

Resistance to Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty: Comment

By ANTONIO CICCONE*

Why do governments so often fail to adopt reforms that economists consider efficiency-enhancing? This is the question addressed in an influential paper by Raquel Fernandez and Dani Rodrik (1991). They argue that one of the reasons is that individual winners and losers of reform can often not be identified beforehand. This individual-specific uncertainty leads to a bias against reform.

Before turning to their model, Fernandez and Rodrik illustrate their argument with an example. The example assumes that voters are risk neutral and that reforms need the support of a majority of the electorate. Fernandez and Rodrik first argue that individual-specific (IS) uncertainty does not lead to a bias against reform as long as the electorate only gets to vote once. Their argument is easiest to explain with the help of Figure 1. The ISU set captures all reforms passed with IS uncertainty. The NO-ISU set captures all reforms passed without IS uncertainty. It can be seen that some reforms (those marked by A) will be enacted with IS uncertainty although they would have been rejected without uncertainty. To see how this may happen suppose that a majority of voters will turn out to lose L from reform and a minority will turn out to gain G from reform. If voters know whether they win or lose for certain when they have to decide, reform will be rejected. If voters only know about the distribution of winners and losers in the population, reform will be passed as long as gains G are large relative to losses L . Figure 1 also shows reforms (those

marked by C) that will be enacted without IS uncertainty although they would have been rejected with uncertainty. A necessary condition for this to happen is that a majority will turn out to gain G from reform and a minority to lose L . If voters know who wins and loses when they make their decision, reform will be accepted. If voters only know about the distribution of winners and losers, reform will be rejected as long as G is small relative to L . As reforms may be enacted with IS uncertainty but not without IS uncertainty and vice versa, Fernandez and Rodrik argue that IS uncertainty does not lead to a bias in favor of or against reform when the electorate only gets to vote once.

To show how IS uncertainty gives rise to a bias against reform, Fernandez and Rodrik introduce a dynamic element into the example by allowing voters to reconsider reform in a second period. They argue that this does not change the NO-ISU set. This is because in the case without IS uncertainty, voters have all the relevant information when they first decide on reform. As there is no news in the second period, voters have no reason to change their decisions. Second period voting will however eliminate all reforms in the ISU set that are not contained in the NO-ISU set (reforms marked by A) according to Fernandez and Rodrik. Their argument is that IS uncertainty will have resolved when voters get to reconsider reform in the second period. All reforms where a majority of workers turn out to lose will therefore be revoked in the second period. Fernandez and Rodrik argue that these are exactly those reforms that would have been rejected in the first period in the case without IS uncertainty. This implies that reforms passed in the first period and sustained in the second period with IS uncertainty (reforms marked by B) are a proper subset of the reforms passed and sustained without uncertainty (the NO-ISU set). This is the sense in which IS

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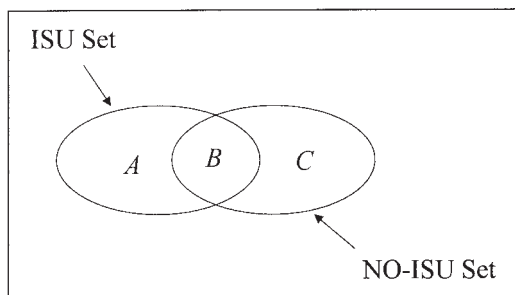


FIGURE 1. INDIVIDUAL-SPECIFIC UNCERTAINTY AND THE BIAS AGAINST REFORM

Notes: The ISU set captures all reforms passed with IS uncertainty. The NO-ISU set captures all reforms passed without IS uncertainty.

uncertainty leads to a bias against reform according to Fernandez and Rodrik.¹

The argument of Fernandez and Rodrik requires that voters reject reform after it has been implemented and IS uncertainty has been resolved if they would have rejected reform in the first period had there been no uncertainty. Or equivalently, support for sustaining reform after it has been implemented and IS uncertainty has been resolved cannot be greater than support for enacting reform in the first period had there been no uncertainty. While there are instances where this condition will be satisfied, there are also cases where it does not hold. For example, the condition does not hold in the model of Fernandez and Rodrik.

The model of Fernandez and Rodrik is a two-period, two-sector, small open economy where workers vote on trade reform at the beginning of each period. After each election they decide

whether to switch sector. Trade reform makes it relatively more attractive to work in one of the two sectors. Workers who switch sector in the first period must pay a switching cost. Fernandez and Rodrik are interested in whether trade reform will be in place in the second period in two different cases. In the case without IS uncertainty, workers know the switching cost with certainty when they have to vote in the first period. In the case with IS uncertainty, workers are uncertain about the switching cost when they have to vote in the first period. The model implies that some workers may support trade reform in the *first* and in the *second* period in the case with IS uncertainty although they would have voted against reform without uncertainty. Hence, IS uncertainty does not lead to a bias against trade reform.

Why would some workers vote for trade reform in the *first* period in the case with IS uncertainty although they would have voted against reform without uncertainty? The first reason is that workers are effectively risk-loving because they have the option of staying in their original sector. IS uncertainty therefore may increase the expected payoff of trade reform (Michael Rothschild and Joseph Stiglitz, 1970). The second reason is that Fernandez and Rodrik effectively assume that IS uncertainty lowers the expected switching cost for some workers. This explains why some workers may support trade reform in the first period with IS uncertainty although they would have voted against it without uncertainty. But why would they still support trade reform in the *second* period after they have found out about their switching costs? The first reason is that Fernandez and Rodrik assume that part of the switching cost is sunk at the time workers have to decide whether to actually switch sector. Some workers will therefore switch sector in the first period although without uncertainty they would have voted against trade reform because of high total switching costs. These workers will support trade reform in the second period because switching costs are sunk at that time. The second reason operates even if there is no sunk cost when workers have to decide whether to switch. Once trade reform has been passed it becomes more attractive to work in the sector that gains. Workers therefore respond by switching sector,

¹ So far nothing has been said about whether reforms are socially desirable in the sense that the sum of gains and losses across voters is positive. This is important because reforms rejected with IS uncertainty may be socially *undesirable*. Consider for example the case where uncertainty is such that all voters only know the distribution of gains and losses from reform. In this case reforms will be enacted with IS uncertainty if and only if they are socially desirable (the ISU set in Figure 1 coincides with the set of socially desirable reforms). IS uncertainty therefore eliminates socially undesirable reforms that would have been enacted and sustained without uncertainty, leading to a bias *in favor of* socially desirable reform.

which translates into support for maintaining reform in the second period.²

The remainder of the paper discusses the model of Fernandez and Rodrik in more detail and develops an alternative model where there will be no trade reform with IS uncertainty if there is no trade reform without uncertainty.

I. The Fernandez and Rodrik (1991) Model of Trade Reform

A. Static Model

There are two sectors, X and Y , producing different goods with constant-returns-to-scale technologies using labor only. Wages and prices are expressed in terms of good Y . Before trade reform, wages are identical in both sectors. Workers are considering whether to support a trade reform that will increase the price of good X in terms of good Y and therefore raise the wage in sector X in terms of good Y , w_X (reform does not affect the wage in sector Y , w_Y , and therefore makes it more attractive to work in sector X). Once trade reform is passed, workers can switch between sectors at a cost that comes in two parts. A part $\theta \geq 0$, common to all workers, that must be paid to have the option of switching sector, and an individual-specific part $c_i \geq 0$ that must only be paid by workers who actually switch.³ Trade reform is passed if and only if a majority of workers vote for it. Workers know θ when they vote. Regarding the individual-specific cost c_i , Fernandez and Rodrik discuss two cases. In the case without IS uncertainty, workers know c_i with certainty when they have to vote. In the IS uncertainty case, workers only know the distribution of c_i in their sector when they have to vote. They find out about c_i after trade reform has been passed if they paid θ . All workers have identical prefer-

ences and vote for trade reform if and only if reform increases their expected utility. The indirect utility function of workers who earn a wage w in terms of good Y and face a relative price P_X for good X can be written as $v(P_X)w$, where $v(P_X)$ is strictly decreasing in P_X . The indirect utility function is strictly decreasing in P_X because workers want to consume good X at all prices and a higher relative price of good X implies that the same wage in terms of good Y translates into a smaller quantity of good X .

Fernandez and Rodrik use this model to analyze how IS uncertainty affects the support of workers for trade reform. It is clear that workers initially in sector X will vote for trade reform whether or not there is IS uncertainty because trade reform makes working in sector X more attractive relative to working in sector Y . Hence, trade reform will be enacted whether there is IS uncertainty or not if workers in sector X are a majority of the electorate. It will therefore be assumed that workers initially in Y are a majority of the electorate. The key issue in this case is how the vote of workers initially in sector Y will be affected by IS uncertainty. To answer this question, suppose that trade reform has been passed and consider workers in sector Y who have already incurred θ and found out about c_i . These workers must now decide whether to actually switch to sector X . As θ is sunk, they will switch to sector X if and only if the resulting wage increase is greater than c_i . This implies that the end-of-period payoff of workers with an individual-specific switching cost c_i , $V_{ISU}^R(c_i)$, will be

$$(1) \quad V_{ISU}^R(c_i) = v(P_X^R)(\text{Max}[w_X^R - c_i, w_Y] - \theta),$$

where P_X^R and w_X^R denote the price of good X and the wage in sector X after trade reform (the wage in sector Y is unaffected by trade reform). The end-of-period payoff of workers initially in sector Y if trade reform is rejected is

$$(2) \quad V^{NR} = v(P_X^{NR})w_Y,$$

where P_X^{NR} denotes the price of good X before trade reform (and therefore the price if there is no reform). In the case with IS uncertainty, workers are assumed to only know the distribution of c_i among workers in their sector. All

² This reason why reforms may be maintained once they have been introduced is related to the argument of Stephen Coate and Stephen Morris (1999). They argue that once an economic policy is introduced, agents will respond by undertaking actions in order to benefit from it, and these actions will translate into political pressure to retain the policy.

³ Fernandez and Rodrik make these assumptions explicit in footnote 9 on p. 1149 and in footnote 15 on p. 1153.

workers in sector Y are therefore identical when they vote. Their expected utility from trade reform with IS uncertainty at the time they vote is $EV_{ISU}^R(c_i)$ if they incur θ , where the expectation is taken using the distribution of c_i among workers in sector Y . Workers in sector Y will therefore vote for trade reform in the case with IS uncertainty if and only if

$$(3) \quad V^{NR} \leq EV_{ISU}^R(c_i).$$

If (3) holds and trade reform is passed, workers initially in sector Y will incur θ and find out about c_i . If c_i turns out to be lower than the wage increase from switching to sector X , they will switch sector. If (3) does not hold, all workers in sector Y will vote against trade reform.

In the case without IS uncertainty, the end-of-period payoff of workers initially in sector Y with individual-specific cost c_i is

$$(4) \quad V_{NO-ISU}^R(c_i) = v(P_X^R) \text{Max}[w_X^R - \theta - c_i, w_Y]$$

if trade reform is passed. The difference between (4) and (1) arises because workers will incur θ in the case without IS uncertainty only if they end up switching sector. Combining (4) and (2) yields that workers initially in sector Y will vote for trade reform in the case without IS uncertainty if and only if their cost c_i satisfies

$$(5) \quad V^{NR} \leq V_{NO-ISU}^R(c_i).$$

Figure 2 depicts the end-of-period payoffs of workers in sector Y in the case without IS uncertainty, $V_{NO-ISU}^R(c_i)$, and in the case with IS uncertainty assuming that workers incurred θ , $V_{ISU}^R(c_i)$. $V_{NO-ISU}^R(c_i)$ lies above $V_{ISU}^R(c_i)$ for large c_i because workers in sector Y who do not switch sector (because of high switching costs) will not incur θ in the case without IS uncertainty. The figure also shows the end-of-period payoff of workers in sector Y in the case where trade reform is rejected, V^{NR} . $V_{NO-ISU}^R(c_i)$ has been drawn so that workers in sector Y with zero individual-specific switching cost are better off *ex post* with trade reform. Workers in sector Y with individual-specific switching costs above c_L are worse off *ex post* with trade reform.

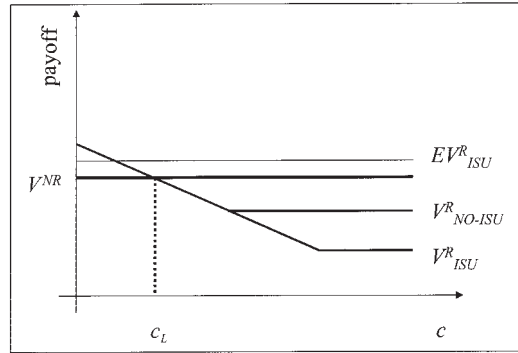


FIGURE 2. PAYOFF WITH AND WITHOUT TRADE REFORM IN THE STATIC MODEL

Notes: $V_{NO-ISU}^R(c_i)$ is the end-of-period payoff of workers initially in sector Y as a function of the individual-specific switching cost c_i in the case without IS uncertainty if trade reform is enacted. $V_{ISU}^R(c_i)$ is the end-of-period payoff of workers initially in sector Y who incur θ as a function of the individual-specific switching cost in the case with IS uncertainty if trade reform is enacted.

It is now straightforward to prove that IS uncertainty does not lead to a bias in favor of or against trade reform in the static model.

PROPOSITION 1: *There are instances where trade reform would pass without IS uncertainty but not with uncertainty. There are also instances where trade reform would pass with IS uncertainty but not without uncertainty.*

PROOF:

To prove the first part of the proposition, suppose that (3) is not satisfied. In this case, trade reform will be rejected with IS uncertainty (as workers initially in sector Y are a majority of the electorate). Trade reform would pass without IS uncertainty however, if workers in sector X combined with workers in sector Y who gain from trade reform [because their switching costs satisfy (5)] constitute a majority of the electorate. It is straightforward to see that the two conditions can be satisfied simultaneously. For example, suppose that workers in sector X are 49.5 percent of the electorate and that 1 percent of workers in sector Y have a zero switching cost while all others have a very high switching cost. To prove the second part of the proposition, suppose that (3) is satisfied. In this case

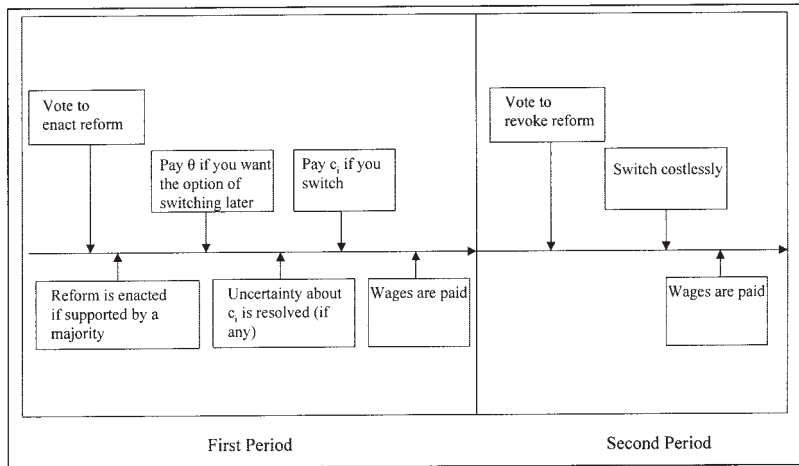


FIGURE 3. TIMING IN THE TWO-PERIOD TRADE MODEL

trade reform will be enacted with IS uncertainty as workers initially in sector Y vote for it. Suppose also that workers in sector Y whose switching costs do not satisfy (5) constitute a majority of the electorate. This implies that trade reform would be rejected without IS uncertainty because more than half of the electorate would be worse off with trade reform. To see that the two conditions can be satisfied simultaneously, suppose that initially there are no workers in sector X . In this case trade reform will be rejected without IS uncertainty if and only if workers in sector Y with the median switching cost would be worse off with trade reform.⁴ Notice that $V_{ISU}^R(c_i)$ is a strictly convex function of c_i (see Figure 2) because workers have the option of staying in the sector where they started out. Workers in sector Y therefore are effectively risk-loving and the expected value $EV_{ISU}^R(c_i)$ may be greater than V^{NR} even if the distribution of c_i is symmetric and workers in sector Y with the median switching cost will be worse off *ex post* with trade reform, see Rothschild and Stiglitz (1970). Workers in sector Y therefore may support trade reform with IS uncertainty al-

though more than half of them would vote against trade reform without uncertainty. Another reason why the two conditions may be satisfied simultaneously is that the average switching cost may be low relative to median switching cost.

B. Two-Period Model

In the two-period model, workers vote twice on trade reform, at the beginning of the first period and at the beginning of the second period. Wages are paid at the end of each period. Workers initially in sector Y are still assumed to be a majority of the electorate, and the timing of events in the first period is exactly as in the static model. In the second period, trade reform can be reversed costlessly. Workers who switched sector in the first period can costlessly switch back in the second period but switching costs incurred in the first period are sunk. In the case without IS uncertainty, workers know their total switching cost $\theta + c_i$ at the beginning of the first period. In the case with IS uncertainty, they only know θ and the distribution of c_i among workers in their sector at the beginning of the first period. They find out about c_i after trade reform is passed if they paid θ . Figure 3 illustrates the timing of events.

The possible equilibrium outcomes in the two-period model are: trade reform is rejected in both periods (no trade reform); trade reform

⁴ The model satisfies the assumptions of the median voter theorem. It is important to recognize, however, that generally the median voter is not the worker in sector Y with the median switching cost (because workers in sector X vote for reform).

TABLE 1—TRADE REFORM IN THE TWO-PERIOD MODEL

No IS uncertainty	IS uncertainty
Permanent trade reform	Permanent trade reform/ Temporary trade reform/ No trade reform
No trade reform	Permanent trade reform/ Temporary trade reform/ No trade reform

Notes: Permanent trade reform refers to trade reform being passed in the first period and sustained in the second period. Temporary trade reform refers to trade reform being passed in the first period but revoked in the second. No trade reform refers to trade reform being rejected in both periods.

is passed in the first period and revoked in the second period (temporary trade reform); and trade reform is passed in the first period and sustained in the second period (permanent trade reform). (Trade reform is never rejected in the first period and passed in the second period in equilibrium.⁵) Table 1 anticipates the results with and without IS uncertainty. The first row indicates that IS uncertainty may lead to no trade reform, temporary trade reform, or permanent trade reform in circumstances where there would have been permanent trade reform without uncertainty. The second row indicates that IS uncertainty may lead to no trade reform, temporary trade reform, or permanent trade reform in circumstances where there would have been no trade reform without uncertainty. Hence, IS uncertainty does not lead to a bias against trade reform.

The intuition for why there may be no trade reform with IS uncertainty although there would be a permanent trade reform without uncertainty is analogous to the static model (average switching costs may be high although there are enough workers with low switching costs for trade reform to be passed without IS uncertainty). The remainder of this section proves that there may be a permanent trade reform with IS uncertainty

⁵ Intuitively, the reason is that voters who gain from a one-period trade reform must gain even more from a two-period trade reform as switching costs remain the same but wage increases are realized over two periods. Hence, it is a contradiction for a majority to vote for trade reform in the second period but against trade reform in the first period.

although there would be no trade reform without uncertainty.⁶

A Sufficient Condition for Reform Being Rejected in Both Periods Without IS Uncertainty.—Denote the discount rate applied to second-period payoffs by $0 < \delta < 1$. Suppose that there is no IS uncertainty and that the following condition holds:

Condition A: Workers initially in sector Y for whom

$$\begin{aligned}
 (1 + \delta)V^{NR} &\geq W_{NO-ISU}^R(c_i) \\
 &\equiv v(P_X^R)\text{Max}[(1 + \delta)w_X^R - c_i \\
 &\quad - \theta, (1 + \delta)w_Y]
 \end{aligned}$$

holds constitute a strict majority of the electorate.

V^{NR} denotes the utility of working in sector Y for one period at before-trade-reform prices. The left-hand side of the inequality above is therefore equal to the discounted utility of workers in sector Y if workers believe that trade reform will be rejected in the second period if rejected in the first period and these beliefs turn out to be correct. The right-hand side of the inequality is the discounted utility of workers in sector Y as a function of their switching costs if workers believe that trade reform will be sustained in the second period if enacted in the first period and these beliefs turn out to be correct. The expression takes into account that workers will switch if and only if discounted income in sector X after the total switching cost, $(1 + \delta)w_X^R - c_i - \theta$, exceeds discounted income in sector Y , $(1 + \delta)w_Y$.

LEMMA 1: *If Condition A holds, trade reform will be rejected in the first period and in the*

⁶ Characterizing all instances where there will be permanent trade reform with IS uncertainty but not without uncertainty is involved because of multiple equilibria. If workers believe that trade reform is temporary, they are less inclined to switch sector in the first period and fewer workers will end up supporting reform in the second period. If workers believe that trade reform is permanent, they are more inclined to switch sector in the first period and more workers will end up supporting reform in the second period.

second period if there is no IS uncertainty.⁷ This is the case whatever workers' beliefs about election outcomes in the second period should trade reform be enacted in the first period.

PROOF:

Assume first that all workers believe that trade reform will be rejected in the second period if rejected in the first period and sustained in the second period if enacted in the first period. In this case, Condition A implies that the discounted utility at the beginning of the first period of no trade reform exceeds the discounted utility of permanent trade reform for a majority of workers. Trade reform will therefore be rejected in the first period. Moreover, the condition also implies that the utility of no trade reform in the second period exceeds the utility of trade reform in the second period (workers would have to bear the same switching costs as in the case of permanent trade reform but the benefits of trade reform would be realized for one period only). Trade reform will therefore also be rejected in the second period. Workers' beliefs that trade reform will be rejected in the second period if rejected in the first period would therefore be rational. The proof that trade reform will be rejected in both periods if Condition A holds, even if workers believe that trade reform if enacted in the first period will be rejected in the second period, is very similar and therefore omitted.

A Sufficient Condition for Reform in the First Period with IS Uncertainty.—Now assume that there is IS uncertainty. Suppose also that the following condition holds:

Condition B: $(1 + \delta)V^{NR} \leq EW_{ISU}^R(c_i) \equiv Ev(P_X^R)(\text{Max}[(1 + \delta)w_X^R - c_i, (1 + \delta)w_Y] - \theta)$.

The right-hand side of this inequality is the expected utility of workers in sector Y who incur θ , if workers believe that trade reform will be sustained in the second period if enacted in the first period and these beliefs turn out to be

correct. The expression takes into account that θ is sunk when workers have to decide whether to switch sector at the end of the first period. Workers in sector Y therefore will switch to X if and only if discounted income in sector X less the individual-specific switching cost, $(1 + \delta)w_X^R - c_i$, exceeds discounted income in sector Y , $(1 + \delta)w_Y$.

LEMMA 2: *If Condition B holds, all workers in sector Y will vote for trade reform in the first period with IS uncertainty if they believe that trade reform will be sustained in the second period if passed in the first period. This is the case whatever workers' beliefs about election outcomes in the second period should trade reform be rejected in the first period.*

PROOF:

This follows directly from Condition B in the case where workers believe that trade reform will be rejected in the second period if rejected in the first period. In the case where workers believe that trade reform will be enacted in the second period if rejected in the first period, the argument is more involved and relegated to the Appendix.

Workers' beliefs that trade reform if passed in the first period will be sustained in the second period will be rational if enough workers switch to X in the first period for sector- X workers to be a majority at the beginning of the second period. This is because workers who switched to X will vote to sustain trade reform in the second period as first-period switching costs are sunk.

A Sufficient Condition for Reform Being Sustained in the Second Period with IS Uncertainty.—Suppose that the following condition holds:

Condition C: Workers in sector Y for whom

$$(1 + \delta)w_X^R - c_i \leq (1 + \delta)w_Y$$

holds are a minority of the electorate.

To see the implications of this condition suppose that trade reform has been enacted in the first period with the vote of workers in sector Y and that workers believe that trade reform will

⁷ Or equivalently, as the model satisfies the assumptions of the median voter theorem, the median voter rejects trade reform in both periods in the case without IS uncertainty.

be sustained in the second period. In this case Condition C implies that workers who switch to sector X plus workers already in sector X will be a majority of the electorate at the beginning of the second period.

LEMMA 3: *If Conditions B and C hold, trade reform will be passed in the first period and sustained in the second period if workers believe that reform will be sustained in the second period if passed in the first period. This is the case whatever workers' beliefs about election outcomes in the second period should trade reform be rejected in the first period.*

PROOF:

Condition B implies that all workers in sector Y support reform in the first period and pay the cost of having the option of switching θ . Condition C ensures that enough workers switch to sector X at the end of the first period for reform to be sustained in the second period.

Lemmas 1–3 imply that if Conditions A–C are satisfied, there will be a permanent trade reform with IS uncertainty although reform would be rejected in both periods without uncertainty. The next question therefore is whether the three conditions can be satisfied simultaneously for some $\theta \geq 0$ and some distribution of individual-specific switching costs. The reasons why Conditions A and B can be satisfied simultaneously are analogous to the static model. If the distribution of c_i is symmetric, the reason is that workers in sector Y are effectively risk-loving. Another reason is that the mean of the distribution of c_i may be lower than the median. Conditions B and C can be satisfied simultaneously because the smaller the number of workers in sector Y with high switching costs the lower the expected switching cost in the case with IS uncertainty.

That Conditions A and C can be satisfied simultaneously is easiest to see graphically. Figure 4 graphs $(1 + \delta)V^{NR}$ as well as $W_{NO-ISU}^R(c_i)$ and $W_{ISU}^R(c_i)$. The reason why $W_{NO-ISU}^R(c_i)$ lies below $(1 + \delta)V^{NR}$ for large c_i is that workers who stay in sector Y (because of high switching costs) are worse off with trade reform than without because the relative price of good X increases. $W_{NO-ISU}^R(c_i)$ lies above $W_{ISU}^R(c_i)$ for

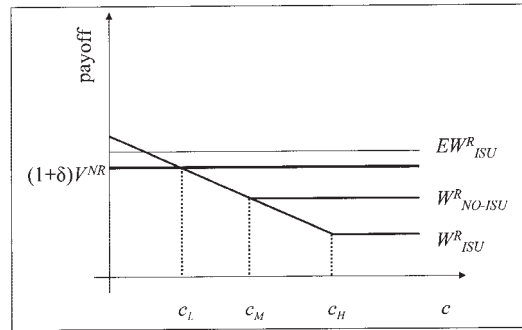


FIGURE 4. PAYOFF WITH AND WITHOUT TRADE REFORM IN THE TWO-PERIOD MODEL

Notes: The figure illustrates Conditions A–C. Workers with individual-specific switching costs above c_L are a majority of the electorate (Condition A). Hence, not enough workers support trade reform without IS uncertainty. Workers with individual-specific switching costs above c_H are a minority of the electorate (Condition C). Hence, too few workers remain in sector Y at the end of the first period for reform to be revoked in the second period. Combined with $(1 + \delta)V^{NR} \leq EW_{ISU}^R(c_i)$ (Condition B), this implies that trade reform is passed in the first period and sustained in the second with IS uncertainty.

large c_i because workers in sector Y who do not switch (because of high switching costs) will not incur θ in the case without IS uncertainty. Condition A is equivalent to workers in sector Y with individual-specific costs above c_L being more than half of the electorate. Condition C is equivalent to workers in sector Y with individual-specific costs above c_H being less than half of the electorate (because workers with individual-specific costs above c_H will not switch sector at the end of the first period in the case with IS uncertainty even if they voted for reform in the first period). Conditions A and C can therefore be satisfied simultaneously as long as there is a sufficiently large number of workers with individual-specific switching costs between c_L and c_U .

The gap between c_L and c_H decreases as the cost of having the option of switching, θ , falls. But c_L will be strictly smaller than c_H even if workers do not have to incur any cost to have the option of switching ($\theta = 0$). In this case workers will not have incurred any sunk cost when they have to decide to switch sector, which implies that $W_{NO-ISU}^R(c_i)$ coincides with

$W_{ISU}^R(c_i)$ and hence that $c_H = c_M$. Workers will therefore switch sector in the case with IS uncertainty if and only if they would switch without uncertainty. This raises the question of why some workers in sector Y switch sector after they find out about their switching costs although they would have voted against trade reform had they known their switching costs. The reason is that workers in sector Y who vote against trade reform without IS uncertainty do so because they are better off in sector Y at *before* trade reform prices than in sector X at *after* trade reform prices once they take into account their switching costs. Once reform has been enacted, workers compare the wages in sector Y and in sector X at *after* trade reform prices. As relative prices have changed in favor of sector X , some workers will switch although they would have voted against reform without IS uncertainty.

The next proposition summarizes the main result of this section.

PROPOSITION 2: *There may be a permanent trade reform with IS uncertainty although reform would be rejected in both periods without uncertainty. This will be the case even if workers do not have to incur any cost to have the option of switching ($\theta = 0$).*

II. An Alternative Two-Period Model of Trade Reform

Consider now a modified version of the two-period model. Costs of switching between sectors are zero. But workers initially in sector Y differ in their efficiency e_i in sector X and therefore earn $w_X^R e_i$ if they switch sector and trade reform is enacted. Suppose also that the wage of workers in sector Y exceeds their expected wage in sector X before trade reform and that workers initially in sector Y are a majority of the electorate. In the case without IS uncertainty, workers know their efficiency when they have to vote in the first period. In the case with IS uncertainty, workers only know the distribution of the efficiency parameter among workers in sector Y when they have to vote in the first period. They find out about their efficiency after working in sector X for one period. The main difference between this model and the one in the previous

section is that workers will not have incurred any sunk cost at the time they vote in the second period. As a result, there will be no permanent trade reform with IS uncertainty if there is no trade reform without uncertainty in the modified model. Before proving this result, it is necessary to determine when trade reform will be rejected without IS uncertainty.

A Necessary and Sufficient Condition for Reform Being Rejected in Both Periods Without IS Uncertainty.—Suppose that the following condition holds:

Condition D: Workers in sector Y for whom

$$v(P_X^{NR})w_Y \geq v(P_X^R)\text{Max}[w_X^R e_i, w_Y]$$

holds constitute a majority of the electorate.

The left-hand side of the inequality is the one-period utility of working in sector Y if reform is rejected. The right-hand side is the one-period utility of a worker starting out in sector Y with efficiency e_i in sector X if reform is enacted. Condition D is therefore necessary and sufficient for trade reform not to be in place in the second period. It is straightforward to show that the condition also implies that trade reform will be rejected in the first period.

The next proposition summarizes the main result of the modified trade model.

PROPOSITION 3: *If trade reform is not in place in the second period without IS uncertainty, it will not be in place with uncertainty.*

PROOF:

Suppose there is IS uncertainty and that workers in sector Y switch sector in the first period. In this case Condition D implies that trade reform will be revoked in the second period. Now suppose that workers in sector Y do not switch sector in the first period. In this case they must have voted against trade reform in the first period. Moreover, they will vote against trade reform again in the second period. The proof is easiest by contradiction. Suppose that they vote against trade reform in the first period, do not switch sector, and vote for trade reform in the second period. For workers in sector Y to

vote for trade reform in the second period in this case, their expected utility of switching to sector X if trade reform is passed must be greater than their utility of staying in sector Y in the case without trade reform, $v(P_X^R)Ew_X^R e_i \geq v(P_X^{NR})w_Y$. This implies that the expected wage in sector X must be greater than the wage in sector Y , $Ew_X^R e_i > w_Y$ as $v(P_X^R) < v(P_X^{NR})$. The expected utility of rejecting trade reform in the first period is $v(P_X^{NR})w_Y + \delta v(P_X^R)Ew_X^R e_i$ if workers expect trade reform to be passed in the second period and $(1 + \delta)v(P_X^{NR})w_Y$ if they expect trade reform to be rejected in the second period. The expected utility of passing trade reform in the first period for workers in sector Y if $Ew_X^R e_i > w_Y$ is $v(P_X^R)Ew_X^R e_i + \delta v(P_X^R)w_Y$ because they will switch sector after trade reform is passed and know that trade reform will be revoked in the second period as Condition D holds. $v(P_X^R)Ew_X^R e_i \geq v(P_X^{NR})w_Y$ therefore implies that the expected utility of trade reform being passed is greater than the expected utility of trade reform being rejected in the first period for workers in sector Y , which contradicts that they voted against trade reform.⁸

While trade reform will not be in place in the second period in the case with IS uncertainty if reform would not have been in place without uncertainty, it is possible to have no trade reform with IS uncertainty even if there would be

⁸ If $v(P_X^R)Ew_X^R e_i = v(P_X^{NR})w_Y$ workers in sector Y would be indifferent between passing and rejecting trade reform in the first period and in the second period. If they voted against trade reform in the first period and for trade reform in the second in this case, trade reform would be in place in the second period with IS uncertainty but not without. This possibility is ignored because it requires workers resolving ties differently in the two periods.

permanent trade reform without uncertainty. This requires that expected utility of trade reform for one period is strictly lower than the utility of no reform, $v(P_X^R)Ew_X^R e_i < v(P_X^{NR})w_Y$ and that Condition D does not hold. The two conditions will be satisfied simultaneously if the expected efficiency in sector X of workers starting out in sector Y is low but there are enough workers with high efficiency. Proposition 3 combined with this last result implies that IS uncertainty will lead to a bias against trade reform in the modified trade model.

It is important to recognize however that IS uncertainty will eliminate some trade reforms that are socially *undesirable* but would be passed without uncertainty. Without uncertainty, workers in sector X together with workers in Y with high productivity in X are able to pass a trade reform that is potentially very costly for those who continue working in sector Y . The cost could be so high that trade reform reduces the sum of utilities (utilitarian welfare) in the economy. With IS uncertainty, all trade reforms that are passed will increase utilitarian welfare. The reason is that workers in sector Y will support trade reform in this case only if their expected utility of trade reform being passed is greater than their utility of trade reform being rejected. As workers in sector Y are assumed to know the distribution of efficiencies in their sector, this implies that the sum of utilities of workers in sector Y will increase if trade reform is passed. As all workers in sector X gain from trade reform, this means that trade reform necessarily increases utilitarian welfare if passed in the case with IS uncertainty. IS uncertainty will therefore lead to a *bias in favor of socially desirable* trade reform.

APPENDIX

Consider the Fernandez and Rodrik (1991) two-period trade model and suppose that workers believe that trade reform will be enacted in the second period if rejected in the first period. The following proves that workers in sector Y will still vote for trade reform at the beginning of the first period with IS uncertainty if they believe that trade reform will be sustained in the second period if passed in the first period and Condition B holds.

In this case, the *ex ante* payoff for workers in sector Y if trade reform is rejected in the first period is

$$(A1) \quad V^{NR} + \delta \text{Max}[Ev(P_X^R)\text{Max}[w_X^R - c_i - \theta, w_Y - \theta], v(P_X^R)w_Y].$$

This is because they will only pay θ in the second period if the expected payoff at the beginning of the second period from switching into sector X is greater than the payoff from staying in sector Y . To see that Condition B implies that (A1) is smaller than $Ev(P_X^R)\text{Max}[(1 + \delta)w_X^R - c_i - \theta, (1 + \delta)w_Y - \theta]$ it is useful to distinguish two cases.

- (i) $Ev(P_X^R)\text{Max}[w_X^R - c_i - \theta, w_Y - \theta] < v(P_X^R)w_Y$. In this case $Ev(P_X^R)\text{Max}[w_X^R - c_i - \theta, w_Y - \theta] \leq V^{NR}$, which implies that (A1) is smaller than $(1 + \delta)V^{NR}$. Combined with Condition B, this yields the result.
- (ii) $Ev(P_X^R)\text{Max}[w_X^R - c_i - \theta, w_Y - \theta] \geq v(P_X^R)w_Y$. In this case Condition B implies that (A1) is smaller than

(A2)

$$Ev(P_X^R)\text{Max}[w_X^R - c_i/(1 + \delta) - \theta/(1 + \delta), w_Y - \theta/(1 + \delta)] + \delta Ev(P_X^R)\text{Max}[w_X^R - c_i - \theta, w_Y - \theta].$$

As the second term is smaller than $Ev(P_X^R)\text{Max}[w_X^R - c_i/(1 + \delta) - \theta/(1 + \delta), w_Y - \theta/(1 + \delta)]$, (A2) is smaller than $(1 + \delta)Ev(P_X^R)\text{Max}[w_X^R - c_i/(1 + \delta) - \theta/(1 + \delta), w_Y - \theta/(1 + \delta)] = Ev(P_X^R)\text{Max}[(1 + \delta)w_X^R - c_i - \theta, (1 + \delta)w_Y - \theta]$, which yields the result.

REFERENCES

- Coate, Stephen, and Morris, Stephen.** "Policy Persistence." *American Economic Review*, December 1999, 89(5), pp. 1327–36.
- Fernandez, Raquel and Rodrik, Dani.** "Resistance to Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty." *American Economic Review*, December 1991, 81(5), pp. 1146–55.
- Rothschild, Michael and Stiglitz, Joseph.** "Increasing Risk: Definition," *Journal of Economic Theory*, January 1970, 2(3), pp. 225–43.