

Escaping a Protectionist Rut: Policy Mechanisms for Trade Reform in a Democracy*

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Abstract

This paper analyzes the dynamics of trade policy reform under democracy. In an overlapping generations model, heterogeneous agents may acquire skills when young thereby determining the skill composition of their cohort. Current and anticipated trade policies influence education decisions and thus the identity of the median voter. We show that there may exist two political steady states: one protectionist and one liberal. Transition from the former to the latter can be achieved by government announcements, temporary educational subsidies, or tariff liberalization by trading partners, but generally not by transfer payments to adversely affected workers. We find additionally that reform is politically feasible only if the proposed liberalization is sufficiently large, suggesting that radical reform may be necessary for escaping a protectionist political rut.

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1 Introduction

The political process of trade liberalization is inherently dynamic, the path to reform characterized by difficult and often unpopular labor market adjustments that may give rise to political foot dragging or backsliding. In the presence of populist voter pressure, proposed liberalization programs that commence with great fanfare and optimism may easily (and frequently do) succumb to public backlash. In democratic political environments – which necessarily are subject to constant legislative reevaluation – generational differences, evolving expectations, and individual workers’ abilities to adapt to changing market conditions surely are paramount in determining the ultimate success or failure of liberalization efforts.

Our paper takes a new modelling approach to highlight the potential importance of voters’ future expectations and intergenerational differences in a dynamic political economy model, while maintaining a parsimonious analytical structure customary to the trade literature. We develop a two period overlapping generations (OLG) model with endogenous skill acquisition in which agents vote every period on a referendum to adjust the current trade policy or to maintain the status quo. When deciding whether to acquire skills, heterogeneous agents within each generational cohort take into account current and expected trade policies. The model exhibits a feedback mechanism in which trade policy determines the skill composition of the population, and hence the identity of the median voter, who in turn votes on trade policy.

In the policy referendum, voters choose between two economic states of the world, a relatively protectionist regime or its more liberal counterpart. In each period, those who are old at the time of the vote are committed to one sector or the other based on their skill acquisition decisions when young, and therefore have polarized tariff preferences, preferring either protectionism or free trade. In contrast, younger workers who have yet to make skill acquisition decisions weigh potential lifetime utility under each policy regime viewing the skill acquisition decision as endogenous. Adopting the developed country perspective, we show that in an economy with comparative advantage in skill-intensive products, skilled older workers favor free trade, while unskilled, import-competing older workers favor trade barriers.¹ The pivotal young generation splits the vote, with lower ability workers support-

¹Our framework is consistent with empirical evidence, such as Scheve and Slaughter (2001), who find

ing protectionism and higher ability workers favoring open markets.

Given the population’s skill composition at the time of the vote and the expected trade regime in the future, we find the potential for multiple *political steady states*, which are defined as economic equilibria under which the median voter would elect to maintain the status quo trade policy. The multiplicity of equilibria obtains because the existing policy regime affects not only the skill acquisition choices of the young generation, but also the identity of the median voter. The more protectionist the existing policy, the greater the unskilled proportion of the older generation (which unambiguously opposes reform), and thus the lower the relative skill level of the median voter among her younger (pivotal) cohort. Intuitively, the status quo enjoys the power of hysteresis through the past skill acquisition decisions of the older generation.

When the model generates multiple political steady states, voters may get stuck in a “protectionist rut” even though the country as a whole would be better off under the more liberal regime, itself a politically sustainable equilibrium.² Given that there are efficiency gains from freer trade, transition from the relatively protectionist regime to a more liberal policy should be feasible. We show that transition can be achieved by credible policy announcements as well as temporary educational subsidies that tilt the balance towards the more liberal policy path. Traditional trade adjustment assistance through temporary transfer payments, on the other hand, may be counter-productive if the compensation scheme adversely affects workers’ ex ante skill acquisition decisions. We find moreover that the political feasibility of transition increases in the magnitude of the tariff liberalization, and also in the presence of “reciprocal” reforms by trading partners. Radical policy proposals and multilateral liberalization agreements thus may be more likely to be approved than small or unilateral reforms.

Our analysis continues a select tradition in analyzing dynamic aspects of endogenous that voters’ support for trade barriers is significantly and negatively correlated with skill level, and Beaulieu and Magee (2004), who show that industries’ net trade orientation serves as a strong predictor for labor union PAC contributions.

²This finding is reminiscent of Basu and Van (1998), who demonstrate the potential for multiple equilibria in the context of child labor, though in their model multiplicity arises via labor markets rather than through the political system.

trade policy. In an important early contribution, Cassing and Hillman (1986) use the political support function approach to analyze protection for industries that decline over time. While the newer, micro-founded literature has focused predominantly on static models, there are important exceptions: Brainard and Verdier (1994) extend the ‘protection for sale’ model of Grossman and Helpman (1994) by adding a prior adjustment decision on the part of firms, and Brainard and Verdier (1997) subsequently use this framework to revisit the protection of senescent industries as in Cassing and Hillman (1986). A prior investment decision by firms is also the cornerstone of Maggi and Rodríguez-Clare (1998, 2007) who endogenize the commitment to trade liberalization in a lobbying game and subsequently use their approach to propose a novel theory of trade agreements. Another important contribution along these lines is McLaren (2002) who shows how prior investment decisions can lock countries into a preferential, rather than multilateral, liberalization policy.

Whereas the preceding papers concentrate on the decisions of firms and on lobbying, we emphasize how the skill acquisition decisions of individuals influence their voting behavior with regard to trade policy. But where Staiger and Tabellini (1987) emphasize the time consistency of trade policy to show that such a policy will involve excessive protection due to the redistributive goals of a benevolent government, we rely on a median voter approach without the possibility to commit and are still able to explain positive levels of protection. And unlike Fernandez and Rodrik (1991), who in their seminal contribution show how individual uncertainty can give rise to status-quo bias, we are able to establish such a bias in a deterministic setting under perfect information. The possibility of multiple trade policy equilibria has been shown recently by Krishna and Mitra (2006) who use a two country median voter model of endogenous trade liberalization. Their setting is static, however, and does not give rise to multiple political equilibria in a unilateral context as ours does. Finally, in an important recent contribution Davidson, Matusz, and Nelson (2007) show that the order in which the median voter decides on trade liberalization as well as accompanying compensatory transfer scheme can fundamentally change the policy outcome. While sequencing is a clever way to endogenize the second policy dimension, an achievement that we do not aspire to match in the current paper, the combined decision on the policy mix remains static.³

³Also different, their model treats individuals’ industry affiliation as exogenous whereas skill acquisition

Our approach and results in this paper, though novel to the trade literature, are motivated in part by recent work in macroeconomics. In particular, our approach is similar to that in Hassler, Rodríguez Mora, Storesletten, and Zilibotti (2003) who analyze domestic redistributive policies, and relates to quantitative models by Bassetto (1999), Saint Paul (2001), Krusell and Ríos-Rull (1996), and Krusell, Quadrini, and Ríos-Rull (1996). These authors find, as we do, the potential for multiple equilibria, and the Hassler, Rodríguez Mora, Storesletten, and Zilibotti (2003) model in particular shares the feature that the identity of the current constituency supporting a proposed policy depends on the status quo policy framework. Ortega (2004) uses a similar approach to analyze the nexus between immigration policy and redistribution, yet skill acquisition is entirely stochastic in his model. Earlier papers that feature a feedback loop between public policy and individual behavior include Glomm and Ravikumar (1995), Saint Paul and Verdier (1997), and Benabou (2000). Our model differs from this earlier work in a number of important dimensions; perhaps most notably, intergenerational political frictions in voting are a key element in our model, whereas previous studies assume that the young do not vote, so that the median voter does not have a stake in the future economy.⁴

Beyond the realm of political economy, our work relates to important contributions to the broader trade literature that use a dynamic framework to analyze agents' decisions, taking policy as given. Findlay and Kierzkowski (1983) present an OLG model in continuous time where agents decide on human capital acquisition, and Borsook (1987) introduces heterogeneous agents in such a framework, which comes close to the economic side of the model we employ in this paper. Matsuyama (1992) uses a continuous time OLG setup where agents, whose comparative advantage differs across sectors, decide up-front which sector to enter depending on current and future trade policies. Though not a trade paper per se, Eicher (1996) analyzes similar issues in his insightful study of the interaction between skill acquisition decisions and endogenous technological innovation. In addition to OLG models, – and thus implied trade policy preferences – is endogenous in our framework.

⁴In giving suffrage to the young generation, our model both highlights the role of intergenerational voting blocks and permits a number of interesting and relevant extensions, such as differential voter turnout across generations or population growth. Moreover, allowing the young to vote eliminates the potential for cyclical sunspot equilibria. (See Section 2.2.)

there are numerous studies in trade that consider a finite sequence of time periods where heterogenous agents can make human capital investments. Bougheas and Riezman (2007) analyze how the distribution of human capital determines the respective trade policies of two countries. Willmann (2004) shows how the attempt to compensate the losers from liberalization can undermine the gains from trade due to strategic under-investment in human capital, while Long, Riezman, and Soubeyran (2007) analyze how trade liberalization affects the acquisition of sector specific human capital. All these studies, however, stop short of endogenizing trade policy. Notably, the closing sentence of Matsuyama (1992) advocates future work to analyze the “dynamic formation of commercial policy” – precisely the aim of the present paper.

The paper proceeds as follows. Section 2 describes the model and establishes the conditions under which multiple political steady states exist. Section 3 then describes the potential for transition between steady states, focussing first on the role of expectations and then on active policy prescriptions for inducing reform. Section 4 concludes.

2 A Model of Political Stasis

The model is designed to capture a dynamic environment in which both current and future trade policy influence individuals’ skill acquisition decisions and voting behavior. Our OLG approach highlights the importance of the status quo policy in determining the existing skill composition of workers – and thus the identity (not just the policy preference) of the median voter – and the concomitant intra- and inter-generational political friction borne of different abilities to adjust between unskilled and skilled work. The model allows formal evaluation of how voters’ preferences and choices depend on current and expected trade policies, representing how voting populations evolve in response to changing economic conditions.

Equilibrium in this model has two components: economic and political. We begin in Section 2.1 by defining an economic equilibrium as the skill composition and production levels that would result from an exogenous time path of tariffs; an *economic steady state* is then just the economic equilibrium that would obtain under a constant exogenous tariff

level. Section 2.2 then endogenizes the political process to evaluate the existence, properties, and potential multiplicity of political equilibria and *political steady states*. As in Krishna and Mitra (2006) we first develop the model without inclusion of tariff revenue to simplify the analytical exposition. Appendix A2 demonstrates the robustness of the results to lump sum redistribution of tariff revenue.⁵

2.1 The Model Economy

The model consists of a small open economy that may produce, consume, and trade two goods: a skill-based good, S , which requires skilled labor to produce, and a basic good, U , produced using unskilled labor. Let good S be the economy's natural export good (i.e. take the perspective of an industrialized country). Designating U as numéraire, the domestic relative price of good S then is given by $p \equiv \frac{p^w}{\tau}$, where p^w represents the exogenous world relative price and τ is defined as one plus the ad-valorem tariff on the basic good. Both goods are produced under perfect competition with constant returns to scale technologies. There is no uncertainty in the model and borrowing and lending are ruled out.⁶

The economy's population consists of a continuum of agents with *ex-ante* heterogeneous natural abilities and rational expectations with perfect foresight.⁷ Agents live for two periods; thus at any point in time, two generations, the 'young' and the 'old', comprise the total population. Every generation is assumed to be the same size, with mass normalized to one. Individuals of each generation are indexed by $a \in [0, 1]$ according to ability level. We assume that within each generation, the distribution of ability levels is uniform over the unit interval. Agent $a = 0$ is the least able of her generation, and agent $a = 1$ the most able.

Every agent is endowed with one unit of labor in each period of life. At birth, each

⁵Redistribution through non-uniform tariff revenue rebates is analytically equivalent to the tax and transfer scheme discussed in Section 3.

⁶Introducing an independent savings channel (for instance, through international financial markets at a fixed world interest rate) will not change the qualitative results of our analysis as long as savings (or borrowing) decisions are interior.

⁷Uncertainty over future policy outcomes would strengthen our results further, compounding our findings by the uncertainty-driven status quo bias mechanism in Fernandez and Rodrik (1991).

individual chooses either to remain unskilled for her lifetime or to acquire skills at a constant fixed education cost $c \in [0, 1]$ units of labor. If an agent elects to remain unskilled, she inelastically supplies one unit of unskilled labor in each period of her life. If instead she chooses to earn an education, she supplies the $(1 - c)$ units of unskilled labor that remain after paying for education when young, and subsequently $(1 + a)$ efficiency units of skilled labor when old. Comparing the sectoral mobility of both age groups, note that agents are assumed to be free to choose between sectors when young by choosing education, while they are sectorally immobile when old.⁸

We assume an extreme form of factor specificity in the production functions for both goods: the basic good is produced only from unskilled labor and the skill-based good solely from skilled labor.⁹ While our assumption that each good uses only one factor of production simplifies the analysis, this is not a necessary condition for our results.¹⁰

An agent will acquire skills only if doing so maximizes her lifetime indirect utility. Preferences are identical across individuals and functionally separable across time. Let each agent's lifetime utility function be given by:

$$u(x_u^y, x_s^y) + \beta u(x_u^o, x_s^o), \quad (2.1)$$

where $\beta > 0$ represents the intertemporal discount factor, $x_s^y(x_u^y)$ denotes the individual's consumption of good S (U) when she is young, and $x_s^o(x_u^o)$ her consumption of good S (U) when old. We assume intratemporal utility is a function of current consumption, given by $u(x_u, x_s) \equiv x_s^\alpha x_u^{1-\alpha}$, so that the corresponding within-period indirect utility function is $v(p, I) \equiv Kp^{-\alpha}I$, where $K \equiv \alpha^\alpha(1 - \alpha)^{1-\alpha} > 0$, I denotes current nominal income, and $\alpha \in (0, 1)$. A key advantage of this functional form is that it allows us to focus on the skill

⁸Falvey, Greenaway, and Silva (2007) develop a model in which agents can earn an education at any point along a continuous time dimension, and show that sectoral mobility does decrease in age.

⁹Unskilled workers cannot produce skill-based goods, and no established skilled (second generation) worker would revert to unskilled good production as long as the skill premium is positive, which is implied in autarky by the Cobb-Douglas structure of preferences assumed momentarily, and under trade by the assumption that S is the natural export good.

¹⁰As in Matsuyama (1992) our assumption simplifies the analysis by reducing the dimensionality of the price vector and relieves us of resorting to the Stolper–Samuelson result, which would deliver the same results under a more general production structure.

acquisition decision by abstracting from consumption smoothing.¹¹

By choice of units, one unit of unskilled labor produces exactly one unit of the basic good, so that the nominal wage to unskilled labor is normalized to one for all agents. From the assumption that one unit of skilled labor by agent a produces $(1 + a)$ units of good S , perfect competition implies that the nominal *skilled* wage to agent a at time t is $(1 + a)p_t$. Thus, as a function of current and future prices, p_t and p_{t+1} , a given agent a will acquire skills iff:

$$v(p_t, 1 - c) + \beta v(p_{t+1}, (1 + a)p_{t+1}) \geq v(p_t, 1) + \beta v(p_{t+1}, 1). \quad (2.2)$$

From (2.2) and the functional form of the sub-utility function in (2.1) we can define the *threshold agent*, \hat{a}_t , under a diversified equilibrium as the member of the young generation at time t who is just indifferent between remaining unskilled and getting an education given the discount rate, the cost of education, the preference parameter α , and current and anticipated tariffs:

$$\hat{a}_t(\tau_t, \tau_{t+1}) \equiv \max \left\{ 0, \frac{\beta + c \left(\frac{\tau_t}{\tau_{t+1}} \right)^\alpha}{\beta p^w} \tau_{t+1} - 1 \right\}. \quad (2.3)$$

Note that the corner solution in which all agents acquire skills, $\hat{a} = 0$, does not imply a specialized economy (as long as $c < 1$), since all workers are assumed to be unskilled while young. The assumption that the country has comparative advantage in production of the skill-based good ensures that $\hat{a} < 1$ in equilibrium.

Based on the critical value in (2.3), we can summarize the educational decisions of any agent as follows:

Proposition 2.1 *An agent of generation t with ability level $a \in [0, 1]$ remains unskilled for life if $a \leq \hat{a}(\tau_t, \tau_{t+1})$, and acquires skills otherwise.*

Because each generation of agents is mapped to the unit interval with a uniform distribution, \hat{a} also equals the proportion of unskilled workers in each generation. For notational convenience, we define an economic equilibrium in terms of the equilibrium proportion of

¹¹Under constant marginal utility of income, agents' skill acquisition decisions are orthogonal to savings and wealth.

each generation that acquires skills: $\theta_t \equiv 1 - \hat{a}_t$. Output of each good at time t then may be written as a function of the skill composition of the old (generation $t - 1$) and the young (generation t). Since the parameters (p^w, β, c, α) are assumed to be fixed and exogenous, we suppress these arguments in definitions hereafter.

Definition 2.1 Economic Equilibrium. *As a function of an exogenous tariff sequence, an economic equilibrium is characterized by the currently young and older generations' skill composition and current levels of production over time in each sector so that $\forall t$:*

$$\theta_t(\tau_t, \tau_{t+1}) = 2 - \frac{\beta + c\left(\frac{\tau_t}{\tau_{t+1}}\right)^\alpha}{\beta p^w} \tau_{t+1} \quad (2.4)$$

$$\theta_{t-1}(\tau_{t-1}, \tau_t) = 2 - \frac{\beta + c\left(\frac{\tau_{t-1}}{\tau_t}\right)^\alpha}{\beta p^w} \tau_t \quad (2.5)$$

$$q_t^u(\theta_{t-1}, \theta_t) = 2 - \theta_{t-1} - c\theta_t, \quad (2.6)$$

$$q_t^s(\theta_{t-1}) = \int_{\hat{a}_{t-1}}^1 (1 + a) da = 2\theta_{t-1} - \frac{\theta_{t-1}^2}{2}. \quad (2.7)$$

Since the model assumes a small open economy,¹² the definition of an *economic steady state* is trivial. For a given world price, p^w , economic equilibrium is determined uniquely by the last period, current, and next-period tariffs; thus, if the tariff is fixed (and this is understood by voters), an economic steady state is reached. Formally:

Definition 2.2 Economic Steady State. *The steady state economic equilibrium under a constant tariff level τ is characterized by a constant skill composition across generations and a constant level of production in each sector according to:*

$$\theta(\tau) = 2 - \frac{\beta + c}{\beta p^w} \tau, \quad (2.8)$$

$$q_u(\theta) = 2 - (1 + c)\theta, \quad (2.9)$$

$$q_s(\theta) = 2\theta - \frac{\theta^2}{2}. \quad (2.10)$$

2.2 The Political Process

We model the political process as a direct democracy over trade policy. At the beginning of each period, every agent in the population votes on current trade policy, which subsequently

¹²The derivation of the autarkic steady state and autarkic steady state price is offered in the appendix.

determines the wages and prices for that period. Agents have complete information and perfect foresight when they make their voting decisions. We adopt a binary referendum framework;¹³ agents can vote either to maintain the status quo tariff policy, τ^o , or to switch to some alternate regime, τ' . The two possible tariff regimes, denoted τ_L and τ_P , are for now taken as given, assumed to be fixed by a third party agenda setter whose objectives are the focus of Section 3. Without loss of generality, let $\tau_L < \tau_P$ and think of the former as the liberal and the latter as the protectionist tariff. We define the *reform step* as $\Delta \equiv \tau^o - \tau'$, so that $\Delta > 0$ represents a trade liberalization from τ_P to τ_L , while $\Delta < 0$ would imply a protectionist shift from τ_L to τ_P . We assume that there is no bureaucratic or time cost of changing tariff regimes.

Trade policy is determined by majority vote. In the case of a tie, we assume that the status quo is maintained. If half or more of the population (i.e. voting mass ≥ 1 ; recall that the mass of the total population is 2) votes in favor of the status quo tariff policy the tariff regime remains unchanged and the existing tariff regime is deemed *politically stable*. If instead the majority votes for reform, the tariff switches to the proposed alternative regime immediately. Given that the single-crossing condition is satisfied, the median voter – hereafter with characteristics denoted by superscript M – is decisive.

We define a political equilibrium to be any economic equilibrium in which agents' expected time path of tariffs would be maintained endogenously under the existing political process, given rational expectations and perfect foresight.¹⁴ Formally:

Definition 2.3 Political Equilibrium. *A political equilibrium is defined by a sequence of tariffs, $\{\dots, \tau_{t-1}, \tau_t, \tau_{t+1}, \dots\}$, and generational skill compositions, $\{\dots, \theta_{t-1}, \theta_t, \theta_{t+1}, \dots\}$, such*

¹³The binary structure we adopt does not imply a substantial loss of generality. Our framework does rule an unstable equilibrium, however, in which the indifferent voter is the median voter each period. (See Appendix A3.)

¹⁴Unlike Hassler, Rodríguez Mora, Storesletten, and Zilibotti (2003), we do not restrict attention to Markov perfect equilibria. (Due to our small open economy structure, we do not suffer from the vast multiplicity of equilibria common in dynamic models.) The Markov perfect equilibrium concept (which requires that voters' strategies are a fixed mapping from payoff relevant state variables) would only eliminate the class of transition equilibria outlined in part (iv) of Proposition 2.7, which are of particular interest in the trade context.

that $\forall t$:

1. $\tau_t = \arg \max_{\tau_t \in \{\tau_P, \tau_L\}} V(\tau_t, \tau_{t+1}; a_t^M, p^w, \beta, c, \alpha)$, and
2. $\theta_t = \theta(\tau_t, \tau_{t+1}) = 2 - \frac{\beta + c \left(\frac{\tau_t}{\tau_{t+1}}\right)^\alpha}{\beta p^w} \tau_{t+1}$,

where a_t^M denotes the ability level of the median voter at time t .

The first condition requires that the median voter at time t chooses the current tariff $\tau_t \in \{\tau_P, \tau_L\}$ to maximize her lifetime indirect utility, $V(\cdot)$, with the perfect foresight of the next period tariff, τ_{t+1} . The second condition requires that the skill composition of each cohort is determined in (economic) equilibrium as in (2.4), again subject to perfect foresight of both current and future tariffs: τ_t, τ_{t+1} .

We define a *political steady state* to be any economic steady state in which the status quo policy (the policy implemented in the previous period, hereafter denoted by $\tau^o \equiv \tau_{t-1}$) would be maintained endogenously under the existing political process. Thus, a political steady state is an economic steady state given by (2.8) - (2.10) under *either* initial tariff regime, $\tau^o \in \{\tau_L, \tau_P\}$, in which the median voter would elect to maintain the status quo tariff policy over the economic equilibrium that would arise under the proposed alternative. Formally:

Definition 2.4 Political Steady State. *A political steady state is reached when $\tau_t \equiv T(\theta(\tau_{t-1})) = \tau_{t-1}$. A political steady state is summarized by the (constant) skill composition of the population under the steady state tariff, $\bar{\tau}$:*

$$\theta(\bar{\tau}) = 2 - \frac{\beta + c}{\beta p^w} \bar{\tau}. \quad (2.11)$$

Our framework provides a straightforward environment for evaluating political equilibria. We begin by evaluating the trade policy preferences of each generation, and then arrange both young and old voters over the population interval $[0, 2]$ in weakly ascending order of each individual's preference for trade openness; the most protectionist voters are indexed closest to zero, the most liberal closest to 2. We then exploit the structure of the model to characterize the identities of two key voters among the population at any given

time: the median voter, whose vote is decisive in the referendum, and the indifferent voter, who separates the population between those who prefer the more protectionist regime and those who would prefer the more liberal tariff policy.

Older Voters. It is immediate that members of the older generation must be polarized in the trade policy debate. Because older workers are intersectorally immobile, the older unskilled (import-competing) workers have an unambiguous preference for the highest possible tariff (autarky), while all of the older skilled workers prefer the smallest tariff possible. (For semantic convenience we will refer to this as free trade, keeping in mind that it could be a trade subsidy in the absence of a non-negativity constraint on the tariff.) To confirm that the most preferred trade policy by any older worker is necessarily a corner solution, simply note that the indirect utility of older unskilled (skilled) workers is strictly decreasing (increasing) in the local relative price according to:

$$V^{u,o} = v(p, 1) = Kp^{-\alpha}1, \quad (2.12)$$

$$V^{s,o} = v(p, (1+a)p) = Kp^{1-\alpha}(1+a). \quad (2.13)$$

Thus:

Proposition 2.2 *Among the older generation, political support for the liberal tariff regime is non-decreasing in ability level: the unskilled (lower ability) older agents strictly prefer the protectionist regime, while the skilled (higher ability) older agents strictly prefer the more liberal tariff policy.*

Starting from an economic equilibrium at time t in which the skill composition of older workers is given by θ_{t-1} , fraction $(1 - \theta_{t-1})$ of the older generation is unskilled and thus unambiguously favors autarky; these voters can then be lined up on the left-most end of the $[0, 2]$ population interval. Likewise, proportion θ_{t-1} of the older generation is unambiguously pro free trade and therefore can be stacked at the top end of the population interval. Accordingly, the younger generation spans the population interval from $[1 - \theta_{t-1}, 2 - \theta_{t-1}]$. It is then immediate that the median voter must be a member of the young generation; by definition, the median voter is the individual at the center of the population interval

(namely agent $j = 1$) and since $\theta_{t-1} \leq 1$ by definition, the young generation necessarily spans the median of the overall population.

Young Voters. Assessing the trade policy preferences of the pivotal younger generation is more involved than for the older cohort because, unlike their older counterparts, the young can adjust their educational decisions in response to the current realization of tariff policy. It is still the case that every agent’s most preferred tariff will be characterized by a corner solution so that the young generation, like the old, can be categorized as either protectionists or free traders. The young agents of each natural ability level can be characterized as either lifetime net producers or net consumers of the basic good, depending on the current and anticipated tariff levels. Members of the former group will favor protectionism (the lower the relative price of the skill-based good, the better) while the lifetime net suppliers of skill-based goods may or may not prefer free trade, depending on the (discounted) returns to skill acquisition relative to the cost of education.

A simple observation provides substantial leverage in evaluating both the structure of trade policy preferences among the young generation and the characteristics of political equilibria. Notice that for any fixed future tariff, every young voter would strictly prefer protectionism in the current period.¹⁵ (Recall that all workers are assumed to provide unskilled labor in the first period of life regardless of whether or not they undergo training to become skilled workers in the future.) Thus, even a pro-reform young voter would strictly prefer “protection today and free trade tomorrow” to “free trade today and free trade tomorrow.” This implies that the *only* reason that a young voter would vote for liberalization in the current period is to influence the voting outcome in the next period.

This universal preference for high tariffs while young (again, holding future tariff policy fixed) allows us to rule out the possibility of a protectionist shift from τ_L to τ_P in political equilibrium, since if the median voter rationally expected protection in the future, she would never vote for the liberal regime in the current period. We can then

¹⁵Under the extreme parametric assumption that $c = 1$ such that agents cannot earn wages as unskilled workers when undergoing skill-acquisition process, young future-skilled workers would be indifferent over first-period trade policy (holding second period trade policy fixed, and assuming agents hold no initial wealth).

immediately rule out the possibility both of a one-time permanent shift from a liberal regime to protectionism, and, moreover, of *any* temporary deviation from *either* status quo policy in equilibrium.¹⁶ Starting from a protectionist status quo, no young voter would optimally choose temporary liberalization with a rational expectation of a protectionist regime in the next period. A similar argument rules out the possibility of temporary protection: if starting from a liberal regime, a young voter at time T expected that she could deviate temporarily to protection (returning to a liberal regime in the next period), then by rational expectations her predecessor at $T - 1$ would have anticipated this behavior and thus voted for protection as well, contradicting the initial assumption of a liberal status quo at time T . Since temporary deviations from the status quo cannot occur in equilibrium, we can reduce young voters' policy preferences to a choice between permanent maintenance of the status quo versus a permanent and immediate shift from the protectionist to the liberal regime.

To characterize how trade policy preferences depend on young voters' skill acquisition decisions, we categorize the young generation into three groups: those who would upgrade their skills under either policy regime (the *high ability* agents), those who would educate themselves only under the more liberal policy regime (the *middle ability* agents), and those who would remain unskilled under either regime (the *low ability* agents). Using $\hat{a}_P \equiv \hat{a}(\tau_P, \tau_P)$ ($\hat{a}_L \equiv \hat{a}(\tau_L, \tau_L)$) to denote the ability of the threshold agent under a current and future protectionist (liberal) regime according to (2.3), and recalling that \hat{a} is increasing in τ (the greater the level of import protection, the higher the ability of the threshold agent and the lower the skill composition of the population) so that $\hat{a}_P \geq \hat{a}_L$,¹⁷ the three types of agents are sorted on the generational unit interval as summarized in the following proposition. Figure 1 illustrates.

Proposition 2.3 *For any pair of tariff alternatives, $\{\tau_L, \tau_P\}$, there are three types of young agents:*

¹⁶That is, we can rule out the possibility of political equilibria that include tariff sequences $\tau_{t-1} \rightarrow \tau_t = \tau_L \rightarrow \tau_P$. The temporary deviation time paths: $\tau_{t-1} \rightarrow \tau_t \rightarrow \tau_{t+1} = \tau_L \rightarrow \tau_P \rightarrow \tau_L$ or $\tau_P \rightarrow \tau_L \rightarrow \tau_P$, are thereby ruled out. (Cyclical sun spot equilibria could be restored by assuming that only the old generation has suffrage, in which case an additional class of "anything goes" equilibria would arise in proposition 2.7.)

¹⁷The inequality is weak only in the corner scenario in which all agents would choose to acquire skills under both tariff regimes; i.e. $\hat{a}_P = \hat{a}_L = 0$.

- i) **low ability** agents with ability $a \leq \hat{a}_L$, who would remain unskilled under either constant (current and future) tariff regime, τ_L or τ_P ;
- ii) **middle ability** agents with ability $a \in (\hat{a}_L, \hat{a}_P]$, who would acquire skills under the liberal regime but not under the protectionist regime; and
- iii) **high ability** agents with $a > \hat{a}_P$, who would acquire skills under either (current and future) tariff regime, τ_L or τ_P .

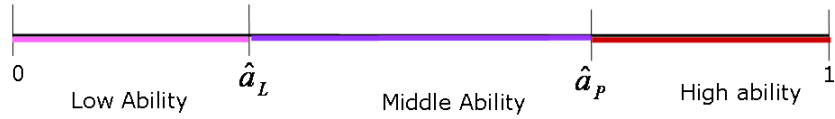


Figure 1: Young Generation Ability Types

Since the lowest ability workers will remain unskilled under either tariff policy, they will unambiguously favor protectionism. Thus, we can stack fraction \hat{a}_L of the young generation alongside their older counterparts on the left hand side of the population interval.

The middle ability agents, those with ability levels $a \in (\hat{a}_L, \hat{a}_P]$, will educate only under the expectation of the more liberal tariff regime. The proportion of the middle ability group that supports the more liberal tariff regime (if any) depends on the tradeoff between first period unskilled wages and education cost and second period income. A middle ability

agent will vote in favor of the more liberal regime if:

$$\begin{aligned} v(p_P, 1) + \beta v(p_P, 1) &\leq v(p_L, 1 - c) + \beta v(p_L, (1 + a)p_L) \\ \iff a &\geq \frac{\tau_P^\alpha \tau_L^{-\alpha} (1 + \beta) - (1 - c)}{\beta p^w} \tau_L - 1. \end{aligned} \quad (2.14)$$

This expression demonstrates that the higher ability agents within the group would be the first to support freer trade; the higher an agent's ability, the higher her skilled wage and hence the greater her expected gains from liberalization.

Like the rest of the population, the high ability agents' most preferred trade policies are again characterized by a corner solution. A high ability agent $a \in (\hat{a}_P, 1]$ will support the liberal regime if:

$$\begin{aligned} v(p_P, 1 - c) + \beta v(p_P, (1 + a)p_P) &\leq v(p_L, 1 - c) + \beta v(p_L, (1 + a)p_L) \\ \iff a &\geq \frac{(\tau_P^\alpha - \tau_L^\alpha)}{(\tau_L^{\alpha-1} - \tau_P^{\alpha-1})} \frac{1 - c}{\beta p^w} - 1. \end{aligned} \quad (2.15)$$

Thus, we again find that the highest ability agents among the group will be the first to support liberalization. The expressions in (2.14) and (2.15) coincide at the border between the high and middle ability groups (where $a = \hat{a}_P$) so that if (2.14) or (2.15) holds with equality for some $a' \in (\hat{a}_L, 1]$, then (2.14) ((2.15)) holds with strict inequality for all agents $a \in (a', a^P]$ ($a > a' \cap (\hat{a}_P, 1]$) and is violated for all $a < a'$. Interestingly, even the highest ability agents of the young generation will not necessarily favor free trade. This ambiguity in trade policy preferences is driven by friction between unskilled earnings in the first stage of life and the discounted skilled earnings in the second period of life. We summarize our findings as follows:

Proposition 2.4 *Among the young generation, the political support for the liberal tariff regime is non-decreasing in ability level;*

- i) Low ability agents with $a \in [0, \hat{a}_L)$ strictly prefer the protectionist regime;*
- ii) of the middle ability agents with $a \in [\hat{a}_L, \hat{a}_P)$, those with individual ability less (greater) than $\tilde{a}_m \equiv \frac{\tau_P^\alpha \tau_L^{-\alpha} (1 + \beta) - (1 - c)}{\beta p^w} \tau_L - 1$ prefer the high (low) tariff,*
- iii) of the high ability agents with $a \in [\hat{a}_P, 1]$, those with individual ability less (greater) than $\tilde{a}_h \equiv \frac{(\tau_P^\alpha - \tau_L^\alpha)}{(\tau_L^{\alpha-1} - \tau_P^{\alpha-1})} \frac{1 - c}{\beta p^w} - 1$ prefer the high (low) tariff.*

This proposition implies that the young voters can be indexed over the population interval in increasing ability type. For any initial skill composition of the older generation, θ_{t-1} , then, the young generation can be arranged ascending in ability type over the interval $[1-\theta_{t-1}, 2-\theta_{t-1}]$ of the population support $[0, 2]$. Based on this ordering we can identify and compare first, the indifferent agent who separates the protectionists from the free-traders and second, the median voter.

The Indifferent Voter. We define the indifferent voter to be the (zero mass) individual who separates the population between the protectionists and the free traders. Building on Proposition 2.4, we have that:

Proposition 2.5 *The indifferent agent, $\tilde{a}(\tau_L, \tau_P)$, is a young voter of middle or high ability. If $\tilde{a}_m \in [\hat{a}_L, \hat{a}_P)$, she is a middle ability agent and if $\tilde{a}_h \in [\hat{a}_P, 1]$, she is high ability.*

Notice that because the indifferent voter is young, her identity is independent of the status quo tariff policy or the skill composition of the older generation.

The Median Voter. Since fraction $1 - \theta_{1-t} \leq 1$ of the older generation is protectionist and the young voters are mapped to the population interval according to ability type, the identity of the median voter is immediate:

Proposition 2.6 *The median voter at time t is the member of the young generation with ability level $a_t^M \equiv a^M(\tau_{t-1}, \tau_t) = \theta_{t-1}$.*

The identity of the median voter therefore depends on both the status quo and the realized (and ex-ante expected) contemporary tariff regimes through the skill composition of the older generation. As one might expect, the ability level of the median voter is decreasing with the measure of older unskilled workers ($1 - \theta_{t-1}$); the greater the vested interest in a high tariff among the older generation, the more difficult it will be to implement tariff liberalization, since only a small proportion of the young vote is then needed to block a proposed reform. Conversely, the greater the skill composition of the older workers, the higher the ability of the median voter and the better the chance for the liberal regime. Figure 2 summarizes.

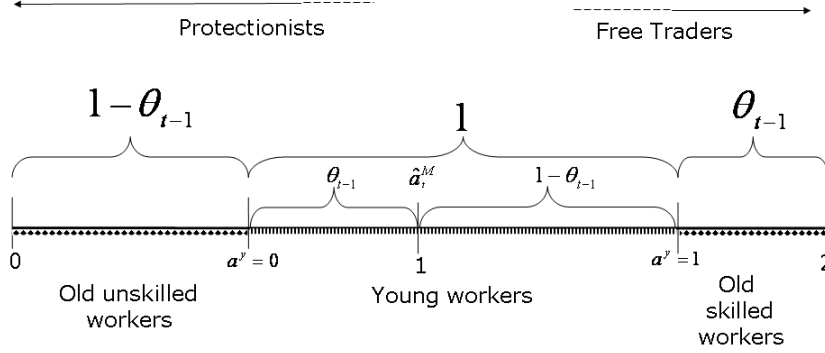


Figure 2: The Population Interval by Trade Policy Preference

2.3 Political Equilibria

We evaluate the existence of political equilibria by comparing the relative position of the median and indifferent voters on the population interval. If the indifferent voter lies to the left of the median voter, then the median voter will favor free trade and thus vote for the liberal regime; if instead the indifferent voter lies to the right of the median voter, the protectionist regime will succeed in the referendum. The key is to recognize that under rational expectations and individually optimal skill acquisition decisions, the identity of the median voter depends on both the status quo and *realized* tariff regimes according to Proposition 2.6. In contrast, the identity of the indifferent voter is independent of the status quo tariff, pinned down on the population interval for any pair of tariff alternatives by $\tilde{a}(\tau_L, \tau_P)$.

For any pair of possible tariff regimes, τ_L and τ_P , the equilibrium skill composition of the older generation can take three possible values: $\theta(\tau_P, \tau_P)$, $\theta(\tau_L, \tau_L)$, or $\theta(\tau_P, \tau_L)$, depending on the status quo and current tariff policy.¹⁸ Following Proposition 2.6, there

¹⁸Recall that $\theta(\tau_L, \tau_P)$ can be eliminated immediately from the discussion of political equilibria, pursuant

are then three possible median voters identified on the population interval: the young agents with ability $a^M(\tau_P, \tau_P)$, $a^M(\tau_P, \tau_L)$, and $a^M(\tau_L, \tau_L)$. From (2.4), we verify that $a^M(\tau_P, \tau_P) < a^M(\tau_P, \tau_L) < a^M(\tau_L, \tau_L)$; intuitively, the ability level of the median voter will be lowest when the older generation makes its skill acquisition decisions under the expectation of lifetime protectionist trade policy, and highest when older workers anticipate a lifetime of freer trade. For any set of parameter values and tariff alternatives, the position of the indifferent voter among these potential median voters determines the set of political equilibrium possibilities.¹⁹ There are four important cases to consider, which we characterize as follows:

Proposition 2.7 *Depending on the relative position of the indifferent and median voters over the young generation interval, there are four possibilities:*

- i) $\tilde{a} < a^M(\tau_P, \tau_P) < a^M(\tau_P, \tau_L) < a^M(\tau_L, \tau_L)$: The unique political equilibrium is the liberal steady state under which $\tau_t = \tau_L \forall t$.*
- ii) $a^M(\tau_P, \tau_P) < a^M(\tau_P, \tau_L) < a^M(\tau_L, \tau_L) < \tilde{a}$: The unique political equilibrium is the protectionist steady state under which $\tau_t = \tau_P \forall t$.*
- iii) $a^M(\tau_P, \tau_P) < a^M(\tau_P, \tau_L) \leq \tilde{a} \leq a^M(\tau_L, \tau_L)$: There are two possible political equilibria, the liberal steady state under which $\tau_t = \tau_P \forall t$, and the protectionist steady state for which $\tau_t = \tau_L \forall t$.*
- iv) $a^M(\tau_P, \tau_P) \leq \tilde{a} < a^M(\tau_P, \tau_L) < a^M(\tau_L, \tau_L)$: There exist three types of political equilibria, the two steady states in (iii) as well as every policy path of the form $\tau_t = \tau_P$ for $t < T$ and $\tau_t = \tau_L$ for $t \geq T$.*

The first two are simple but relatively uninteresting scenarios in which the unique political equilibrium is characterized by a political steady state under either τ_L or τ_P .

to the discussion on page 15, which rules out the possibility of a protectionist shift from τ_L to τ_P in any political equilibrium.

¹⁹We have confirmed the existence of each scenario under reasonable parameter values. For instance, all four equilibrium possibilities may be generated by varying just the cost of skill acquisition. Setting $\alpha = .5, \beta = 1, p^w = 1.5, \tau_L = 1.2$, and $\tau_P = 1.75$, yields the conditions for (i), (ii), (iii) and (iv) in Proposition 2.7, respectively for values $c = .3, .75, .65$, and $.5$.

First, if the indifferent voter lies to the left of all three potential median voter ability levels so that all three potential median voters would favor the liberal regime, the unique political equilibrium is characterized by the political steady state under τ_L according to (2.11). The second possibility is the opposite extreme in which the median voter lies to the right of all three potential median voters such that the political steady state under τ_P is the unique political equilibrium. These possibilities are depicted in Panels A and B in Figure 3.

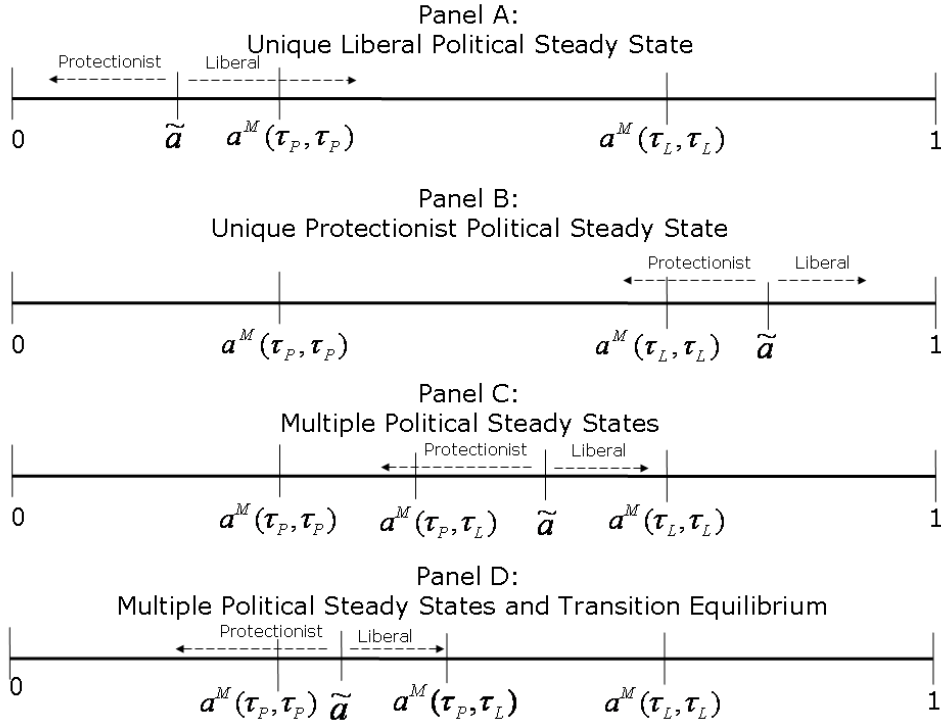


Figure 3: Political Steady States

The focus of this paper is of course the intermediate possibility in which the indifferent voter lies between the median voter that would obtain under either steady state tariff policy (i.e. $\tilde{a} \in [a^M(\tau_P, \tau_P), a^M(\tau_L, \tau_L)]$) as in Panels C and D of Figure 3) so that there exist multiple political steady states; starting from a protectionist status quo the median voter would vote to maintain protection, while starting from the liberal status quo policy, the median voter would vote to maintain the lower tariff.

The case of multiple political steady states itself consists of two possible scenarios— in

the first, $\tilde{a} \in [a^M(\tau_P, \tau_L), a^M(\tau_L, \tau_L)]$, as in part (iii) of Proposition 2.7 and Panel C of Figure 3; in this instance, the two political steady states are the only political equilibria, since the median voter that would obtain if the older generation voted for protection when young but expected liberalization in the second stage of life, $a^M(\tau_P, \tau_L)$, would favor protection (generating a contradiction). The remaining case, outlined in part (iv) of Proposition 2.7 and illustrated in Panel D, permits an additional form of equilibrium in which the time path of trade policy is characterized by a single transition from the protectionist regime to the liberal regime. Starting from a protectionist status quo, voters can rationally expect reform to occur in the next period, since the then-implied median voter in the next period, $a^M(\tau_P, \tau_L)$, would indeed favor the liberal regime (i.e. $\tilde{a} < a^M(\tau_P, \tau_L)$).²⁰ Since this one time, “organic” transition could occur at any point in the time path of the economy, there are in fact a multiplicity of these equilibria.

Henceforth, we explore the case in which parameter values are such that multiple equilibria exist for some reasonable values of τ_P and τ_L (bound below by free trade and above by the prohibitive tariff), so that $\tilde{a} \in [a^M(\tau_P, \tau_P), a^M(\tau_L, \tau_L)]$. The question then arises, if the economy is in a “bad” equilibrium from a national welfare maximization standpoint – a protectionist rut characterized by the political steady state under τ_P – whether and how it can transition to the more liberal steady state under τ_L . The answer is the focus of the next section, which explores the possibility of different mechanisms for transitioning between steady states.

3 Transition Mechanisms

Given our small open economy framework, it is immediate that each generational cohort would enjoy an unambiguously higher level of utilitarian social welfare under the liberal steady state than under the protectionist steady state. This familiar fact leads us to analyze potential mechanisms that induce transition from the protectionist steady state to a more liberal regime.

²⁰It should be noted that this “organic” transition equilibrium cannot be Markov perfect without some exogenous and *payoff-relevant* change at time $T - 1$ to allow a shift in young voters’ expectations for future trade policy (and thus their optimal skill acquisition decisions) the period before liberalization occurs.

It is understood that the cause of transition out of steady state must lie outside of the political process modeled so far, since the median voter under the protectionist steady state has, by definition, no interest in such a change. In asking how the protectionist steady state can be escaped, we therefore implicitly assume the existence of a third party agenda setter whose objective is utilitarian social welfare maximization. We argue that the presence of an outside agenda setter is a reasonable approximation to the political structure observed in many democracies, particularly when it comes to broad, liberalizing reforms. It is often the case that a few political elites — frequently un-elected — define the structure of political platforms or the design of ballot referenda to be put forward to the voting public.²¹

In what follows, we focus first on the role of announcements, subsequently analyze different forms of trade adjustment assistance, then evaluate the potential for external actors to influence the country’s voting outcome through the terms-of-trade, and finally examine the role of referendum structure by varying the step size of the tariff reform.

3.1 Announcements and Organic Political Change

Expectations over future trade policy play a crucial role in our framework. In particular, if the economy is caught in the protectionist steady state, the high tariff regime is perpetuated by agents’ self-fulfilling beliefs that the same regime will remain in place next period. It is this very belief that leads to skill acquisition decisions and a subsequent skill composition which in turn bring about a median voter next period who decides to keep in place this regime. One possibility to break away from this vicious circle is to alter agents’ expectations over future trade policy. If young workers anticipate freer trade in the future, they will upgrade their skills accordingly. This anticipatory skill upgrading will increase in turn the skill composition of the older generation in the next period, and thus the future constituency in favor of liberalization.

If the potential future constituency supporting free trade is sufficiently large, an “or-

²¹Consider, for example, the process of trade liberalization in the U.S.: fast track negotiating authority grants the President (the agenda setter) the right to design the structure of proposed trade agreements, each of which is subsequently sent to Congress (composed of heterogeneous voters) only for the final up or down referendum.

ganic” political shift from a protectionist steady state to a liberal steady state can arise in political equilibrium, as in case (iv) of Proposition 2.7. When $\tilde{a} \in [a^M(\tau_P, \tau_P), a^M(\tau_P, \tau_L)]$, both steady states are politically stable and, in addition, a transitional equilibrium exists. If starting from a protectionist steady state at some time T , enough members of the then-young generation upgrade their skills under the expectation of more liberal trade at time $T + 1$ so that $a_{T+1}^M = \theta_T = \theta(\tau_P, \tau_L) > \tilde{a}$, the expectation of freer trade at time $T + 1$ will have been rational and self-fulfilling. To the extent, then, that an outside actor can induce a shift in beliefs, from the rational and self-fulfilling expectation of maintained protection to the rational and self-fulfilling expectation of transition, the economy will endogenously shift to the liberal steady state. Thus:

Proposition 3.1 *If $\tilde{a} \in [a^M(\tau_P, \tau_P), a^M(\tau_P, \tau_L)]$ and $\tau_t = \tau_P$ for all $t \leq T$, then an exogenous change in beliefs of the young in period T from expecting protection to expecting the liberal regime in period $T + 1$ leads to a transition from the protectionist steady state to the liberal steady state from period $T + 1$ onward.*

The question is how expectations can be altered to bring about reform in this way. Forces that can induce a change in anticipated future policy could be new actors from either outside or inside the country itself. Inside actors could be elder statesmen or political pundits weighing in on trade policy or politicians’ announcements of anticipated future trade deals. Outside actors could be foreign governments pushing for multilateral trade talks or applying political pressure for reform cast as “inevitable”. Even the popular press could bring about changes in beliefs – and thus reform – simply by suggesting that change is on the horizon.

In practice, the credibility of announcements will play an important role in shaping expectations about the future, even when organic political reform is possible. We would expect that an outside actor seeking to induce a shift in expectations would most likely need to rely on a commitment device, such as a bilateral treaty or impending accession to, for example, the World Trade Organization or the European Union, unless she possesses a form of inherent credibility. See Staiger and Tabellini (1987), Bagwell and Staiger (1999, 2002) for more about the potential role of trade agreements and international institutions

in achieving trade liberalization through improved government credibility and other means.

3.2 Trade Adjustment Assistance

Policy supplements to trade reform in developed countries are commonly known as trade adjustment assistance programs, TAA for short. TAA packages typically involve a set of simultaneous measures aimed to placate those voters negatively affected by trade reform, while facilitating structural change by enabling workers to switch sectors. Policies typically include both worker training programs and direct transfers to compensate the economic losers from trade liberalization, paid for (net) by the beneficiaries of the reform. In this section we analyze two such measures: education subsidies and direct transfers from economic winners to losers.²² These two measures turn out to have opposite effects on the ultimate political viability of reform, and are thereby illustrative of the range of possible outcomes of TAA measures, positive as well as negative.

3.2.1 Education Subsidies

One way to influence workers' skill acquisition decisions in favor of liberalization is to subsidize education. We consider a simple policy in which education is subsidized by reducing the cost of acquiring skills, financed by a poll tax. It is straightforward to demonstrate that such a subsidy will improve the skill composition of each generational cohort, which, if sufficiently substantial, can bring about a median voter who favors trade liberalization.

Formally, let $s \in [0, c]$ denote the (gross) subsidy paid to every young agent who decides to acquire skills, reducing the cost of doing so from c to $c - s$. Requiring this subsidy to be fully funded, the government balanced budget condition implies that the poll tax is: $\delta = \frac{s}{2}\theta_t$. Taking this into account, equation (2.2) governing the skill acquisition decision is modified as follows:

$$v(p_t, 1 - (c - s) - \delta) + \beta v(p_{t+1}, (1 + a)p_{t+1} - \delta) \geq v(p_t, 1 - \delta) + \beta v(p_{t+1}, 1 - \delta), \quad (3.1)$$

where it has been assumed that the agent expects the policy to be in place for the two

²²Retraining of older workers lies outside the scope of the model, since we abstract from sectoral frictions — or rather assume them to be infinite — by ruling out mobility in the second period of life.

periods of her lifetime.²³ This results in the following modified critical ability level:

$$\hat{a}_t(\tau_t, \tau_{t+1}) \equiv \frac{\beta + (c - s)\left(\frac{\tau_t}{\tau_{t+1}}\right)^\alpha}{\beta p^w} \tau_{t+1} - 1. \quad (3.2)$$

Clearly, the education subsidy decreases the critical ability level and thus increases the skill composition of each generation. Note that the poll tax itself does not directly influence the education decision, since it must be paid irrespective of whether one acquires skills.

Similar to the analysis in the baseline case, the skill acquisition decision determines the identity of the median voter among the young, via the skill composition of the old generation. With the education subsidy:

$$a_t^M \equiv \theta_{t-1} = 2 - \frac{\beta + (c - s)\left(\frac{\tau_{t-1}}{\tau_t}\right)^\alpha}{\beta p^w} \tau_t \quad (3.3)$$

By increasing the number of skilled older workers, the education subsidy raises the equilibrium skill level of the median voter. Correspondingly, the support for protection is decreasing in the education subsidy.

In evaluating how the education subsidy affects the identity of the indifferent voter, we again have to distinguish two cases: that in which the indifferent voter acquires skills under both regimes, and the case in which she acquires skills only when the tariff is low. In the first case, the identity of the indifferent voter takes the form:

$$\tilde{a}_h = \frac{\tau_L^\alpha(1 - c + s - (1 + \beta)\delta_L) - \tau_P^\alpha(1 - c + s - (1 + \beta)\delta_P)}{\beta(\tau_P^{\alpha-1} - \tau_L^{\alpha-1})p^w} - 1, \quad (3.4)$$

and in the second, it is:

$$\tilde{a}_m = \frac{\tau_L^\alpha(1 + \beta)(1 - \delta_P) - \tau_P^\alpha(1 - c + s - (1 + \beta)\delta_L)}{\beta p^w \tau_L^{\alpha-1}} - 1, \quad (3.5)$$

where δ_L (δ_P) is the poll tax under the liberal (protectionist) regime and $\delta_L > \delta_P$ reflects the higher equilibrium skill composition under the lower tariffs.²⁴ Differentiating (3.3) - (3.5) with respect to the subsidy, s , and taking into account the government's budget constraint yields the following result:

²³This assumption easily can be relaxed; assuming the subsidy to be in place for one period would only alter the value of the tax, which has no effect on the skill acquisition decision.

²⁴Since $\delta_L \equiv \frac{s}{2}\theta(\tau_L, \tau_L)$ and $\delta_P \equiv \frac{s}{2}\theta(\tau_P, \tau_P)$, $\delta_L > \delta_P$ follows immediately.

Proposition 3.2 *A poll-tax funded education subsidy $s > 0$ has the political effects*

$$\frac{d\tilde{a}_m}{ds} < \frac{d\tilde{a}_h}{ds} < 0 < \frac{da^M}{ds}$$

and thus increases (decreases) the political viability of the liberal (protectionist) steady state regime.

While the ability level of the median voter under each regime increases with the education subsidy, the reverse happens to the indifferent voter; these two effects work in tandem to decrease the political viability of the protectionist steady state. Indeed, if the ability level of the indifferent voter falls below the identity of the median voter under the protectionist steady state, the protectionist regime will become politically unstable. The education subsidy thereby may induce a transition from the protectionist to the more liberal regime with the ensuing welfare benefits overall. Figure 4 illustrates.

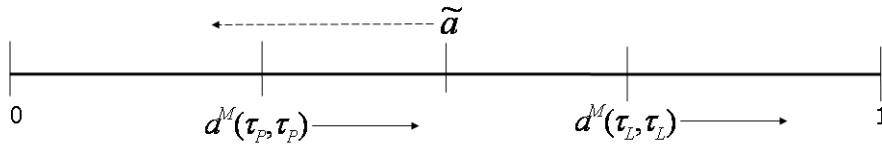


Figure 4: The Effect of Education Subsidies

Notice two things. First, the education subsidy is regressive, in that it increases the (net of transfers) wage gap between skilled and unskilled workers. Because all workers

are taxed to pay for the education subsidy, the lowest ability workers who will remain unskilled even in the presence of a subsidy are taxed at the expense of their higher ability contemporaries. Thus, the tariff liberalizing benefit of blanket educational subsidies should be weighed against the concomitant increase in income inequality between low and high ability agents. Second, once transition has occurred the education subsidy can be abolished provided that the new liberal steady state is politically stable without the subsidy. (i.e. under cases *(iii)* and *(iv)* in Proposition 2.7.) The implied increase in income inequality therefore would be temporary also.

Finally, note that the TAA education subsidy may be used in concert with government announcements to bring about reform. From (3.5), the identity of the median voter in a transitional period, $a^M(\tau_P, \tau_L)$ also moves to the right with implementation of a subsidy for skill acquisition. Thus, starting from the scenario in case *(iii)* of Proposition 2.7, a decrease in the cost of education could shift the indifferent voter to the left of the transitional median voter, $a^M(\tau_P, \tau_L)$, introducing the potential for announcement-led equilibrium reform. Thus, a combination of education subsidies and announcements can be successful even if the education subsidy alone is not sufficient to render the protectionist steady state politically unstable.

3.2.2 Transfers

Another common policy supplement to trade reform in developed countries consists of direct compensation schemes designed to partially offset the losses faced by older workers who are adversely affected by trade liberalization.²⁵ Unlike the transition mechanisms discussed

²⁵It is important to be cautious with semantics when discussing transfers in the TAA context. Consistent with conventional economic terminology, this section refers to transfers as lump sum redistribution payments from skilled to unskilled workers. Policy makers, however, more frequently use the phrase “transfer programs” to describe alternate forms of payments that might be better described as education subsidies. Specifically, programs that offer wage subsidies to only “displaced workers” (i.e. agents who switch sectoral orientation following trade liberalization) are best characterized in our model as targeted education subsidies, since they effectively reduce the net cost of skill acquisition for agents with $a \in [\hat{a}(\tau_P, \tau_L), \hat{a}(\tau_P, \tau_P)]$. See Davidson and Matusz (2006) for a careful comparison of wage and employment compensation schemes in the TAA context.

thus far, which appear to be suitable means to achieve freer trade, we find that direct transfers to adversely affected workers may be counter-productive. Intuitively, transfers can depress the incentive for young workers to anticipate and adjust to freer trade. Similar to the educational subsidies analyzed above, transfers change the economic profitability of skill acquisition, but now in the opposite direction. Skill acquisition becomes less attractive, making trade liberalization even harder to achieve politically, even though the trade adjustment component may make reform appear more palatable at first sight.

Formally, suppose the unskilled old receive a subsidy s per person if, starting from a protectionist regime, trade liberalization is enacted. To give the transfer scheme the best chance, we assume that transfers apply to only those workers who are old at the time of transition. Thus, the unskilled young cannot expect transfers (as they still have the option to acquire skills), and the program expires once the economy returns to steady state.²⁶ To finance the transfer payments, we assume that the government introduces a poll tax of δ to be paid by the skilled.²⁷ Consider a potential transition from the protectionist regime to the liberal regime, to occur, without loss of generality, at time T . The new critical ability level for skill acquisition starting from generation $T - 1$ (the generation who will be old when transition occurs) is then:

$$\hat{a}(\tau_{T-1}, \tau_T) \equiv \frac{\beta(1 + s + \delta) + c\left(\frac{\tau_{T-1}}{\tau_T}\right)^\alpha}{\beta p^w} \tau_T - 1, \quad (3.6)$$

where the subsidy s and the tax δ at time T satisfy the government budget constraint, $s(1 - \theta_{T-1}) = \delta\theta_{T-1}$ (hence, $s\hat{a}(\tau_{T-1}, \tau_T) = \delta(1 - \hat{a}(\tau_{T-1}, \tau_T))$). Notice that the transfer program will not directly influence the skill acquisition decisions of any other generations; cohorts born during any $t < T - 1$ or $t > T$ will not be alive at time T when the transfer scheme is in place, and generation $t = T$ will be born into the liberal steady state (recall that prices adjust immediately in a small open economy), and are thus ineligible for transfer payments.

²⁶Relaxing either of these assumptions serves only to strengthen our results (in both cases, by increasing the ability level of the indifferent voter).

²⁷Note that the skilled with relatively low ability actually lose from trade liberalization. However, trade adjustment programs typically do not make this distinction, basing compensation on employment status rather than overall worker welfare.

Substituting the government budget constraint into (3.6) and totally differentiating confirms that the critical ability level increases with the size of the transfer program:

$$\frac{d\hat{a}(\tau_P, \tau_L)}{d\delta} = \frac{1}{\hat{a}(\tau_P, \tau_L)} \left(\frac{p^w}{\tau_L} + \frac{\delta}{\hat{a}(\tau_P, \tau_L)^2} \right)^{-1} > 0; \quad (3.7)$$

Under the assumption that transfers do not completely offset unskilled old workers' losses from liberalization, and that taxes are not so large to make skilled older workers into protectionists,²⁸ we then have that the median voter who would obtain at the time of transition, T , is of a lower ability type – and thus more likely protectionist – under the transfer scheme than in the base line (no transfer) case.

Whereas the transitional median voter shifts to the left under the transfer scheme, the indifferent voter remains unchanged since she is young and unskilled, and thus ineligible for transfer payments and exempt from taxes on skilled labor. It is immediate that the political feasibility of trade liberalization diminishes:

Proposition 3.3 *Trade adjustment assistance to the unskilled workers in the older generation, financed by a poll-tax δ , has the political effects*

$$\frac{da^M(\tau_P, \tau_L)}{d\delta} < 0 = \frac{d\tilde{a}}{d\delta} \quad (3.8)$$

and thus decreases the political viability of transition from the protectionist regime to the liberal steady state.

Proposition 3.3 implies that transfer augmented trade liberalization might not be politically stable at all, even if such a transition would have been feasible without direct transfers. The model thus highlights the potentially perverse result that seemingly conciliatory transfers may in fact render trade liberalization more difficult – or even impossible – due to their adverse effect on the workers' incentives to prepare for economic change. Indeed, a cynic might suggest that conditioning liberalization on accompanying transfers could be used by some as a way to stall reform.

This said, the results do not necessarily imply that transfers are bad policy. First, if transfer payments are paid only to “displaced workers” – i.e. agents $a \in [\hat{a}(\tau_P, \tau_L), \hat{a}(\tau_P, \tau_P)]$

²⁸This certainly seems the most relevant assumption in practice. Formally, we assume $s < (\frac{\tau_P}{\tau_L})^\alpha - 1$ and $\delta < [1 - (\frac{\tau_P}{\tau_L})^{\alpha-1}] \frac{p^w}{\tau_L} (1 + \hat{a}(\tau_P, \tau_L))$.

who would have remained in the import-competing sector but for the anticipated liberalization – then such transfers are defacto education subsidies targeted to the marginal workers, and will therefore *improve* the political viability of liberalization in accordance with Proposition 3.4. Further, to the extent that transfers are *unanticipated*, they would not imply the same distortionary shift in skill acquisition behavior. Third, the absence of sectoral mobility among old workers assumed in our model leads to particularly stark results; in general, the greater the ability of experienced workers to adapt to changing economic conditions, the less distortionary transfer payments may be. Finally, transfer schemes are almost always progressive in practice, and thus serve a redistributive purpose; a government (with a different social welfare function) may find that greater equality is worth the cost of economic efficiency. Despite these caveats, Proposition 3.3 illustrates a potential danger that is germane to many TAA transfer schemes: sectorally targeted transfers can reduce workers’ ex ante incentives to shift out of import competing industries, and thus may erode the potential future political constituency located in export oriented, pro-reform sectors.

3.3 External Terms of Trade Changes

The political support for trade reform depends in large part on the skill composition of the population, which is determined in part by the terms of trade. So far, we have taken world prices as given, but it is obvious that a favorable shift in the country’s terms of trade will lead to a higher proportion of the population acquiring skills, and thus greater support for the liberal regime. The more favorable the terms of trade, the lower the critical ability level separating the skilled from the unskilled, $\hat{a}(\tau_t, \tau_{t+1})$. Thus, the higher is the world relative price of the skill-based good, the fewer unskilled individuals among the older generation who oppose liberalization and the greater the ability level of the median voter. At the same time, a change in the terms of trade has no first order effect on the identity of the indifferent agent among the young. Thus:

Proposition 3.4 *An exogenous improvement in the terms of trade increases the political support for trade liberalization.*

Among the many forces that can shift a country's terms of trade, it is natural in our context to focus on the trade policy decisions taken by trading partners. Suppose a large trading partner liberalizes trade, for example by lowering the import tariff on the skill-intensive good that the country under consideration exports to its partner. This unilateral liberalization on part of the partner country will result in a favorable shift in the home country's terms of trade. As outlined above, the change in the terms of trade shifts the window of median voters to the right. And as the median voters are of higher ability and more pro-trade, the liberalized regime tends to become politically stable (if it was not), the transition equilibrium becomes feasible, and the protectionist regime loses political stability.²⁹

This positive correlation between unilateral trade policy decisions by large trading partners opens up the possibility of multiple equilibria in a non-cooperative international trade policy game. The reason is that trade liberalization on part of the other country makes domestic liberalization politically feasible, and vice versa.³⁰ Such a multiplicity of equilibria in the international context comes in addition to the inherent multiplicity of equilibria that our model exhibits even in a purely unilateral context. Indeed, the latter feature is among the key novelties of our model, as we demonstrate the potential for multiple equilibria even for small countries without any change in the terms of trade.

3.4 Radical Reform

This final section explores a different sort of thought experiment, asking whether there are preconditions on the structure of a liberalization referendum necessary for reform to be possible. From the analysis in Section 2.2 it is clear that the existence of any political steady state depends not only on the status quo tariff, but also on the alternative regime, since the identity of the indifferent voter (and hence implicitly the trade preferences of the median voter) depends on the pair of tariff alternatives; i.e. $\tilde{a} \equiv \tilde{a}(\tau_L, \tau_P)$. The policy question

²⁹The potential for a large country to induce irreversible trade liberalization in a small trading partner is similar in spirit to McLaren (1997). Indeed, here as in McLaren's paper, the large trading partner could easily revert to more protectionist policies without fear of retaliation once its small trading counterpart reaches the liberal steady state.

³⁰This mechanism has been pioneered by Krishna and Mitra (2005) and Krishna and Mitra (2006).

is then: starting from a given regime, which proposed tariff alternatives (if any) would ensure that the status quo is maintained as the unique political steady state, which would lead to an unambiguous regime shift by making the status quo politically unstable, and which referendum alternatives admit the possibility of multiple equilibria? Recall that the referendum is structured as a choice between the status quo and some alternative regime,³¹ and we refer to a proposed tariff alternative as “reform” if it decreases the tariff and as “entrenchment” otherwise.

Perhaps surprisingly, we find that the best way to block reform (apart from offering entrenching tariff proposals) is to propose a relatively minor tariff liberalization. Starting from a protectionist steady state, a tariff liberalization referendum is sure to fail for a sufficiently small reform step, since (tautologically) $\lim_{\tau' \rightarrow \tau_P} a^M(\tau_P, \tau') = a^M(\tau_P, \tau_P)$. That is, the median voter who would obtain if voters rationally expected a shift from the protectionist regime to the alternative regime is vanishingly close to the status quo protectionist median voter, as the reform step converges to zero.

Proposition 3.5 *There exists a sufficiently small critical reform step size Δ such that the status quo tariff τ_P is politically stable against any alternative tariff $\tau' < \tau_P$ if $\tau_P - \tau' < \Delta$.*

Figure 5 offers a demonstration of this result using a numerical example to evaluate the range of tariff liberalization proposals that admit multiple steady states.³² Given an initial benchmark protectionist regime, τ_P , and set of parameter values (α, β, c, p^w) , we can derive the identities of both the median and the indifferent voters among the young generation as a function of the proposed tariff alternative, τ .³³ Focussing on the case of tariff reform, we assume that $\tau \leq \tau_P$.³⁴ For values of the tariff alternative at which $\tilde{a}(\tau_P, \tau) >$

³¹Alternative assumptions both would be inconsistent with the nature of referenda (almost always a choice about whether or not to adopt a policy change), but also would yield uninteresting results. (The agenda setter could ensure a political shift simply by making the two proposed regimes different from the status quo (and vanishingly similar), and could maintain the status quo simply by offering the degenerate “choice” between the status quo and itself.)

³²We thank Devashish Mitra for suggesting this form of graphical representation.

³³For the purposes of demonstration and ease of calculation, we set $\alpha \equiv .5, c \equiv .5, \beta \equiv 1, p^w \equiv 1.5$, and $\tau_P = 1.75$.

³⁴We note that the alternative case of tariff entrenchment is simply the inverse of the scenario discussed

$a^M(\tau, \tau)$ (the median voter under the proposed liberal regime would favor protectionism), the unique political steady state will be the protectionist regime. Alternatively, proposed tariff alternatives under which $\tilde{a}(\tau_P, \tau) < a^M(\tau, \tau)$, support two political steady states – both the proposed alternative and the protectionist status quo.

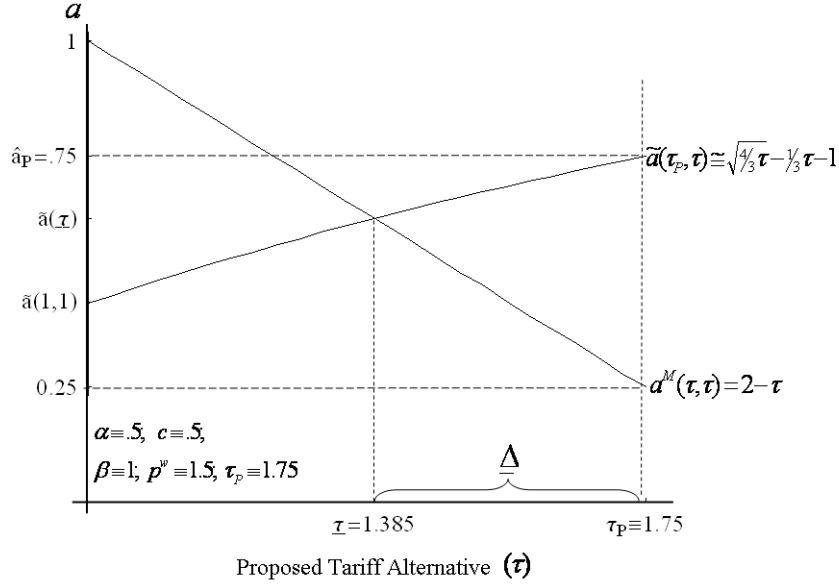


Figure 5: Minimum Reform Step

It is immediate that there exists a range of tariff reform proposals, $\tau \in (\underline{\tau}, \tau_P)$ that are too modest to admit even the possibility of reform, since they are not themselves politically stable. Conversely, more radical tariff reform proposals – those with a reform step greater than $\underline{\Delta}$ – are politically stable and therefore permit the potential for reform through the policy channels identified in earlier subsections. Intuitively, since voters' preferences are unambiguously protectionist or pro free trade, no voter would strictly prefer a small reform to radical reform; there are no moderate voters (except the zero-mass indifferent voter), only two extremist voter blocks. Reducing the magnitude of the reform step therefore serves only to decrease the potential constituency of skilled workers who would favor liberalization.

here.

Our finding that radical reform may be necessary to generate the political support for tariff reform parallels the similar finding by Krishna and Mitra (2006) whose intuition also applies in this context: because voters' political allegiances depend on their (net lifetime) sectoral orientation, and are monotonically increasing in the relative price of the good in which they have comparative advantage, a *big* shift in the proportion of the population employed in the export oriented (skill-based) sector is necessary to generate political support for reform. But while in their model, shifting workers' sectoral orientation requires exogenous changes in terms of trade, this section demonstrates that (potential) political support for tariff reform can be generated by sufficiently radical liberalization proposals.

4 Conclusion

This paper evaluates the dynamic political economy aspects of tariff reform in the presence of populist politics. The model is designed in such a way to capture (i) a dynamic environment, specifically the potential influence of the status quo policy on the identity of the median voter, (ii) the political frictions both within and across generations borne of different abilities to adjust to changing economic conditions, and (iii) the endogeneity of voters' policy preferences and choices with current and expected economic conditions. Populations can and do evolve in response to economic conditions; this paper constructs a simple model to evaluate how and why these changes can (and sometimes do not) occur.

We find that multiple political steady states may exist within an economy, and thus that voters potentially can get stuck in a "protectionist rut" even though aggregate welfare would be higher under a more liberal tariff regime. A series of thought experiments and comparative statics exercises demonstrate that the multiplicity of political equilibria can be broken through a number of third party induced changes. We discuss several potential mechanisms for escaping the protectionist rut: announcements of future policy commitments (for instance, bilateral trade agreement talks, IMF trade policy targets, or pending accession to the World Trade Organization) that change young voters' expectations about the future; terms of trade improvements triggered by trading partners' unilateral tariff reforms; temporary education subsidies that reduce the cost of skill acquisition and thus

increase the political constituency in favor of open markets; and structuring referenda to put forward substantial reform packages rather than minor policy changes. We also find, perhaps provocatively, that transfer payments to workers in the import-competing sectors following trade liberalization may reduce the potential for endogenous political reform, unless they are carefully constructed in such a way that they do not adversely influence young workers' skill acquisition decisions.

Our model and results adopt the perspective of a developed country, assumed to have natural comparative advantage in the skill-based good. While the results from the developing country perspective are *mathematically* simply the inverse of the findings outlined in the previous sections, it is worth taking a moment to highlight the important differences in their policy implications. Specifically, the positive implication of the base-line model in Section 2, that countries can get stuck in a protectionist rut when too little of the population acquires skills, is reversed for the developing country case. For a country with comparative advantage in the unskilled based good, the model indicates that protectionist rut arises when, from an efficiency standpoint, too many workers acquire skills. Thus, to escape a protectionist regime, the model suggests the implementation of education taxes rather than subsidies. At face value, this result is starkly unappealing (and seemingly unrealistic). But our findings are easily recast: suppose that we reframe the two sectors of the economy, so that one is secondary school intensive (e.g. manufacturing), while the other is post-secondary intensive (e.g. pharmaceutical). In that case, the model suggests that greater investment in secondary school education would lead to reform in one country, while more investment in post-secondary institutions would induce reform in the other. Once sectoral choice and education are viewed in a richer context, application of our model's results to a developing country framework generates sensible interpretations.

There are a number of promising extensions to be pursued in subsequent research. First, from a theoretical perspective, it would be interesting to move away from the simple two good model to explore the skill acquisition decision in a richer framework with a multiplicity of sectoral opportunities. (Such a study would, among other things, formalize the qualitative suggestion put forth in the previous paragraph.) Empirically, cross country panel studies could explore the potential influence of variations in educational access, cost,

and education, differential voter turnout across generations, and welfare programs on the success of trade reform and public ratification of regional integration agreements. Finally, one could envision formal policy analysis of the optimal structure of the trade adjustment assistance (TAA) programs focussed on both generational and individual worker differences that would offer transfer payments to “buy out” old unskilled workers, while offering only education subsidies to younger, less able, workers.

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A1 Autarkic Equilibrium

The autarkic equilibrium price, p^a , and skill composition of the older generation, $\theta(p^a)$, are given implicitly by the pair of equations:

$$p^a(\theta) = \frac{\alpha}{1-\alpha} \frac{2-\theta(1+c)}{2\theta - \frac{\theta^2}{2}}; \quad (\text{A1.1})$$

$$\theta(p^a) = \min \left\{ 1, \max \left[0, 2 - \frac{\beta+c}{\beta p^a} \right] \right\}. \quad (\text{A1.2})$$

Where the first expression is derived from the market clearing condition,³⁵ and the second equation pins down the equilibrium skill composition according to (2.8) and under the boundary conditions that by definition $0 \leq \theta \leq 1$. Solving yields the parametric form of the (interior) autarkic price:

$$p^a = \frac{\alpha\beta c + \sqrt{((1-\alpha)c + \beta(1+\alpha(1+c)))^2 - 2\alpha\beta((1-\alpha)c + \beta(1+\alpha(1+2c)))}}{2(1-\alpha)\beta}. \quad (\text{A1.3})$$

Notice that the Cobb-Douglas preference structure (with $\alpha \in (0, 1)$) ensures that the economy will be diversified in autarky. Thus, we know that $\theta(p^a) > 0$ so that the lower boundary condition on θ will not bind. It is possible, however, to reach a corner solution in which $\theta(p^a) = 1$; even if every agent is skilled in the second period of life, the young generation will produce a positive quantity of the unskilled good as long as $c < 1$. The corner solution at $\theta(p^a) = 1$ will obtain if $\frac{\alpha}{1-\alpha} \geq \frac{3}{2} \frac{\beta+c}{\beta(1-c)}$; that is, every worker will upgrade her skills under autarky for sufficiently high values of α (strong preference for the skill-based good) or β (a low discount rate). Conversely, the boundary condition is certain *not* to bind in the limit as $c \rightarrow 1$.

A2 Tariff Revenue

This appendix investigates how the paper's results are affected by the collection and redistribution of tariff revenue. As is customary in the literature, we assume that in each period tariff revenue is distributed uniformly among the members of the population. Denoting the aggregate tariff revenue at time t by R_t , this implies that each agent alive at time t receives an allocation of $r_t = R_t/2$.

It is clear that uniform redistribution of tariff revenue will not affect individuals' skill acquisition decisions. To see this, note that equation (2.2) has to be augmented with the inclusion of tariff revenue as follows:

$$v(p_t, 1 - c + r_t) + \beta v(p_{t+1}, (1+a)p_{t+1} + r_{t+1}) \geq v(p_t, 1 + r_t) + \beta v(p_{t+1}, 1 + r_{t+1}). \quad (\text{A2.1})$$

³⁵i.e. $q^s(p^a) = d^s(p^a) \Rightarrow q^s(\theta(p^a)) = \frac{\alpha}{p^a} \left[p^a q^s(\theta(p^a)) + q^u(\theta(p^a)) \right] \Rightarrow p^a = \frac{\alpha}{1-\alpha} \frac{q^s(\theta(p^a))}{q^u(\theta(p^a))}$.

Evaluating the inequality, the tariff revenue payments cancel immediately, since the marginal utility of income is constant under Cobb-Douglas preferences. Thus, we have that every agents' skill acquisition decision – and hence the identity of the median voter – is independent of the (uniform) tariff revenue rebate, r_t .

The tariff revenue rebate clearly does carry important implications for individuals' preferences over trade policy, as the payment generally will vary with the tariff. We can solve the modified model to generate the following expression for the per capita tariff rebate as a function of the ad-valorem tariff and skill composition of the population:

$$r_t = \frac{1}{2}(\tau_t - 1) \frac{\alpha c \theta_t + (2(1 - \alpha) \frac{p^w}{\tau_t} + \alpha) \theta_{t-1} - \frac{1}{2}(1 - \alpha) \theta_{t-1}^2 \frac{p^w}{\tau_t} - 2\alpha}{1 - (1 - \alpha)(\tau_t - 1)} \quad (\text{A2.2})$$

Tautologically, tariff revenue is zero under a free trade regime ($\tau = 1$). Likewise, as the tariff approaches the prohibitive level, tariff revenue must again fall back to zero. But within the intermediate range of positive, non-prohibitive tariffs, revenue is a positive and concave function of the tariff: starting from free trade, revenue at first increases with the tariff until the revenue maximizing tariff is reached, and then revenue falls with the tariff approaching the prohibitive level.

Returning to our main analysis, a choice between any two tariff regimes entails a change in tariff revenue that can be positive, negative, or possibly zero. This revenue effect will in general change the identity of the indifferent voter, although it does not affect the identities of the respective median voters as noted earlier.

Consider, for illustration, a case in which tariff revenue is lower for τ_L than for τ_P .³⁶ The loss in tariff revenue that accompanies liberalization (or the forgone increase in revenue from maintained liberalism) – which we did not consider in the main text – makes τ_L somewhat less attractive relative to τ_P and therefore increases the ability level of the indifferent voter relative to the case in which tariff revenue is discarded. This rightward shift in \bar{a} may jeopardize the political stability of the liberal regime while strengthening the stability of the more protectionist tariff. And indeed, if both tariff regimes constituted political steady states when ignoring tariff revenue, it is possible that uniform redistribution of the collected tariff receipts could completely undercut the political stability of the liberal regime so that the τ_P would constitute the unique political steady state.

In sum, while the redistribution of tariff revenue in general will influence the identity of the indifferent voter within the population and thus the potential multiplicity of political steady states given any set of exogenous parameter values, it does not change the qualitative conclusions of the main text.

A3 Existence of Multiple Political Steady States

The conditions under which multiple political steady states can obtain naturally depends on parameter values and the choice of tariff alternatives τ_L and τ_P . A simple graphical

³⁶Normative economics would suggest that this case is the more relevant, in which liberalization brings a concomitant loss in tariff revenue. Note that the opposite case is simply the mirror image.

exposition proves useful for thinking about the set of possibilities.

Given parameters $(\alpha, \beta, c, \text{ and } p^w)$, political equilibrium is reached when at every period t , the median voter would vote for the contemporary tariff, τ_t , that makes her the median voter given the status quo tariff, τ_{t-1} .³⁷ Figure 6 represents political equilibria as the intersection of two loci in (τ_t, a) space: the first maps the identity of the median voter among the young generation given the status quo tariff, and the second identifies each young voter's most preferred tariff.³⁸ Political equilibrium is reached when the two functions intersect. By considering the influence of parameter values on these loci, we can evaluate the conditions under which multiple political steady states arise.

In each panel of Figure 6, the dashed lines labeled by $a^M(\tau_{t-1}, \tau_t)$ map the identity of the median voter as a function of the current tariff, τ_t , given the (fixed) status quo tariff, $\tau_{t-1} \in \{\tau_L, \tau_P\}$. By proposition 2.6 and equation (2.5):

$$a^M(\tau_{t-1}, \tau_t) = 2 - \frac{\beta + c\left(\frac{\tau_{t-1}}{\tau_t}\right)^\alpha}{\beta p^w} \tau_t, \quad (\text{A3.1})$$

which is monotonically decreasing and convex in τ_t . The lower is τ_t , the greater the skill composition of generation $t - 1$, and thus the higher the ability level of the median voter at time t . The remaining arguments, including τ_{t-1} , are shift parameters for the function in (τ_t, a) space. Notably, an increase in τ_{t-1} will shift the median voter function to the left: the higher the status quo tariff, the lower the implied ability level of the median voter, just as demonstrated in Figure 2. Thus, the function $a^M(\tau_P, \tau_t)$ must lie everywhere to the left of $a^M(\tau_L, \tau_t)$, as illustrated in each panel of Figure 6.

The function given by the solid line, $\tau^o(a)$, in each panel illustrates each young voter's most preferred tariff as a function of ability level, $a \in [0, 1]$. In the binary referendum framework, voters with ability level $a < \tilde{a}(\tau_L, \tau_P)$ prefer τ_P while voters with ability $a > \tilde{a}(\tau_L, \tau_P)$ prefer τ_L . This most preferred tariff mapping is therefore characterized by the step function:

$$\tau^o(a) = \begin{cases} \tau_P, & \text{if } a \leq \tilde{a}(\tau_L, \tau_P); \\ \tau_L, & \text{if } a > \tilde{a}(\tau_L, \tau_P). \end{cases} \quad (\text{A3.2})$$

In our binary referendum framework, the most preferred tariff must by definition take the value of either τ_P or τ_L , but it is noteworthy that in an unrestricted (continuous) tariff referendum framework, the most preferred tariff function would continue to take a step form due to individuals' polarized tariff preferences. Every voter (save the zero mass indifferent voter) would prefer either the prohibitive tariff or free trade. Thus, it is clear that our binary referendum framework mirrors that of a continuous policy space, since only the boundaries of the support of the policy space would arise as stable equilibrium outcomes. A continuous policy space could potentially give rise to an additional razor's edge equilibrium in which

³⁷Recall that the identity of the median voter at time t is given by $a_t^M = \theta_{t-1}$ by proposition 2.6, and the skill composition of the older generation at time t depends on the tariffs at both time $t - 1$ and time t according to (2.5).

³⁸Recall from the discussion on page 14 that in equilibrium young voters choose between an immediate and permanent tariff change, or maintaining the status quo now and forever. Thus, the most preferred tariff structure is either τ_P at both time t and time $t + 1$ or τ_L at both time t and $t + 1$.

the indifferent voter each period chooses the interior tariff that would ensure her role as median voter. Such an equilibrium would not be stable, however, in the sense that any marginal deviation from the interior equilibrium tariff would lead to an immediate jump to a boundary tariff equilibrium (τ_L or τ_P).

The first two panels of Figure 6 demonstrate the potential for unique political steady states. In Panel A, any possible median voter arising from either a protectionist status quo or a liberal status quo would prefer τ_L over τ_P . Or equivalently, $\tilde{a}(\tau_L, \tau_P)$ lies to the left of the set of possible median voters. In Panel B the reverse holds: starting from either status quo, every potential median voter prefers τ_P over τ_L .

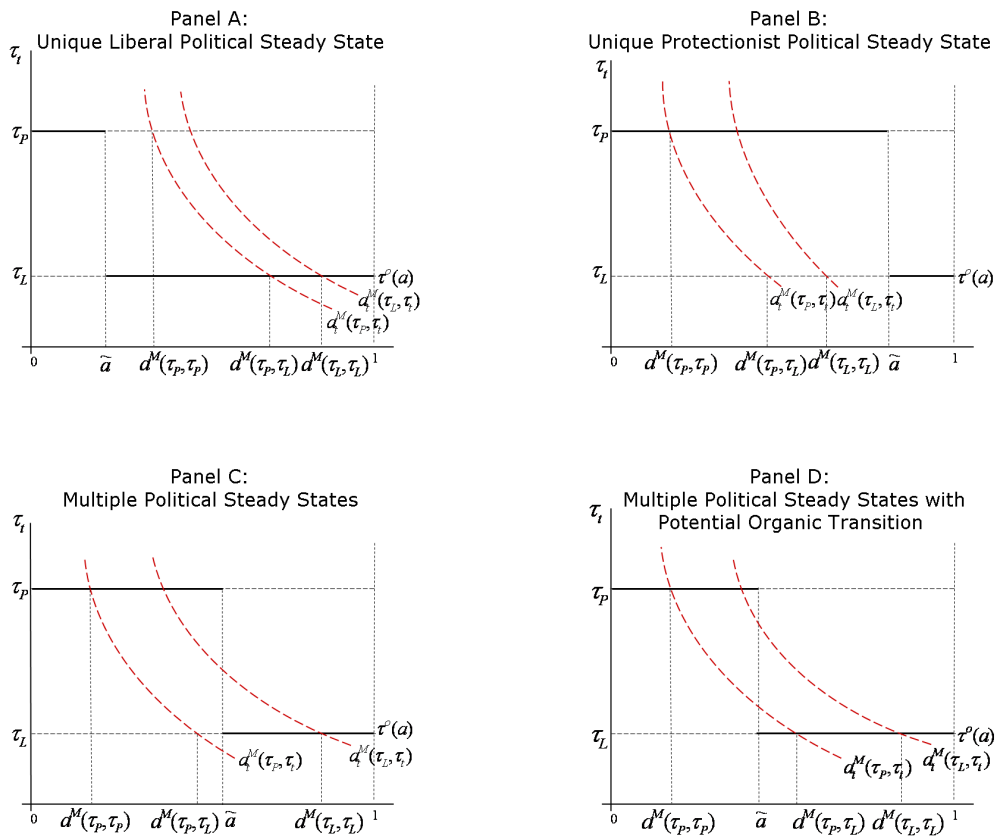


Figure 6: Equilibrium Existence.

The case of multiple political steady states is represented in Panels C and D. In both panels, starting from a protectionist regime at $t - 1$, the median voter who will arise if $\tau_t = \tau_P$ is implemented prefers τ_P , while starting from a liberal status quo, the median voter who would obtain under $\tau_t = \tau_L$ prefers τ_L . Panel D demonstrates additionally the possibility of the organic transition in which, starting from the protectionist status quo

tariff, the median voter who would obtain under a liberal regime at time t , $a^M(\tau_P, \tau_L)$ prefers τ_L .³⁹

Comparing the four panels in Figure 6 demonstrates the role of parameter values in generating multiple political steady states. Specifically, multiple equilibria will arise as long as the median voter loci, $a^M(\tau_P, \tau_t)$ and $a^M(\tau_L, \tau_t)$ span the neighborhood of the indifferent voter. From (A3.1), it is clear that the discount factor (β), terms of trade (p^w), and cost of education (c) can shift the median voter loci to the right or left, by increasing or decreasing the net return to skill acquisition.⁴⁰ Increasing the difference between τ_P and τ_L will shift the two loci farther apart, thus expanding the potential for multiple equilibria to arise, while reducing the scope of tariff alternatives would have the opposite effect.

³⁹Recall that rational expectations and perfect foresight rule out equilibria in which the median voter is the agent with ability level $a^M = \theta(\tau_L, \tau_P)$, since a young voter at time t would never vote for τ_L at time t if the (correctly anticipated) next period tariff is τ_P . Since it is of little consequence, $a^M(\tau_L, \tau_P)$ is not labeled in the figures. It is straightforward to verify that $a^M(\tau_L, \tau_P) \in (a^M(\tau_P, \tau_P), a^M(\tau_P, \tau_L))$, as depicted.

⁴⁰The role of α is less transparent, as it influences the slope of the median voter function only when τ_t differs from τ_{t-1} .