestall democratization by adopting the status quo price.

As mentioned above, a key feature of equilibrium is the efficiency implications. If the elite own the scarce factor then, by the Stolper-Samuelson theorem, the economy will be relatively closed under dictatorship. If the elite respond to the threat of revolution by extending the franchise, then democratization and trade liberalization will go hand in hand. As power transfers from the elite to the rest of society who are in the majority, trade policy is determined by the preferences of the median voter who owns the abundant factor and so prefers a more open trade policy regime. Since trade liberalization tends to increase economic efficiency, democratization enhances economic efficiency through its effect on trade policy as argued by classical scholars. On the other hand, if the elite own the relatively abundant factor then democratization will be accompanied by an increase in protectionism and a reduction in economic efficiency. A third possibility is that the elite may be able to use trade policy to defuse the threat of a revolution and forestall democratization. In that case any use of trade policy and its efficiency implications will be transitory and may therefore fluctuate over time. It is in these terms that the paper demonstrates heterogeneity in outcomes for “a given institutional metric”; in this case variation in the institution of democracy between ‘no democracy’ and ‘full democracy’. The main insight from this aspect of the analysis is that any consideration of the efficiency implications of democratization, whether theoretical or econometric, must take comparative advantage into account.

In examining trade-policy responses to price shocks by dictatorial regimes, our framework opens the door to a deeper understanding of how trade policy evolved during some interesting episodes of history. One episode concerns the evolution of British trade policy
during the period from the end of the Napoleonic Wars in 1815 to the eventual repeal of the Corn Laws in 1846. A great deal of research has focused on Britain’s repeal of the Corn Laws in 1846, when tariffs of 7 percent were repealed to free trade. Our framework additionally makes it possible to understand the prior period from 1815 until just before repeal (as well as repeal itself), during which tariffs were reduced from 70 percent to 7 percent. Our explanation is grounded in the fact that Britain’s ruling elite owned land, used intensively to produce agriculture, while the country had a comparative advantage in manufactures which at that time were labor intensive. So the elite preferred a relatively closed regime while the rest of society preferred a relatively open one. During the 1800s there was a transport revolution that dramatically reduced world prices of grain (O’Rourke and Williamson 1999: 33-36). The fall in prices made revolution more appealing to the rest of society since they would adopt a more open regime if they were able to depose the elite regime, facilitating access to cheap grain from the world market. This in turn mandated a gradual fall in the status quo price, which the elite brought about through trade liberalization.

This account would not be complete without considering the other side of the grain market. Prussia’s aristocracy, like Britain’s, held their wealth in large estates but, differently from Britain, Prussia had a comparative advantage in agricultural products such as grain which Britain imported. As owners of the abundant factor, Prussia’s elite enacted low tariffs after the end of the Napoleonic wars. But as transport costs fell and world prices rose, the Prussian ruling elite came under pressure to raise protectionism and did so steadily between 1815 and 1846. The most dramatic rise in protectionism came in 1847 when harvests failed throughout Europe and grain prices rose sharply. In the face of ‘hunger riots’, export taxes on grain were raised by 25 percent in an attempt to maintain the status quo, as would be predicted by our model.4

A similar sequence of events in trade policy-making to those in mid-19th Century Prussia occurred in a number of countries in the 2007-08 world food crisis. Between 2007 and 2011 an estimated 33 food-exporting countries resorted to restrictions on exports

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4Rogowski (1989) also argues (non-formally), by invoking the logic of the Stolper-Samuelson theorem, that abundant factors are likely to organize politically and push for trade liberalization while scarce factors are likely to resist it, possibly resulting in the threat of a revolution. He applies this logic to a number of historical settings, including mid-19th Century Britain and Germany, as well as ancient Greece and Rome.
of grains, rice, and other foodstuffs (Sharma 2011) in response to the initial increase in food prices. Moreover, a number of these countries were dictatorships such as Egypt and Jordan. The ruling landed elites in these countries stood to gain significantly from leaving export markets open during the period. However, violent protests on the streets of these countries prompted the regimes to respond by introducing export restrictions, in line with Prussia’s response a century and a half earlier and in line with the predictions of our model. These historical and present-day trade policy episodes are explained in greater detail in Section 5 below.

In terms of related literature, as far as I’m aware, the closest paper to this one is by Galiani and Torrens (2013). They also explore the role of trade policy in maintaining the status quo in the face of a possible political transition. Their model allows for three groups within society, namely two elite groups in the form of landlords and industrialists, and ‘the people,’ as well as two policy instruments: income taxes as well as trade taxes. While income can be taxed at any rate between zero and one hundred percent, trade policy can take one of only two values: autarky or free trade. Having two policy variables and three groups in society creates scope for two dimensions of conflict over policy: a rich-poor cleavage over the income tax and a landlord-industrialist cleavage over trade policy. They show that if landlords’ and industrialists’ interests conflict over trade policy, autocracies can respond to the threat of revolution by changing trade policy and reallocating political power within the elite (to the elite group with the same trade policy preference as the people) rather than offering to democratize the country which would result in a change in income tax as well as trade policy in the favor of the people. So ‘partial reform’ in Galiani and Torrens’ framework through reallocating power within the elite parallels our ‘partial reform’ through the adoption of the status quo price, which represents a compromise over trade policy that moves in the direction of what the rest of society would prefer. Thus, their framework features a richer set of possible outcomes regarding the balance of power between competing elite groups and the people which our framework does not have. But our framework features capacity to account for the revenue implications of changes in trade policy, which Galiani and Torrens do not consider. This capacity enables us to examine incremental changes in trade policy over time, and is essential for the comparative statics exercise on trade policy that is central to our analysis of price shocks.
Two other papers are closely related. Liu and Ornelas (2013) study the relationship between participation in free trade agreements and the sustainability of democracy. Their model shows that free trade agreements can critically reduce the incentive of authoritarian groups to seek power by destroying protectionist rents, thus increasing the chances of democratic consolidation. Garfinkel, Skaperdas and Syropoulos’ (2008) work is also related in that it considers the relationship between trade policy and political institutions, where their focus is on the possibility of conflict over a traded resource that can lead to civil war.

Most of the prior literature on trade policy focuses on a stable institutional environment where democracy has already been consolidated. In that literature, interest groups are able to lobby the government in order to try to influence the electoral outcome or sway policy in the direction they would like to see it go (Hillman 1982, Hillman and Ursprung 1988, Magee, Brock and Young 1989, Grossman and Helpman 1994, Bagwell and Staiger 1999). Relating to a different branch of that literature, the use of democratization in our model to commit to a certain trade policy is similar to the commitment rationale for trade agreements espoused by Maggi and Rodriguez-Clare (1998, 2007). The common feature that the present paper shares with all of this literature is that it uses a weighted government objective function approach to determine trade policy outcomes. However, in all of the prior literature, the weights on social welfare functions are essentially static, as are the predictions of the models regarding trade policy. Our new model is different in that it features weights on the social welfare function that can change endogenously over time, and hence so can trade policy. This can happen for one of two reasons. Either the form of government changes from dictatorship to democracy, permanently putting a higher weight on the preferences of the rest of society in the government’s objective function. Or there is a temporary shift in weight towards the preferences of the rest of society during periods where trade policy is used to maintain the status quo.\footnote{Bagwell and Staiger (1990, 2003) model fluctuations in the level of protection over time but these arise as a result of temporary surges in import demand, or variations in total demand over the business cycle, rather than endogenous changes in the weights on the government’s objective function as in our framework.}

The paper is structured as follows. Section 2 develops the economic model based around the Heckscher-Ohlin model and uses this to characterize the levels of protectionism
that would be preferred by the elite and the rest of society respectively. Section 3 then
uses the economic model of the previous section to determine the payoffs in a dynamic
game through which the form of government and trade policy are determined. Section
4 examines the effects of world price shocks on trade policy. Section 5 uses the theory
to explain how the model can be used to explain trade policy in Britain and Prussia in
the early 19th Century, and the recent wave of export-measure based protectionism in
response to the world food crisis of 2007-08. Conclusions are drawn in Section 6.

2. The Heckscher-Ohlin Model with Protectionism

The model is of a single small country, populated by a continuum of risk-neutral agents.
Each agent is placed in one of two groups: the elite, e, or ‘the rest of society,’ r. The mass
of each of these groups is normalized to \( \theta \) and 1 respectively so that the total mass of the
population is \( 1 + \theta \). We will assume throughout that the elite constitutes a minority of
the population; \( \theta < 1 \).

The model has an infinite time horizon. A subscript \( t \) denotes the time period
\( t = 0, 1, ..., \infty \). The economy is endowed with a unit each of two primary factors which we
will refer to as \( v^1 \) and \( v^2 \). With slight abuse of notation, we will also use \( v^i \) to refer to the
size of the endowment of factor \( i \). All members of each group, the elite and the workers
respectively, are identical to one another. Each group differs from the other only by its
initial factor endowment. All of \( v^1 \) is distributed evenly among members of the rest of
society, with none belonging to the elite, while each member of the elite is endowed with
an equal share of \( v^2 \). For brevity, we will summarize this endowment structure by saying
that there are ‘boundary endowments’. The price of factor \( v^i, i \in \{1, 2\} \), in period \( t \) is
denoted by \( w^i_t \).

2.1. Production

Both factors, supplied inelastically on aggregate, are fully employed in the production of
two commodities. These commodities are referred to as goods 1 and 2 respectively, and
are priced at \( p^1_t \) and \( p^2_t \) respectively; let \( p_t = p^2_t / p^1_t \). Since the country is small, the world
relative price \( p^w = p^2^w / p^1^w \) is taken as given. In a more general setting where externalities
are possible, $p^w$ would be regarded as the relative price that maximizes efficiency. It will also be helpful later to have notation for the autarky relative price, which we will denote by $p^a = p^{2a}/p^{1a}$.

The economy is competitive, both in production and factor markets. Production of each good requires both factors $v^1$ and $v^2$, but production of good $i$ uses factor $v^i$ relatively intensively. Technology in each sector exhibits constant returns to scale and decreasing marginal returns to each factor. Output of good $i$ in period $t$ is denoted by $x^i_t$. There is free entry into both sectors so that profits are driven to zero. And there is free mobility of factors between sectors so each factor receives the same return in each sector equated to the value of its marginal product. If the economy is open then goods may be traded internationally but factors are not internationally mobile. Write the factor income of a member of group $j$ in period $t$ as $y^j_t$. Based on initial endowments, population shares and production technology, $y^r_t = w^1_t = w^1(p_t)$ and $y^e_t = w^2_t/\theta = w^2(p_t)/\theta$. Accordingly, we can express factor incomes of the two groups as functions of relative prices,

$$y^r_t = y^r(p_t) = w^1(p_t) \quad \text{and} \quad y^e_t = y^e(p_t) = w^2(p_t)/\theta.$$  

(2.1)

Since the structure of the economy is that of a standard $2 \times 2$ Heckscher-Ohlin model, the standard results hold. We are particularly interested in the Stolper-Samuelson theorem which demonstrates that if, in a given period, $p_t$ is increased then the real return to $v^2$ unambiguously increases while the real return to $v^1$ unambiguously decreases. Following Jones (1965), we can express the main implication of the Stolper-Samuelson theorem as follows:

$$w^2_t > p^*_t > 0 > w^1_t$$

where a superscript-\* on a variable $z$ denotes proportional change; $z^* = dz/z$. Given our assumptions about endowments, this result translates directly into the effects of price changes on the respective groups. An increase in $p_t$ will bring about an unambiguous increase in the real factor income of the elite and a reduction in the real factor income of the rest of society. A decrease in $p_t$ has the opposite effect on the incomes of the respective groups. It follows from the Stolper-Samuelson Theorem that $y^e(p_t) > 0 > y^r(p_t)$ where a ‘prime’ denotes the first derivative of a function with respect to the argument in brackets.

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6The conditions required for this relationship to hold globally are established by Gale and Nikaido (1965) and Chipman (1969). These are assumed to hold throughout the analysis.
2.2. Preferences

Agents $j \in \{e, r\}$ have identical preferences and the same discount factor, $\beta < 1$. The expected utility of agent $j$ at time 0 is given by:

$$U_0^j = \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t u(c_{1t}^j, c_{2t}^j)$$

where utility in each period is given by the function $u(c_{1t}^j, c_{2t}^j)$, $c_{it}^j$ is consumption of good $i$ in period $t$ by agent $j$, and $\mathbb{E}_t$ is the expectations operator conditional on information available at time $t$. The per-period utility function is given by

$$u(c_{1t}^j, c_{2t}^j) = c_{1t}^j + u_2(c_{2t}^j),$$

where the sub-utility function $u_2(\cdot)$ is differentiable, increasing, and strictly concave. With these preferences, assuming their income $y_t^j$ is sufficiently high, an individual $j$ in period $t$ consumes $c_{2t}^j = d_2^j(p_t)$ of good 2, where the demand function $d_2^j(\cdot)$ is the inverse of $u_2'(c_{2t}^j)$. At the same time, individual $j$ consumes $c_{1t}^j = Y_t^j - p_t d_1^j(p_t)$ of good 1, where $Y_t^j$ is their total income, comprising of factor income and any revenue raised by policy instruments. Through our analysis we will focus on outcomes where all consumers are at interior solutions and so $c_{2t} = d_2(p_t) = c_{2t}^e = c_{2t}^r$.

2.3. Policy instruments

We will restrict the set of policy instruments to trade taxes and subsidies. These policies drive a wedge between the domestic price and the world price, both for consumers and for producers. For convenience, and without loss of generality, we will assume that trade policy is applied to good 2. Choosing good 1 as the numeraire in the model, we can write $p_t = p_t^2$ and $p^w = p^{2w}$. Note that we have not specified the country’s comparative advantage so good 2 could be either the country’s exportable or its import-competing good. A domestic price in excess of the world price implies an import tariff for a good that is imported and an export subsidy for one that is exported. Domestic prices that are below world prices correspond to import subsidies and export taxes. The net revenue for the policy applied to good 2 in period $t$ is given by

$$nr(p_t) = (p_t - p^w) ((1 + \theta) c_{2t} - x_{2t}).$$
This function gives the net revenue available for redistribution.

We will follow the international trade policy literature in assuming that any revenue collected from a trade policy is rebated to each individual $j$ in lump sum:

$$nr^j (p_t) = (p_t - p^w) \left( c_2 (p_t) - \frac{1}{1+\theta} x_2 (p_t) \right), \quad (2.2)$$

where, in the H-O model, output of good 2, $x_2$, can be determined strictly as a function of domestic relative prices, $p_t$. Symmetrically, if a policy requires revenue for its operation then this will be collected via lump-sum taxes. This approach facilitates our focus explicitly on the general equilibrium effects of changes in prices. The total income of a member of group $j$ is therefore given by the sum of factor income and revenue collected from trade policy (where the latter could be negative):

$$Y^j_t = y^j (p_t) + nr^j (p_t). \quad (2.2)$$

2.4. Welfare of the groups and their preferred levels of openness

The welfare of the representative member of group $j$ can be expressed as follows:

$$W^j (p_t) = y^j (p_t) + nr^j (p_t) + s_2 (p_t). \quad (2.3)$$

where $s_2 (p_t) \equiv u_2 [d_2 (p_t)] - p_t d_2 (p_t)$ is the consumer surplus derived from consumption of good 2. The level of openness that is preferred by each of the groups $e$ and $r$ can be determined from (2.3). The level of $p_t$ that maximizes the welfare of group $j$ is given by the first order condition

$$W_{p_t}^j (p_t) = y_{p_t}^j (p_t) + nr_{p_t}^j (p_t) + s_{p_t}^2 (p_t). \quad (2.4)$$

Given our assumptions about the structure of preferences, the second and third terms of (2.4) (and 2.3) are the same across groups $j \in \{e, r\}$. Therefore, differences in the preferred level of $p_t$ across the respective groups will depend on differences between $y_e^{\prime\prime} (p_t)$ and $y_r^{\prime\prime} (p_t)$. We know from the Stolper-Samuelson theorem that $y_e^{\prime} (p_t) > 0 > y_r^{\prime} (p_t)$. So $W^{\prime\prime} (p_t) > W^{\prime\prime} (p_t)$ for all $p_t$. Assuming that they exist, denote the level of $p_t$ for which $W^{\prime\prime} (p_t) = 0$ by $\hat{p}^e$ and $W^{\prime\prime} (p_t) = 0$ by $\hat{p}^r$. Then under the assumption that $W^{\prime\prime} (p_t) < 0$, we have $\hat{p}^e > \hat{p}^r.$

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7A ‘double prime’ denotes the second derivative with respect to the argument in brackets.
Let us consider the implications of $\hat{p}^e > \hat{p}^r$ when the country has a comparative advantage in good 1 and good 2 in turn. With a comparative advantage in good 1, $p^a > p^w$. Therefore, the rest of society’s welfare is maximized at a higher level of openness than is the elites’. This stands to reason since, when the country has a comparative advantage in good 1, the rest of society own the factor used intensively in the production of the good for which the country has a comparative advantage. Therefore, their factor income is increasing in the level of openness. This provides a greater counterweight in the first order condition for the preferred price level against the potential loss of revenue from the policy as the economy is opened up than for the elite, which gives rise to $\hat{p}^e > \hat{p}^r$. Of course, it may be that one group or the other reaches a corner solution, in which case there are two possibilities: Either the rest of society would prefer free trade while the elite would prefer some level of protection, or the rest of society would prefer some level of protection while the elite would prefer autarky. Or each group’s preferred price level may be at a different corner solution; free trade and autarky respectively. We will ignore the uninteresting cases in which both groups are simultaneously at the same corner solution.

With a comparative advantage in good 2, $p^a < p^w$. In that case the rest of society’s welfare is maximized at a lower level of openness than is the elite’s. With a comparative advantage in good 2, it is the factor income of the elite that is increasing in the level of openness. Summarizing, the level of openness preferred by the respective groups will be determined by which group owns the factor used intensively in the good for which the country has a comparative advantage.

2.5. Trade Policy and Economic Efficiency

We will now establish that trade liberalization is associated with an increase in economic efficiency. It is of course well know that in the absence of market failures free trade maximizes efficiency. And under fairly general circumstances any incremental liberalization of trade policy will increase efficiency incrementally as well. Since in our model we make an unusual set of assumptions, ruling out all redistributive policy except for trade policy itself, we will now confirm that trade liberalization does imply an increase in efficiency under these restrictions.
The utilitarian notion of efficiency determines the total surplus available for distribution to citizens, $\Omega$:

$$\Omega (p_t) = \theta W^e (p_t) + W^r (p_t).$$

(2.5)

Since factor prices are determined as functions of $p_t$ from the corresponding unit cost functions, $w^1(p_t)$ and $w^2(p_t)$, we can write $rev(p_t) = w^1(p_t) + w^2(p_t)$ where $rev(p_t)$ is the revenue function. Using this fact, along with (2.1), we may rewrite (2.5) as

$$\Omega (p_t) = rev(p_t) + (1 + \theta) s_2 (p_t) + nr (p_t).$$

(2.6)

Writing imports as $m(p_t) = (1 + \theta) c_2 (p_t) - x (p_t)$, and taking the total derivative of (2.6), we have

$$d\Omega (p_t) = (\text{rev}' (p_t) + (1 + \theta) s_2' (p_t) + m (p_t) dp_t) dp_t + (p_t - p^w) dm (p_t)$$

Now using the fact that $\text{rev}' (p_t) + (1 + \theta) s_2' (p_t) = -m (p_t)$, this expression simplifies further to

$$d\Omega (p_t) = (p_t - p^w) dm (p_t).$$

Finally, since $c_2' (p_t) < 0$ and $x' (p_t) > 0$, we have that

$$dm (p_t) = (c_2' (p_t) - x' (p_t)) dp_t < 0$$

From this, whether trade liberalization involves a reduction of an import tariff in which case $(p_t - p^w) > 0$ and $dp_t < 0$, or a reduction of an export tax in which case $(p_t - p^w) < 0$ and $dp_t > 0$, we have that $d\Omega (p_t) > 0$ and this implies an unambiguous increase in welfare. Therefore, any adjustment of trade policy that moves the price level $p_t$ in the direction of free trade will increase economic efficiency.

3. Trade Policy and the Form of Government

We will endogenize $p_t$ by combining the Hecksher-Ohlin model set out above with the model of social conflict and franchise extension developed by Acemoglu and Robinson (2000). Initially, political power is held by the elite. The only way that the elite can exercise this power in the model is through their control of trade policy. Under this specification, and for parsimony of notation, we can say that while the elite hold power they set $p_t$ directly.
Although initially they do not hold power, at any point in time $t \geq 0$ the rest of society can mount a revolution that topples the ruling elite regime, after which they install a democracy through which the median voter determines trade policy, $p_t$. The same outcome of democracy can arise if the elite decide voluntarily to extend the franchise. Given that $\theta < 1$, under full democracy the median voter is a member of the rest of society. We will formalize the form of government, $F$, as either rule by the elite, $E$, or democracy, $D$.

Assume that, in any given period $t$, with probability $1 - \rho$ the rest of society are unable to resolve the coordination problem involved in mounting a revolution and hence pose no threat to the elite (we will refer to this as the ‘low threat state’ or $L$). On the other hand, with probability $\rho$ they are able to resolve their coordination problem and hence are in a position to mount a revolution (the ‘high threat state’ or $H$). Denote the state in a given period by the tuple $(F, s)$, where $F \in \{E, D\}$ denotes whether there is a dictatorship of the elite or there is democracy, and $s \in \{H, L\}$ is the threat level to the elite regime if it is in power.

The game is initialized with the assumption that in period 0 there is rule by the elite. Within a period, $t$, the sequence of events is as follows.

1. The world price, $p^w$ is revealed. If there is elite rule, the state $s \in \{H, L\}$ is revealed.

2. The elite decide whether or not to extend the franchise. If they do not, they set trade policy, $p_t$.

3. If $s = H$ then the rest of society decide whether or not to mount a revolution. If $s = L$ then revolution is not an option.

4. If the rest of society decide to mount a revolution, the elite can repress it at cost $\mu$. If the elite repress, any revolution attempt is not successful and elite rule is maintained. If the elite do not repress, a revolution attempt is successful, but costs $\psi$ to each member of society (including the elite and the rest of society), after which there is a transition to democracy. If the rest of society do not mount a successful revolution then elite rule is maintained.
5. If there is democracy then trade policy is set by the median voter (a member of the rest of society).

6. Production takes place, demands are realized, markets clear and consumption takes place.

The world price level revealed in period $t$ is perceived to be permanent. Democracy is an absorbing state; if the franchise is extended then, by assumption, it cannot be rescinded; in $t + 1$ and all periods thereafter the process starts from stage 4. In that case the state $s$ is no longer relevant. Otherwise the game starts again from stage 1. The fact that all members of each of the two respective groups, the elite and the rest of society, are identical to one another (but obviously differ across groups by their endowments) makes the analysis of the game significantly easier because we can model the members of each group as a single player. So we can model the situation set out above as a two-player game between the elite and the rest of society.

3.1. Definition of Equilibrium and Preliminaries to Characterization

The concept of equilibrium we will use is that of Markov Perfection, wherein each player’s strategy depends only on the state in a given period, which is given by the value of $s$, either $L$ or $H$, and the form of government, $F$, which is either $D$ or $E$.\(^8\)

The strategies played by the respective groups are as follows. Let $\sigma^e (F; s)$ be the strategy played by the elite when the state is $s = L$ or $H$ and when the form of government is $F = D$, or $E$. First the elite decide whether or not to extend the franchise. Let $f = 0$ if they do not extend the franchise and $f = 1$ if they do. If $f = 0$ then the elite also set the price level at $p^e$. Conditional on their choice of $p^e$, they then decide whether or not they want to put in place the resources to quash any attempt at revolution; if they do then they each incur $\mu$. Let $q = 0$ if they do not pay $\mu$ and $q = 1$ if they do. If $f = 0$ then $F = E$ in that period; if $f = 1$ then $F = D$ in that period and for all

\(^8\)In our set-up, any Markov Perfect Equilibrium (MPE) coincides with Subgame Perfect Equilibrium (SPE). The reason is that the returns to the various strategies open to the elite are independent of history. SPE and MPE would only diverge if the elite were able to set trade policy after some kind of sunk investment were made by the rest of society, potentially making them vulnerable to a hold-up problem.
periods thereafter. Let \( \sigma^r (F | (f, p^e, q); s) \) be the strategy played by the rest of society. This consists of the decision as to whether or not to mount a revolution; \( a = 1 \) if they do (where \( a \) is a mnemonic for ‘agitate’) and 0 otherwise. If the form of government is democracy, \( F = D \), then the rest of society set the price level at \( p^r \). Since by the timing of events determined above the elite move before the rest of society, the strategy of the rest of society in a given period is conditioned on that of the elite. Let \( \tilde{\sigma}^e (F; s) \) be a best response to \( \sigma^e (F | (f, p^e, q); s) \) for all \( F, s \), and let \( \tilde{\sigma}^r (F | (f, p^e, q); s) \) be a best response to all \( \sigma^e (F; s) \) for all \( F, s \). Then a pure strategy Markov Perfect equilibrium is a set of mutual best responses \( \{ \tilde{\sigma}^e (F; s), \tilde{\sigma}^r (F | (f, p^e, q); s) \} \).

In our characterization of equilibrium, we will restrict attention to the region of the parameter space where the elite may have a commitment problem over trade policy. First note that it will not be rational to incur the cost of repressing an uprising if \( \mu \) is relatively large. If the elite do not repress, the elite may not be able to avert a revolution by (credibly) promising to set \( p^e = \hat{p}^r \); but they will be able to avert revolution by extending the franchise and with it the power to set trade policy, facilitating \( p^r = \hat{p}^r \). Under certain circumstances, which we will determine, the elite may alternatively be able to use trade policy in order to maintain the status quo (i.e. not extend the franchise). Note that the elite would always prefer to maintain the status quo because this entails retention of the power to set trade policy to their advantage when the level of threat is low. In the following it will be helpful to have notation for the occurrence of a revolution, \( R \), and repression, \( Q \).

Let \( V^j (R, \hat{p}^r) \) represent the present discounted value under revolution for \( j \in \{ e, r \} \):

\[
V^j (R, \hat{p}^r) \equiv \frac{W^j (\hat{p}^r)}{1 - \beta} - \psi.
\]  \hspace{1cm} (3.1)

where the term \( 1 - \beta \) provides the net present value when, under democracy, trade policy is chosen by the median voter. For a member of group \( j \), the payoff to democracy takes the form

\[
V^j (D, \hat{p}^r) \equiv \frac{W^j (\hat{p}^r)}{1 - \beta}.
\]  \hspace{1cm} (3.2)

Clearly, both groups would prefer democracy to revolution because, while both outcomes lead to democracy under which \( p_t = \hat{p}^r \) for all \( t \), both groups would prefer to avoid the cost \( \psi \) associated with revolution. Therefore, extension of the franchise always has the
potential to defuse revolution.

Recall that we also want to restrict attention to a situation where the elite cannot always simply head off revolution by temporary redistribution using trade policy. Assume that in period $t$ the state is $H$. The revolution constraint is then given by the following:

$$\frac{W^r (\hat{p}^r)}{1 - \beta} - \psi > W^r (\hat{p}^r) + \beta \frac{W^r (\hat{p}^e)}{1 - \beta}. $$

This expression says that, for a member of the rest of society, the discounted payoff to revolution (on the left hand side) is greater than the immediate payoff from a single period with trade policy set according to the rest of society’s preferred price level, $\hat{p}^r$, followed by a return to the elites’ preferred trade policy in all periods thereafter. By construction, $W^r (\hat{p}^r) > W^r (\hat{p}^e)$. For given $\psi > 0$, the revolution constraint binds providing $\beta$ is sufficiently large. That is, the rest of society must care enough about the future, and the lower payoff entailed by a return to the elite’s preferred price level, that they cannot simply be bought o¤ by a single period of prices set at $\hat{p}^r$. The commitment problem exists in this model if and only if the revolution constraint binds.

In addition, we will want to take into account the elite’s ability to repress a revolution. While this option entails the cost $\mu$, under repression the elite are able to set the price level $\hat{p}^e$ with impunity. Denote by $V^e (Q, \hat{p}^e; s)$ the value function to the elite if they use repression and the state is $s$. The payoff to repression when $s = L$ can be written recursively as follows:

$$V^e (Q, \hat{p}^e; L) = W^e (\hat{p}^e) + \beta ((1 - \rho) V^e (Q, L) + \rho V^e (H, L)).$$

If the state is $H$, then

$$V^e (Q, \hat{p}^e; H) = W^e (\hat{p}^e) - \mu + \beta ((1 - \rho) V^e (Q, L) + \rho V^e (H, L)).$$

Combining these two expressions, we obtain

$$V^e (Q, \hat{p}^e; H) = \frac{W^e (\hat{p}^e)}{1 - \beta} - \frac{(1 - \beta (1 - \rho)) \mu}{1 - \beta}.$$  \hspace{1cm} (3.3)

As one would expect, the higher is $\mu$ the lower the payoff to repression. Since the elite continue to set the price $\hat{p}^e$ under $H$ as well as $L$, the value to the rest of society from repression is the same under $H$ and $L$:

$$V^r (Q, \hat{p}^e) = \frac{W^r (\hat{p}^e)}{1 - \beta}. $$ \hspace{1cm} (3.4)
We will be able to use these expressions to help determine when, under the threat of revolution, the elite will maximize their payoff by using repression.

### 3.2. Characterization of Equilibrium

We are now ready to proceed with our characterization of equilibrium. In order to do so, we will represent the payoffs to the respective groups over time in Bellman-equation form. If in period $t$ the state is $L$ and the elite are in power, there is no threat of revolution. Therefore, in Markov Perfect Equilibrium, $f = 0$ and $p^e = \hat{p}^e$. We can then write the value function of a member of the rest of society as

$$V^r (E, \hat{p}^e; L) \equiv W^r (\hat{p}^e) + \beta (\rho V^r (E, p^e; H) + (1 - \rho) V^r (E, \hat{p}^e; L)).$$

Note from the first term in parentheses that, under the threat of revolution, the elite may set a price $p^e$ other than $\hat{p}^e$ as we will discuss shortly. The value for a member of the elite is written in the same way:

$$V^e (E, \hat{p}^e; L) \equiv W^e (\hat{p}^e) + \beta (\rho V^e (E, p^e; H) + (1 - \rho) V^e (E, \hat{p}^e; L)). \quad (3.5)$$

Now consider the situation where in period $t$, with the elite in power, the state is $H$ and so the threat of a revolution does exist. As outlined previously, the elite have three options as to how to address this threat. The first is to extend the franchise, $f = 1$. Under democracy the median voter, a member of the rest of society, will vote for their most preferred price level $\hat{p}^r$ and the payoff to a member of the rest of society will be $V^r (D, \hat{p}^r)$ as given by (3.2). The second option that the elite have is to repress the threat of revolution. The elite set $\hat{p}^e$ and the payoff to the rest of society will be $V^r (Q, \hat{p}^e)$ as given by (3.4).

The third option is not to extend the franchise or to use repression but to instead bring about redistribution towards the rest of society using trade policy; setting $f = 0$, $q = 0$ and $p^e = p^s$. We will refer to $p^s$ as the ‘status quo’ price. Underlying it is a trade policy set by the elite to maintain the status quo. Given $H$, it will be optimal for the elite to set $p^s$ in such a way as to leave the rest of society just indifferent between mounting a revolution and not doing so, in which case by assumption they will not.
Given any of these three actions by the elite, in principle the workers may still prefer to respond by mounting a revolution. Thus a worker’s strategy solves the problem
\[
\max \{ V^r (R, \hat{p}^r) ; fV^r (D, \hat{p}^r) + (1 - f) qV^r (Q, \hat{p}^e) + (1 - f) (1 - q) V^r (E, p^s ; H) \}.
\]
We have already determined in (3.1), (3.2) and (3.4) the payoffs to the rest of society from revolution, \( V^r (R, \hat{p}^r) \), democracy, \( V^r (D, \hat{p}^r) \), and repression, \( V^r (Q, \hat{p}^e) \) respectively. The payoff to a member of the rest of society when the elite effect redistribution by setting \( p^s \) is
\[
V^r (E, p^s ; H) \equiv W^r (p^s) + \beta \left( \rho V^r (E, p^s ; H) + (1 - \rho) V^r (E, \hat{p}^e ; L) \right).
\]
If in the following period the state of \( H \) is maintained then the elite will continue to set \( p^s \) and the rest of society’s utility will be maintained at the same level. But if the state changes to \( L \) then the elite will (renege on any promise to maintain redistribution with \( p^s \) and) restore their preferred trade policy, bringing about the price level \( \hat{p}^e \).

To find \( p^s \), first define
\[
G (p^e) \equiv \frac{1 - \beta (1 - \rho)}{1 - \beta} W^r (p^e) + \frac{\beta (1 - \rho)}{1 - \beta} W^r (\hat{p}^e) - \left( \frac{W^r (\hat{p}^e) - \psi}{1 - \beta} \right).
\]
Then the rest of society are just indifferent between mounting a revolution and maintaining the status quo if \( p^e \) is set at \( p^s \) such that
\[
G (p^s) = 0.
\]
By the revolution constraint, the sum of the second and third terms of (3.7) must be negative. Therefore, if a value \( p^s \) exists such that \( G (p^s) = 0 \), then the payoff in the current period under \( p^s \) is \( W^r (p^s) > W^r (\hat{p}^e) \). And by the optimality of the choice of \( \hat{p}^e \), it must be the case that \( W^r (\hat{p}^e) > W^r (p^s) \). Putting these observations together, \( W^r (\hat{p}^e) > W^r (p^s) > W^r (\hat{p}^r) \). It also follows, by the fact that \( \hat{p}^e > \hat{p}^r \) and the concavity of \( W^j (p_t) \), that \( \hat{p}^e > p^s > \hat{p}^r \). Note, again by the concavity of \( W^j (p_t) \), that there is a value of \( p_t \) that would yield the same level of welfare for \( r \) as \( p^s \), but the elite would never choose this because it is even further away from \( \hat{p}^e \) than \( \hat{p}^r \). We can therefore also say that \( W^e (\hat{p}^e) > W^e (p^s) > W^e (\hat{p}^r) \). These results are summarize as follows:

**Proposition 1.** The status quo price entails a compromise between the two groups in the sense that: (i) \( \hat{p}^e > p^s > \hat{p}^r \); (ii) \( W^r (\hat{p}^r) > W^r (p^s) > W^r (\hat{p}^e) \); and (iii) \( W^e (\hat{p}^e) > W^e (p^s) > W^e (\hat{p}^r) \).
To characterize equilibrium, we will proceed in two steps. We will first examine the circumstances under which it would be feasible for the elite to use trade policy to prevent a revolution. For this to be feasible, the elite must be able to credibly commit to a trade policy that would give the rest of society a higher level of welfare than they could obtain from mounting a revolution. If so, then the second step is to consider whether it would be cheaper for the elite to use repression instead of trade policy. If the elite cannot credibly commit to use trade policy in this way, then the second step is to consider whether it would be cheaper to use repression or whether the elite would use up less resources by extending the franchise in order to avoid a revolution.

For the first step, let \( \tilde{V}^r (E|\rho; H) \) be the maximum utility that the elite can induce among workers without extending the franchise or using repression. This maximum utility is induced by setting \( p^s = \hat{p}^r \) in (3.6): \( \tilde{V}^r (E|\rho; H) = V^r (E, \hat{p}^r; H) \). Then the condition for the elite to feasibly use trade policy to maintain the status quo is \( \tilde{V}^r (E|\rho; H) \geq V^r (R, \bar{p}^r) \).

Applying the logic developed by AR, we will now establish that there exists a critical level of \( \rho \), denoted \( \bar{\rho} \), at which the elite are just able to prevent a revolution using trade policy. We will then show that for \( \rho > \bar{\rho} \) it is feasible to use trade policy to prevent revolution while for \( \rho < \bar{\rho} \) it is not.

First consider the maximum utility that can be induced among workers when \( \rho = 1 \):

By (3.2)
\[
\tilde{V}^r (E|\rho = 1; H) = \frac{W^r (\hat{p}^r)}{1 - \beta} = V^r (D, \hat{p}^r).
\]

Recall that \( V^r (D, \hat{p}^r) > V^r (R, \bar{p}^r) \), so for \( \rho = 1 \) the elite can credibly commit to use trade policy to make the rest of society better off than if they mounted a revolution.

Next consider the maximum utility that can be induced among the workers when \( \rho = 0 \):
\[
\tilde{V}^r (E|\rho = 0; H) = W^r (\hat{p}^r) + \beta \frac{W^r (\hat{p}^s)}{1 - \beta} < V^r (R, \bar{p}^r)
\]
given that the revolution constraint is satisfied. So when \( \rho = 0 \) revolution yields a higher expected payoff than trade policy. In addition, \( \tilde{V}^r (E|\rho; H) \) is continuously and monotonically increasing in \( \rho \) because an increase in \( \rho \) shifts the weight in the value function (3.6) from \( V^r (E, \hat{p}^r; H) \) to \( V^r (E, \hat{p}^r; H) \), where the latter term is \( V^r (E, p^r; H) \).
but with $\hat{p}^r$ substituted for $p^*$. Therefore, by the intermediate value theorem, there exists a unique $\bar{p} \in (0, 1)$ for which $\tilde{V}^r(E|\rho; H) = V^r(R, \hat{p}^r)$. Thus we have the following lemma.

**Lemma 1.** There exists a unique $\bar{p} \in (0, 1)$ for which $\tilde{V}^r(E|\rho; H) = V^r(R, \hat{p}^r)$.

1. For all $\rho < \bar{p}$, $\tilde{V}^r(E|\rho; H) < V^r(R, \hat{p}^r)$ and so it is not feasible to use trade policy to prevent a revolution.

2. For all $\rho > \bar{p}$, $\tilde{V}^r(E|\rho; H) > V^r(R, \hat{p}^r)$ and so it is feasible to use trade policy to prevent a revolution.

The logic of Lemma 1 is illustrated in Figure 1. For any value of $\rho \in [0, 1]$, the figure compares the maximum level of welfare that the elite can induce in the rest of society using trade policy with the payoff the rest of society can get from revolution. The value of $\rho$ is shown on the horizontal axis while the welfare level of the rest of society is on the vertical axis. The upward sloping line shows the maximum level of welfare that the elite can credibly induce in the rest of society. The horizontal line shows the payoff to revolution. For $\rho > \bar{p}$, it is feasible for the elite to use trade policy to maintain the status quo because they can credibly commit to induce a level of welfare in the rest of society that is greater than revolution. For $\rho < \bar{p}$ this is not feasible. The intuition is that, in expectation, higher $\rho$ the greater is the number of periods in which the elite can credibly commit to use trade policy in the rest of society’s favour. For $\rho > \bar{p}$ this level of welfare is higher than the rest of society could obtain from a revolution. And so over this range of $\rho$ it would be feasible to use trade policy to maintain the status quo. For $\rho < \bar{p}$ the rest of society would expect to gain more from revolution than from trade policy and so the elite must find some alternative approach to maintaining the status quo.

We now want to address the question of when the elite would use repression. Let us take each of the cases $\rho < \bar{p}$ and $\rho > \bar{p}$ in turn. When $\rho < \bar{p}$, by (3.2) the elite face a payoff of $W^e(\hat{p}^r)/(1 - \beta)$ if they extend the franchise and, by (3.3), $(W^e(\hat{p}^r) - (1 - \beta(1 - \rho)) \mu)/(1 - \beta)$ if they repress. When the elite repress, they are better off from being able to set their preferred trade policy, $\hat{p}^e$, but they must pay $\mu$ in periods when the threat is high. Therefore,
if the per-period improvement in welfare that repression yields to the elite as compared to the payoff they receive from \( \hat{p}^{e} \) under democracy, \( W^e (\hat{p}^{e}) - W^e (\hat{p}^r) \), is greater than the expected cost of repression \((1 - \beta (1 - \rho)) \mu \), then the elite will respond to the threat of revolution by using repression. Otherwise they will extend the franchise.

To analyze \( \rho > \bar{p} \), we need to calculate the value to a member of the elite from setting \( p^s \) when the state is \( H \). This can be written recursively as

\[
V^e (E, p^s; H) \equiv W^e (p^s) + \beta (\rho V^e (E, p^s; H) + (1 - \rho) V^e (E, \hat{p}^{e}; L))
\]

Combining this with (3.5), we have

\[
V^e (E, p^s; H) = \frac{\beta (1 - \rho)}{1 - \beta} W^e (\hat{p}^{e}) + \frac{(1 - \beta (1 - \rho))}{1 - \beta} W^e (p^s).
\]  
(3.8)

Comparing (3.8) to (3.3), we find that if \( W^e (\hat{p}^{e}) - W^e (p^s) > \mu \) then \( V^e (Q, \hat{p}^{e}; H) > V^e (E, p^s; H) \) and the elite will use repression. Otherwise they will use trade policy to maintain the status quo.

With that, we now have all the elements in place to characterize equilibrium.

**Proposition 2.** For \( \rho \neq \bar{p} \) there exists a unique pure strategy Markov Perfect Equilibrium with the following characteristics.

1. If \( \rho < \bar{p} \) and \( W^e (\hat{p}^{e}) - W^e (\hat{p}^r) \leq (1 - \beta (1 - \rho)) \mu \) then the elite will respond to the threat of revolution by extending the franchise: \( \tilde{\sigma}^e (E; L) = (f = 0, q = 0, p^e = \hat{p}^{e}) \), \( \tilde{\sigma}^e (E; H) = (f = 1, \cdot) \), \( \tilde{\sigma}^r (E|f = 0, q = 0, \hat{p}^{e}; L) = (a = 0, \cdot) \), \( \tilde{\sigma}^r (E|f = 0, q = 0, p^e; H) = (a = 1, p^r = \hat{p}^{r}) \), \( \tilde{\sigma}^r (E|f = 1, \cdot; H) = (a = 0, p^r = \hat{p}^{r}) \) and \( \tilde{\sigma}^r (D; H) = (p^r = \hat{p}^{r}) \).

2. If \( \rho < \bar{p} \) and \( W^e (\hat{p}^{e}) - W^e (\hat{p}^r) > (1 - \beta (1 - \rho)) \mu \), or if \( \rho > \bar{p} \) and \( W^e (\hat{p}^{e}) - W^e (p^s) > \mu \) then the elite respond to the threat of revolution using repression: \( \tilde{\sigma}^e (E; L) = (f = 0, q = 0, p^e = \hat{p}^{e}) \), \( \tilde{\sigma}^e (E; H) = (f = 0, q = 1, p^e = \hat{p}^{e}) \), \( \tilde{\sigma}^r (E|f = 0, q = 0, \hat{p}^{e}; L) = (a = 0, \cdot) \), \( \tilde{\sigma}^r (E|f = 0, q = 0, p^e; H) = (a = 1, p^r = \hat{p}^{r}) \), and \( \tilde{\sigma}^r (E|f = 0, q = 1, p^e = \hat{p}^{e}; H) = (a = 0, \cdot) \).

3. If \( \rho > \bar{p} \) and \( W^e (p^s) \geq W^e (\hat{p}^{e}) - \mu \) then the elite will temporarily raise the rest of society’s welfare using trade policy in response to the threat of revolution: \( \tilde{\sigma}^e (E; L) = \)
Proposition 2 has the surprising feature that the elite can use trade policy to defuse a revolution when at any given time the opportunity to mount a revolution is relatively likely to arise; i.e. when \( \rho > \bar{\rho} \). With the elite initially in power, only when the opportunity to mount a revolution is relatively unlikely must the elite extend the franchise to the workers if the state switches from \( L \) to \( H \), and with it the power to set trade policy. We can see that when a revolution is relatively unlikely, the elite cannot credibly commitment to sufficiently large transfers using trade policy because in expectation this will happen in too few periods in the future to bring the payoff to the same level as would be obtained under a revolution. On the other hand, if the opportunity to mount a revolution is relatively likely, the number of future periods in which the elite can be held to account is sufficiently high to raise the rest of society’s payoff above that of revolution.

This result combines Proposition 1 of AR with Proposition 21 of Acemoglu (2006) and extends these results to a trade policy setting. We can now use Proposition 1 to characterize in more detail the relationship between trade liberalization and democratization.

By the Stolper-Samuelson Theorem, owners of the scarce factor seek a relatively closed trade regime. So, given that the elite own \( v_2 \), if the country has a comparative advantage in good 1 then elite rule will entail a relatively closed trade regime while democracy will entail a relatively open regime because the median voter is from the rest of society, who own the relatively abundant factor. If on the other hand the country has a comparative advantage in good 2 then the elite will preside over a relatively open trade regime while the economy will be relatively closed under democracy. These observations can be combined with Proposition 1 in a straight forward way to yield the following result.

**Proposition 3.** Consider the equilibrium characterized in Proposition 2.

1. If \( \rho < \bar{\rho} \) and \( W^e(\hat{p}^e) - W^e(\hat{p}^r) \leq (1 - \beta (1 - \rho)) \mu \) and the country has a comparative advantage in good 1 (good 2) then under elite rule the trade regime is relatively
closed (open). Then the threat of revolution is met by extension of the franchise, trade liberalization (protectionism), and an increase (decrease) in economic efficiency.

2. If \( \rho < \bar{p} \) and \( W^e(\hat{p}^e) - W^e(\hat{p}^r) > (1 - \beta (1 - \rho)) \mu \), or if \( \rho > \bar{p} \) and \( W^e(\hat{p}^e) - W^e(\hat{p}^r) > \mu \) then the elite respond to the threat of revolution using repression. If the country has a comparative advantage in good 1 (good 2) then the trade regime remains relatively closed (open) throughout.

3. If \( \rho > \bar{p} \) and \( W^e(p^s) \geq W^e(\hat{p}^e) - \mu \) then the elite will temporarily raise the rest of society’s welfare using trade policy in response to the threat of revolution. If the country has a comparative advantage in good 1 (good 2) then this involves temporary trade liberalization (trade retrenchment) and a correspondingly temporary increase (decrease) in economic efficiency.

Proposition 3.1 shows that only if repression is relatively expensive and the likelihood that the rest of society will resolve their coordination problem is low, coupled with a comparative advantage in good 1 while the elite own \( v_2 \), will democratization go hand in hand with trade liberalization and a corresponding increase in economic efficiency, as advocated by classical scholars. Indeed, if the country has a comparative advantage in good 2 then democratization will actually entail retrenchment to a relatively protectionist regime and a reduction in efficiency. Moreover, Proposition 3.3 shows that if the likelihood that the rest of society will resolve their coordination problem is high while repression is relatively expensive, coupled with a comparative advantage in good 1, then the elite will actually be able to use trade liberalization to forestall democratization. Therefore the model predicts quite a stringent set of conditions under which a ruling elite regime can actually be expected to follow classical liberal advocations.

4. Dictatorial Trade Policy Responses to Price Shocks

We now undertake comparative statics on the equilibrium characterized in Proposition 2, with a specific focus on the response to price shocks. For the purposes of this exercise, we will restrict the parameter space to the region where \( \rho > \bar{p} \) and \( W^e(p^s) \geq W^e(\hat{p}^e) - \mu \), placing us in the range of Proposition 2.3, where it is quite likely that the rest of society
are able to resolve their commitment problem and suppression is relatively costly. Recall using (3.7) that \( p^s \) is the value of \( p^e \) that solves \( G(p^s) = 0 \). The insight of Proposition 2.3 is that, under the assumed parameter restrictions, if \( s = H \) then it is sufficient for the elite to set \( p^s \) in order to maintain the status quo. To analyze the implications of a world price shock, we can carry out comparative statics on \( G(\cdot) \) in order to see how \( p^s \) is affected by a shock to \( p^w \). We will restrict attention to the case where the country has a comparative advantage in good 1 and so imports good 2 if the economy is open to trade. Therefore, the trade instrument will always be an import tariff. However, the analysis can easily be extended to the case of export taxes.

Looking at (3.7), we can see that there are two effects through which \( p^w \) must influence \( p^s \). One is through the ‘direct’ revenue effect whereby a change in \( p^w \) affects the benefits from tariff revenue in \( W^r(\hat{p}) \), \( W^r(\hat{p}^e) \), and \( W^r(p^s) \). The other is through the ‘indirect’ price effects whereby a change in \( p^w \) affects \( \hat{p}^e \) and \( \hat{p}^r \). We will take each in turn, starting with the price effects because it will be useful to have these in hand for the subsequent analysis.

To see how \( \hat{p}^e \) and \( \hat{p}^r \) are affected by \( p^w \), we need to return to group \( j \)'s optimal price problem. Observe from (2.4) that the only route through which \( W^{jt}(p_t) \) is affected by \( p^w \) is through the effect on \( nr^j(p_t) \). Differentiating \( nr^j(p_t) \) with respect to \( p^w \), we obtain

\[
\frac{\partial^2 nr^j(p_t)}{\partial p_t \partial p^w} = -c_2^{jt}(p_t) + \frac{1}{1 + \theta x_2^e(p_t)} > 0,
\]

since \( c_2^{jt}(p_t) < 0 \) and \( x_2^e(p_t) > 0 \). So we know that an increase in \( p^w \) shifts \( W^{jt}(p_t) \) upward, and thus increases \( \hat{p}^i \). Therefore, \( \hat{p}^e \) and \( \hat{p}^r \) both increase as a result of an increase in \( p^w \).

Now, rearrange (3.7) to get \( W^r(p^s) \) on the left hand side and differentiate the resulting expression with respect to \( p^w \) to obtain

\[
\frac{dW^r(p^s)}{dp^w} = \frac{1}{1 - \beta (1 - \rho)} \frac{dW^r(\hat{p}^r)}{dp^w} - \frac{\beta (1 - \rho)}{1 - \beta (1 - \rho)} \frac{dW^r(\hat{p}^e)}{dp^w} \tag{4.1}
\]

where

\[
\frac{dW^r(\hat{p}^r)}{dp^w} = \frac{\partial W^r(\hat{p}^r)}{\partial p^w} + \frac{\partial W^r(\hat{p}^e)}{\partial \hat{p}^e} \frac{\partial \hat{p}^e}{\partial p^w},
\]

and

\[
\frac{dW^r(\hat{p}^e)}{dp^w} = \frac{\partial W^r(\hat{p}^e)}{\partial p^w} + \frac{\partial W^r(\hat{p}^e)}{\partial \hat{p}^e} \frac{\partial \hat{p}^e}{\partial p^w} \tag{4.2}
\]
The direct effect $\partial W^r (\hat{p}^e) / \partial p^w$ is determined simply by the revenue effect: Using (2.2),
\[
\partial n r_j (p_t) / \partial p^w = - \left( c_2^2 (p_t) - \frac{1}{1+\theta} x_2 (p_t) \right)
\]
for given $p_t$. So $\partial W^r (\hat{p}^r) / \partial p^w < 0$ and $\partial W^r (\hat{p}^e) / \partial p^w < 0$. In addition, we have just established that $\partial \hat{p}^e / \partial p^w > 0$ and $\partial \hat{p}^r / \partial p^w > 0$. We also know by the optimality of $\hat{p}^e$ that $\partial W^r (\hat{p}^e) / \partial \hat{p}^e > 0$ and by the fact that $\hat{p}^e > \hat{p}^e$ that $\partial W^r (\hat{p}^r) / \partial \hat{p}^r < 0$. So we can conclude that $dW^r (\hat{p}^e) / dp^w < 0$ and $dW^r (\hat{p}^r) / dp^w < 0$. Using these results in (4.1), we see that without imposing further structure on the model, the effect of a shock to $p^w$ on the right hand side of the equation is ambiguous, and so the effect on $W^r (p^e)$ and hence $p^e$ must be ambiguous as well.

It is worth noting a key assumption on which the foregoing analysis rests. We have assumed that there are no funding constraints on the implementation of $\hat{p}^e$ and $\hat{p}^r$. However, a trade subsidy may in fact be required to implement either of these preferred prices. For example, if the country has a comparative advantage in good 1 and $\hat{p}^r < p^w$ then an export subsidy on good 1 would be necessary to implement $\hat{p}^r$. The implicit assumption being made here is that the revenue raised for such a subsidy could be raised in a non-distortionary way.

Although the outcome of a shock to $p^w$ on $p^e$ is ambiguous, the way we have structured the analysis will be useful in imposing further structure on the model to resolve the ambiguity. We therefore summarize our analysis so far as follows.

**Proposition 4.** Assuming there are no funding constraints on the implementation of $\hat{p}^e$ and $\hat{p}^r$, a positive shock to the world price, $p^w$, brings about an increase in $\hat{p}^e$, $\hat{p}^r$, $W^r (\hat{p}^e)$ and $W^r (\hat{p}^r)$. Since increases in $W^r (\hat{p}^e)$ and $W^r (\hat{p}^r)$ have opposite effects on $W^r (p^e)$, the effect of a shock to $p^w$ on $p^e$ is ambiguous.

Note that this ambiguity carries over into an ambiguous effect on the corresponding ad valorem tariff as well. Using the variables introduced so far, the formula for an ad valorem tariff would be $t = (p^e - p^w) / p^w$. Since we do not know the direction of the effect of an increase in $p^w$ on $p^e$, we cannot tell the effect on $t$ either. However, Proposition 4 also provides us with some guidance as to how this ambiguity can be resolved. If we can impose some further simple structure on the model that shuts down either the influence of the channel through $W^r (\hat{p}^e)$ or $W^r (\hat{p}^r)$ then the ambiguity may be resolved.

Let us assume that $\hat{p}^e > p^a$ and that there is a funding constraint on the implemen-
The assumption that \( p_e > p_a \) seems quite reasonable. It implies that the elite would actually prefer an export subsidy so large that it overwhelmed the country’s natural comparative advantage in good 1 so that it exported good 2. This would yield great personal gain to the elite through their factor income, but would impose a substantial burden on domestic taxation to raise the revenue necessary for the subsidy. Imposing our assumption that there is no domestic fiscal capacity, we have that the elite’s preferred price level is constrained to \( p_e = p^a \).

When \( p_e \) is constrained to \( p_e = p^a \), the effect of the shock to \( p_w \) on \( dW^r (\hat{p}^r) / dp^w \) is completely neutralized. To see this, consider the terms in (4.2). First note that if \( p_e = p^a \) then \( \partial W^r (\hat{p}^r) / \partial p^w = \partial nrj (p_t) / \partial p^w = 0 \) because at autarky tariff revenues are equal to zero. It is obvious that the second term of (4.2) must be equal to zero because if \( p_e = p^a \) then \( \partial \hat{p}^r / \partial p^w = 0 \). So the second term of (4.1) disappears; rewriting this expression accordingly, but expanding to take account of the revenue considerations, we have

\[
\frac{\partial W^r (p^s)}{\partial p^w} + \frac{\partial W^r (p^s)}{\partial p^s} \frac{\partial p^s}{\partial p^w} = \frac{1}{1 - \beta (1 - \rho)} \frac{\partial W^r (\hat{p}^r)}{\partial p^w}.
\]

Now we have already established that \( \partial W^r (\hat{p}^r) / \partial p^w < 0 \). So the sum of the two terms on the left hand side must be negative as well. But note that we can make the coefficient on \( \partial W^r (\hat{p}^r) / \partial p^w \) arbitrarily large by bringing \( \beta \) and \( \rho \) sufficiently close to 1. Note that doing so does not conflict with our restriction on the parameter space to the range of Proposition 2.3. Turning to the left hand side, we already know that \( \partial W^r (p^s) / \partial p^w < 0 \). And by the concavity of \( W (p_t) \) in \( p_t \), coupled with the fact that \( \hat{p}^e > p^s > \hat{p}^r \), we have that \( \partial W^r (p^s) / \partial p^s < 0 \) as well. We require the second term on the left hand side to be negative because \( \partial W^r (p^s) / \partial p^w < \partial W^r (\hat{p}^r) / \partial p^w \). If the second term on the left hand side is to be negative, then it must be the case that \( \partial p^s / \partial p^w > 0 \). And we can choose values of \( \beta \) and \( \rho \) sufficiently close to 1 to ensure that \( \partial p^s / \partial p^w > 1 \) such that the ad valorem tariff \( t \) will rise as the result of an increase in \( p^w \). The analysis is summarized in the following result.

**Proposition 5.** Assume there is a funding constraint on \( \hat{p}^e \) so that \( \hat{p}^e = p^a \). Then the result of a positive shock to \( p^w \) is an increase in \( \hat{p}^r \) and \( p^s \). Moreover, it is possible to choose \( \beta \) and \( \rho \) sufficiently close to 1 so that there is a more-than-proportional increase of \( p^s \) in response to a shock to \( p^w \), so that the response of an ad valorem tariff \( t \) to a
shock to $p^w$ would be positive as well.

This result establishes the conditions on a positive response both of the status quo price, $p^*$, and of the ad valorem tariff, to a world price shock $p^w$. This might more naturally be explained in terms of a reduction in $p^w$. As the world price of the imported good falls, openness becomes more appealing to the rest of society, increasing the payoff to democracy, and hence to a revolution. This in turn provokes the elite to move the status quo price and the tariff in the direction that the rest of society would like to see it go, namely towards free trade.

5. Explainations of Historical and Recent Trade Policy Episodes

This section uses the model’s predictions to shed light on two interesting episodes of trade policy. One is the period of significant changes in trade policy in Britain and Prussia from the end of the Napoleonic Wars in 1815 to the middle of the 19th century. The other is the widespread imposition of export restrictions in response to the world food price shocks of 2007-08.

5.1. Early 19th Century Trade Policy

5.1.1. British Trade Liberalization, 1815-1846

Britain’s repeal of the Corn Laws in 1846 has attracted perhaps more attention than any other single act of trade policy. This is arguably because of the decisive move that Britain made in unilaterally adopting free trade at a time when European trade policy was characterized as “an ocean of protectionism surrounding a few liberal islands” (Bairoch 1989, 7). Yet in terms of magnitudes, the period from the imposition of the Corn Laws in 1815 up until the years prior to repeal is actually more significant. The Corn Laws were enacted to replace the effective protectionism afforded to British agriculture by the naval blockades of the Napoleonic Wars that ended in 1815. Ad valorem tariff equivalents on grain fell from about 70 percent over the period 1815-1827, to about 50 percent over 1828-1841, and about 7 percent over 1842-1845, before repeal in 1846 (Williamson 1990, table 1, 128). The framework that we have set out above makes it possible to understand
this sustained fall in tariffs over the entire period 1815-1846.

Let us begin by considering how the form of government, taxation, factor ownership, and comparative advantage in Britain during the first half of the 19th Century can be characterized in terms of our framework. Prior explanations for Britain’s repeal of the Corn Laws itself have tended to focus on lobbying by special interests in industry of the elected chamber in the British Houses of Parliament, the House of Commons. The logic of these explanations adhere to the logic of lobbying, whereby industrialists petitioned the House of Commons in favor of reform. However, this approach ignores a crucial detail in the structure of government that significantly undermines the influence of the House of Commons in policymaking at that time. Schonhardt-Bailey (2006, 227) points out that the House of Lords held veto power over any law that was passed in the House of Commons. On this basis, it seems fair to argue that the British aristocracy, from whose numbers all members of the House of Lords were drawn, still constituted the ruling elite at that time, and that the form of government in Britain could still essentially be characterized as one of elite rule.9

Is it reasonable to assume that trade taxes were the only tax instruments for the period under consideration. After all, it is well know that Britain adopted the first progressive income tax in 1799 to help finance the war against Napoleon (Zolt and Bird 2005). However, it was not until 1842 that the first peacetime income tax was introduced in Britain by Prime Minister Robert Peel, with all income tax revenue being used prior to that time for the purposes of military conflict rather than redistribution (Schonhardt-Bailey 1996). Therefore, given our focus on the entire period 1815-1846, our assumption that only trade taxes were available seems like a reasonable simplification.

Although factor diversification by land owners into capital did accelerate in the 1830s, members of the House of Lords held, on average, most of their wealth in land in the first half of the 19th Century (Schonhardt-Bailey 2006, 227-231). Since Britain was the first

9The view that Britain was a dictatorship of the elite in the first half of the 19th Century may further be reinforced by the fact that the extension of the voting franchise was quite limited at that time. Prior to the Reform Act of 1832, only about 500,000 men in England and Wales were allowed to vote, with the reforms extending the franchise to a further 300,000 men in a total population of 14 million. Eligibility to vote was dependent upon property ownership or rental of above a threshold value. Moreover, despite these reforms, the House of Commons remained firmly under the control of landowners throughout the Parliament of 1841-1847, with about 80 percent of members consisting of the landowning aristocracy and gentry (Aydelotte 1967, Schonhardt-Bailey 2006, 109).
country to enter into the industrial revolution in the 18th century, by the 19th century it had a comparative advantage in manufacturing based in part on its abundance of labor relative to its European neighbors. This implies that the British aristocracy held most of their interests in the relatively scarce factor at that time. In accordance with the prediction of the Stolper-Samuelson theorem, the aristocracy sought protection for the returns from their relatively scarce factor, land, and obtained it in the form of the Corn Laws. Therefore, the House of Lords was staunchly opposed to repeal of the Corn Laws. Williamson (1990) estimates that the grain rents of land owners in grain producing areas of England would have fallen by 49 percent as a result of the complete removal of tariffs as they stood in 1841. Non-grain rents would have fallen by a more modest 6.5 percent, but arguably sufficient to sustain a coalition of land owners in the House of Lords against trade reform. Why, then did the House of Lords not use its veto to prevent trade liberalization throughout this period. Schonhardt-Bailey (2006, 227-261) argues that the decisive factor centred on fears amongst the Lords that refusal to reform trade policy could give rise to far more sweeping reform driven by revolution. Agitation for repeal of the Corn Laws began as early as 1819 with the Peterloo Massacre. On that occasion, six thousand protesters pressed for repeal of the Corn Laws and democratization, and more than six hundred people were killed or wounded by the attempt to disperse the protestors. This evidence shifts the emphasis of repeal away from the efforts of industrialists who sought trade liberalization as a way to increase profits towards workers who saw this as a way to increase their real wages by obtaining cheaper imports of food. The political environment of early- to mid-19th Century Europe was one of great political agitation, and so the assumption that the threat of revolution was quite likely, i.e. that \( \rho > \bar{\rho} \), during this period seems reasonable (Merriman 1996, 715).^{10}

Against this backdrop, our framework can be used to explain the gradual reduction in trade liberalization over the period 1815-1846. Throughout the period, a revolution in transportation was under way (O'Rourke and Williamson 1999 pp. 33-41). From around 1750 onwards, innovations in transportation dramatically reduced the costs of

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^{10}Rogowski (1989) also argues (non-formally), by invoking the logic of the Stolper-Samuelson theorem, that abundant factors are likely to organize politically and push for trade liberalization while scarce factors are likely to resist it, possibly resulting in the threat of a revolution. He applies this logic to a number of historical settings, including mid-19th Century Britain and Germany, as well as ancient Greece and Rome.
shipping. These are reflected in North’s index (North 1958), which shows a steady decline in shipping rates from 1741-1917, the dawn of World War I (Harley 1988, figure 1). This index shows an overall decline in freight rates in excess of 70 percent over the period 1815-1846, leading to a convergence in grain prices between Europe where a relative scarcity of land made grain expensive and the New World where an abundance of land rendered grain production comparatively cheap.

From the perspective of Britain throughout the period 1815-1846, there was a sustained fall in the world price of grain, and indeed food more generally, relative to manufactures. If we choose the price of manufactures as numeraire, then we can represent the decline in world relative food prices as a decline in $p^w$. This is illustrated in Figure 2 by the fall in $p^w$ from $p^w_0$ to $p^w_1$. Assuming that there is a funding constraint on $\hat{p}^e$, Figure 2 shows how the elite’s preferred price level is fixed at the autarky price level; $p^u = \hat{p}^e$. Figure 2 also illustrates the implication of the funding constraint that $W^{er}(p_t) = 0$ at a level of $p_t$ above $p^u = \hat{p}^e$. The rest of society’s preference for a relatively open regime is shown by the fact that $\hat{p}^r$ is relatively close to $p^w$. In the figure, $\hat{p}^r$ is always greater than $p^w$ but this is necessarily the case and will be influenced by other factors that determine the rest of society’s taste for openness. Proposition 5 predicts that the effect will be a decline in the rest of society’s preferred price level, $\hat{p}^r$, and the status quo price, $p^s$, as illustrated in Figure 1. Proposition 5 goes further to predict that, given $\beta$ and $\rho$ sufficiently high, in response to the fall in $p^w$ there will be a fall in the ad valorem tariff as well. This effect on the tariff is not depicted in Figure 1, but the relatively large underlying fall in $p^s$, from $p^s_0$ to $p^s_1$, is shown. On this basis, the model can explain the decline in the ad valorem tariff equivalent over the period.

The assumption that there was a funding constraint on $\hat{p}^e$ seems justified on the grounds that the British aristocracy would have benefitted from subsidies to agricultural production that were so large as to allow Britain to export manufactures, but that such large subsidies were politically infeasible. It follows then that $\hat{p}^e = p^a$ as assumed in Proposition 5. At the same time, the feature that if the rest of society gained power they would not go all the way to free trade is underpinned by the assumption that by having some degree of protection in place they would benefit from access to tariff revenues. It also seems reasonable to argue that $\rho$ was relatively high throughout the period, on two
bases. Throughout the earlier part of the period 1815-1846, the vestiges of the military organization imposed on the population of British working men in the Battle of Waterloo would have carried over into civilian society. Later, in 1838, John Bright and Richard Cobden formed a pressure group called the Anti-Corn Law League whose specific purpose was to organize those in favor of repeal of the Corn Laws (Schonhardt-Bailey 2006 11-18).

The intuition of Proposition 5 matches the historical accounts of the motivation for Britain’s trade policy over this period quite well. As transport costs fell, ordinary British people, especially those who had moved to the cities to work in the factories, became increasingly aware that their costs of living could be improved through access to cheaper imported food. This in turn increased the appeal of democracy, through which policies more favorable to the rest of society were anticipated. The British aristocracy recognized that some degree of trade liberalization served as a way to give workers what they wanted and thereby defuse the pressure on democratic reform. As argued by Schonhardt-Bailey (2006), at the same time as the Anti-Corn Law League was pressing for trade liberalization, there were also demands for parliamentary reform that would extend the franchise to the working classes. The demands for parliamentary reform were spearheaded by the Chartist movement. They were a working class pressure group who understood that full democratization would usher in trade liberalization as power was transferred through democratization from the aristocracy to the working classes, very much in the spirit of our modelling framework (Schonhardt-Bailey 2006 13). This serves to reinforce the sense in which trade liberalization throughout the period 1815-1846 and ultimate repeal of the Corn Laws was an action undertaken by the ruling elite to forestall democratization.

5.1.2. Prussian Trade Policy and the Hunger Riots, 1815-1848

The history of Prussian trade policy offers an interesting counterpart to the history of British trade policy that we have just reviewed. Prussia at that time consisted of a number of states that are now in East and West Germany as well as parts of Poland. The Kingdom of Prussia was an absolute monarchy throughout this period, and spearheaded the unification of Germany in 1871. Similarly to Britain, Prussia had a landed aristocracy referred to as the ‘Junker’. The process of industrialization was significantly further behind that of Britain at that stage, and the rest of society comprised largely of
a landless peasantry who worked on the large estates, or latifundia, that belonged to the Junker.\textsuperscript{11} The Prussian king and the Junker formed a dictatorial elite at that time, and were essentially free to set trade policy as they saw fit (Hagen 2002).

With transport costs still relatively high and the New World effectively cut off to trade in agricultural products, Prussia had a relative abundance of land and a comparative advantage in agricultural products which it exported to the rest of Europe, including Britain. The Prussian elite had a corresponding incentive to set tariffs on manufactures relatively low. The Prussian tariff of 1818 was regarded when it was enacted as the lowest in Europe, but was raised steadily over the period until 1846 (Kindleberger 1975).

In effect, Prussia was on the other side of the market to Britain for grain and other agricultural products. So from Prussia’s perspective the fall in transport costs throughout the period 1815-1846 was seen as a rise in the world price of agricultural products and hence a rise in \( p^w \). This is illustrated in Figure 3 by the rise in \( p^w \) from \( p^w_0 \) to \( p^w_1 \). Assume this time that there is a funding constraint on \( \hat{p}^w \). Figure 3 shows how in this case it is the rest of society’s preferred price level that is fixed at the autarky price level, \( p^a = \hat{p}^a \), because \( W''(p_t) = 0 \) at a level of \( p_t \) below \( p^a = \hat{p}^a \). The elite’s preference for a relatively open regime is shown by the fact that \( \hat{p}^e \) is relatively close to \( p^w \). The figure depicts a situation where \( \hat{p}^e \) is always less than \( p^w \), perhaps due to revenue raising considerations. The analogue of Proposition 5 applied to a situation where the country has a comparative advantage in good 2 predicts that the effect of an increase in the world price, \( p^w \), will be an increase in the elite’s preferred price level, \( \hat{p}^e \), and a decrease in the status quo price, \( p^s \), as shown in Figure 3. Here the prediction is that, given \( \beta \) and \( \rho \) sufficiently high, in response to the rise in \( p^w \) there will be a rise in the ad valorem tariff on manufactures as well. This is not shown in Figure 3, but the relatively large underlying fall in \( p^s \), from \( p^s_0 \) to \( p^s_1 \), is shown. Therefore, the model can explain the rise in the ad valorem tariff over the period documented by Kindleberger (1975).

More interesting still for the case of Prussia are the events that occurred after 1846. Europe’s ‘last subsistence crisis’ hit in 1847. A potato blight and a drought lead to sharply

\textsuperscript{11}Gerschenkron (1962) has characterized a more sophisticated structure of society in his ‘marriage of iron and rye’ which refers to the alliance between the Junkers and the fledgling industrial class. But this did not emerge until the latter half of the 18th century by which time Germany’s process of industrialization had gained momentum.
increased prices for agricultural products all over Europe (Solar 1997). Food production in Prussia was curtailed and significant quantities of the food that it did produce flowed out of the country, attracted by even higher prices elsewhere on the continent. This would be captured by a further rise in $p^w$, this time driven not by a fall in transport costs but by a reduction in supply abroad. The result was was that many Prussians were unable to afford to feed themselves. This situation triggered the so-called ‘hunger riots’ in 1847. The ruling regime’s response was to introduce export taxes of 25 percent on grain in that year, whose purpose was to prevent grain from leaving the country and food prices rising even further. This action reflects a further increase in $p^w$ in response to the sharp rise in $p^w$, again as our model would predict. Note that, by the Lerner symmetry theorem, an increase in an import tariff on manufactures would have the same distributional consequences as an increase in an export tax on grain.

5.2. World Food Price Shocks 2007-08 and Export Restrictions

A striking feature of the world food price shock of 2007-08, initiated by population growth and urbanisation especially in the developing world, was the widespread imposition of measures to restrict exports by food exporting countries. Eight different types of policy measure were used to restrict exports. All of these measures entail holding local prices below world prices as in our model. In many cases these measures were introduced in response to social unrest triggered by steeply rising food prices. As Sharma (2011) explains, of the 105 countries in his sample, 33 introduced policies to reduce exports. Of these, 9 countries were in Africa, 15 in Asia and 5 were in Latin America and the Caribbean. While only some of these countries are outright dictatorships like Jordan, a significant number of them such as Pakistan, Russia and Ukraine would be regarded as countries where the democratic process is significantly compromised by the poor functioning of institutions such as free speech and free political representation. To the extent that the ruling regime is able to manipulate trade policy to extend their time in office, our model may presents a useful way of understanding the tendency in all of these countries to restrict exports.

Food exporting countries generally have a comparative advantage in food because they have a relative abundance of land. A simple characterization of many food exporting developing countries is one where the ruling elite own the land used intensively in the
production of primary products, as in early-19th century Prussia. So the model would predict that in these countries the ruling elite would prefer a relatively open trade regime, and that under the threat of revolution they could implement the status quo price through export restrictions.

6. Conclusions

In this paper, we have combined the classic $2 \times 2$ Heckscher-Ohlin model with Acemoglu and Robinson’s model of the form of government to yield a new theory of trade policy under dictatorship and democratization. The first two results established in the paper were concerned with showing that the Acemoglu-Robinson result characterizing equilibrium in a closed economy extends in a natural way to a trading economy. By linking these models together, we were able to extend this characterization by incorporating the relationship between which groups own the underlying factor endowments and trade reform or protectionism. Although it is generally agreed that democratization and trade liberalization are beneficial from a normative perspective, this outcome was shown only to be in line with the incentives of a ruling elite when they own the factor that is not used intensively in the production of the good for which the country has a comparative advantage. Since the elite usually own the factor used intensively in the production of the good for which the country does have a comparative advantage, the model actually predicts that a democratic transition might in fact be accompanied by an increase in protectionism and a decline in economic efficiency.

The paper also characterized a set of circumstances under which the ruling elite could use trade policy to forestall democratization. The dynamics of this equilibrium outcome were then analyzed in terms of the implications of a world price shock, and illustrated in terms of the improvements in transportation technology throughout the early 19th Century. This technological change lead to a fall in the prices that Britain could import agricultural products and a rise in the prices at which Prussia could export them. Given that both countries where ruled by landed aristocracies, but had opposite comparative advantages, the prediction of the model is the opposite for the respective countries: a fall in the status quo price and hence for Britain but a rise for Prussia. A careful look at the
history of trade policy over the period showed that the prediction of the model appears to have been borne out in practice.

Four main questions are provoked by the framework presented in this paper. The first concerns how this theory measures up against previous theories of protectionism in its ability to explain patterns in the data? The second concerns the dynamic process governing the interaction between trade liberalization and eventual franchise extension. The third is why we ever observe revolution, as in the Arab Spring, if either trade policy or franchise extension can be used to maintain the status quo. The fourth, related to the second and third, concerns how multilateral agencies such as the International Monetary Fund, World Bank and World Trade Organization should manage the process of democratization and trade liberalization given that they may have an important bearing on one another. Let us close by briefly discussing the scope for future research in each of these areas in turn.

As discussed in the Introduction, previous theories of protectionism tended to focus on efforts by special interest groups to lobby the government financially for their preferred trade policy. A combination of the theory developed in the present paper and earlier theories would facilitate an even more nuanced account of the variation in tariff rates across countries. Following the literature initiated by Goldberg and Maggi (1999), there would also be scope to test the relative importance of the respective theories of protectionism against the data. Importantly, Acemoglu, Johnson and Robinson (2005) show that European countries that were more exposed to Atlantic trade in the sense that they had a lot of Atlantic coastline and whose governing executives were more bound by democratic constraints tended to grow faster. Based on our framework one would want to ask whether this happened because dictatorial regimes had to open up to maintain the status quo or because democratization went hand in hand with trade liberalization for countries that extended the franchise.

It would be interesting to examine the interaction over time of the incentive to use tariffs to defuse the threat of revolution against the broader impetus to extend the franchise. For example, technological change could alter the relative payoff to the workers over time of gaining control over trade policy under democracy versus maintaining the status quo. Following Neary (1978), the freeing up of the mobility of various different
types of factor over time could affect the preferences of their owners over trade policy. This in turn might help to explain, for example, why tariff reduction both through the 19th Century and nowadays is often gradual.

Our analysis begs the question as to why the deposed regimes in the Middle East did not use trade policy to prevent the revolutions of the Arab Spring? Ellis and Fender (2010) show, in a closed economy environment characterized by uncertainty, that it may be rational for a ruling elite to set policies under which a revolution may arise with some probability. The framework of the present paper is open-economy but does not allow for uncertainty. A combination of the two frameworks could explain why an elite might fail to use trade policy to the fullest extent possible to prevent a revolution, even though such policy action might be possible in principle.

The response of the multilateral institutions to the export restrictions following the world food crisis of 2007-08 was to urge the perpetrators to remove the measures (e.g. World Bank 2008a, 2008b). However, a literature is emerging to argue that although the trade-based measures are second best, they may represent the most practical redistributive policies that can be found under the constraints faced by many developing countries (Do, Levchenko and Ravallion 2013). The present paper makes a different but related point that dictatorial regimes are unlikely to heed calls to remove export-restrictive measures if they are instrumental in their political survival. Much work remains to be done in order to fully understand the motivation behind the recent wave of export-measure based protectionism and how it can effectively be addressed.
References


[40] Smith, A., (1776); *The Wealth of Nations.*


Figure 1: Characterization of Equilibrium

- Payoff to democracy
- Payoff to revolution
- Payoff to 1 period transfer using trade policy

Maximum welfare that elite can credibly promise the rest of society

$P[\text{state is 'high threat' in any period}]$
Figure 2: Britain’s Trade Policy 1815-1846; c.a. in good 1= manufactures
Figure 3: Prussia’s Trade Policy 1815-1848; c.a. in good 2 = food