

# Learning About Reform: Time-Varying Support for Structural Adjustment

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## Abstract

Political support for structural reforms can vary dramatically over time. Countries that have sustained reforms have seen their popularity grow, while others have witnessed sudden reversals of political support. Opinion can reverse itself, without any apparent provocation, when voters are learning about the effects of reform. In this model, structural adjustment causes a drop in government services and temporary unemployment. The unemployed gradually learn about when they will be re-employed. As labor markets adjust and the cost of reform is revealed, support can gradually rise, it can remain low and suddenly rise, or there can be a quick reversal of support for a previously popular policy. Cross-sectional data, event studies and case study support the explanation. Extensions consider international policies to maintain support for reform.

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When evaluating the political feasibility of a reform, it is important to consider not only political support today, but also how opinions will evolve over time. Nowhere is the importance of changing political support more apparent than in countries undergoing a structural adjustment. As of 1992, 19 countries had attempted trade liberalization; one third of those attempts failed. By 1995, almost every country in Latin America had attempted to reduce their trade barriers. Most of these reform attempts prompted labor strikes (Edwards 1995). But opposition to adjustment has not been uniform, across countries, or over time. Countries that have sustained reforms have seen their popularity rise (Haggard and Kaufman 1992). Meanwhile, others have witnessed sudden collapses of public support for their agendas. Where do these dramatic and sudden reversals of public opinion come from?

This paper argues that voters change their opinion as they learn about how a reform affects their well-being. Economic adjustment creates frictional unemployment. The unemployed learn about the duration of the unemployment spell generated by the reform. Three forces increase support over time. First, resolution of uncertainty over time reduces opposition to reform. Second, costs of reform are sunk. Third, public good provision increases. As workers find jobs and incomes rise, so does government tariff revenue, which is used to produce public goods. When public goods become sufficiently abundant, a mass of voters previously opposed to reform switch to supporting it. Popularity surges. Alternatively, strong support for reform can collapse when unemployed workers learn that their unemployment spell will be longer than previously expected. Rather than requiring a big event such as a macroeconomic crisis, a new exchange rate regime, or an expectation of political regime change (as in Jain and Mukand (2003a)) to generate reversals, a gradual learning process causes occasional, sudden political shifts.

Section 1 builds a model where a tariff reduction causes workers to be fired from an import sector and move gradually to the export sector. Frictional unemployment arises from a Mortensen-Pissarides labor search process. Tariff cuts also reduce government revenue. This revenue is used to provide public goods for all workers. Each voter weighs the expected cost of unemployment and lost public goods against the benefit of lower prices for imported goods and thus a higher real

wage. Section 2 describes the dynamics of political support for reform. It examines forward-looking voting, where voters ignore sunk costs and simply compare their expected utility from continuing the policy to the expected utility of repeal. To capture the idea of disenchantment with the reform process, section 2.4 also considers retrospective voting, where votes are based on an evaluation of whether the reform has increased their past, present and future lifetime well-being.

Uncertainty generates initial opposition to reform, even though, ex post, most will gain from the new policies. Fernandez and Rodrik (1991) and Jain and Mukand (2003b) use this initial opposition to generate status quo bias. In contrast, this model features a government that can withstand a period of low popularity, as long as political support recovers by an election date. Furthermore, this paper models a labor matching process, instead of using an abstract utility shock, as the source of uncertainty about reform outcomes. In addition, the model considers the effect of reform on the government's ability to provide public goods and services. This fiscal effect makes surges in political support possible. Finally, being specific about the source of uncertainty makes it possible to evaluate the model empirically and to use to model to formulate optimal policy. Section 3 analyzes the effect of two policy remedies: a policy to reduce matching frictions and an increase in the provision of public goods.

Much of the political economy of trade literature focuses on interest group lobbying where the majority of agents who suffer small losses from the policy have no voice in the policy process.<sup>1</sup> There are two reasons this paper departs from the special interest analysis. First, when potential losses and gains from reform are large, voting, striking or rioting are common and low-cost ways for big groups to exercise their influence. Special interest models are a more accurate description of small tariff reductions implemented in countries like the U.S.. Second, this paper explains why workers, who stand to gain economically, often protest reform. Special interest theories explain only the opposition of concentrated capital owners to reform.

Section 4 uses cross-country, event study and case study data to argue that this model's approach is the right one. It argues that government stability and trade policy are statistically related across

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<sup>1</sup>Examples include Findlay and Wellisz (1982), Brock, Magee and Young (1989), Hillman (1982), and Grossman and Helpman (1994).

countries. Second, event studies back up the assumptions of the economic model. After reforms are undertaken, employment falls and then rises, while real wages rise. Finally, data on unemployment, wages and political unrest in Chile suggest that the political trade-offs described in the model are relevant concerns. In particular, workers do have a voice in the policy process. By organizing and protesting, they constrain the pace of economic reform.

Uncertainty and learning are important aspects of a broad array of development policies. While the policy reform modeled is a tariff, the same effect would result from elimination of credit subsidies, elimination of quotas, or privatization of inefficient government enterprises. Each of these reforms would prompt labor reallocation and subsequent learning about individual costs and benefits of reform. This paper offers a framework to analyze the political ramifications of learning.

## 1 The Model

**Preferences** There is one small home economy and a world economy. The home economy is populated by a continuum of agents with mass 1, each with identical preferences and time preference  $\beta$ . Preferences at time  $t$  are determined by a utility stream from a domestically produced export good  $x$ , an import-competing good  $m$ , and a separable utility flow from a public good  $g$ .

$$\int_{s=t}^{\infty} e^{-\beta s} [u(x_s, m_s) + u_g(g_s)] ds \tag{1}$$

$u$  and  $u_g$  are strictly concave, increasing and satisfy Inada conditions. Separability is not crucial, but it buys analytical tractability.  $x$  is a numeraire; its world price is one. For simplicity, consumers in this economy are not allowed to save, and consumption is non-storable. Markets are incomplete. Agents cannot trade any claims to future consumption.

Employed workers inelastically supply one unit of labor every period. Let  $I \in \{w, 0\}$  be a flow of income for a worker.  $w$  is the wage of an employed worker, while the unemployed have no income.

Letting  $P^H$  be the domestic price of import goods, the budget constraint for a consumer is:

$$x_t + P_t^H m_t = I_t \quad \forall t. \quad (2)$$

**Production** There are three sectors in this economy. Sectors, denoted by  $i$ , include an export sector, an import sector, and a government sector,  $i \in \{x, m, g\}$ . Any worker can work in any sector; labor is not sector specific.

For exports, output equals the fraction of labor used in production,  $L$ :

$$F_x(L) = L. \quad (3)$$

The linearity ensures that wages stay constant. The production function for import-competing goods,  $F_m(L)$ , is continuously differentiable, increasing, and concave. There is a large supply of labor that exceeds demand in the import sector so that there is labor left over to produce exports. The assumption of no capital in the economy can be relaxed. It is not included because it increases the number of types of individuals in the economy, makes the political analysis more cumbersome, and does not change the results.

Since this is a model of a small country, world market prices are viewed as exogenous. Let  $P$  be the world price of an import good and let imports be subject to a tariff  $\tau$ . Assume that there is a reform at date 0. Import tariffs decrease from  $\tau_0$  to  $\tau_1$ . Then,

$$P_t^H = \begin{cases} P + \tau_0 & \forall t < 0 \\ P + \tau_1 & \forall t \geq 0 \end{cases} \quad (4)$$

**Government** The government in this model is just a technology for transforming tariff revenue into public goods  $g$ . The government is not an optimizing agent because the results are focused on understanding the political reactions to a given policy, rather than what policy is chosen. The assumption that tariffs are the only source of revenue simplifies the analysis and captures the fact

that structural reforms often impact primary sources of government revenue in developing countries (Burgess and Stern (1993), Agenor and Montiel (1996)).

The production function for  $g$  takes the form:

$$G(L) = L. \tag{5}$$

It would never be rational for a government to operate in the region where revenue is decreasing in the tariff. Therefore  $G'(L) > 0$ . The public good has the characteristics of a service. It does not accumulate; anything provided in one period cannot be consumed in any subsequent period. Since structural reforms are often a response to a debt crisis, when governments are excluded from international credit markets, suppose the government cannot borrow or lend. The amount spent on the public good each period must equal the tariff revenue in each period. Section 5.2 relaxes this assumption.

**Labor Market Dynamics** The model's source of friction and dynamics is the labor market. When an industry (or government) wants to fire workers, that can happen immediately. Finding a job takes time. All fired workers eventually find a job in another sector. Job arrival for a worker is a Poisson process, as in Pissarides (1985), and Mortensen (1986). Let the fraction of the population that is unemployed at date  $t$  be  $n(t)$ . Before the tariff reform, the economy is at full employment. The job arrival rate for a worker,  $\psi = -\dot{n}(t)/n(t)$ , is constant over time.  $\psi$  can be interpreted as either the probability that a particular job seeker will find employment in the next unit of time, or the fraction of unemployed people who are matched with jobs per unit time. This assumption simplifies the analysis considerably. However, a job arrival rate that is decreasing over the spell of unemployment because of adverse selection will produce a similar result.<sup>2</sup>

If workers lose jobs, they face uncertainty over the period of time for which they will be un-

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<sup>2</sup>This matching process appears different from the matching functions used in labor models because job vacancies do not enter into the formula for probability of finding a job. The reason is that the export sector, which will absorb the excess labor, has a linear production technology, and therefore, a perfectly elastic demand for labor. So, a notion of job availability similar to that in the labor matching models does not exist in this setting.

employed. The constant job arrival rate ensures that the expected future cost of unemployment is time invariant for an unemployed worker and is identical across unemployed workers.

**Equilibrium in economic variables** Given parameters  $(P, \psi, \tau_0, \tau_1)$ , an equilibrium is a level of import and export consumption functions that depend on income and the relative price of imports to exports,  $m(I, P^H)$  and  $x(I, P^H)$ ; labor demand in the import sector  $L_m(\tau)$ ; a public good supply  $g(\tau, n_t)$ ; a sequence of unemployment levels,  $\{n_t\}$ , and a wage  $w$ , such that the following conditions are satisfied.

1. **Consumers maximize utility.** The first-order conditions for consumer optimization are:

$\partial u(x, m)/\partial m = P^H$  and  $\partial u(x, m)/\partial x = 1$ . These conditions produce demand functions  $m(I, P^H)$  and  $x(I, P^H)$ . Since unemployed workers cannot afford to buy any goods,  $m(I, P^H)$  and  $x(I, P^H)$  can take on three values, one amount demanded by employed people at pre-reform prices, one demand by employed people at post-reform prices, and zero demand from all unemployed people.

2. **Producers maximize profit.** Producers choose an amount of labor to hire, given the fixed world price of their goods. Exporters choose  $L$  to maximize  $L - wL$ . This ensures the wage in the export sector will always be 1, but it also means that any labor demand is optimal. The export sector absorbs all excess labor supply. Import-competing producers solve

$$\max_L P^H F_m(L) - wL. \tag{6}$$

The solution is  $L_m(\tau)$  such that  $F'(L_m(\tau)) = w/(P + \tau)$ .

3. **Nash wage bargaining.** There exist some Nash bargaining weights such that the equilibrium wage in every import sector is 1, the same as the export sector wage.<sup>3</sup> For simplicity,

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<sup>3</sup>This must be true because if a worker refused the wage offer, their reservation value would come from the value of first search for a job and then being employed in the export sector. That reservation value is less than the wage 1 every period. The firm can have a reservation value for a worker greater than one if it reduces production to boost the marginal product of labor. Since wage 1 can always be in the bargaining set, it is an equilibrium outcome for some Nash bargaining weights.

we use these weights so that the equilibrium wage in all sectors will be 1.

4. **Government turns revenue into public goods.** The flow of government revenue is the tariff times domestic demand for imports minus domestic supply. Since  $w = 1$ , each unit of  $g$  costs one unit of consumption to produce. By assumption, government spending equals tariff revenue. Since unemployed workers, a fraction  $n(t)$  of the population, have no income and hence zero demand for import goods, tariff revenue is the tariff level times the import demand from employed people, minus domestic production of  $m$ .

$$g(\tau, n_t) = \tau[(1 - n_t)m(w, P_1 + \tau) - F_m(L_m(\tau))]. \quad (7)$$

5. **Unemployment Dynamics.** At the reform date,  $t = 0$ , unemployment is the difference between the pre-reform labor demand and the post-reform labor demand:

$$n_0^+ = L_m(\tau_0) - L_m(\tau_1) + g(\tau_0) - g(\tau_1). \quad (8)$$

Note that only the import-competing sector and the government sector fire workers after the tariff reduction. This is because the export sector's prices are not affected by reform. The export sector gradually absorbs all unemployed labor.

Given the constant job matching rate,  $\psi$ , unemployment exhibits exponential decay:

$$n_t = e^{-\psi t} n_0. \quad (9)$$

The key predictions are a rise in unemployment at the time of the reform, and afterward, a gradual fall in unemployment, a decrease in the price level and therefore, an increase in real wages.

**Political Support** Voters who are forward-looking ask the following question when casting their vote: "Given my situation today, do I want to continue the reform implemented by the current government, or should I vote for the opposition to repeal the reform?" But what does repeal entail?

One possibility is that workers must search for new jobs, even though the sectoral composition of labor is just as it was prior to the initial reform. In this case, the unemployed would still have to search for jobs so that there is never value to repeal and thus never opposition to an implemented reform. To keep political support realistic, assume that all workers return to their old jobs. If old employers knew their workers were a good match, they could immediately employ them after the reform is reversed.

Characterizing political support requires new notation. Let  $V_t$  be realized future utility, starting at date  $t$ , as a function of current income  $I$ , the tariff rate  $\tau$ , and aggregate unemployment  $n$ .

$$V_t(I, \tau, n) \equiv \int_{s=t}^{\infty} e^{-\beta(s-t)} u(x(I_s, P + \tau), m(I_s, P + \tau)) + u_g(g(\tau, n_s)) ds \quad (10)$$

Since a person employed at date  $s > 0$  stays employed forever, the economy without reform is at full employment forever. Lifetime utility without reform would be  $V_0(w, \tau, 0)$ . Voter  $i$  supports reform at date  $t$  if

$$E_t[V_t(w_{it}, \tau_1, n_t)] > V_t(w, \tau_0, 0). \quad (11)$$

where  $w_{it} = w$  in periods during which  $i$  is employed and  $w_{it} = 0$  when unemployed. A reform is politically feasible if (11) holds for at least a fraction  $\alpha$  of the population, at the election date.

## 2 Results

This section characterizes how political support evolves over time and what is the feasible set of reforms. Section 2.1 characterizes the three types of constraints on political feasibility that the government might face. Section 2.2 describes what kinds of reforms can be both politically unpopular and welfare-improving. For this subset of reforms, section 2.3 describes the possible time paths of political support. Support increases because forward-looking voters look only at the future expected utility. Since future utility always rises as workers get matched with jobs, political support grows. There can be jumps in political support that come from an increase in public

goods provision. But this type of voting rule cannot explain why support for reform occasionally collapses. Therefore, section 2.4 introduces retrospective voters who consider both past and future costs and benefits from the reform. Since workers can learn that reform has been more costly than they originally thought, political support may decline. That decline can take the form of sudden reversals of political support.

## 2.1 Three Political Constraints

There are three possible constraints that a government could face when trying to lower tariffs while maintaining sufficient popular support at future date  $t$ .

1. **Utility Constraint** binds if the unemployment rate is greater than maximum level of opposition for the policy to remain feasible ( $1 - \alpha$ ) and the unemployed are indifferent to reform. Lowering  $\tau$  slightly in this case would cause unemployed voters to oppose reform.

$$n_t > 1 - \alpha \quad \text{and} \quad E_t[V(0, \tau_1, n_t)] = V(w, \tau_0, 0) \quad (12)$$

When the constraint binds, the expected loss from temporary unemployment and the reduction in public goods is just offset by the reduction in import prices. I call this a utility constraint because it stipulates the minimum level of utility that unemployed people must receive.

2. **Employment Constraint** binds if the employment rate is precisely  $\alpha$ , employed workers favor reform, and unemployed workers oppose it.

$$n_t = 1 - \alpha, \quad V(w, \tau_1, n_t) > V(w, \tau_0, 0) \quad \text{and} \quad E_t[V(0, \tau_1, n_t)] < V(w, \tau_0, 0) \quad (13)$$

3. **Public Good Constraint** binds at date  $t$  if the unemployment rate is less than  $1 - \alpha$  and employed workers are indifferent to the reform. Lowering the tariff by an infinitesimal amount

compromise employed workers' support.

$$n_t < 1 - \alpha \quad \text{and} \quad V(w, \tau_1, n_t) = V(w, \tau_0, 0) \quad (14)$$

People employed at time zero have not lost any wages. The only reason they would oppose reform is because the level of public goods provided is lower after the reform. In this case, the loss of public good just offsets the gains from lower import prices.

## 2.2 Welfare and Initial Support

Since reforms that make people worse off are less interesting, the analysis will focus on welfare-increasing tariffs. If the public good constraint binds, then the tariff reform is not welfare increasing; when employed workers are just indifferent between the new tariff and the old, unemployed workers are strictly worse off. So, the weighted average utility is lower after the reform than before. The next two propositions show that when the utility or unemployment constraints bind, a reform can be welfare-improving. All proofs are in the appendix.

**Proposition 1.** *When the utility constraint binds, there exists a set of tariffs  $T$  such that all reforms  $\tau_1 \in T$  are welfare increasing but politically infeasible at the time of the reform.*

Note that popular and welfare-enhancing reforms are different sets of reforms because of the distribution of gains across the population. Welfare-decreasing reforms could be quite popular if large losses were concentrated in a small section of the population. That is not what is driving this result. Rather, it is uncertainty among a majority of the population that makes the reform unpopular. Theorem 2 demonstrates the important role of uncertainty by showing that a reform that is unpopular ex ante can benefit a majority ex post, after all uncertainty is resolved.

**Proposition 2.** *When the utility or employment constraints bind, there exists a set  $S$  and a discount factor  $\beta$ , such that all reforms  $\tau_1 \in S$ , benefit a majority of workers but are politically infeasible at the time of the reform.*

Figure 1 illustrates why this proposition holds. At the reform date, (left panel) a mass  $\rho_0$  of agents know that they will remain employed, have a higher real wage and therefore have a high benefit from reform. The other  $(1 - \rho_0)$  agents know that they will become unemployed. If unemployed, an agent may expect that unemployment will be short and that he will gain from the reform ( $v_0 > 0$ ). Or, he may expect to lose ( $v_0 < 0$ ). As time goes on, workers start to be matched with jobs (right panel). Workers that are matched quickly learn that they have high gains from reform (the curved line), but not quite as high as the workers who never lost their jobs. Workers that are not yet matched with jobs become more pessimistic about the cost of reform ( $v_1 < v_0$ ).



Figure 1: Distribution of welfare gains from a reform at two dates. If expected gain is greater than zero, agents support reform. Otherwise, they are opposed.

If the unemployed are initially pessimistic ( $v_0 < 0$ ), then support for reform will rise over time as the number of unemployed people falls ( $\rho_1 > \rho_0$ ). If the unemployed are optimistic, then reform will initially enjoy widespread support. Over time, the expected benefit of reform falls for those who remain unemployed. When expected benefit falls below zero ( $v_1 < 0$ ), all the unemployed suddenly reverse their opinions and oppose reform.

An interpretation of these results is that workers often oppose structural adjustment reforms because they know they are likely to bear some transition cost, and they fear being one of the unlucky few who suffer high costs. If the workers knew exactly their post-reform outcomes at the

time of the vote, the majority would know that they would benefit and the reform would pass.

The previous analysis focused only on political support at the reform date. Because governments can often withstand a period of unpopularity as long as they regain majority support by the next election, we examine the dynamics of political support following reform.

### 2.3 Dynamics of Political Support

There are two factors that cause voters' expected future utility to rise over time after the reform. The first factor is that more people are finding jobs, which increases their expected future utility. The second factor is that as employment rises, the demand for imports rises, tariff revenue rises, and the available amount of public good increases. This increases everybody's utility equally. Although both effects can cause support for the reform to rise over time, they are fundamentally different phenomena. One factor, the increase in public goods provision, is deterministic while the other factor, finding a job, is a stochastic and idiosyncratic process. There is also force that can cause support to fall: Each period, the unemployed learn that they will remain unemployed for one period longer and their expected total cost of reform rises.

Support continues to increase until full employment is reached. Support continues to rise because a worker employed at date zero makes almost the same comparison between future utilities that a worker employed on date  $t > 0$  makes, at the time of his employment. The one difference between the two utility comparisons is that the worker at time zero is factoring in a lower supply of public goods in the immediate future. If an employed worker at time 0 supports reform when public goods supply is at its minimum, then so will all workers employed at later dates. Let  $\rho(\tau, t)$  be the political support for reform  $\tau$  at date  $t$ .

**Proposition 3.** *Under forward-looking voting, when the unemployment constraint binds, political support is equal to the fraction of employed people. If  $V_0(0, \tau_1, 0) \leq V_0(w, \tau_0, 0)$ , then*

$$\rho(\tau, t) = 1 - n_t \quad \forall t \geq 0.$$

**A Sudden Surge in Support** Figure 2 shows the time path of political support. If unemployed workers are initially pessimistic, but the supply of public goods rises sufficiently, unemployed people can suddenly switch from opposing to favoring reform. Support will rise gradually with employment, until it jumps discontinuously to 1 and stays there forever afterwards. The increase in support is prompted purely by the increase in public good provision.

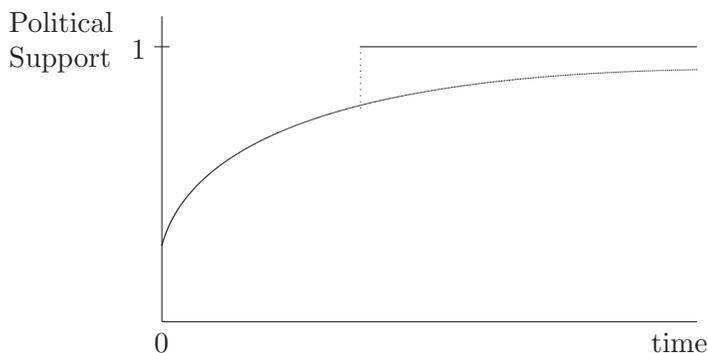


Figure 2: Two possible time paths of political support. Support can grow gradually to one, or grow gradually and then jump discretely to one.

**Proposition 4.** *If voters are forward-looking, the unemployed are initially pessimistic ((11) does not hold at  $t = 0$ ), and an unemployed person would favor reform if public good provision were at its full-employment level ( $E_t[V_t(0, \tau_1, 0)] > V_t(w, \tau_0, 0)$ ), then political support will rise discretely at a date  $\bar{T}$ .*

The proposition follows from continuity of  $E_t[V_t(0, \tau_1, n_t)]$  in  $t$ . The date of the jump  $\bar{T}$  will be the date when (11) holds with equality.

If voters are forward-looking, and if the election date is far enough in the future and the government can withstand majority opposition until that election date, any tariff policy can be politically sustainable. In contrast, with retrospective voters, political support will continue to rise until it is unanimous. Therefore, the only limit to how much tariffs can be lowered (with a sufficiently long time to election) is imposed by the public good constraint.

## 2.4 Retrospective Voting

To explain why political support for reforms often falls, we need to consider a different kind of voter. Forward-looking voting ignores the past actions of a government in a way that is arguably incongruous with observed voting behavior. Suppose a reform caused large welfare losses in the past, but at the election date, continuation is less costly than repeal. Then, voters would vote for the incumbent government without any consideration of the harm they caused. In contrast, retrospective voters ask themselves, “Are you better off today than you were before the reform?” In this voting regime, voters use the ballot as a way to reward or punish politicians for their previous behavior. That is their instrument to ensure that politicians do not deviate from their announced platforms. (See Ferejohn (1986) for a model of rational retrospective voting.) Another way to interpret these results is as forward-looking voting in a model where the job matching rate falls over time. If, for example, searchers learned about personal characteristics that made them less employable, or if anything else made searchers more pessimistic about their future over time, they would exhibit similar behavior to retrospective voters.

Retrospective voters compare their expected *lifetime* utility with and without the reform. For workers who never lose their job, political support for the policy never changes after the reform date. Even when aggregate unemployment falls and public good provision rises, the period utility flow changes, but the expected lifetime utility does not. Expected lifetime utility does not change because no new information is arriving. Workers knew that employment would rise and already incorporated it into expected utility. With retrospective voting, political support only changes when beliefs change.

The interesting dynamics come from workers who initially lose their jobs. A worker who found a job at date  $t$  supports reform at all times  $s \geq t$  if their lifetime utility with reform (now known with certainty) is greater than their lifetime utility without reform.

$$E_t[V_0(0, \tau_1, n_0)] > V_0(w, \tau_0, 0). \tag{15}$$

Unemployed workers support reform at date  $t$  if the same inequality in (15) holds. However, their expectation is conditional on a different information set. They do not yet know the date of their employment and are uncertain about gains or losses from reform. They will support reform if they are sufficiently optimistic about reemployment prospects. Again, the evolution of aggregate unemployment  $n_t$  over time is known with certainty. However, the evolution of income  $I_t$  is not known. Learning about the path of  $I_t$  will change workers' support over time.

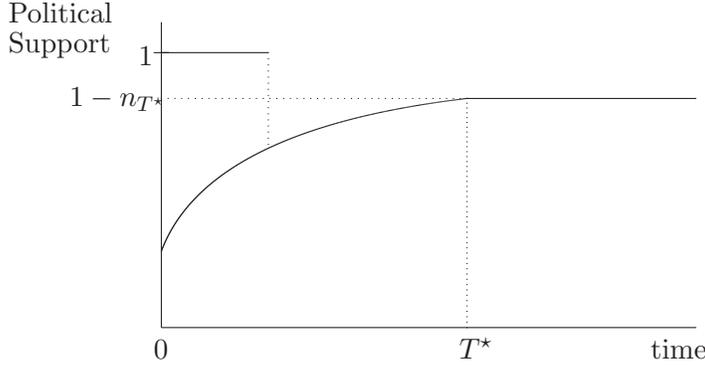


Figure 3: Two possible time paths of political support with retrospective voting. Support can grow and then level off, or collapse suddenly, then grow, then level off.

**Proposition 5.** *Under retrospective voting, when the unemployment constraint binds, the political support function increases with the number of employed people until a cutoff date  $T^*$ . After  $T^*$ , political support is constant.*

$$\rho(\tau, t) = \begin{cases} 1 - n_t & \forall t \leq T^* \\ 1 - n_{T^*} & \forall t \geq T^* \end{cases}$$

Prior to  $T^*$ , all employed people benefit from reform, and all unemployed people expect to be hurt by reform, just as at time zero. At  $T^*$ , a worker who finds a job at that date has lost exactly as much from unemployment and reduced public goods consumption as he has gained from reduced import prices. After  $T^*$ , workers who find jobs will still oppose the reform because it has been costly to them. Since no additional people support the reform after  $T^*$ , political support stays constant from then on.

**A Sudden Reversal** Sudden reversals of opinion are possible when there are many unemployed people and they become more pessimistic over time. As they spend longer and longer in unemployment, their expected loss from reform grows. Each day, they learn more bad news. The bad news is that they will face at least one more day of unemployment. This increases their expected duration of employment and expected cost of reform. At some point, their utility constraint binds and they switch from supporting reform to opposing it.

**Proposition 6.** *If voters are retrospective and the unemployed are initially optimistic ((15) holds at  $t = 0$ ), then political support will drop discretely at a date  $\tilde{T}$ .*

The date when support drops will be the date  $\tilde{T}$  when (15) holds with equality. At that time, support will fall by the number of unemployed  $n_t$ .

## 2.5 Effects of Political Instability

Less stable governments are those that are less able to hold power when opposition to their policies rises. Such governments are more constrained in the tariff reductions they can implement. Government instability is modeled as a shorter time until election. The partial derivative of the minimum feasible tariff with respect to the election date describes the predicted effect of instability on a government's ability to liberalize.

Let  $T$  be the election date or date until which an unstable, unpopular government can retain office. If the government is unemployment constrained and voters are forward-looking, then the minimum feasible tariff is the  $\tau^*$  such that unemployment at date  $t$  is  $1 - \alpha$ :

$$(L_m(\tau_0) - L_m(\tau^*) + g(\tau_0, 0) - g(\tau^*, n_0))e^{-\psi T} = 1 - \alpha \quad (16)$$

Since unemployment is decreasing in  $T$  and decreasing in  $\tau^*$ ,  $\partial\tau^*/\partial T < 0$ . This means a more stable government can enact a lower tariff, or a larger set of feasible reforms.

Similarly, when the government is utility constrained and voters are forward-looking,  $\tau^*$  is the value that causes unemployment utility to be equal to pre-reform utility at the election date:

$V_T(0, \tau^*, n_T) = V_0(0, \tau_0, 0)$ . Because the supply of public goods rises over time,  $\partial V/\partial T > 0$  and  $\partial \tau^*/\partial T < 0$ .

Since governments will be utility constrained sometimes and unemployment constrained other times, the overall relationship between instability and openness should be negative.

### 3 International Policy

International institutions can design policies that exploit or exacerbate changes in public opinion. This section employs forward-looking voters and either a binding utility or a binding unemployment constraint to consider the effects of IMF and World Bank-style policies.

#### 3.1 World Bank Policy

The World Bank commonly provides targeted funding for projects that help economies operate more efficiently. The output of these projects is not usually a good that directly provides utility, but rather an intermediate resource that helps citizens extract more utility from their existing economic environment, such as a job-retraining and placement program. Suppose the World Bank could fund a program to match workers to jobs at a rate  $\tilde{\psi} > \psi$ . The effect depends on whether the government is unemployment or utility constrained.

**Case 1: The Unemployment Constraint Binds** With forward-looking voters, the lowest politically feasible tariff is the  $\tau^*$  that makes the unemployment rate at the election date  $t$  equal  $1/2$ . Because World Bank policy increases employment faster, it can enlarge the set of feasible tariff reforms. However, if an election is imminent and  $t$  approaches zero, the effect of a higher matching rate disappears. As a country becomes less stable, or elections draw near, World Bank style adjustment policies become ineffective at easing political constraints. If a country has no time to adjust, the adjustment rate becomes irrelevant.

**Case 2: The Utility Constraint Binds** If the utility constraint binds, World Bank policy helps immediately. If workers expect a faster job placement rate, they will expect a shorter duration of unemployment. They will also expect the provision of public goods to rise faster. Both of these forces will create support for a larger reform at time 0.

### 3.2 IMF Loans

Suppose the IMF offered a loan to the home country, conditional on their enacting and maintaining tariff reductions. The government could use this credit to intertemporally reallocate its supply of public goods. If the reform is repealed, no further loan disbursements will be made.

**Case 1: Utility Constraint Binds** To pass the lowest possible tariff, the government needs to increase the level of utility for unemployed workers. The most efficient way to increase unemployed utility is to raise the supply of public goods  $g_t$  and keep  $g_t$  constant, until unemployed people are no longer a political threat. When the employment rate exceeds  $\alpha$ , the supply of public goods should fall to a level that makes repayment of the loan feasible. If support of the employed workers becomes a binding constraint, then the new  $g_t$  should be set to satisfy this constraint. Over time, as employment continues to rise, tariff revenue will rise and debt repayment will be possible.

**Case 2: Employment Constraint Binds** To sustain support, the government must produce enough public goods initially to ensure sufficient employment ( $n_0 = 1 - \alpha$ ). As workers find jobs in the private sector, public goods provision can be reduced. The rate at which public goods and public employment should be cut equals to the rate of employment growth in the private sector.<sup>4</sup>  $dg_t = -\psi n_t dt \quad \forall t \leq T$ . When employment exceeds  $\alpha$ , the relevant constraint will be employed workers' utility. Because employed people may oppose reform if the public goods level drops too

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<sup>4</sup>Reducing the supply of public goods and therefore the amount of government-employed labor over time complicates the analysis. Now there is an additional state that an agent can be in: potentially unemployed in the future. If the government is utility constrained, these potentially unemployed workers will have a higher utility than unemployed people. Therefore, their utility will never be a binding constraint and they will not affect the minimum tariff level. If the government is unemployment constrained, then a high enough time preference parameter or a gradual enough spending reduction policy will ensure support for the reform among the potentially unemployed.

low, the government must provide a minimum level of  $g_t$ .

In sum, the model tells us that tariff reform should happen first, and then any necessary fiscal austerity should be imposed later. Undertaking both at the same time is disastrous from a political standpoint. At the time of the reform, the IMF should lend to the country to allow expansionary fiscal policy. Because this spending makes unemployed people less opposed to reform and increases employment, it would increase political support. Later, when labor reallocation is underway, the IMF could mandate fiscal austerity without jeopardizing political support for the reforms. World Bank policy could would hasten labor market adjustment and therefore expedite the contractionary phase of the IMF plan.

## 4 Motivating Empirical Evidence

The model examines a particular set of political trade-offs surrounding the enactment of a structural reform. This section uses a variety of data to argue that these are important trade-offs in understanding the experience of developing countries. The first part makes the simple point that politics are related to differences in trade policy across countries. It documents the negative cross-country relationship between openness and instability predicted in section 2.5. The second part argues that an increase in real wages and an increase, then decrease in unemployment are standard economic consequences of structural reforms. Thus, the economic trade-offs that agents in the model consider are real concerns. The third part focuses on a single reform episode in Chile. It argues that unemployment comes from the tariff reform and that voters, instead of suffering from a free-rider problem, take to the streets in organized protest. Finally, it shows that this political opposition can constrain, and even reverse, the reform process.

### 4.1 Openness vs. Instability

Most countries never have a revolution or coup. Therefore the measure of instability separates countries into two groups: highly unstable and reasonably stable. Between these two groups, the

set of feasible tariff reforms, and thus openness, should be decreasing in the stability. Section 2.5 derives this prediction from the model. This prediction is confirmed by the data. The significant negative coefficient on revolutions and coups (data from Barro and Lee (1994)) indicates that instability and openness, measured as the volume of trade relative to GDP, are indeed negatively related (table 1).

Revolutions and Coups	RGDP in 1960
-0.10 (0.027)	
-0.051 (0.026)	$7.0 * 10^{-6}$ ( $5.0 * 10^{-6}$ )

Table 1: Government stability and trade openness. The equation estimated is  $Openness_j = constant_j + \beta_1 RevCoup_j + \beta_2 GDP60_j + \epsilon_j$ , where  $j$  is a country index. Row 1 constrains  $\beta_2 = 0$ . Real GDP is PPP-adjusted and comes from Penn World Tables. 92 countries. Standard errors in parentheses.

One problem with this exercise is that both political stability and openness could be caused by some common external factor. One way to correct for wealth-related causes is to include 1960 GDP in the regression. This does not change the result. The coefficient on revolutions and coups is negative with a p-value of 6%. This correlation is still only suggestive, and this analysis is subject to all the common criticisms of cross-country regressions. There are other factors besides wealth that could restrict openness and cause instability. Also, measurement error makes any comparison of cross-country quantities suspect. So, these results are only an encouraging first step.

## 4.2 Wage and Employment Event Studies

The model predicts structural reforms should cause real wages to rise, beginning at the reform date. Employment should fall after the reforms begin and then rise as the economy adjusts. This section asks if these predictions are verified.

In the model, the reform date is quite clear. However, in the data, a series of policy changes occur over time, making each change's effect difficult to distinguish. For this reason, the empirical analysis does not focus on individual tariff changes, but rather on end dates of large structural reforms. The reason for using reform end dates, rather than start dates is that planned reforms may not be credible. Of course, even at the end dates, employers may wait to adjust until they

	Time trend	Post-reform * Time
Employment	-0.43	2.21 (0.81)
Wage	- 0.04	3.96 (0.77)

Table 2: Wages and employment exhibit trend breaks at reform end dates. Equations estimated are (1)  $Employment_{jt} = constant_j + \beta_1(t - t^*) + \beta_2(t - t^*)\mathbb{1}_{t>t^*} + \epsilon_{jt}$  and (2)  $Wage_{jt} = constant_j + \beta_1t + \beta_2t * \mathbb{1}_{t>t^*} + \epsilon_{jt}$ , where  $t^*$  is the reform end date. Employment is the fraction of the population employed and wage is the average wage and compensation for an employed worker, PPP adjusted, in 1992 U.S. dollars. Wage and employment data are from UNIDO industrial statistics database. PPP data is from the World Bank's SIMA database. Adjustment beginning and ending dates are published in Jayarajah and Branson (1995). Standard error in parentheses.

know that reforms will stick. Evidence of such a delay is discussed below. The wage data is average PPP-adjusted wage and compensation for an employed worker. Employment is the fraction of the population employed. Both variables are expressed in percentage deviations from country means. After dropping countries without complete wage and employment data, there are 18 countries.

During the last year of the adjustment period, the employment rate falls by 5.5% on average, and subsequently rises by 8% two years after the adjustment programs are complete. During the reform, real wages are stable, within 2% of their long-run trend. But after the reform is complete, they take off. Wages rise an average of 5% within two years and 16% within four years. Of course, theory predicts that the real wage should rise sharply and then level off quickly. However, price rigidities or credibility questions could account for the delayed response. Despite the small sample, the increase in employment and wage growth after reforms is statistically significant (table 2).

Employment and wages exhibit breaks in trend around the reform dates that are consistent with the model. While this is reassuring, it still averages many different types of reforms in many types of economies and institutions and is silent on causality. The next step examines one example of reform in more detail.

### 4.3 Case Study: Chilean Economic Reform

In 1974, Chile began a program of tariff reductions. Between 1974 and 1979, Pinochet lowered Chile's maximum import tariff rate from over 200% to just 10%. The political reactions and policy changes during this reform episode illustrate four features of the model.

First, the economic reactions to the tariff reform included a large increase in unemployment. Early in 1974, when the tariff reforms began, unemployment was below 5%, a ten-year low. That year, unemployment shot up to over 10%. In the following two years, as the average tariff was cut in half, unemployment continued to rise to 17% while real GDP per capita fell by 20%. Figure 4 illustrates the tariff reform and its consequences for unemployment. At the same time, macro economic events, like oil price shocks, could have also cause unemployment to change. However, the sectoral pattern of unemployment suggests that trade reform played an important role. Using a data set of sectoral employment in the greater Santiago area, Edwards and Edwards (1996) find that the degree of liberalization of a sector is significantly positively related to the probability of a worker in that sector being unemployed in 1976, 1979 or 1981.

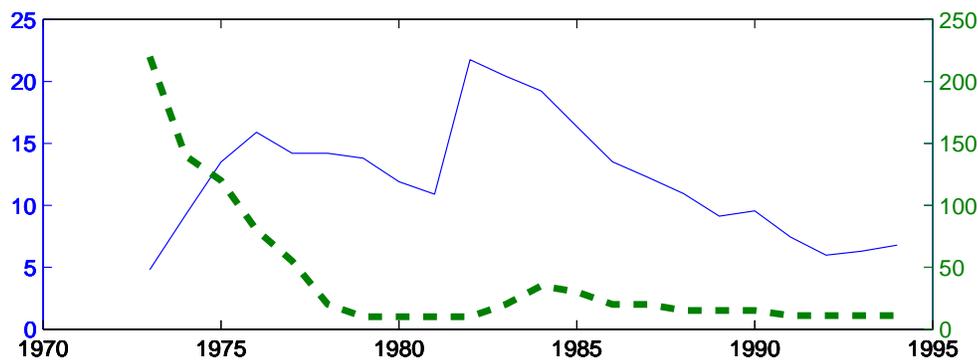


Figure 4: Chilean unemployment (solid line, left axis) and tariff (dashed line, right axis). The tariff level is the maximum tariff applied to all goods. Unemployment statistics and tariff levels from Edwards and Edwards (2000).

Second, reform was accompanied by contractionary fiscal policy. In 1975, the Chilean government reduced spending by 11% and froze its budget the following year (figures from the World Bank). By 1977, the economy was beginning to adjust. From 1977 until the end of 1981, per capita income grew at a rapid 5-8% per year, while government spending grew at slightly slower rates.

Third, labor mobilized to actively oppose the reform. Instead of falling victim to the free-rider problem, labor leaders acted to mobilize large groups of citizens in protest. A group of labor leaders calling themselves “The Group of 10” were very vocal about workers’ opposition to the reforms

(Edwards and Lederman 1998). Labor unions organized mass protests in the streets of Chile's cities despite the laws outlawing union activity. In 1991, newly elected president, Patricio Aylwin, repealed the union laws. In June of that year, the final tariff reduction occurred, bringing the tariff down from 15% to 11%. The frequency of labor protests per worker increased 25% between 1990 and 1991, remained around 5 strikes per 100,000 workers in 1992 and fell consistently every year thereafter (Edwards and Edwards 2000).

Fourth, the labor opposition constrained the policy changes the government was able to make. Despite the fact that there was not literally a majority of citizens out of work or a majority taking to the streets, the size of the political upheaval was sufficient to cause the repeal of some reforms and to delay the reform program. In March of 1983, amidst widespread labor unrest, the reforms of the previous decade were partially reversed as the uniform tariff rate doubled. Tariffs soon rose to 35%, three and a half times their pre-crisis level. The public opposition to reform was so powerful that even a dictator like Pinochet was forced to reverse reforms to maintain support. When the economic crisis subsided and growth resumed, tariffs reductions began once again. By May 1988, the uniform tariff was brought back down to 15%, and by June 1991, the tariff was down to 11%.

More recent examples of similar episodes of protest and consolidation are the Zapatista revolt in Mexico and the Nicaraguan transportation strike, both in 1994. Attempts at openness in Indonesia in 1998 and Ecuador in 1999-2000 both resulted in the resignation of the head of state.

## 5 Conclusion

Resolution of uncertainty about labor market outcomes following structural adjustment can cause support for reform to rise gradually; it can also cause reversals: sudden increases and decreases in political support. Most of the time, as workers are matched with jobs and uncertainty is resolved, political support for reform rises and the reform becomes "consolidated." The evidence on employment and wages around reform episodes is consistent with this explanation. Occasionally, support for reform can collapse when unemployed workers cease to be optimistic about their unemployment

duration. Similarly, opposition to reform can dissolve when the aggregate income increases, tax revenues rise, and the provision of public goods makes unemployment less costly.

Analysis of international development policy suggests an optimal form of structural adjustment program when labor reallocation and spending cuts are necessary. Undertaking first private and then public adjustment would give the reform a higher chance of success. Maintaining political support is of most concern in unstable countries. But even in a strong regime like Pinochet's, public pressure can cause reversal of reforms.

There are many limitations to this model. One deserves special mention. The level of unemployment necessary for a democratic government in a two-party system to be voted out is often 50% or more. Such high unemployment is unrealistic. However, unemployment in this model captures many different hardships that a worker might face such as underemployment, lower wages, or harder work for the same pay. For example, a 1991 study of Mexican unemployment in the midst of their adjustment program found that 15% of Mexicans were unemployed and over 40% were underemployed. The Nicaraguan research center, FIDEG, found that 75% of women and 65% of men experienced cuts in wages, benefits, or work hours following Nicaragua's 1990 adjustment reform.<sup>5</sup> If at least half of the population suffers from lower wage work or underemployment, then the results generated by the model are plausible. Furthermore, the Chilean example showed how a vocal minority can sway opinion and halt reform.

This framework could be used to address other questions, such as the relationship between existing unemployment and a government's ability to liberalize. Economists have noted that many countries have reduced tariffs in times of economic crisis (Krueger (1991), Tornell (1998)). Background unemployment will increase the number of people who gain from lower tariffs because they have no job to lose and will have a higher real wage when they do get a job. In addition, it will decrease the value of having a job because the job may terminate at any future date. Both factors broaden the range of feasible tariffs and make reforms more likely in crises.

Extending the model to allow learning about reform consequences from other countries could

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<sup>5</sup>Mexican statistics available at [www.hartford-hwp.com/archives/46/013.html](http://www.hartford-hwp.com/archives/46/013.html). Nicaraguan statistics available at [www.cs.unb.ca/alopez/politics/structural.html](http://www.cs.unb.ca/alopez/politics/structural.html).

provide the impetus for the sudden reversal in thinking about structural adjustment. Prior to the 1980's, heterodox reforms, import substitution, and price fixing were the norm. After a few early experiments with orthodox policies, that norm suddenly changed. In a model where countries have little prior information about the effects of orthodox reform, they would initially choose heterodox policies. However a few countries that have a low expected cost of experimentation would eventually try the orthodox reform. If those countries are successful, all countries learn from their experience and revise their beliefs about the benefits of orthodoxy upward. Beliefs could reach a critical threshold where learning from reforms spurs more reforms. A wave of reform sweeps across the developing world.

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# A Appendix

## A.1 Proof of Proposition 1

Prove: When political constraint (2) binds, then there exists a set of tariffs  $T$  such that all reforms  $\tau_1 \in T$  are welfare-increasing but politically infeasible.

If the utility constraint is satisfied, then

$$V_0(0, \tau_1, n_0) \geq V_0(w, \tau_0, 0). \quad (17)$$

By assumption, utility is strictly increasing in each good. That is sufficient for indirect utility to be increasing in income. Therefore,

$$V_0(w, \tau_1, n_0) > V_0(0, \tau_0, n_0).$$

Suppose that the utility constraint is binding so that (17) holds with equality. Social welfare is just a weighted sum of these two lifetime utilities. Note that since there is a continuum of workers, realized aggregate social welfare is equal to its time zero expectation.

$$\begin{aligned} SW &= (1 - n_0)V_0(w, \tau_1, n_0) + n_0V_0(0, \tau_1, n_0) \\ &> V_0(w, \tau_0, 0). \end{aligned} \quad (18)$$

Since the net welfare gains are strictly positive when the utility constraint just holds with equality and since welfare is continuous in the tariff, there exists a set tariffs  $T$  s.t.  $\forall \tau \in T$ ,  $\tau$  equation 17 does not hold but inequality 18 is still satisfied.

## A.2 Proof of Proposition 2

Prove: When political constraints (2) or (3) bind, then there exist a set of politically infeasible tariffs  $S$  such that for some discount factor  $\beta$ , and for all reforms  $\tau_1 \in S$ , the realized gains of a majority of voters will be  $\geq 0$ . Let  $\nu$  be an

indirect utility function:

$$\nu(I, \tau, n) \equiv x(I, P + \tau) + u_m(m(I, P + \tau)) + u_g(g(\tau, n)).$$

Case 1: The Employment Constraint (3) Binds

If constraint 3 binds, then half the workers/voters are employed at time 0 and have certain gains from reform. For more than half the population to be made better off from reform, it must only be true that some worker who is unemployed at time 0 gains from reform.

As long as constraint 1 does not bind simultaneously, workers who never lose their jobs support reform:  $V_0(w, \tau_1, n_0) > V_0(w, \tau_0, 0)$ . Because welfare is continuous in the employment date  $t$ , realized lifetime welfare of someone employed at  $t$  converges to  $V_0(w, \tau_1, n_0)$ , as  $t \rightarrow 0$ . Therefore, there must be a positive mass of workers who are employed quickly enough so that their realized welfare is greater after reform. This implies that a majority has realized gains from reform.

Case 2: The Utility Constraint (2) Binds

If the utility constraint binds then the following two statements must be true:

$$V_0(0, \tau_1, n_0) = V_0(w, \tau_0, 0) \quad \text{and} \quad V_0(w, \tau_1, n_0) > V_0(w, \tau_0, 0).$$

If the first equality holds, this implies

$$\psi \int_{t=0}^{\infty} e^{-(\beta+\psi)t} \nu(0, \tau_0, n_t) + e^{-\beta t} (1 - e^{-\psi t}) \nu(w, \tau_0, n_t) dt = V_0(w, \tau_0, 0) \quad (19)$$

Let  $\nu^E(\tau)$  be the utility flow from private goods only of an employed person facing tariff  $\tau$ . Since the unemployed have zero income, their utility from private goods is zero. Let  $G = \int_0^{\infty} e^{-\beta t} g(\tau, n_t) dt$  and let  $V^- \equiv V_0(w, \tau_0, 0)$ . Then (19) can be rewritten as

$$\begin{aligned} \psi \int_{t=0}^{\infty} e^{-\beta t} (1 - e^{-\psi t}) \nu^E(\tau) dt &= V^- - G \\ \psi \left( \frac{1}{\beta} - \frac{1}{\psi + \beta} \right) \nu^E(\tau) &= V^- - G \end{aligned}$$

$$\frac{\psi^2}{\beta(\beta + \psi)} = \frac{V^- - G}{\nu^E(\tau)}$$

If a majority of agents gain ex-post, the the probability that a given agent is employed by a cutoff date that yields him zero net gain over no reform is 1/2. Let  $\eta$  be the employment date and  $\eta^*$  be the employment date that yield zero net gain from reform. Then,  $\eta^*$  satisfies

$$\begin{aligned} \frac{e^{-\beta\eta^*}}{\beta} \nu^E(\tau) + G &= V^- \\ \eta^* &= -\frac{1}{\beta} (\ln(V^- - G) - \ln(\nu^E(\tau))) \end{aligned}$$

Since  $\eta$  follows a poisson process with arrival rate  $\psi$ , the probability of a job arriving before  $\eta^*$  is

$$1 - \exp\left(-\frac{\psi}{\beta} (\ln(V^- - G) - \ln(\nu^E(\tau)))\right).$$

For a majority of agents to benefit, this expression must be greater than 1/2. Rearranging terms:

$$\left(\frac{V^- - G}{\nu^E(\tau)}\right)^{\frac{\psi}{\beta}} < 1/2$$

We know that when the utility constraint binds,  $\frac{V^- - G}{\nu^E(\tau)} = \frac{\psi^2}{\beta(\beta + \psi)}$ . This lowest feasible tariff benefits a majority if

$$\left(\frac{\psi^2}{\beta(\beta + \psi)}\right)^{\frac{\psi}{\beta}} < \frac{1}{2}.$$

### A.3 Proof of Proposition 3

Prove: Under retrospective voting, when the unemployment constraint binds, the political support function takes the following form:

$$\rho(\tau, t) = \begin{cases} 1 - n_t & \forall t \leq T^* \\ 1 - n_{T^*} & \forall t \geq T^* \end{cases}$$

where  $T^*$  is a solution to

$$\int_{z=0}^{T^*} e^{-\beta z} \nu(0, \tau, n_z) dz + e^{-\beta T^*} V_t(w, \tau_1, n_{T^*}) > V_0(w, \tau_0, 1).$$

Step 1: If unemployed workers oppose, or are indifferent to reform at date 0, then all unemployed workers at any date  $t > 0$  must oppose reform.

If an unemployed worker at date 0 is weakly opposed to reform, then  $V_0(0, \tau_1, n_0) \leq V_0(w, \tau_0, 0)$ . A worker still unemployed at date  $t$  has expected lifetime utility

$$\int_{z=0}^t e^{-\beta z} \nu(0, \tau, n_z) dz + e^{-\beta z} V_t(0, \tau_1, n_t) \tag{20}$$

Realize that  $V_0(0, \tau_1, n_0)$  is an expectation over the present discounted value of a stream of  $\nu$ 's whose lower bound at time  $z$  is  $\nu(0, \tau, n_z)$ . Therefore, (20) must be less than  $V_0(0, \tau_1, n_0)$ . This implies that all workers unemployed at  $t > 0$  must also oppose reform.

Step 2: If a worker employed at date  $t$  supports (or is indifferent to) reform at all dates  $t' > t$ , then a worker employed at date  $s < t$  supports reform at all dates  $s' > s$ .

Consider a worker employed at date  $s$  where  $s < t$ . With the tariff reform, at all dates  $t' \geq t$ , they would have utility of

$$\int_{z=0}^s e^{-\beta z} \nu(0, \tau, n_z) dz + e^{-\beta s} V_t(w, \tau_1, n_t) \geq V_0(w, \tau_0, 1) \tag{21}$$

This is equal to the utility of the agent employed at  $t$ , plus  $\int_{z=s}^t e^{-\beta z} (\nu(w, \tau, n_z) - \nu(0, \tau, n_z)) dz$ .

To prove that the person employed at date  $s$  strictly benefits from the tariff reduction whenever a worker employed at date  $t > s$  benefits or is indifferent, it suffices to show that  $(\nu(w, \tau, n_z) - \nu(0, \tau, n_z)) > 0$ . This holds because  $\nu$  is increasing in income, as show in the proof of proposition 1.

Step 3: If a worker employed at  $t$  opposes the tariff reform (or is indifferent) at all dates  $t' \geq t$ , then any worker employed at a date  $s$  where  $s > t$  will oppose the reform at all dates  $s' \geq s$ .

The worker's lifetime utility without reform will be the same as all other workers'. With the tariff reform, he will have earned strictly less income between dates  $t$  and  $s$ , and the same income at every other date. Therefore, his lifetime utility with reform is less by the amount  $\int_{z=t}^s e^{-\beta z} (\nu(0, \tau, n_z) - \nu(w, \tau, n_z)) dz$ .

If the time  $t$  worker opposes reform, the time  $s$  worker must oppose reform as well.

Step 4: There exists a  $T^*$  such that

$$\int_{z=0}^{T^*} e^{-\beta z} \nu(0, \tau, n_z) dz + e^{-\beta T^*} V_t(w, \tau_1, n_{T^*}) > V_0(w, \tau_0, 0).$$

At  $t=0$ , the left hand side is greater than the right hand side:

$$V_t(w, \tau_1, n_{T^*}) > V_0(w, \tau_0, 0).$$

This holds because, by assumption, employed people favor reform at date 0.

At  $t = \infty$ , the left hand side is less than the right hand side:

$$\int_{z=0}^{T^*} e^{-\beta z} \nu(0, \tau, n_z) dz < \int_{z=0}^{T^*} e^{-\beta z} \nu(w, \tau, n_z) dz$$

because indirect utility is increasing in income. Since the left hand side is a continuous function in  $t$ , by the intermediate value theorem, there exists some  $T^*$  such that the two sides are equal.

Step 5:

At  $t = T^*$ , the inequality conditions in both step 1 and step 2 hold. Therefore, for this particular  $t$ , any worker hired at date  $s < T^*$  will favor the policy at all  $s' > s$ , any worker hired at date  $s > T^*$  will oppose the policy at all dates  $s' > s$ , and unemployed always oppose reform. These three conditions deliver the result in the proposition.

## A.4 Proof of Proposition 4

As  $t \rightarrow \infty$ , (15) will cease to hold. The reason is that a worker who is forever unemployed consumes no private goods, compared to some a consumption level without reform. The consumption of public goods also falls because of the assumption that the government is on the left side of the Laffer curve. Since  $E_t[V_0]$  is continuous in  $t$ , by the intermediate value theorem, there exists a  $\tilde{T}$  when (15) holds with equality. Since  $E_t[V_0]$  is monotonically decreasing in  $t$ , (15) will fail to hold for all  $t > \tilde{T}$ . This means that all unemployed people will support reform before  $\tilde{T}$  and oppose reform after. Therefore, support drops by  $n_t$  at  $\tilde{T}$ .

## A.5 Proof of Proposition 5

Prove: Under forward-looking voting, when the unemployment constraint binds, the political support function takes the following form:

$$\rho(\tau, t) = 1 - n_t \quad \forall t \geq 0$$

if

$$V_0(0, \tau_1, 0) < V_0(w, \tau_0, 0).$$

Step 1: If an unemployed worker opposes reform at time 0, unemployed workers will always oppose reform.

The future expected utility of an unemployed worker at time zero is:

$$V_0(0, \tau, n) = E\left[\int_{z=0}^{\infty} e^{-\beta z} \nu(I, \tau, n_z) dz \mid I_0 = 0\right].$$

A worker who is still unemployed at time  $t$  and conditions on that knowledge has future expected utility

$$V_t(0, \tau, n) \equiv E\left[\int_{s=t}^{\infty} e^{-\beta(s-t)} \nu(I, \tau, n_s) ds \mid I_t = 0\right].$$

Substituting in the probability of finding a job at date  $s$ ,

$$= \int_{s=t}^{\infty} e^{-(\beta+\psi)(s-t)} \nu(0, \tau, n_s) ds + \int_{s=t}^{\infty} e^{-\beta(s-t)} (1 - e^{-\psi(s-t)}) \nu(w, \tau, n_s) ds$$

Defining  $z$  to be  $s - t$ , reveals that this expression is exactly equivalent to  $V_0(0, \tau, n_t)$ . Since  $V_0(0, \tau_1, 0) < V_0(w, \tau_0, 0)$  by assumption, and  $V$  is increasing in  $n$ , it must also be that  $V_0(0, \tau_1, N_t) < V_0(w, \tau_0, 0)$ . This implies that the worker employed at date  $t$  must also oppose reform.

Step 2: If an employed worker supports reform at time 0, all employed workers will always support reform.

If an employed worker supports reform at time 0, this implies that

$$V_0(w, \tau_1, n_0) \geq V_0(w, \tau_0, 0).$$

An employed worker at time  $t$  supports reform iff

$$V_0(w, \tau_1, n_t) \geq V_0(w, \tau_0, 0).$$

Since  $V$  is increasing in the current flow of public goods, and  $\partial g_t / \partial n_t > 0$ ,

$$V_0(w, \tau_1, n_t) \geq V_0(w, \tau_1, n_0).$$

Inequalities (A.5) and (A.5) together imply that (A.5) holds  $\forall t$ .

Step 3:

A binding unemployment constraint implies that employed people support reform at time zero and unemployed people oppose reform at time zero. Since support is always equal to the fraction of employed people, the proposition holds.