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Trade Reform, Policy Uncertainty, and the Current Account

Sweder van Wijnbergen

Permanent changes in trade policy do not affect intertemporal prices and should thus leave private savings unaffected. But if trade reform will not be reversed and the government cannot credibly communicate that intent, consumers trade on the wrong assumption — so private savings are lower than they should be. This justifies policy intervention to increase private savings.

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Rapid trade liberalization is often followed by a surge of imports and a deterioration in the current account. The macroeconomic counterpart of this is a decline in private savings.

The expectation that tariffs will be reimposed lowers the expected consumption rate of interest (makes current goods cheaper in terms of future goods). So anticipation of a future tariff increase will increase current consumption if the intertemporal substitution elasticity is higher than 1. If consumers internalize the impact of future tariff revenues on their after-tax income, the effect on savings will *always* be negative — even for an intertemporal substitution elasticity below 1.

What is the impact of policy uncertainty on private savings? To deal separately with the impact of shifts in intertemporal prices and with risk aversion, van Wijnbergen uses the Ordinal Certainty Equivalence approach. He establishes that trade policy uncertainty by itself will further reduce savings if (1) there is positive risk aversion and (b) the intertemporal substitution elasticity exceeds 1.

This result is interesting for two reasons. First, it shows how policy uncertainty about tariffs reinforces the negative effect on savings of an expected policy reversal exactly when intertemporal substitution elasticity is high. So the two effects go in the same direction exactly when they matter most.

Second and more academic, in the standard expected utility approach, risk aversion is low when intertemporal substitution is high, because the relevant elasticities are each other's inverse — so whenever the uncertainty effect is important, the direct anticipation effect is not, and vice versa. This result is reversed in the non-expected utility approach, as van Wijnbergen found out: the two effects are complementary where the direct anticipation is important.

These results have important policy implications. If trade reform will not be reversed but the government cannot credibly communicate that to the private sector, consumers effectively trade on the wrong intertemporal prices. So, private savings are lower than they should be. This justifies policy intervention to increase private savings, preferably through a temporary increase in consumption taxes. If this is not feasible, the second best is a temporary tariff — the equivalent to gradual rather than "cold turkey" liberalization.

The case for such intervention is strengthened by the possibility that the private savings response could create such a large current account deficit that the trade reform itself would indeed get reversed — in a self-fulfilling prophecy.

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Trade Reform, Policy Uncertainty and the Current Account

by

Sweder van Wijnbergen

World Bank
and CEPR

I am indebted to Patricio Arrau and Ravi Kanbur for helpful discussions.

1 Introduction

Rapid and comprehensive reduction in barriers to international trade has often been followed by a sharp deterioration in the current account (Rodrik (1990); Dornbusch (1987)[1]/). The steep, $9 bUS deterioration in Mexico's current account the 2 years after the trade reform process was accelerated in 1987 is only the most recent example. The macroeconomic counterpart of the deterioration has typically been a decline in private savings; no clear response pattern has been observed for private investment. Economic theory has in recent years reached clear conclusions on these matters; the problem with these conclusions is that they seem counterfactual.

The problem does not really reside with investment. The investment response will depend on relative capital intensity of the industry whose protection is removed compared to the sectors favored by trade liberalization. Putty-clay considerations would tend to strengthen the investment response, as old capital gets scrapped more quickly in response to changing relative prices. On the other hand, policy uncertainty bestows an option value on assets more liquid than physical capital (van Wijnbergen (1985)) and thus tends to depress investment. But with no clear prediction emerging from economic theory, the ambiguous empirical record on this score is only to be expected.

But the situation is different with savings. In an elegant analysis, Razin and Svensson (1983) pointed out that a permanent reduction in tariffs affects current and future goods in the same way, leaving intertemporal relative prices and private savings unchanged. Gradual tariff reduction in fact raises the price of current goods in terms of future goods and would thus tend to improve private savings (Edwards and van Wijnbergen (1988) make a case for gradualism in the presence of capital market imperfections on this basis). It is this body of theory that, for all its theoretical elegance, seems firmly at variance with the facts.

This paper starts from the observation that anticipated policy reversal may explain a decline in private savings for the same reason gradual tariff reduction causes private savings to go up. Temporarily low tariffs lower the relative price of current goods in terms of future goods and thus tend to depress private savings.

However, the possibility of policy reversal does more than skew intertemporal relative prices towards today rather than tomorrow; it also increases policy uncertainty per se. Is it possible that this increase in uncertainty reinforces the private savings impact of an anticipated reversal of trade reform? This cannot really be analyzed in the standard expected utility framework because risk aversion and intertemporal substitution, two very different attributes of consumer preferences, are arbitrarily confined to be inversely related in that framework. I show that, in the context of imperfectly credible trade reform, this inverse relation implies that policy uncertainty is unimportant when it would reduce private savings, and, when important, would tend to increase private savings.

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[1] Dornbusch (1987) makes the point in a different context: he argues that an increase in tariffs would improve the US current account. By symmetry (not an innocuous assumption..), this supports the view that a decrease would deteriorate the CA.

But this conclusion depends entirely on the inverse relation between sk aversion and intertemporal substitution elasticity imposed arbitrarily by the framework of expected utility maximization. The "Ordinal Certainty Equivalence" (OCE) approach introduced by Selden (1978) offers a way out of the straightjacket imposed by expected utility maximization. The OCE approach allows independent parametrization of risk aversion and intertemporal substitution. Within the OCE framework, I show that, with positive risk aversion, policy uncertainty will in fact reinforce the negative savings impact of an anticipated policy reversal especially when that negative impact is strong. This suggests that with high risk aversion and high intertemporal substitution, a rapid trade reform that is not fully credible may depress private savings significantly, with attendant negative impact on the current account. This conclusion seems to accord well with actual experience.

2 The model

There are two periods, 0 and 1. Thus the time consistency problems that naive applications of the OCE approach lead to in multi-period setting (cf Weil (1990)) do not arise. Consumers consume home and foreign goods in each period. We choose the home good as numeraire; and the exogenous world relative price of the foreign good in terms of the home good is normalized to one. There is no tariff in period zero; we have just entered a period of complete trade liberalization. But π, the probability that the old tariff will be restored in the next period, is larger than zero. If such a policy reversal takes place, the future local price of the foreign good, T_1, will equal $t_1 > 1$. Without a reversal, $T_1 = 1$.

To simplify the structure of income effects, we assume that consumers have no within period income, just wealth at the beginning of period 0, W_0. Wealth is spent today or tomorrow, and within each period on home goods h and imports m. Wealth not spent in period 0 earns a certain rate of return R (the world rate of interest) between period 0 and 1.

We assume homothetic, unit-elastic preferences accross goods within a time period. Consumers know the within period tariff at the beginning of the period, before allocating expenditure over home and foreign goods. We can therefore define real consumption expenditure C_1 and the associated dual price index p_1 (a "*" indicates an optimally chosen quantity):

$$C_1 = (h_1^* + m_1^* T_1)/p_1 \qquad (1)$$

$$p_1 = T_1^{\alpha}$$

C_0 is defined similarly. By assumption the first period tariff is zero: $T_0 = 1$. α is the budget share of foreign goods in each period; α is constant because of the assumption of a unitary within-period substitution elasticity.

Under these assumptions, the within-period budget identities are:

$$W_2 = 0,\ pC_1 = W_1 \qquad (2)$$
$$W_1 = (W_0 - C_0)R$$

We use the "Ordinal Certainty Equivalence" framework (Selden (1978)) to disentangle risk aversion and intertemporal substitution. Risk aversion is parametrized by the coefficient of relative risk aversion, γ; intertemporal substitution by the intertemporal substitution elasticity $1/\rho$. This results in a welfare function:

$$V = (C_0^{1-\rho} + \beta\ (EC_1^{1-\gamma})^{\frac{1-\rho}{1-\gamma}})^{\frac{1}{1-\rho}}$$
$$= (C_0^{1-\rho} + \beta\ C_{1,RA}^{1-\rho})^{\frac{1}{1-\rho}} \qquad (3)$$
$$with\ C_{1,RA} = (E(C_1^{1-\gamma}))^{\frac{1}{1-\gamma}}$$

Using (1) and (2) yields an expression for C_1:

$$W_0 = C_0 + (T_1^e/R)C_1$$
$$= C_0 + C_1/R^* \ where\ R^* = \frac{R}{T_1^e} \qquad (4)$$

Thus,

$$C_1 = R^*(W_0 - C_0)$$
$$\therefore EC_1^{1-\gamma} = (W_0 - C_0)^{1-\gamma}\ E(R^{*(1-\gamma)}) \qquad (5)$$
$$= (W_0 - C_0)^{1-\gamma} R_\gamma^{1-\gamma}$$

by definition of R_γ as $(ER^{*\,1-\gamma})^{(1/(1-\gamma))}$. Standard calculation then shows that

$$C_0 = \frac{1}{1+A}\ W_0 \qquad (6)$$

where

Trade policy reversal thus affects private consumption in period 0 entirely through its impact on the risk-adjusted consumption rate of interest,

$$A = \beta^{\frac{1}{\rho}} R_\gamma^{\frac{(1-\rho)}{\rho}} \tag{7}$$

R_γ. An increase in this rate will affect first period consumption:

$$\frac{\partial C_0}{\partial R_\gamma} = -\frac{1}{(1+A)^2} \frac{A}{R_\gamma} \frac{(1-\rho)}{\rho} \tag{8}$$
$$= \varphi(\rho-1); \ \varphi > 0$$

If the intertemporal substitution is larger than one ($\rho < 1$), a higher risk adjusted consumption rate of interest depresses private consumption, in line with well established theory.

3 Trade Reform, Future Policy Reversal and Private Savings

3.1 Anticipated Trade Policy Reversal and Private Savings

Consider first the impact of anticipated trade policy reversal. With the utility structure used, uncertainty has no impact if the coefficient of risk aversion, γ, is set to zero. Thus, with $\gamma=0$, any impact on savings is due exclusively to the anticipation of policy reversal, not to uncertainty per se.

Assume a simple binomial distribution over future tariff rates:

$$T_1 = \begin{matrix} t_1 \text{ with probability } \pi \\ 1 \text{ with probability } 1-\pi \end{matrix} \tag{9}$$

Thus the risk adjusted consumption rate of interest becomes:

$$R_\gamma = \left(E\left(\frac{R}{T_1^a}\right)^{1-\gamma}\right)^{\frac{1}{1-\gamma}} \tag{10}$$
$$= R\left(1+\pi\left(t_1^{-a(1-\gamma)}-1\right)\right)^{\frac{1}{1-\gamma}}$$

Without risk aversion, $\gamma=0$, and the risk adjusted consumption rate of interest rate in fact equals the expected rate:

$$R_0 = (1-\pi)R + \pi t_1^{-a} R \tag{11}$$
$$= R(1 + \pi(t_1^{-a}-1))$$

From (11) and (8), one can easily assess the impact of anticipated trade policy reversal on first period consumption:

$$\frac{\partial C_0}{\partial \pi} = \left(\frac{\partial C_0}{\partial R_\gamma}\right)_{\gamma=0} \left(\frac{\partial R_\gamma}{\partial \pi}\right)_{\gamma=0}$$

$$= \varphi R(t_1^{-\varepsilon}-1)(\rho-1) \qquad (12)$$

$$> 0 \; iff \; \frac{1}{\rho} > 1$$

(12) establishes the first point of this paper; an anticipated trade policy reversal (i.e. an anticipation that future tariffs will exceed current tariffs) will lead to an increase in current consumption or a decline in private savings if the intertemporal substitution elasticity exceeds 1.[2]/

3.2 Private Savings and Uncertainty about Future Trade Policy.

Does uncertainty on future trade policy per se, for any given expected value of future tariffs [3]/, have an impact on first period consumption? This would open up a second channel through which a trade reform with less than complete credibility could affect private savings. This could be assessed by increasing the variance for given expected value of the future dual price index, p_1. However, the particular structure of the model makes it rather difficult to engineer a mean preserving increase in uncertainty; this would imply a very non-linear restriction on t_1 and π (it requires keeping expression (11) constant). We therefore follow a different approach.

In the OCE framework, assuming $\gamma=0$ eliminates all impact of uncertainty. Thus an analysis of the case for $\gamma=0$ isolates the pure expected reversal effect, with no pollution by uncertainty per se; this is the case presented in Section 3.1. The impact of uncertainty can then be assessed by looking at the impact of increasing γ. Increasing γ leaves the expected consumption discount rate unaffected, since it only involves a change in preferences, not in the objective environment. It therefore does not have a first order effect on the expected reversal effect analysed in Section 3.1; in the OCE approach risk aversion and intertemporal substitution can be separated. Therefore the impact of increasing γ is the impact of uncertainty at the value γ has been increased to. Finally, since the only uncertainty in the model is the uncertainty related to future tariffs, the entire impact of the increase in γ is due to the existing uncertainty about future trade policy. The impact of an increase in γ would be zero if there was no tariff uncertainty.

Therefore we consider how an increase in γ would affect first period consumption given the stochastic structure outlined in (9). Once again, the

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[2] The impact on savings will be unconditionally negative if consumers anticipate the income effects of a second period rebate of tariff revenues.

[3] or, more precisely, for any given expected value of the consumption discount rate.

entire impact of both uncertainty and of increases in γ runs through the impact on the risk adjusted interest rate. Thus consider the derivative of R_γ with respect to γ. To this end we introduce some simplifying notation. Define first the consumption discount rate in case of a zero future tariff as R_H, and in the case of a positive future tariff as R_L. Also, define k as $k=1-\gamma$. One then gets:

$$R_\gamma = (\pi R_L^k + (1-\pi) R_H^k)^{\frac{1}{k}} \qquad (13)$$
$$= (ER_i^k)^{\frac{1}{k}};\ i = L,H$$

E is the expectations operator over the distribution specified in equ. (9). Taking logs and bringing k to the other side yields: [4]/

$$k\ logR_\gamma = \log(ER_i^k) \qquad (14)$$

Log-differentiation yields:

$$\frac{k}{R_\gamma}\frac{dR_\gamma}{dk} + logR_\gamma = \frac{E(R_i^k \log(R_i))}{E(R_i^k)} \qquad (15)$$

Multiply both sides by k and rearrange terms to get:

$$E(R_i^k)\ \frac{k^2}{R_\gamma}\frac{dR_\gamma}{dk} = \qquad (16)$$
$$= E(R_i^k \log(R_i^k)) - E(R_i^k) * \log(ER_i^k)$$
$$> 0$$

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[4] I am indebted to Ravi Kanbur for the following derivation; the result is a special case of a general proposition in Diamond and Stiglitz (1974).

The inequality in (16) obtains because of convexity of the function $f(z)=z\log(z)$. But since $k = 1 - \gamma$, equ. (16) establishes what we are after:

$$(16), k=1-\gamma \Rightarrow \frac{dR_1}{d\gamma} < 0 \qquad (17)$$

Thus introducing risk aversion in the presence of uncertainty about future trade reform will unambiguously lower the risk adjusted consumption rate of interest, something that it would not have done without the trade related uncertainty (since there is no other source of uncertainty). We can therefore conclude that uncertainty about future trade policy reversal will lower the risk adjusted consumption rate of interest. But (8) states that a cut in the risk adjusted rate of interest will depress private savings if the intertemporal substitution elasticity is larger than one ($\rho < 1$). We can thus claim the following proposition:

Proposition 1: Uncertainty about future trade policy per se (i.e. for given <u>expected</u> value of the tariff) will depress private consumption today if the intertemporal rate of substitution exceeds one ($\rho < 1$) and there is positive risk aversion ($\gamma > 0$).

4 Conclusions

This paper starts from the observation that trade liberalization is often followed by a strong surge of imports and an accompanying current account deterioration. The macro-economic counterpart of this CA deterioration is typically a decline in savings rather than an investment boom. We show first of all that a positive probability of reimposition of tariffs in the future lowers the expected consumption rate of interest (makes current goods cheaper in terms of future goods). Therefore an anticipated future tariff increase will increase current consumption if the intertemporal substitution elasticity is higher than one. If consumers internalise the impact of future tariff revenues on their after-tax income, the savings impact will <u>always</u> be negative, even for an intertemporal substitution elasiticity below one.

The second, and less obvious, result concerns the impact of policy uncertainty per se on private savings. We are able to deal separately with the impact of shifts in expected intertemporal relative prices and with risk aversion by using the Ordinal Certainty Equivalence approach pioneered by Selden (1978). This approach relaxes the rigid inverse relationship between intertemporal substitution and risk aversion that characterizes the expected utility approach to consumer choice under uncertainty. Within Selden's OCE framework, we establish that policy uncertainty per se will further reduce private savings if: (a) there is positive risk aversion; (b) the intertemporal substitution elasticity exceeds one.

This is an interesting result for two reasons. First it shows how policy uncertainty about future tariffs will reinforce the negative savings impact of the direct anticipated reversal effect exactly when the latter is large (intertemporal substitution elasticity is high). The two effects thus go into the same direction exactly when they matter most. The second observation is

more academic. In the standard expected utility approach, risk aversion is low when intertemporal substitution is high, because the relevant elasticities are each other's inverse. The consequence of this is that whenever the uncertainty effect is important, the direct anticipation effect is not and vice versa. This result is reversed in the non-expected utility approach, as we found out: the two effects are complementary in the case where the direct anticipation effect is important.

These results have important policy implications. If the trade reform will not be reversed, but the Government cannot credibly communicate that to the private sector, consumers effectively trade off the wrong intertemporal prices. As a consequence, private savings will be suboptimally low; this justifies policy intervention to increase private savings, preferably through a temprorary increase in consumption taxes. If that is not feasible, a case can be made for temporary tariffs as a second best response; this would be equivalent to gradual rather than "cold turkey" liberalization. This is a special case of a more general point made by Calvo (1988a,b): mistaken beliefs about future policy act like a distortion and therefore justify policy intervention in principle.

A magnifying impact could come about if the private savings response leads to such a large current account deficit that the trade reform itself does in fact get reversed, a case of self-fulfilling prophecy. [5]/ This very real possibility further strengthens the case for policy intervention to increase private savings, and, arguably, for external support in the early periods of trade reform, possibly through institutions like the World Bank or IMF.

References

Calvo, G. (1988a), "Credibility and Economic Policy", presented at the conference: Spain and the European Monetary System.

Calvo, G. (1988b), "Costly Trade Liberalizations: Durable Goods and Capital Mobility", IMF Staff Papers, Vol.35, pp.461-74

Diamond, P. and J. Stiglitz (1974), "Increases in Risk and Risk Aversion", Journal of Economic Theory, Vol.8, pp.337-60.

Dornbusch, R. (1987),"External Balance Correction: Depreciation or Correction?", Brookings Papers on Economic Activity, 1987, No.1, pp.249-71

Dornbusch, R. (1989), "Credibility and Stabilization", mimeo, MIT.

Edwards, S. and S. van Wijnbergen (1987),"The Welfare Effects of Trade and Capital Market Liberalization", International Economic Review, Vol.27, pp. 141-149

Razin, A. and L. Svensson (1983),"An Asymmetry between Import and Export

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[5] Dornbusch (1989) discusses the possibility of such self-fulfilling equilibria in the context of stabilization programs.

Taxes", Economic Letters, Vol.13, pp.55-57.

Rodrik, D. (1990), "Trade Policies and Development: Some New Issues", mimeo, Kennedy School of Government, Harvard University.

Selden, L. (1978), "A New Representation of Preferences over "Certain X Uncertain" Consumption Pairs: The "Ordinal Certainty Equivalence" Hypothesis", Econometrica, Vol. 46, no. 5, pp 1025-45.

Weil, Ph. (1990), "Non-Expected Utility in Macroeconomics", Quarterly Journal of Economics, Vol.CV, pp 29-43.

van Wijnbergen, S. (1985), "Trade Reform, Capital Flight and the Value of Information", Economic Letters, Vol.19, pp.369-72.

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