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THE CURRENT ACCOUNT IN THE MACROECONOMIC ADJUSTMENT PROCESS

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ABSTRACT

This paper provides a formal analysis of the current account balance in a dynamic model with optimizing agents. Two analytical ideas are stressed. First, an economy's current account balance depends as much on future economic trends as on the current economic environment. A shift in fiscal policy, for example, will have one effect on the current account if it is perceived to be temporary and another if it is seen to be permanent. Second, temporary disturbances in the economy have permanent effects, by altering the entire future path of the economy's international indebtedness.

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Introduction

Macroeconomic adjustments to changes in the economic environment are importantly conditioned by the intertemporal choices of economic agents. Purely transitory disturbances, for example, can have persistent effects when they cause agents to recalculate plans over an extended planning horizon. For an open economy linked to a world market, one important aspect of intertemporal plans is the time path of net indebtedness of domestic agents to the rest of the world. When agents face an intertemporal budget constraint, a decision to alter current indebtedness implies changes in future consumption possibilities, and so will be based on expectations of the entire future path of key variables, and not just today's variables. For this reason, an economy's current account, which measures changes in national net indebtedness, depends as much on future economic trends as on the current economic environment.

In the first section of this paper, I present a formal model to show how today's current account is a function of both current and future economic variables. A given shift in fiscal policy, for example, will have one effect on the current account if it is perceived to be temporary and another if it is seen to be permanent. Moreover, when temporary disturbances alter the current account today, they also affect the future values of consumption, prices and output, as agents adjust future spending in line with changing indebtedness. These future changes are often neglected in analyses of the effects of a policy change. As a side point, it will be clear that "external balance" or a zero current account position is not, in general, a valid policy target. Household welfare is improved by the possibility of running current account surpluses and deficits in response to exogenous shocks.

This paper stresses the determination of the current account under classical assumptions of market clearing and continuous full employment. Without doubt, the impact of various disturbances on the current account will be different under Keynesian, or non-market clearing conditions. But even in the Keynesian case, the importance of the intertemporal dimension in current account determination will remain unchanged.

The Nature of Current Account Determination

The current account measures the extent of an economy's net borrowing or lending vis-a-vis the rest of the world in a given period, and thus is the outcome of savings and investment decisions. Static models that write the current account as a function of export and import often blur the intertemporal considerations inherent in savings and investment behavior. I will approach the current account from the other extreme, modelling it as an outcome of behavior of far-sighted, intertemporally optimizing households and firms.

The intertemporal choices reflect, of course, the interaction of intertemporal budget constraints and tastes. The budget constraints can be stated two ways, and each is insightful. From a national perspective, financial claims on the rest of the world B change according to the relationship:

$$(1) \qquad \dot{B} = CA = Q + r^*B - C - G$$

Here CA stands for curernt account, Q is gross domestic product (hence $Q + r^*B$ is gross national product), C is household consumption and G is government fiscal expenditure. (I ignore investment until the concluding section.) When $B > 0$, the country is a creditor, and when $B < 0$, it is a debtor. For simplicity, we suppose that all financial assets are short-term, with instantaneous real yield (in terms of numeraire commodity) r^*, with r^* fixed.

One way to impose an intertemporal budget constraint is to posit that in the long-run, the country is neither a creditor nor debtor in present value terms:

$$\lim_{t \to \infty} e^{-r^* t} B = 0$$

That is, claims or debt vis-a-vis the rest of the world must grow more slowly than the rate of interest. Imposing this condition on (1) yields immediately:[1/]

$$(2) \qquad \int_0^\infty e^{-r^* t} (C + G)dt = B(0) + \int_0^\infty e^{-r^* t} Q dt$$

Thus, the discounted value of domestic absorption must equal the sum of initial net claims on the rest of the world and the discounted value of domestic production. Note that by transposing G in (2), we have the budget constraint for household spending:

$$(3) \qquad \int_0^\infty e^{-r^* t} C dt = B(0) + \int_0^\infty e^{-r^* t}(Q - G)dt = W(0)$$

Here, W(0) is initial household human and financial wealth. If an infinite-lived household takes (3) as its budget constraint, its consumption possibilities are affected by the present value of government expenditures, but not by the <u>path</u> of taxes.[2/] For this reason, a "Ricardian equivalence proposition" will apply in the models that follow, so that consumer expenditure, the trade balance and current account will be invariant to the path of taxes and government deficits, given the path of government expenditure, $\{G(t)\}$.[3/] (I will use the notation $\{x(t)\}$ to signify the time path of x.)

If we rearrange (2) once again, we get a second way to view the intertemporal budget constraint:

$$(4) \qquad \int_0^\infty e^{-r^*t}(Q - G - C)dt = - B(0).$$

According to this expression, which is stressed by Krugman [1981], the discounted value of trade surpluses (Q-C-G) must exactly balance the initial net indebtedness of the economy, -B(0). Trade deficits in early years, for example, must be matched in present value terms by surpluses in later years, if B(0) = 0. Policies which increase borrowing in early years imply a fall in absorption relative to output in later years.

It is convenient to define the "permanent" or "perpetuity equivalent" of a variable X, which we will denote $X^P(t)$, by the relationship:

$$(5) \qquad \int_t^\infty e^{-r^*(\tau-t)}X^P(t)d\tau = \int_t^\infty e^{-r^*(\tau-t)}X(\tau)d\tau$$

or $X^P(t) = r^*\int_t^\infty e^{-r^*(\tau-t)}X(\tau)d\tau$. With this definition, the household constraint becomes:

$$(6) \qquad \int_0^\infty e^{-r^*t}C(t)dt = B(0) + [Q^P(0) - G^P(0)]/r^*$$

or

$$(6') \qquad C^P(t) = r^*W(t)$$

Also, with the trade balance Q-C-G denoted as TB, we have $TB^P(0) = -r^*B(0) = Q^P(0)-C^P(0)-G^P(0)$.

This last expression suggests an intuitive approach to trade balance and current account determination.[4/] Since $TB = Q-C-G$ and $TB^P = Q^P-C^P-G^P$, we know that $TB-TB^P = (Q-Q^P) - (C-C^P) - (G-G^P)$. The intertemporal budget constraint implies $TB^P = -r^*B$, and since $CA = TB + r^*B$, we can write $CA = (Q-Q^P) - (C-C^P) - (G-G^P)$. In the model that follows, $C-C^P$ results from the consumer's intertemporal allocation problem. The basic result of the consumer decision is that consumption is smoothed relative to income, as in the permanent income model. In the extreme case of smoothing, $C \equiv C^P$, so $CA = (Q-Q^P) - (G-G^P)$. More generally, $C-C^P$ will depend on wealth, the interest rate, and the rate of time preference. For the utility function presented below, $C-C^P = (\delta-r^*)W$, so $CA = (Q-Q^P) + (r^*-\delta)W - (G-G^P)$. Also, in the model below, $Q-Q^P$ is determined endogenously, as a function of foreign demand shocks and domestic productivity shocks.

From this simple expression for CA, we see that at least three phenomena give rise to current account deficits, all related to household preferences for certain consumption paths and to the intertemporal budget constraint.

First, when current income is low relative to permanent income, $(Q-Q^P) < 0$, households dissave in order to maintain consumption. Absorption remains higher than temporarily-depressed income, and a deficit results. Thus, a temporary decline in world demand for home goods that reduces the terms of trade, or a temporary decline in domestic productivity that reduces real income tends to give rise to trade and current account deficits. Permanent demand or supply shocks, on the contrary, need not induce a deficit, if both current and permanent income are reduced in equal proportion by the shocks. Household consumption drops by the extent of the reduction in (permanent) real income.

Second, a divergence of the rate of return to savings and the rate of time preference gives rise to external imbalance: $(r^{*}-\delta)W$. Even with a flat real income profile, households may have an incentive to tilt their consumption streams relative to income streams because of the rewards or costs of postponing consumption.

Third, when fiscal expenditure is high relative to its permanent level, the current account will tend to be in deficit, by $(G-G^{P})$. Note that in (6), the household budget constraint is a negative function of G^{P}, but for a given G^{P} is unaffected by the path of G. Thus, farsighted households will adjust consumption downward according to the permanent level of government spending, not the current level.[5/] When $G > G^{P}$, total absorption C + G will also tend to be above average, so that a current temporary fiscal expansion will tend to cause trade deficits now and surpluses in the future.

Later, in the second section, we will see that shifts in investment demand are a fourth factor in current account determination.

A Formal Model of the Current Account

Now I turn to a model of the current account and dynamic responses to supply and demand shocks. In general, dynamic models with optimizing agents are not easily solved analytically, and recourse to simulations is often necessary. To facilitate the discussion, then, I focus on a specific model that can be analytically solved, and describe how various modifications would affect key results.

National output Q is assumed to be the sum of outputs of two productive sectors, a pure traded good sector, producing Q^T, and a semi-tradeable sector, producing Q^S. The pure traded good is in perfectly elastic supply on the world market, and is taken as numeraire. The semi-tradeable good is exported on the world market subject to an export demand schedule that is downward sloping in its relative price $\pi(t)$. For simplicity, the instantaneous demand schedule is assumed to be $W^*(t)/\pi(t)$, where W^* is an external and exogenous foreign demand-shift variable. (The unitary elasticity helps to preserve linearity in the model.)

Households consume both goods, in amounts C^T and C^S. The value of total consumption in traded goods units is $C = C^T + \pi C^S$. The government also consumes both goods with $G = G^T + \pi G^S$. For simplicity, I will assume that G is divided in fixed proportion among the two goods, with $\pi G^S = \lambda G$, $G^T = (1-\lambda)G$. Equilibrium in the S-market requires:

$$(7) \qquad Q^S(t) = C^S(t) + G^S(t) + W^*(t)/\pi(t)$$

Household demands are derived from an intertemporal optimization problem of the form:

$$(8) \qquad \max_{C^T,C^S} \int_0^\infty e^{-\delta t} U(C^T,C^S)dt$$

subject to the budget constraint in (4). Here, utility is additively separable, with the important implication (and simplification) that households can use a two-step procedure: first select $C(t)$, and then divide $C(t)$ among $C^T(t)$ and $C^S(s)$ as a function of $\pi(t)$. I also assume that δ, the pure rate of time preference, is fixed. (I return to this assumption later.)

To get a tractable model it is useful to specialize utility further, by writing $U(C^T, C^S)$ as $\log(C^{T(1-\alpha)}C^{S\alpha})$. This form has a number of helpful features. First, total expenditure $C(t)$ is linear in household wealth $W(t)$. This linearity is a property of a class of "intertemporally homothetic" utility functions, of which $\log(\cdot)$ is a member.[6/] Second, $C(t)$ is divided in constant expenditure shares on πC^S and C^T respectively.

When this assumption is maximized subject to (4), the optimal consumption path is governed by the relationships:

(9)
$$\dot{C}_T = (r^* - \delta)C_T$$
$$\pi C^S = [\alpha/(1-\alpha)]C_T$$
and the budget constraint
$$\int_0^\infty e^{-r^*t}[C_T + \pi C^S]dt = W(0)$$

Solving the differential equation in (9), it is easy to show that

(10)
$$C^T(t) = (1-\alpha)\delta W(t)$$
$$\pi(t)C^S(t) = \alpha\delta W(t)$$
$$W(t) = e^{(r^*-\delta)t}W(0)$$
$$C(t) = e^{(r^*-\delta)t}C(0)$$

Thus, both wealth and consumption expenditure rise according to the divergence of r^* and δ, with households accumulating wealth whenever the rate of return exceeds the rate of time perference. Expenditures are linear in wealth, as noted above, with constant of proportionality δ. Note that (10) is not a final form of consumption since W depends on Q $(= Q^T + \pi Q^S)$, which in turn depends on $\{\gamma(t)\}$, $\{\pi(t)\}$, etc.

To complete the model, the supply side must be further laid out. I chose a convenient production possibility frontier of the form:[8/]

$$Q^S = (\gamma(t)L - Q^T)^{\beta} \tag{11}$$

Here $\gamma(t)$ represents an exogenous productivity shift variable, and L is exogenous (and fixed) labor supply. With perfect competition $dQ^T/dQ^S = \pi(t)$, which implies that $Q^T = \gamma(t)L - \beta\pi Q^S$. Since $Q = Q^T + \pi Q^S$, we have

$$Q = \gamma(t)L + (1-\beta)\pi Q^S \tag{12}$$

To solve the model, we first find W(0). The trick here is that the value of production itself depends on demand through demand effects on the relative price π. We know from the definition of W that:

$$W(0) = [Q^P(0) - G^P(0)]/r^* + B(0) \tag{13}$$

Now, $Q^P(0) = [\gamma L + (1-\beta)\pi Q^S]^P$, by equation (12), and the definition of the P-operator, defined in equation (5). By market clearing, $\pi Q^S = \alpha\delta W + \lambda G + W^*$, which we can substitute into the expression for $Q^P(0)$. Note also that $W^P(0)$ is $W(0)/\delta$.[9/] Using the linearity of the P-operator, and the definition of $Q^P(0)$, we can rewrite (13) as

(14)
$$W(0) = r^{*-1}[1-\alpha(1-\beta)]^{-1}\{L\gamma^P(0) + (1-\beta)W^{*P}(0) - [1-(1-\beta)\lambda]G^P(0) + r^*B^N(0)\}$$

Equation (14) also holds for all t.

Now from the consumer demand equations, C^T and $\pi(t)C^S(t)$ depend only on wealth, and not on current values of any variables, with $C^T(t) = \delta W(t) = \delta e^{(r^*-\delta)}W(0)$, and W(0) given in (14). $\pi(t)C^S(t)$ is similarly found.

We can summarize current account behavior in two ways. First, $CA(0) = Q(0) + r^*B(0) - G(0) - C(0)$. Substituting $\gamma L + (1-\beta)\pi Q^S(0)$ for Q(0), invoking market clearing, and using (10) in the consumer demand expression, we find:

(15)
$$CA(0) = (r^*-\delta)W(0) + (1-\beta)[W^*(0)-W^{*P}(0)] - [1-\lambda(1-\beta)][G(0)-G^P(0)] + L[\gamma(0)-\gamma^P(0)]$$

This is the general equilibrium version of the CA equation that was motivated heuristically in the first section. It differs from the earlier formula by allowing for the general equilibrium feedbacks of W* and G on Q. Once again, we see a time-preference motive in the first RHS term in (15) and a consumption-smoothing motive in the next three terms. When r* exceeds the rate of time preference, households accumulate wealth. Next, when world demand is above its permanent level, or productivity is above its permanent level, then households also accumulate. Finally, when G exceeds G^P, total absorption is temporarily high and the country runs a deficit. As before, equation (15) holds for any time t.

A related way to summarize current account behavior is to measure the cummulative deficits between 0 and t. Since CA = $\dot{B}$, we have that

$$B(t) - B(0) = \int_0^t CA(\tau)d\tau.$$

To find B(t), we may use the differential equation (1). Thus

$$B(t) = e^{r^*t}B(0) + e^{r^*t}\int_0^t (Q-C-G)e^{-r^*t}dt.$$

Now we substitute δW for C, and $\gamma L + (1-\beta)\pi Q^S$ for Q. After tedious manipulation, we end up with the expression:

$$\begin{aligned}(16)\qquad \int_0^t CA(\tau)d\tau &= B(t) - B(0)\\ &= [e^{(r^*-\delta)t}-1]W(0) + Le^{r^*t}\int_0^t e^{-r^*\tau}[\gamma(\tau)-\gamma^P(0)]d\tau\\ &\quad + (1-\beta)e^{r^*t}\int_0^t e^{-r^*\tau}[W^*(\tau)-W^{*P}(0)]d\tau\\ &\quad - [1-(1-\beta)\lambda]e^{r^*t}\int_0^t e^{-r^*\tau}[G(\tau)-G^P(0)]d\tau\end{aligned}$$

The <u>cumulative</u> current account deficit between 0 and t is thus: (1) proportional to W(0) with a positive dependence if and only if $r^* > \delta$; (2) increasing in the discounted cumulative deviations of λ and W^* from $\gamma^P(0)$ and $W^*(0)$; and (3) decreasing in the discounted cumulative deviation of $G(\tau)$ from $G^P(0)$. Once again, cumulative deficits depend on the average deviations of actual from permanent income over the interval.

To some extent, these results depend on specific household utility function that we are examining. Obstfeld [1980, 1981] among others has recently modelled the current account under the Uzawa formulation that the households' rate of time preference varies according to the level of instantaneous utility, with $\delta'[U(\cdot)] > 0$. When this alternative assumption is made, the level of $W(0)$ has the additional role of influencing the magnitude of δ along an adjustment path. A high value of initial wealth $W(0)$, by itself, will tend to induce current account deficits, by raising $\delta[U(C(0))]$ relative to r^*.

Finally, let us now turn to some comparative dynamic exercises. Consider three types of perturbations:

(a) a <u>temporary</u> shock:

$$x(t) \text{ becomes } \begin{cases} x(t) + \Theta & 0 \le t \le T \\ x(t) & T < t \end{cases}$$

(b) a <u>permanent</u> shock:

$$x(t) \text{ become } x(t) + \Theta \quad 0 \le t \le \infty$$

(c) an <u>anticipated future</u> shock:

$$x(t) \text{ becomes } \begin{cases} x(t) & 0 \le t \le T \\ x(t) + \Theta & T \le t \end{cases}$$

Such shocks to W^*, δ, or G affect the current account both through the wealth term in (16), and the consumption-smoothing terms. In general, a temporary rise in δ, or W^*, or fall in G, will lead to a rise in CA, unless δ is much greater than r^*. In that case, the positive wealth effect following such a shock leads households to borrow even more against their now higher wealth, causing deficits to rise.[10/] A permanent shock that raises wealth improves the current account if and only if $r^* > \delta$. An anticipated shock that raises wealth typcially worsens the current account, and does so necessarily if $r^* < \delta$.

Perhaps more interesting are the comparative dynamic effects of various perturbations on $\pi(t)$, $Q^T(t)$, and $Q^S(t)$. Here we find explicit expressions for the long-run effects of temporary disturbances in G, δ, and W^*. First, note from the market equilibrium conditions that:

$$
\begin{aligned}
\pi Q^S(t) &= \alpha\delta W(t) + \lambda G(t) + W^*(t) \\
Q^S(t) &= K_0[\alpha\delta W(t) + \lambda G(t) + W^*(t)]^{\beta} \\
\pi(t) &= K_1[\alpha\delta W(t) + \lambda G(t) + W^*(t)]^{1-\beta} \\
Q^T(t) &= \delta(t)L - \beta\alpha\delta W(t) - \beta\lambda G(t) - \beta W^*(t)
\end{aligned}
\tag{17}
$$

where K_0, K_1 are constants

We see that semi-tradeable production and its relative price are increasing functions of $W(t)$, $w^*(t)$, and $G(t)$. $Q^T(t)$ is, in turn, a declining function of Q^S. From (17), it is clear that production and prices at time $t > T$, are affected by temporary shocks during $0 \leq t \leq T$ according to the effects of these shocks on $W(t)$. Since $W(t) = e^{(r^*-\delta)t}W(0)$, any temporary shock which reduces $W(0)$ will lead, after time T, to a lower profile of $Q^S(t)$, $\pi(t)$, and a higher profile of $Q^T(t)$.

As an example, consider a temporary fiscal expansion. The change in $G^P(0)$ is given by:

$$-\int_0^T e^{-r^*\tau}\Theta d\tau = -(1-e^{-r^*T})\Theta.$$

Thus, according to (14), $\Delta W(0)$ is given by $-r^{*-1}[1-\alpha(1-\beta)]^{-1}(1-\beta)(1-e^{-r^*T})\Theta$. Since $W(t)$ is given by $e^{(r^*-\delta)t}W(0)$, we have:

$$\Delta W(t) = -r^{*-1}[1-\alpha(1-\beta)]^{-1}[1-(1-\beta)\lambda](1-e^{-r^*T})e^{(r^*-\delta)t}\Theta, \text{ for all } t \tag{18}$$

Thus, $W(t)$ is necessarily reduced. Since $G(t)$ is unchanged for $t > T$, it is clear from (18) that the temporary fiscal expansion unambiguously reduces $\pi(t)$ $Q^S(t)$, and raises $Q^T(t)$, for $t > T$. The effects on production and relative prices before time T depend on two offsetting effects. Demand for Q^S, at given π, rises by $\lambda\Theta$, while household demand falls by $\alpha\delta\Delta W(t)$. The relative magnitude of these offsetting effects depends on: (1) the marginal productivities to consume Q^S out of G and C; and (2) the duration of the temporary expansion. If the expansion is very short ($T \approx 0$), then $\Delta W(0)$ is also small, and $\pi(t)$ and $Q^S(t)$ are positively affected. In the benchmark case $r^* = \delta$, we find that $\Delta Q^S \geq 0$ and $\Delta\pi \geq 0$ for $t < T$ if and only if $\lambda > (1-e^{-r^*T})\alpha$.

It is useful to remember how these results differ in the case of no capital mobility. With a zero current account balance, $\Delta C(t) = -\Theta$ for $t \leq T$ and $\Delta C(t) = 0$ for $t > T$, rather than $\Delta C(t) = -\delta e^{(r^*-\delta)t}\Delta W(0)$. That is, the fiscal expansion crowds out consumption one-for-one. The general expressions for πQ^S, π, Q^S, and Q^T become:

$$(19)\qquad \begin{aligned} \pi(t)Q^S(t) &= (1-\alpha\beta)^{-1}[\gamma(t)L + (\lambda-\alpha)G(t) + W^*(t)] \\ Q^S(t) &= [\alpha\delta(t)L + (\lambda-\alpha)G(t) + W^*(t)]^{\beta} \\ \pi(t) &= [\alpha\delta(t)L + (\lambda-\alpha)G(t) + W^*(t)]^{(1-\beta)} \\ Q^T(t) &= (1-\alpha\beta)^{-1}[(1-\alpha)\delta(t)L - (1-\beta)(\lambda-\alpha)G(t) \\ &\quad - (1-\beta)W^*(t)] \end{aligned}$$

where $\varepsilon_0, \varepsilon_1$ are constants

First, notice that temporary shocks during $t < T$ have no effect on resource allocation for $t \geq T$. Households, in the aggregate, cannot reallocate their consumption streams to smooth the effects of ΔG. If they try, the domestic interest rates adjust until households are satisfied with the path governed by $\Delta C(t) = -\Delta G(t)$. Second, notice that the direction of the fiscal effect is now given by $\lambda - \alpha$, rather than $\lambda - \alpha(1-e^{-r^*T})$. This difference again reflects the fact that with no capital mobility the drop in consumption is the opposite of the rise in G.

As a final exercise, let us examine the current account and resource allocational effects of a "Reagan-type" announcement of future cuts in government spending. (Remember that in our analysis, announced tax cuts have no effect unless they presage cuts in government spending.) To simplify the illustration, we set $r^* = \delta$. Then:

$$\Delta W(0) = \Delta W(t) = r^{*-1}[1-\alpha(1-\beta)^{-1}][\int_T^{\infty} e^{-r^*\tau}\Theta d\tau][1-(1-\beta)\lambda].$$

We see that $\Delta C(t)$, which equals $\delta\Delta W(t)$, is necessarily positive, with the implication that for $t < T$, $\pi(t)$ rises along with $Q^S(t)$, while $Q^T(t)$ falls. The trade balance and current account deteriorate initially. After time T, the change in the current account is zero, while the trade balance goes into surplus to support a service account deficit. Note that $\Delta\pi(t)$ is either positive or negative for $t > T$, with the sign again depending on the relative magnitudes of α and λ. Specifically, for $t > T$, $\Delta\pi(t) > 0$ if and only if $\lambda < \alpha e^{-r^*T}$. For large T, the long-run effect is almost surely a depreciation.

Extensions and Conclusions

This paper has illustrated some of the intertemporal aspects of current account determination, and the role of the current account in macroeconomic adjustment. Given the difficulties inherent in working with intertemporal optimizing models, the paper relies heavily on a simple framework, and a specific set of functional forms. The principle that farsighted behavior by householders and firms makes the current account a function of current and future expected variables is certainly robust to changes in model specification. So too is the notion that temporary disturbances have long-run effects through their impact on the optimal intertemporal consumption path of households.

Certain key results do, however, depend on the specific assumptions laid out in the model. I have already mentioned how the introduction of a time-varying discount factor in the utility function can change the likelihood of surpluses and deficits following shocks to real income. A second type of modification, in which households have a finite rather than infinite planning horizon, has even stronger effects on some of our conclusions[11/]. In this case, government tax and debt policy can have important effects on the level of the current account balance and the path of resource allocation. Government can reallocate welfare between alternative generations (defined by their planning horizons), raising the possibility of an optimal current account policy that maximizes an intergenerational social welfare function.

Perhaps the most important deficiency of the simple model is the absence of investment in physical capital. Shifts in investment opportunities over time give rise to strong current account effects in theoretical models, and empirical work seems to confirm the strong, even dominant, role of investment in cross-country current account behavior (cf. Sachs [1981a, 1981b]). Investment is important because under high capital mobility all domestic investments are undertaken that exceed the world cost of capital, regardless of domestic savings rates. If new domestic investment opportunities arise that just meet the world market rate of return, the domestic current account worsens one-for-one with the rise in investment.

Adding optimal investment plans to an intertemporal model enormously complicates the algebra, and typically forces a retreat to simulations (cf. Sachs [1980, 1982]. The simulation exercises point to the following conclusions. First, permanent increases in world demand are likely to induce <u>deficits</u> initially, as the demand increases spur domestic capital formation and hence foreign capital inflows. Similarly, a fall in world demand can actually result in surpluses. Second, the resource allocational effects of temporary disturbances tend to be magnified when capital accumulation is permitted, since the long-run supply elasticities of the various sectors are raised by the possibility of sectoral capital accumulation.

Footnotes

1 Solving (1), we have that

$$B(t) = B(0)\cdot e^{r^*t} + e^{r^*t} \cdot \int_0^t e^{-r^*\tau}[Q(\tau)-C(\tau)-G(\tau)]d\tau$$

Multiplying both sides of this expression by e^{-r^*t}, and taking limits, we have

$$0 = B(0) + \int_0^\infty e^{-r^*\tau}[Q(\tau)-C(\tau)-G(\tau)]d\tau$$

From this, (2) is immediate.

2 Of course, the government's budget constraint implies that the discounted value of taxes equals the discounted value of government expenditures net of initial government claims on the private sector and the rest of the world.

3 See Barro [1974] for a discussion of this doctrine. In addition to the assumption of infinite-lived households, the equivalence proposition requires that taxes be non-distorting, as is assumed in this model.

4 I thank Michael Bruno for suggesting this simplified approach for deriving the current account equation.

5 The complete independence of C and G, for given G^P, depends on the assumption that the household utility from G and C is strongly separable.

6 See and Lipton and Sachs [1981] for a formal derivation of the optimal consumption program under the assumptions of this paper.

7 Specifically, the constant relative risk aversion function $u(C) = (C^{1-\gamma} - \gamma)/(1-\gamma)$ all result in $C(t)$ linear in $W(t)$. Only in the case of log $(\cdot)$, however, is the constant of proportionality between $C(t)$ and $W(t)$ invariant to the future path of interest rates. For a useful discussion of the utility function in current account behavior, see Svennson and Razin [1981].

8 The PPF can be derived from sectoral production functions of the form: $Q^T = \gamma(t)L^T$, $Q^S = (\gamma(t)L^S)^\beta$, $L^T + L^S = L$.

9 By (15), $W^P(0) = \int_0^\infty e^{-r^*t}\, W(t)dt$. Since $W(t) = W(0)e^{(r^*-\delta)t}$, we find by direct substitution that $W^P(0) = W(0)/\delta$.

10 From (15), $\Delta CA(0) = (r^*-\delta)\ \Delta W(0)$ + consumption smoothing terms. For $\delta >> r^*$ the positive wealth effect may dominate the consumption-smoothing effect.

11 See Buiter [1981] for an example of such a model, using the overlapping generations framework.

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