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"CURRENT ACCOUNT SUSTAINABILITY"/

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Preliminary
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CURRENT ACCOUNT SUSTAINABILITY*

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ABSTRACT

This paper puts forward a notion of current account sustainability that explicitly takes into account willingness to pay and willingness to lend in addition to intertemporal solvency. It argues that this notion of sustainability provides a better framework for understanding the variety of country experiences with protracted current account imbalances. Based on this notion, we identify a number of operational indicators related to the structure of the economy, the economic policy stance, and political economy factors. We use these sustainability indicators to evaluate the experience of a number of countries that ran persistent current account imbalances, and show which indicators help discriminate between those that underwent an external crisis and those that did not. Accordingly, we derive policy implications concerning persistent external imbalances consistently with our notion of sustainability.

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I. INTRODUCTION

What persistent level of current account deficits should be considered sustainable? Conventional wisdom is that current account deficits above 5% of GDP flash a red light, in particular if the deficit is financed with short-term debt or foreign exchange reserves, and if it reflects high consumption spending. How seriously should these, or any, thresholds be taken ? Which other factors should be considered in the evaluation of sustained current account imbalances? A cursory look at historical episodes suggests that a number of countries, such as Australia, Ireland, Israel, and South Korea, were able to sustain persistent current account deficits close to this threshold for several years, while others, such as Chile and Mexico, suffered severe external crises.

The natural question that comes to mind in evaluating the viability of external imbalances is whether the country is solvent; that is, whether it has the ability to generate sufficient trade surpluses in the future to repay existing debt. We argue in this paper that this notion of solvency, which is satisfied when the country meets its intertemporal budget constraint, is not always appropriate in evaluating the sustainability of external imbalances. First, it considers only the ability to pay, but abstracts from the willingness to pay. The present value of trade surpluses may theoretically be sufficient to repay the country's external debt, but it may not be politically feasible to divert output from domestic to external use in order to service the debt. Second, this notion of solvency often relies on the assumption that foreign investors are willing to lend to the country on current terms. This assumption, however, may be unrealistic, in particular when there is uncertainty about the country's willingness to meet its debt obligations. Clearly, availability of foreign funds, together with other market imperfections, imposes constraints on the sustainability of current account imbalances in addition to those imposed by pure intertemporal solvency.

In this paper we argue that a notion of current account sustainability that explicitly takes into account willingness to pay and willingness to lend in addition to intertemporal solvency analysis provides a better framework for understanding the variety of country experiences with protracted current account imbalances. We use this notion in the study of a selected number of countries, with the purpose of identifying the major determinants of current account sustainability. Some of these countries experienced an external crisis, while others were able to sustain persistent current account imbalances. In addition to the burden of external debt service (adjusted for growth and real exchange rate changes), we find that among the most important operational indicators of current account sustainability are the size of the export sector and the level of international competitiveness, the level of domestic savings, the composition of external liabilities, the strength of the financial system, and the degree of political stability. In addition, fiscal

consolidation is often a key feature of the adjustment required to generate trade surpluses.

The rest of the paper is organized as follows. Section II makes the notion of sustainability of current account imbalances more precise. Section III develops the notion of intertemporal solvency, which links current account imbalances with intertemporal consumption and investment decisions, using simple relations derived from national accounting identities. Section IV examines key determinants of willingness to pay and to lend in the context of a simple model of international portfolio allocation and moral hazard. Section V develops a set of operational indicators of sustainability, based on the theoretical analysis of the previous sections, and Section VI discusses the role of these factors in a few actual country experiences. We relate these experiences to the theoretical discussion, and in Section VII we try to distill some policy lessons. Section VIII concludes.

II. THE NOTION OF SUSTAINABILITY

The current account deficit (or surplus) is the positive (negative) increment to the stock of external liabilities of the economy. An evaluation of persistent current account imbalances has to take into account their contribution to the build-up of this stock. Three related questions are frequently asked in relation with an economy's external imbalances: is a debtor country solvent ? Are current account imbalances sustainable ? Is the current account deficit excessive ? We focus on the first two questions, and discuss briefly the third.

II.1 Solvency and sustainability

Solvency is theoretically defined in relation to an economy's present value budget constraint. In this sense, an economy is solvent if the present discounted value of future trade surpluses equals current external indebtedness. In the case of public finances, solvency implies that the present discounted value of future budget surpluses is equal to the current public debt. The practical applicability of the theoretical definition is hampered by the fact that it relies on future events/policy decisions without imposing any "structure" on them. For example, in the case of fiscal imbalances, if future surpluses are sufficiently large virtually any deficit path can be consistent with intertemporal solvency. Therefore researchers have attempted to define a baseline for future policy actions. In the case of public sector solvency this has typically been done by postulating a continuation into the indefinite future of the current policy stance and no change in the relevant features of the macroeconomic environment.1/ This gives rise to the notion

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1/ See, for example, Corsetti and Roubini (1991).

of "sustainability" -- the current policy stance is "sustainable" if its continuation in the indefinite future does not violate solvency (budget) constraints.

The definition of sustainability based on solvency considerations is simpler for fiscal imbalances, given that these can be associated (at least to some degree) with direct policy decisions on taxation and government expenditure. Defining sustainability is more complex in the case of current account imbalances, given that these reflect the interaction between savings and investment decisions of the government and domestic private agents, as well as the lending decisions of foreign investors. While government decisions can, to a first approximation, be taken as given, this is not the case for private sector decisions. Furthermore, a key relative price -- the exchange rate -- is a forward-looking variable that by definition depends on the future evolution of policy variables.

An alternative way of formulating the question of whether current account imbalances are "sustainable" is the following. Is a continuation of the current policy stance and/or of the present private sector behavior going to entail the need for a "drastic" policy shift (such as, for example, a sudden policy tightening causing a large recession), or to lead to a "crisis" (such as, for example, an exchange rate collapse leading to an inability to service external obligations)? If the answer is yes, we have a case of unsustainability. This drastic change in policy or crisis situation can be triggered by a domestic or an external shock, that causes a shift in domestic and foreign investors' confidence and a reversal of international capital flows.1/ Note that the shift in foreign investors' confidence may relate to their perception of a country's inability or unwillingness to meet its external obligations.

In order to give some meaningful content to the definition of current account sustainability, two related issues must be addressed. First, if a continuation in the indefinite future of current government policy implies the violation of budget constraints, forward-looking private agents will anticipate that a "policy shift" has to occur. For example, if external borrowing is growing without bound under the current policy stance, private agents' expectations will reflect the anticipation of a policy reversal, which could take the form of debt default, a drastic devaluation and/or fiscal adjustment. Ignoring these expectations and their reflections on private sector behavior (as is commonly the practice in "baseline scenarios") can lead to forecasting errors and overestimation of the durability of such unsustainable policy.

1/ In the presence of uncertainty, definition of solvency and sustainability rely to some degree on expected values, implying that in some states of the world insolvency will occur. Under these circumstances, the issue becomes how likely the occurrence of a "bad" scenario is, and how vulnerable is a country to external shocks (which depends, among other things, on the expected distribution of the shock).

Private sector's anticipations of future policy changes are reflected, for example, in interest rate differentials (when the exchange rate is pegged), and capital flight, both reflecting expectations of a future devaluation or -- for capital flight -- of future taxation of domestic assets.

The second issue concerns the "trigger" that will give rise to the policy reversal. The evaluation of a policy scenario based on a model that incorporates the expectations of forward-looking private agents needs a specification of the "event" that will trigger a policy shift. For example, this event could be a given combination of a level of the external debt to GDP ratio and the realization of a negative shock. Evidently, private agents' behavior and its implications for the future path of the economy will depend on the particular "trigger". The event that would trigger a policy shift is in principle different across countries, and may reflect different degrees of vulnerability to external shocks, or a difference in the capacity to undertake adjustment policies. An example of the first would be the degree of diversification of the export base, that makes a country more or less vulnerable to terms of trade shocks; an example of the second is the political-economic situation, that will affect the ability of the government to implement drastic changes in policy without causing social and political upheaval. 1/

II.2 "Excessive" current account imbalances

The question whether given current account balances are "excessive" can be answered only in the context of a model that yields predictions about the "equilibrium" path of external imbalances. Actual imbalances can then be compared to the theoretically predicted ones in order to judge whether they have been excessive or not. For example, a benchmark for defining what constitutes excessive deficits can be based on a representative agent model, with consumption behavior based on the permanent income hypothesis, in the presence of free capital mobility and investment adjustment costs.

Two main approaches to the empirical implementation of this model have been used. The first approach (see Leiderman and Razin (1991), Glick and Rogoff (1995) and Razin (1995)) relies on structural estimation of the model, and focuses in particular on estimated responses to various types of shocks (permanent and transitory, country-specific and global). The estimated responses can be used to evaluate the persistence of current account

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1/ Another implication is that the probability private agents attribute to a policy shift is state-contingent, and can be taken to be a measure of sustainability.For a more thorough discussion of this issue, see, for example, Horne (1991). A different notion of sustainability was put forward by Krugman in the context of the dollar overvaluation in the mid-eighties (Krugman (1985, 1988)). He extrapolated the future path of the exchange rate using interest rate parity and evaluated at this exchange rate the implied future path of the US current account balance. Having found an explosive path of US external liabilities, he concluded that the level of the dollar (and its market forecasted path) was unsustainable.

imbalances. The second approach (see, for example, Ghosh and Ostry (1995)) uses vector autoregression analysis to estimate the consumption-smoothing current account, which is equal to minus the present discounted value of expected changes in national cash flow (i.e., output minus investment minus government spending). The predicted current account behavior is then used as a benchmark to evaluate "excessive" current account imbalances.

The three concepts of solvency, sustainability and "excessive" current account deficits imply an increasing order of restrictiveness. The first concept, based on the intertemporal budget constraint, can accommodate a variety of future behavior patterns. The second is based on a continuation of the current policy stance, and therefore imposes more structure on future behavior. Within the notion of sustainability, we can also include cases in which a timely reversal of the current policy stance is sufficient to prevent a "hard landing". The notion of "excessive" current account deficits is instead based on deviations from an "optimal" benchmark, derived under the assumption of perfect capital mobility and efficient financial markets.

III. INTERTEMPORAL SOLVENCY

In this Section we use standard accounting identities to present the notion of intertemporal solvency, emphasizing in particular the role of growth, interest rates and the real exchange rate.

III.1 Intertemporal budget constraints

We define intertemporal solvency as a situation in which the country as a whole, and each economic unit within the country, including the government, obey their respective intertemporal budget constraints. In the context of the overall economy's resource constraint, the current account clearly plays a crucial role, since it measures the change in the net foreign asset position of the country. In an accounting framework, the current account balance, CA, is defined as follows:

$$\begin{aligned} CA_t \equiv F_t - F_{t-1} &= Y_t + rF_{t-1} - C_t - I_t - G_t \\ &= S_{pt} + S_{gt} - I_t \end{aligned} \tag{1}$$

where F is the stock of net foreign assets, Y is GDP, r is the world interest rate (assumed for simplicity to be constant), C is private consumption, G is government current expenditure, I is total investment (private and public), S_p is private savings and S_g is public savings. As the second equality in (1) shows, the current account balance is also equal to the difference between the economy's total savings and total investment.

Following Sachs (1982), we calculate the annuity values of each form of income and spending, Y_t, C_t, G_t and I_t, which we identify with the superscript

P.1/ Government solvency requires equality between the permanent level of government consumption and the annuity value of public sector wealth, which is given by the PDV of taxes plus the initial net asset position of the government:

$$G^P = \frac{r}{1+r}\left[(1+r)F_{g\,t-1} + \sum_{s=t}^{\infty}\left[\frac{1}{1+r}\right]^{s-t} T_s\right] \qquad (2)$$

where F_g is the public sector's level of net assets. The net foreign asset position of the country, F, is given by $F_p + F_g$, since government net liabilities vis-à-vis the private sector cancel out.

Using (2) and (2b) together with the economy's resource constraint (1) we obtain the following expression for the current account:

$$CA_t = (Y_t - Y_t^P) - (C_t - C_t^P) - (I_t - I_t^P) - (G_t - G_t^P) \qquad (3)$$

Therefore, current account imbalances in an intertemporally solvent economy reflect deviations of output, consumption, investment and/or government spending from their "permanent" levels. Of course, in order to evaluate the effects on the current account balance of deviations of, say, government spending from its permanent level, it is necessary to have a model which specifies the behavior of consumption, investment and output. For example, with full consumption smoothing the level of consumption C_t would always be equal to C^P. Assuming that investment decisions are driven by technology and world real interest rates and that the capital stock and labor force are fully utilized in production, a positive deviation of government spending G_t from its permanent level G^P would generate a current account deficit. This deficit is the result of private agents' decisions to smooth consumption by borrowing from

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1/ The annuity value is calculated from the sum of the present discounted values (PDV) of present and future flows, and is given by:

$$X^P = \frac{r}{1+r}\sum_{s=t}^{\infty}\left[\frac{1}{1+r}\right]^{s-t} X_s \qquad X = Y, C, G, I \qquad (2a)$$

In order to ensure solvency of the private sector, the PDV of lifetime consumption should be equal to the PDV of lifetime disposable income (private sector wealth). Accordingly, the permanent (solvent) level of private consumption must equal the annuity value of private sector wealth:

$$C^P = \frac{r}{1+r}\left[(1+r)F_{p\,t-1} + \sum_{s=t}^{\infty}\left[\frac{1}{1+r}\right]^{s-t}(Y_s - I_s - T_s)\right] \qquad (2b)$$

where F_p is the private sector's level of net assets (domestic and foreign) and T is the tax burden. See Obstfeld and Rogoff (1995) for a more complete discussion.

abroad during periods of temporarily high government spending. If instead output is above its permanent level, consumption smoothing would imply a current account surplus. In a Keynesian setting, however, focusing on deviations between actual and potential output, positive deviations of output from its potential level are associated with current account deficits.

III.2 Growth, the External Debt Burden and the Real Exchange Rate

We now turn to the examination of how relative price changes, the level of real interest rates and the rate of economic growth interact with trade imbalances in shaping the evolution of the ratio of external debt to GDP, the measure of the external debt burden.

Assume that the domestic economy grows at a given rate $\gamma < r$ 1/ let s_t, p_t, p^*_t, and i^*_t be the nominal exchange rate, the domestic GDP deflator, the foreign GDP deflator, and the world nominal interest rate, respectively, and define the real exchange rate q_t as $p_t/s_t p^*_t$. We can then re-write the current account identity (1) as follows:

$$s_t p_t^* F_t - s_t p_{t-1}^* F_{t-1} = p_t(Y_t - C_t - G_t - I_t) + i^* s_t p_{t-1}^* F_{t-1} \qquad (4)$$

where F_t is now the stock of foreign assets denominated in foreign goods.2/ Let the foreign assets to output ratio f_t be equal to $F_{t-1}/q_t Y_t$. Dividing both sides of (4) by nominal GDP, $p_t Y_t$, and re-arranging terms, we obtain:

$$f_{t+1} - f_t = \frac{1}{(1+\gamma_t)(1+\epsilon_t)}[tb_t + f_t(r^* - \epsilon_t - \gamma_t - \gamma_t\epsilon_t)] \qquad (5)$$

where $f_t = F_{t-1}/Y_t$, other lower-case letters indicate the ratio of the respective variables to GDP, and ϵ is the rate of real appreciation of the domestic currency. This expression simply says that changes in the ratio of foreign assets to GDP are driven by trade imbalances and by a "debt dynamics" term proportional to $f\ (r^* - \gamma - \epsilon)$.3/ This latter term rises with the world rate

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1/ Otherwise a country could play "Ponzi games" indefinitely -- that is, borrowing to repay interest on its outstanding debt, without violating solvency conditions, as long as total indebtedness rises at a rate below the economy's growth rate. This possibility, which can arise in a Samuelson-type overlapping generations model (see Gale (1974)), implies that the economy follows a dynamically inefficient growth path.

2/ Equation (20) shows that the ratio of current account imbalances to domestic GDP is not invariant to the world inflation rate, analogously to the measure of the domestic budget deficit (inclusive of interest payments) in the presence of domestic inflation. A more precise measure of the current account would need to account for the fact that with positive world inflation and foreign assets (liabilities) denominated in nominal terms part of the measured current account imbalances reflect anticipated repayment of principal.

3/ We ignore the term $\gamma\epsilon$, which is a discrete time residual.

of interest and falls with the rate of real exchange rate appreciation and the rate of growth of the domestic economy.

Consider now an economy in steady state, in which consumption, investment, public expenditure and the stock of foreign assets (liabilities) are constant as a fraction of GDP. What is the long-run net resource transfer (trade surplus) that an indebted country must undertake in order to keep the debt to output ratio constant? From equation (5), we get

$$tb = 1 - i - c - g = -f(r^* - \epsilon - \gamma) \qquad (6)$$

where *tb* is the long-run trade balance. This expression highlights the role played by the average future value of world interest rates, domestic growth and the long-run trend in the real exchange rate in determining the resource transfers necessary to keep the debt to GDP ratio from increasing.1/ Consider the case in which the long-run real exchange rate is constant ($\epsilon = 0$). Condition (6) then indicates that the country's long-run absorption can be higher than its income only if the country is a net creditor. In this case the country will run a trade deficit, equal to $(r-\gamma)f$, but a current account surplus equal to γf, thanks to the interest it earns on its foreign assets. In other words, in the presence of economic growth permanent current account deficits can be consistent with solvency even when the growth rate is below the world interest rate, provided they are accompanied by sufficiently large trade surpluses.

Clearly, if the long-run growth rate of the economy is zero, the current account must be balanced in order for the foreign debt (assets) to GDP ratio to be constant. In this case, a country that is a debtor in the long run will have to run a trade surplus, equal to $-rf$, to pay the interest on its external liabilities, while a country that is a long-run creditor will run a trade deficit.

In the long run, the dynamics of the real exchange rate can be assumed to be driven by the evolution of productivity differentials between the traded and nontraded goods in the domestic economy and in the rest of the world (the Balassa-Samuelson effect). Define *d* as the (log of the) relative price of traded goods across countries, and a^T (a^N) as (the log of) the productivity level in the traded (nontraded) sector. As shown in Appendix I, we can then express the changes in the real exchange rate as follows:
where a star indicates "foreign" variables, α (υ) is the labor share in the traded (nontraded) goods sector and β is the share of traded goods in the price

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1/ Cohen (1995) considers the Mexican resource transfers (as a fraction of GDP) after the 1982 debt crisis as an "upper bound" on the feasible resource transfers for heavily indebted countries. He then compares this magnitude with the equivalent of equation (19) for other highly indebted countries, in order to assess their solvency prospects.

$$\epsilon = \dot{d} + (1-\beta)[\frac{\upsilon}{\alpha}(\hat{a}_T - \hat{a}_T^*) - (\hat{a}_N - \hat{a}_N^*)] \qquad (7)$$

index used for the calculation of the real exchange rate.1/ For given behavior of productivity in the nontraded good sectors, countries with more rapid productivity increases in the traded goods sector than its trading partners will, ceteris paribus, experience a real exchange rate appreciation and therefore can sustain a larger debt to output ratio.

IV. WILLINGNESS TO PAY AND WILLINGNESS TO LEND

So far we have considered a world in which market imperfections such as asymmetric information, moral hazard, and absence of bankruptcy arrangements do not play a role in shaping intenrational borrowing and lending. These problems, however, are particularly relevant for country borrowers characterized by shallower financial markets, higher vulnerability to terms of trade shocks, and higher political uncertainty. In this section we focus on the factors that determine international investors' willingness to lend to a given country. To highlight this issue in a simple way, we present a simple (static) model of international portfolio diversification with moral hazard. An international investor has to decide its optimal portfolio allocation by choosing investment projects across J+1 countries, indexed by j. The rate of return in the home country (j = H) expressed in foreign currency follows an i.i.d. process with mean ρ_H and variance σ_H^2. The remaining J countries (the rest of the world) are symmetric and have rates of return r^j, which follow a random i.i.d. process with mean ρ and variance σ^2.

Assume that the international investor has a portfolio of size W, and denote by θ the share of the investor's portfolio allocated to the home country. Her/his portfolio's expected return is given by:

$$W[\theta\rho_H + (1-\theta)\rho] \qquad (8)$$

$$\rho_H = i_H - \frac{\hat{S}}{S}$$

and the variance is given by

1/ See the Appendix for the analytial derivations. The coefficients α, β and υ are assumed for simplicity to be equal across countries. Traded goods are typically industrial and agricultural products, as well as some services (such as travel), while nontraded goods comprise construction and other services, including government services. A terms of trade shock would affect the level of *d*.

$$W^2(\theta^2\sigma_H^2 + \frac{(1-\theta)^2}{J}\sigma^2) \qquad (9)$$

where i_H is the rate of return in the home country's currency, s is the exchange rate between the home country and the rest of the world and a dot indicates a time derivative. The variance on the rate of return σ_H^2 represents the combined effect of exchange rate risk and domestic interest rate risk. Clearly, both ρ_H and σ_H^2 are endogenous, since they depend on the government's policy choices. This endogeneity is made explicit below (see equation (15)). The international investor is assumed to have constant absolute risk aversion, with a coefficient γ. Thus, expected utility U is given by:

$$U = W[\theta\rho_H + (1-\theta)\rho] - \frac{\gamma W^2}{2}[\theta^2\sigma_H^2 + \frac{(1-\theta)^2}{J}\sigma^2] \qquad (10)$$

Maximizing expected utility with respect to θ and denoting the foreign currency value of home country's indebtedness θW by B_H we obtain:

$$B_H = (\sigma_H^2 + \frac{\sigma^2}{J})^{-1}[\frac{i_H - \dot{s}/s - \rho}{\gamma} + W\frac{\sigma^2}{J}] \qquad (11)$$

Figure 1 depicts the supply of external finance B_H as a function of the mean rate of return in the home country ρ_H, which will be identified as the cost of foreign borrowing. From equation (11) one can verify that the supply schedule is upward-sloping; that is, the country has to raise the rate of interest (adjusted for expected exchange rate changes) in order to elicit more capital from abroad. Furthermore, the supply schedule shifts upwards as: i) the opportunities for international diversification (J) rise (as in the case of "emerging markets"); ii) the country's credit and exchange rate risk (σ_H^2) increases; iii) the rate of interest in the rest of the world (ρ) increases. It shifts downwards as iv) the riskiness of the rest of the world's investment projects (σ) rises and v) the size of the world's portfolio (W) increases. 1/

[FIGURE 1 ABOUT HERE]

As highlighted in Figure 1, at the given level of external liabilities B_H, in order to elicit external funding a country must pay the rate of interest ρ_H which is determined as the intersection between the supply-of-external-funds schedule and the vertical line originating at B_H. If a "bad" shock that shifts the supply schedule upwards occurs, there will be an increase in the country's cost of external borrowing ρ_H. This increase may force the country to

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1/ As shown in Calvo (1995) and Calvo and Mendoza (1995), small "news" about the mean return of the investment project in the home country can have a large effect on the share of world portfolio allocated to the home country, provided that the portfolio is well diversified (J is large).

drastically change its policy stance in order to generate the additional flow of resources necessary to service external liabilities.1/

So far we have assumed that there is symmetric information about the characteristics of the countries' investment projects. We now turn to the case in which information is asymmetric, so that borrowers are better informed about the riskiness of projects than international investors. As shown in Stiglitz and Weiss (1981) in the context of bank lending, this informational structure can lead to credit rationing. The fundamental factor is that the rate of interest a bank charges may itself affect the riskiness of loans by either i) affecting the action of borrowers (moral hazard or incentive effect) or ii) sorting potential borrowers (the adverse selection effect). We now illustrate the first channel.

Suppose that the country is risk neutral, and that if it borrows an amount B, expressed in foreign currency, it is charged an interest rate r_H. The country will have an incentive to default on its loan if the real return on its project Y plus the real collateral C are insufficient to repay the promised amount:

$$C + Y < \frac{s}{p} B(1 + r_H) \tag{12}$$

where p is the domestic price level, so that s/p is the real exchange rate. In a strict sense, collateral can be identified with the "equity" of the country in the project. Alternatively, it could be interpreted as loan guarantees or as those country assets that can be seized by the lender in the event of a default. In a more general sense, it could include the present value of the cost of penalties imposed on a defaulting country, such as trade disruptions and isolation from international capital markets, and an evaluation of the "reputation cost" associated with default.

A surprise real depreciation of the domestic currency (due, for example, to a negative terms of trade shock) increases -- ceteris paribus -- the probability of default. Furthermore, investors' perception of the policy

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1/ Equation (11) can be re-arranged to yield a risk premium-adjusted interest rate parity condition as a function of the deviation of the portfolio share of the home country θ from the minimum variance portfolio share θ_{min}:

$$rp = i_H - \frac{\dot{S}}{S} - \rho = \gamma W(\sigma_H^2 + \sigma^2/J)(\theta - \theta_{\min})$$
$$\theta_{\min} = \frac{\sigma^2/J}{\sigma^2/J + \sigma_H^2} \tag{11a}$$

The risk premium is exogenous in this model, and the home country's share of the world portfolio adjusts so as to ensure that (11) holds. A more complete model would endogenize the domestic rate of return and its variance, the rate of depreciation and hence the risk premium.

instruments the government will use to meet external obligations is influenced by political economy considerations. For example, capital flight driven by fear of direct taxation or exchange rate depreciation can increase external debt, *B*, beyond the accumulated level of past current account imbalances.1/

The existence of implicit or explicit bailout clauses can worsen moral hazard problems, in an analogous fashion to a decline in collateral. In practice, the international financial community may be unwilling to let a country default on its debt obligations, because of the trade and capital markets disruptions this could induce or for protection of foreign investors (e.g., Mexico 1994). Moral hazard problems may be exacerbated by the implicit or explicit bailout clauses within a debtor country: for example, excessive borrowing by the banking sector can be induced by expectations of a government bailout should the sector run into financial difficulties.

To illustrate the effect of moral hazard problems on the supply of external funds, suppose that the country can choose between two investment projects, 1 and 2, and assume for simplicity that purchasing power parity holds, so that $s/p = 1$. The expected return to the i project is:

$$\pi_i = E[\max(Y_i - (1 + r_H)B, -C)] \qquad i = 1,2 \tag{13}$$

The derivative of the expected return with respect to the rate of interest is given by:

$$\frac{d\pi_i}{dr_H} = -B[1 - F_i((1 + r_H)B - C)] \tag{14}$$

where F_i (.) is the probability of default using project i. If, for some r, $\pi_1 = \pi_2$, then an increase in r_H would lower the expected return from the project with the higher probability of repaying the loan by more than the other project. Thus, the increase in the interest rate results in the country preferring the project with the higher probability of default.

The expected rate of return to the international investor and its variance will be given by:

1/ In this case, *B* represents gross external imbalances for the country as a whole. However, the virtual impossibility to tax foreign assets held abroad by domestic residents make this the relevant measure of debt.

$$\rho_H = (1 - F_i) r_H + F_i \frac{C}{B}$$

$$\sigma_H^2 = \frac{F_i}{1 - F_i} (\rho_H - \frac{C}{B})^2 \qquad (15)$$

Consider first the expected rate of return. By raising the interest rate r_H, the probability of default, F_i, rises *for a given project*. Furthermore, as a consequence of the interest rate increase the firm is more likely to choose a riskier project, thereby further increasing the probability of default. Even if the foreign investor were risk neutral, it could find it optimal to "ration" credit supply at a given interest rate, rather than raising the rate in the face of excess demand for credit. This would happen if the expected return from the loan actually fell with an increase in r_H, due to the increase in the probability of default. The possibility of credit rationing is enhanced by the foreign investor's risk aversion. Indeed, credit rationing could occur even when the expected return ρ_H increases with r_H, because the variance of returns rises as well (see (15)).

For our purposes, we can consider (15) as establishing a positive relation between the mean rate of return ρ_H and its variance σ_H^2. This implies that the credit supply curve for the country will be even steeper than in figure 1 (see equation (11)), and that it may entail credit rationing, with the foreign investor unwilling to lend to the country more than a given amount at an interest rate at which the country would demand more funds.

The foregoing analysis underscores the possibility that external funds would "dry up" when an economy is hit by a negative shock of the type (i)-(v), listed below equation (11). The trigger of a crisis could come from the foreign investor's perception of condition (12) -- that is, from the likelihood that the debt burden $B(1 + r_H)$ will exceed $C + Y$. This can be caused by factors such as an increase in world interest rates, a negative supply shock such as a terms-of-trade decline, a change in the perceived solvency of the financial sector that would call for a government bailout, or a change in the perceived political costs of default.1/ Similar to, but more dramatic than in, the case of symmetric information, the pre-existing policy can turn out to be unsustainable.

In addition to the case considered above, in which a shock can change the perception of a country's ability to meet its external obligations, debt-driven balance of payments crises can be generated by a fundamental inconsistency in macroeconomic policy, such as expansionary monetary policy under a fixed

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1/ The political and economic costs of default, and hence the risk premium, could be different for domestic and external debt.

exchange rate or persistent fiscal imbalances, which result in protracted current account deficits. Appendix II presents two examples, that highlight the role of external debt accumulation and external borrowing constraints respectively.

V. OPERATIONAL INDICATORS OF SUSTAINABILITY

This section discusses possible operational indicators of current account sustainability, based the analysis of solvency and willingness to lend considerations identified in Sections III and IV, respectively. We focus in particular on the economy's structure, macroeconomic policy, and political economy factors, and link them with the evolution of external imbalances.

V.I Structural features

i) Investment/savings. The current account balance is determined by the difference between national savings and domestic investment. For a given current account balance, the levels of savings and investment can have implications for the sustainability of the external position, for a given current account imbalance. High levels of investment imply -- ceteris paribus -- higher future growth through the build-up of a larger productive capacity, and therefore enhance intertemporal solvency (see equation (6)).1/ High savings and investment ratios can also act as a signal of creditworthiness to international investors, because they raise the perceived ability to service and reduce external debt.2/

ii) Economic growth. Fast-growing countries can sustain persistent current account deficits without increasing their external indebtedness relative to GDP, as can be seen, for example, from equations (5) and (6). In addition to the accumulation of physical capital through investment, stressed in the previous paragraph, high growth is driven by other factors such as the accumulation of human capital and increases in total factor productivity.

iii) Openness. The degree of openness can be defined as the ratio of exports to GDP. In order to service and reduce external indebtedness, a country needs to rely on traded goods' production as a source of foreign exchange. Clearly, countries with a large exports sector can service external debts more easily, because debt service will absorb a lower fraction of their total export proceeds. In order to generate the foreign exchange necessary to service

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1/ This assumes that investment projects are growth-enhancing. It is possible, however, that investment projects are not chosen efficiently, because of financial market distortions or because they are driven by political priorities.

2/ In terms of equation (12), higher investment would be reflected in a higher present value of output (a higher Y), reducing default risk.

external debt in case of an interruption in capital flows, a country needs to engineer a resource shift towards the exports sector. This sectoral shift is likely to be more costly in a closed economy. Furthermore, since this shift cannot occur instantly, sharp import compression may become necessary, with adverse consequences on the domestic industries relying on "essential" imported inputs (Sachs (1985) and Sachs and Warner (1995)).

Clearly, trade disruptions associated with debt default are more costly for an open economy. Consequently, sudden reversals of capital inflows will be less likely, because foreign investors will perceive the country -- ceteris paribus -- as less risky.1/

The commodity composition of trade can be an important indicator of vulnerability. Fluctuations in commodity prices have a larger impact on the terms of trade for countries with a narrow export base, and those particularly dependent on raw materials for their imports, as shown in equation (20). Terms of trade fluctuations can weaken the ability of the economy to sustain current account deficits.2/

The sectoral composition of growth may be an additional indicator of potential external difficulties. In particular, low export growth could reflect an exchange rate misalignment, which may point to the need of a policy reversal. A related argument is that for a small open economy large external trade can imply a more diversified input base for production, and hence higher productivity growth. A positive impact on productivity can also come from access to technology embodied in internationally traded goods.3/

iv) Composition of external liabilities

The composition of external liabilities may have an impact on the ability of a country to absorb smoothly a shock. In general terms, we can distinguish between "debt" and "equity" instruments. In principle, equity financing allows asset price adjustments to absorb at least part of negative shocks, so that part of the burden is borne by foreign equity investors. In contrast, in the case of foreign currency debt financing, the country bears most of the burden,

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1/ In terms of equation (12), higher costs of default would be equivalent to a higher C.

2/ Ghosh and Ostry (1994) found support for the view that large current account deficits are more likely to be unsustainable in countries with a less diversified export base in the context of a model based on precautionary savings. Mendoza (1995) presents evidence that the volatility of terms of trade is associated with lower economic growth in a wide sample of countries.

3/ For some empirical evidence on the importance of international productivity spillovers, see Coe and Helpman (1995) and Coe, Helpman and Hoffmaister (1995).

provided it does not default.1/ The structure of equity and debt liabilities is also important in order to evaluate a country's vulnerability to shocks. With regard to equity, portfolio investment is potentially more volatile than foreign direct investment. With regard to debt, its maturity structure, currency composition and whether it carries fixed or floating interest all affect vulnerability to shocks. The risk of external shocks is enhanced by short-term maturities, foreign currency denomination and variable interest because the impact on the debt burden is magnified.

v) Financial structure. In developing countries, financial intermediation is typically dominated by banks: bank deposits are the most important form of private savings and bank loans the main source of finance for firms.2/ The disciplinary effect of competition with alternative forms of financial intermediation is limited, and therefore the role of bank supervision is essential. The fact that it is more likely that banks will be bailed out by the central bank (government), relative to other financial institutions, can also imply more risk-taking behavior in a bank-dominated financial system. Problems are likely to surface when the central bank itself is involved in direct lending, financed through high reserve requirements, because of the conflict this implies with the arm's length supervision role. A financial structure with poor bank supervision, weak monitoring of borrowers make a country more vulnerable to external shocks, and more prone to experience balance of payments crises.

V.2 Macroeconomic Policy Stance

i) Monetary and exchange rate policy. The level of the real exchange rate is an important indicator of sustainability. A persistent real exchange rate appreciation can be driven by "fundamental" factors such as high productivity growth in the traded goods sector, or favorable terms of trade shocks. However, in the context of a fixed or managed exchange rate system, it could reflect a fundamental inconsistency between the monetary policy stance and exchange rate policy, giving rise to "overvaluation".

In this case, the overvaluation would typically be maintained by high domestic interest rates and/or by the presence of capital controls. An overvalued exchange rate would encourage a decline in savings as domestic residents intertemporally substitute present for future consumption. It can also cause a decline in economic activity, both because of the high interest

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1/ In terms of equation (12), a shift to equity financing could also improve lending terms for the same total amount of external liabilities, if Y is interpreted as the country's share in the resources generated by the project (B/Y would remain unchanged, but C/Y would rise, reducing default risk).

2/ For evidence on Latin American countries, see Rojas-Suarez and Weisbrod (1995).

rates needed to maintain the exchange rate peg and because the traded goods sector is "priced out" of world markets. These effects would contribute to a widening of current account imbalances and loss of foreign exchange reserves. The drain of foreign reserves can be reinforced by expectations of a future devaluation, that encourage capital outflows.1/ Finally, the weakening of the export sector hinders the ability of the country to sustain external imbalances.

There is also the possibility, however, that a real exchange rate appreciation would result from large capital inflows; to the extent that these are not driven by long-term fundamentals, they can result in an overvaluation. Weaknesses in domestic financial intermediation and supervision (which we discuss below) can hinder the efficient allocation of capital inflows between consumption and investment, and contribute to the overvaluation.2/

ii) Fiscal policy. In order to examine the relation between fiscal and external imbalances, we start from a benchmark "debt neutrality" case (Barro (1974)), where there is no correlation between the public sector deficit and current account imbalances. This can be seen most easily in the context of the intertemporal framework of Section III (see equation (3)): the current account is independent of the time profile of taxation, and therefore of the budget deficit.3/ Among other things, the debt neutrality result relies on the fact that consumption depends only on lifetime income and that taxes are not distortionary. In the context of equation (3), distortionary taxes would have an effect on the level of output and investment, and would therefore affect the current account. Furthermore, if consumption depends also on disposable income, for example because some consumers are unable to borrow at the same terms as the government, lower taxes today would induce higher consumption (see Jappelli and Pagano (1989)). Similarly for the firms, the effective easing of borrowing constraints associated with lower present taxes could induce an increase in

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1/ The link between inconsistent monetary and exchange rate policies and speculative attacks on a country's foreign exchange reserves was elegantly formalized by Krugman (1979). See also Appendix II.

2/ On problems posed by large capital inflows, see, for example, Fernandez-Arias and Montiel (1995).

3/ This result can be understood by considering the effect of public sector deficits (negative public savings) on private sector savings. If the private sector fully internalizes the fact that higher deficits today will need to be covered by higher taxation in the future, private savings will rise, to fully offset the negative public savings, without any interest rate change (and therefore without any effect on investment). In that case, government bonds issues associated with the deficit are not regarded as net wealth, and do not influence current private consumption. The invariance of the domestic savings/investment balance implies that the current account is unaffected.

investment. Analogous effects would obtain if future tax obligations are not expected to fall entirely on current period taxpayers. 1/

All the effects discussed so far would imply, among other things, a positive correlation between budget deficits and current account deficits. The discussion also suggests that the strength of this correlation may depend on the degree of development of domestic financial markets. Namely, in countries with underdeveloped or highly regulated financial markets we would expect to find stronger links between the fiscal stance and the current account balance, and therefore between government budget solvency and current account sustainability.

The degree of private sector saving offset to a given increase in public sector saving may also depend on the level of public debt. With low public debt the current generation could view a future debt stabilization policy (via fiscal surpluses) as remote, thus the future tax liabilities are perceived to be small and fiscal adjustments affect aggregate demand and savings. In contrast, with high public debt the future debt stabilization looks imminent and the debt neutrality is at a full force. The link between the twin deficits may therefore be stronger the lower is the level of public debt. Another implication of this line of reasoning is that the effects of fiscal stabilization on aggregate demand are weaker the higher is the public debt burden.2/

iii) Trade policy. Countries with a protectionist trade policy are more likely to have a limited export base. Consequently, they are more vulnerable to shocks and their current account deficits less sustainable. A process of trade liberalization typically necessitates shifts in relative prices; under these circumstances, a devaluation of the exchange rate would encourage a transfer of resources to the traded goods sector (see, for example, Edwards (19??)).

1/ If the future tax obligations arising from the deficit are expected to be met by higher consumption taxes, present consumption would rise (and present savings would fall) as the increase in the relative price of future consumption induces intertemporal substitution of present for future consumption (see Frenkel and Razin (1987)). The same argument applies if future tax obligations are to be met with the inflation tax (for example, after the abandonment of an exchange rate peg). Indeed, if consumers have to hold money balances for consumption purposes, future inflation increases the relative cost of future consumption purchases (see, for example, Calvo (1986)), thereby encouraging a shift from future to present consumption. Differences between present and expected future tax burden can be the effect of political factors. Consider, for example, a model in the spirit of Alesina and Tabellini (1990), where there exists a politically motivated fiscal deficit bias, caused by the fact that the current government does not share the spending priorities of a possible successor, and is therefore willing to commit future tax revenues to debt service, rather than to spending. This will result in future tax rates being higher than current tax rates. If taxes fall on consumption, intertemporal substitution would push private agents towards higher consumption in the present than in the future, therefore implying a current account deficit.

2/ For an analytical presentation of this argument, see Sutherland (1995).

It would also facilitate containment of external imbalances during the transition.

iii) Capital account policy regime. When the capital account is very open, *de jure* or *de facto*, a country is more vulnerable to sudden reversals in the direction of capital flows. This reversal may concern not only foreign capital, but also domestic capital.1/ Clearly, the degree of de facto opening of the capital account is endogenous, and depends in particular on the strength of the incentives to export capital (risk-adjusted rate of return differentials due to domestic policy misalignments, political instability etc.). Capital controls are a distortion that puts a wedge between rates of return on capital in the domestic economy and abroad. They can also affect the consistency of the macroeconomic policy stance: for example, capital controls can allow a government to temporarily pursue an expansionary monetary policy with a fixed exchange rate, thereby weakening the current account. An open capital account can provide a disciplining device, since this policy inconsistency would result in the collapse of the peg.

A related argument is that an open capital account could serve as a signal of a country's commitment to the pursuit of "sustainable" policies, and thereby raise foreign investors' perception of the country's creditworthiness. This would contribute to reducing the cost of capital for the country and/or to increase the supply of foreign funds (see, for example, Bartolini and Drazen (1994)). On the other side, economic research and practical experience have also highlighted the potential dangers associated with poor financial supervision and a weak banking system when the capital account is open (see, for example, Diaz-Alejandro (1985)).

V.3 Political economy factors

Numerous empirical studies have documented the detrimental macroeconomic effects of political instability.2/ In the context of current account sustainability, political instability can be important for various reasons. Domestic and foreign investors become more susceptible to the risk of a sudden policy reversal -- for example, a government favoring free capital mobility may be replaced by one more prone to the imposition of capital controls or more prone to default. This makes the occurrence of capital outflows more likely.

1/ This is exemplified by the experience of several Latin American countries (such as Argentina, Mexico, Peru, and Venezuela) in the run-up to the debt crisis (see, for example, Diaz Alejandro (1985) and Sachs (1985)). For those countries, the level of "official" foreign debt at the time of the debt crisis was much higher than the cumulative value of past current account imbalances, indicating that the accumulation of debt had financed not only excess of imports over exports, but also private capital outflows.

2/ See, for example, Alesina, Ozler, Roubini and Swagel (1992) and Cukierman, Edwards and Tabellini (1992).

Political instability is often driven by distributional conflict, which can cause capital flight as a response to the fear of capital taxation (see, for example, Alesina and Tabellini (1989)). Indicators of this type of political instability are for example, the historical frequency of changes in government and/or attempted coups, and measures of industrial strife.

The political situation can affect the sustainability of external liabilities for different reasons. For example, a "weak" government may have difficulties in undertaking economic adjustment that may be needed in response to a shock, because of the difficulty inherent in gathering sufficient political support. Also, a government facing an election may be reluctant to implement adjustment measures for fear of jeopardizing its electoral chances. Indicators of this form of "policy rigidity" are the degree of support of the government in Parliament, the party composition of government (coalition vs majority) and the timing of elections.

V.4 Market expectations

So far we have discussed economic, structural and political economy factors that may affect the sustainability of persistent current account imbalances. A key issue is, of course, whether it is possible to rely on a set of indicators that help signal the likelihood of a major policy shift and/or a crisis situation. As mentioned in Section II, private agents' behavior is affected by their anticipation of possible future policy shifts. The behavior of capital flows and foreign exchange reserves are the most obvious indicator of domestic and foreign investors' perceptions of a country's creditworthiness. Bond prices or interest rate spreads on international loans and bonds (such as Brady bonds) also provide a useful measure of international investors' perceptions of the country's ability to service its external obligations. There is a danger, however, that these market-based indicators would fail to signal problems ahead of time;1/ it is therefore essential to take into consideration the more general set of factors discussed earlier in this section.

VI. COUNTRY EPISODES

So far we have discussed conceptual aspects of current account sustainability, emphasizing the role of overall foreign indebtedness, vulnerability to shocks and government solvency. We now turn to a description of the experience of a selected group of countries with persistent current account imbalances. These experiences are divided into "good" and "bad" ones. We define "good" experiences as those where crises did not occur, either

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1/ This may reflect the possibility that financial markets react too late or too abruptly, or that they are plagued by misperceptions and expectational errors, making them less reliable in ascertaining sustainability.

because of a fundamental consistency in economic policy or because of a timely policy reversal. By contrast, we define "bad" experiences as those in which a crisis did occur, so that a policy reversal was forced by the crisis. We attempt to characterize these different experiences in terms of the factors discussed in the previous section: macroeconomic policy stance; structural characteristics of the economy; political factors; and balance of payments shocks.

The countries we consider in this paper are Australia, Chile, Ireland, Israel, Mexico, and South Korea.1/ The experiences of these countries can be broadly characterized as follows. Chile (1982) and Mexico (1976, 1982 and 1994) suffered external crises. Other countries, such as Ireland (1982 and 1987), Israel (1985) and South Korea (1980) had a policy reversal that prevented potential external crises, while Australia (1990-95) has sustained persistent current account deficits with no drastic policy change. We shall look for common factors in the above experiences in order to draw some tentative policy lessons. The short "case studies" are accompanied by Charts describing the evolution of the current account, investment, savings and the real exchange rate.

VI.1 Australia, 1981-94

Australia has run almost uninterrupted current account deficits for the past 40 years (the exception being 1973), and the impact of persistent current account imbalances has been at the center of the economic policy debate for a long time.2/ The average size of current account deficits has been close to 5 percent of GDP since the early eighties, considerably higher than in the previous decades.

At the end of the 1970s, Australia's net external position was characterized by low external debt (6 percent of GDP, or 25 percent of Australia's net external liabilities), since the capital inflows that financed the current account imbalances took mainly the form of equity. Australia experienced a recession in 1982-3, but a rapid recovery thereafter, with output growth averaging 4.5 percent for the rest of the decade. At the end of 1983 the exchange rate, which had followed a crawling peg since 1976, was floated. Following a negative terms of trade shock in 1985-86, current account imbalances worsened, with a deficit close to 6 percent percent of GDP in 1985 and 1986. As terms of trade improved, the current account deficit narrowed somewhat during the following two years, but it widened again considerably in

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1/ In a final draft, we plan to extend this sample so as to include Hungary, Indonesia, Malaysia and Turkey.

2/ There is a widespread difference of views on how serious external problems are. For an "optimistic" view, see Pitchford (1989). For a pessimistic view, see the November 4, 1995 leader in *the Economist*.

1989. The increase in current account imbalances took place notwithstanding a fiscal policy tightening that started in 1984 and led to the emergence of a surplus by 1989. The increase in public savings was offset by an increase in private spending, in particular on investment. The persistent current account imbalances and the shift towards debt financing resulted in an increase in the ratio of external debt to GDP to over 30 percent by the end of 1989, with debt service absorbing 20 percent of total export receipts.

The 1990s started with a recession, triggered by a fall in business investment, a depreciation in the real exchange rate, and a decline in commercial property prices, which resulted in a sharp increase in unemployment. Output recovered in 1992 and 1993, driven mainly by increases in private consumption and net exports, as the real exchange rate continued to depreciate. Growth accelerated in 1994 to around 5 percent, driven by buoyant domestic demand. The investment share of GDP, however, failed to regain the levels reached in the 1980s. The fiscal balance, that had registered a surplus until 1990, returned to a deficit, which was close to 6 percent in 1993, and current account imbalances widened again, and are forecasted to exceed 5 percent of GDP in 1995.

What are the main characteristics of Australia's external position? During the 1980s, following the worldwide deregulation of financial markets and the removal of capital controls, capital flows took mainly the form of debt. During the last five years, instead, current account imbalances were mainly financed by net equity flows, while debt accumulation was quite modest. Indeed, Australia stands out among OECD countries for the large fraction of external liabilities that take the form of equity. The external debt to GDP ratio stood at 36 percent at the end of 1994, with two thirds of the debt reflecting private obligations.1/ A significant fraction of this debt (over 40 percent) is denominated in Australian dollars, making the external position less vulnerable to fluctuations in the exchange rate.

A salient feature of the economy is the floating exchange rate regime, which makes them less vulnerable to a balance of payments crisis. The real effective exchange rate is currently more depreciated than its historical average. The degree of openness has increased over time, with the export ratio rising from 15 percent in the early eighties to around 20 percent in 1994. The composition of exports has been changing, with the importance of wool and other agricultural products declining and with exports of minerals and manufactures increasing; nevertheless, the economy remains vulnerable to swings in the terms of trade. The investment ratio, which averaged 24 percent over the eighties, has declined to an average of 20 percent over the period 1990-94; the GDP share of national savings (that averaged 16.5 percent during the latter period) has

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1/ In 1993, interest payments on external debt were around 2 percent of GDP.

also declined. The growth rate has exceeded the OECD average over the past ten years. There is no political instability and the financial system is well developed. In terms of our range of indicators, these factors point to a sustainable current account position, notwithstanding the decline in savings and investment.

VI.2 Chile: 1977-82

The first half of the seventies was a turbulent period for Chile, both politically and economically. The coup in 1973 ousted Allende's socialist government and installed a military regime, with radically different economic policies. In particular, after a period during which the role of government in the economy had steadily increased, the new regime strived for balancing the budget, privatization and trade liberalization. During this period, the economy endured a severe recession (1974-75), resulting from a combination of external shocks (fall in the price of copper and increase in the price of oil) and domestic policy tightening.

By 1978, yearly inflation was reduced from over 400 percent in 1973 to 30 percent, the public sector was in surplus (1.5 percent of GDP), and the economy was growing at 8 percent. However, the pick-up in investment and the low level of private savings implied a large current account deficit (5.2 percent of GDP). Furthermore, the unemployment rate stood above 14 percent. Following the adoption of a schedule of preannounced devaluations of the nominal exchange rate (the *tablita*) for a year and a half, the government decided to use the exchange rate as a full-fledged nominal anchor in the disinflation process, and fixed the rate vis-à-vis the dollar in June 1979. The following years were characterized by a continuation of strong recovery. Inflation, however, declined slowly, with full backward-looking indexation providing inertial momentum (Edwards and Cox-Edwards (1987)). This inflationary process was sustained by monetary growth due to large capital inflows, reflecting private sector external borrowing to finance investment.1/ Consequently, the real exchange rate appreciated rapidly and the current account balance deteriorated, with the ratio of the deficit to GDP reaching double digits in 1981.2/

By late 1981 wholesale prices were falling, but the magnitude of the cumulative real appreciation caused expectations of a devaluation and therefore a widening of interest rate spreads between peso- and dollar-denominated

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1/ As pointed out by Edwards and Cox Edwards (1987) among others, private foreign borrowing did not carry government guarantees. A large fraction of foreign borrowing was carried out by the so-called *grupos* -- large conglomerates that included industrial firms as well as banks. They had been major buyers of privatized firms, and their banks extended most of their lending to firms of the same conglomerate, circumventing lax regulations.

2/ The real appreciation of the peso was compounded by the fact that the dollar (to which the peso was pegged) was appreciating against other major currencies during the period 1979-82.

assets. Output began to decline and unemployment increased. In 1982 a sequence of external events -- a sharp decline in the terms of trade, the large increase in world interest rates, and a drying up of external sources of financing following the Mexican debt crisis -- forced the government to abandon its exchange rate peg. In June 1982, the exchange rate was devalued by 18 percent and the wage indexation scheme was abandoned. This, however, was not sufficient. As in Mexico in 1994, speculation against the peso increased and reserves declined rapidly. Towards the end of 1982, in the wake of an impending financial crisis the government imposed capital controls and import surcharges. By June of 1983, the peso had been devalued in nominal terms by close to 100 percent with respect to its June 1982 level.

The crisis caused widespread bankruptcies in the private sector, and the government was forced to liquidate banks but also to bail out several other financial and non-financial institutions. In particular, the central bank intervened in support of the banking system, giving rise to a large quasi-fiscal deficit (Larrañaga (1989)). The absence of government guarantees on private foreign borrowing notwithstanding, the government assumed responsibility for a large fraction of the private sector's foreign liabilities. The government's overall fiscal balance deteriorated for additional reasons -- namely, the revenue effects of the recession and, especially, the reform of the social security system which had been undertaken in 1981.1/ The crisis was extremely severe: output fell by 14 percent in 1983 alone and unemployment rose dramatically to close to 20 percent (Corbo and Fischer (1994)). Inflation rebounded to its "historical" level of 27 percent, and the management of the crisis caused an initial policy reversal with respect to exchange rate policy, wage indexation, current and capital account openness, and privatization. Starting in 1984, however, the government resumed its policy of trade liberalization, privatization and deregulation, and the adjustment of the Chilean economy, although painful, was relatively rapid. Growth resumed in 1984, and has averaged over 6 percent over the last ten years.

It should be noted that not all the indicators discussed in the previous section pointed to a likely crisis. The economy was experiencing fast economic growth. The fiscal balance was in surplus throughout this period; indeed, the government had been reducing its external liabilities. Investment was growing rapidly, albeit from a low base, and so were exports (until 1981). However, Which factors can then explain the 1982 crisis?

i) The size of external debt. External indebtedness had reached 50 percent of GDP in 1981, with interest payments totalling 6 percent of GDP.

1/ Clearly, the latter simply reflects a shift from implicit to explicit government liabilities in the context of a move from a pas-as-you-go system to a funded system.

ii) an overvalued real exchange rate. Inflation failed to converge rapidly to world levels due to the effects of lagged wage indexation, as well as to increased demand for nontradables fueled by foreign borrowing. Investment was stimulated by the reduced the price of imported capital goods, as well as by the possibility to get financing on world markets at the world rate of interest, given the pegged exchange rate.

iii) Low level of savings. National savings averaged only 10 percent of GDP during the period 1978-81. Their decline was particularly significant in 1981, possibly reflecting intertemporal substitution effects.

iv) Weak financial system/overborrowing. "Overborrowing" by the private sector was fueled by the availability of foreign credit (following the recycling of oil exporters' surpluses) and facilitated by weak supervision of the banking sector, which encouraged risk-taking behavior. In this context, de la Cuadra and Valdes-Prieto (1991) stress the negative role played by the government's extension to the private sector of exchange rate and interest rate risk guarantees.

v) severe external shocks: the large increase in world interest rates, the drying up of foreign financing, and a decline in the terms of trade.1/

Interestingly, the fiscal burden of the crisis turned out to be extremely large. Indeed, it reflected not only the increase in the real debt burden following the real depreciation of the peso and the increase in world interest rates, and the fall in revenues due to the crisis, but also the cost of assuming a large fraction of private external debt.

VI.3 IRELAND (1980-1994)

Ireland is an interesting case of a country with persistently large current account imbalances leading to a large external debt, that has achieved a remarkable turnaround in its external accounts. As in the Israeli case, this turnaround was the result of a drastic fiscal stabilization plan, aimed at reversing the increasing trend of the public debt to GDP ratio.

In the late seventies, Ireland's external imbalances worsened dramatically following the second oil shock. Although exports had increased throughout the decade, imports had risen more rapidly: by 1979, the current account deficit was around 13 percent of GDP, and it remained above 10 percent of GDP over the next three years. This worsening reflected a continuing decline in the ratio of public savings to GDP, as well as a fall in private savings, that more than offset a decline in the GDP share of investment. As a result, the government's external public debt doubled as a fraction of GDP from 22 percent of GDP in 1979 to 45 percent in 1982. Inflation rose to over 20 percent in 1981, and the fiscal deficit reached 12 percent of GDP. To face these growing macroeconomic

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1/ The intensity of these effects was compounded by the narrow commodity specialization of exports.

imbalances, in 1982 the government implemented a fiscal adjustment plan, which was accompanied by a sharp disinflation strategy centered on the pegging of the Irish punt within the EMS. By 1984, the full-employment primary deficit had been reduced by more than 7 percentage points of GDP, thanks primarily to tax increases, (Giavazzi and Pagano, 1990), but not eliminated, and inflation had fallen below 10 percent. Private consumption and investment fell dramatically, but exports rose rapidly, by more than 10 percentage points of a GDP. The export boom was driven by large increases in manufacturing exports, which are mainly produced by foreign firms.1/ This resulted in a remarkable turnaround in the trade balance, from a deficit of over 12 percent of GDP in 1981 to a surplus of 1 percent of GDP in 1984.

During this period, the high interest burden and the appreciation of the US dollar implied an increase in the ratio of public external debt to GDP to almost 60 percent by 1984.2/ Notwithstanding the fiscal adjustment effort, the domestic public debt also kept rising, and the ratio of total debt to GDP reached 130 percent in 1987. In that year, another drastic fiscal stabilization plan was implemented. This time, the plan relied more heavily on expenditure cuts than the previous plan. This time the fiscal contraction was preceded by an exchange rate devaluation, in order to stimulate exports. The fiscal stabilization reduced fiscal imbalances by 9 percentage points of GDP (8 of which consisting of primary balance) between 1986 and 1989, reversing the increasing trend of the public debt to GDP ratio.3/ The economy, spurred by very favorable external developments, grew at an average rate of over 4 percent between 1988 and 1994, and gross public debt declined to around 90 percent by 1994.

The stabilization was accompanied by another drastic improvement in the current account balance, thanks to an increase in the trade surplus to over 10 percentage points of GDP. Once again, exports of manufactures expanded rapidly: they now account for over 40 percent of GDP. As a result, Ireland ran a current account surplus, for the first time in 20 years.

Some specific features of the Irish experience should be pointed out. Foreign direct investment has clearly played a very important role, and has decisively contributed to the increase in export orientation and to the change in the composition of exports away from agricultural goods towards manufactured

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1/ Since its entry in the European Community in 1973 Ireland had early seventies Ireland had received large foreign direct investment.

2/ The fraction of the external debt denominated in dollars was ?? in 19??.

3/ The ratio of public external debt to GDP also declined. During this period, there was an increase in foreigners' holdings of punt-denominated securities, so that the decline in foreign currency debt overstates the actual decline in public external debt.

goods.1/ By 1990, foreign firms accounted for around one half of Ireland's manufacturing gross output and over 75 percent of its manufacturing exports (OECD, 1993). As a consequence, the current account balance shows a sizable deficit in net factor income, due to interest on foreign borrowing and, especially, profit repatriation.2/ This deficit is in part compensated by large net current transfers, in particular from the European Union, which amounted to over 6 percent of GNP in 1993.

In summary, Ireland's large external imbalances in the early and mid-eighties were clearly associated with an unsustainable fiscal policy stance. The drastic contraction in fiscal policy was accompanied by strong export-led growth that helped reverse the pattern of large persistent external deficits.3/ The increase in exports was itself stimulated by the 1987 devaluation that made the real exchange rate competitive. Favorable external conditions (the boom in the UK and the US, the fall in commodity prices and world interest rates) also played an important role. The large increase in unemployment, only partly re-absorbed, and the large decline in the investment share (from over 30 percent in the late seventies to 15 percent in 1993) are the lingering negative aspects of a successful adjustment strategy.

VI.4 Israel

Throughout its short history, Israel has run persistent current account deficits, notwithstanding large unilateral transfers from abroad, with the exception of the period 1986-89. Economic growth, sustained by periodic waves of immigration and by high investment rates, averaged 10 percent until the early seventies, a pace that was resumed in the early nineties. During the seventies and the eighties, however, growth was much more modest, and the issue of sustainability of external imbalances came to the forefront, especially in two episodes. The first episode (Israel I), in 1973-74, was characterized by the increase in oil prices and by the Yom Kippur war; the second (Israel II), started in 1979 but lasted until the mid-eighties. We shall focus here on the second episode.

During the period 1979 to mid-1985, the Israeli economy experienced low growth, high inflation, large fiscal imbalances (around 15 percent of GNP) and large current account deficits. As a result, domestic and foreign public debt accumulated rapidly, reaching levels of about 110 percent and 84 percent of GNP, respectively, in 1984. The dramatic acceleration of inflation in 1984 to over 400 percent per year underscored the need for drastic stabilization

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1/ OECD figures on the level of FDI in Ireland are somewhat misleading, due to... See OECD (1991).

2/ As a result, the difference between GDP and GNP was over 11 percent in 1993 (OECD, 1995).

3/ There is a debate regarding the degree to which transfer pricing, encouraged by favorable tax treatment of capital, increases recorded exports. Even "correcting" exports for profit repatriation, however, their increase is remarkable.

measures. In June of the following year, an inflation stabilization plan was implemented. Its main characteristics were the fixing of the exchange rate after a big devaluation, monetary tightening, and a massive fiscal adjustment (expenditure cuts, tax increases and increased transfers from abroad) that led to an elimination of the budget deficit. Inflation declined abruptly to the 15-20 percent range. An additional "payoff" of the stabilization plan was a remarkable turnaround in external accounts. The current account, which showed an average deficit of over 7 percent of GNP over the previous three years, turned to a surplus of 5 percent of GNP in 1985. This adjustment defused the risk of excessive external indebtedness: the foreign public debt to GDP ratio was rapidly reduced from 84 percent of GDP in 1984 to around 30 percent by 1990. (48 percent [1984] to 28 percent [1991] for net external debt over GDP).1/

What accounted for the turnaround in the current account balance? Investment declined sharply, while national savings and international transfers increased. In the following years, international transfers fell as a proportion of GNP, investment rates remained low, and national savings stable but at a higher level than during the inflationary period. The competitiveness of the export sector was at a historical peak, enhanced by the upfront exchange rate depreciation, the de-indexation of wages, and the fiscal consolidation (see Chart ??). More generally, the degree of openness of the economy was high and favored by free trade agreements with the European Community and the United States. Clearly, the increase in international transfers facilitated the adjustment of the Israeli economy to a low inflation environment, by obviating the need for even more drastic fiscal adjustment measures. The consumption boom following the exchange rate-based stabilization plan reduced private savings as a proportion of GNP, but by less than the increase in public savings, despite the fact that substantial budget cuts were implemented.

In contrast to other countries in our sample, the fiscal/current account adjustment process was not triggered by unfavorable external shocks. Indeed, the adjustment was actually facilitated by external developments (the increase in transfers and the decline in the price of oil in 1986). The fiscal adjustment process was an example of "expansionary fiscal consolidation" and unemployment did not increase (Razin and Sadka (1995)).2/

VI.5 Korea

1/ For a discussion of the Israeli stabilization episode, see Bruno (1993) and Bufman and Leiderman (1995).

2/ The expansionary effects of fiscal consolidation come from a decline in the present value of future taxes. This can occur for two reasons: permanent reductions in government spending and the reduction in the present value of the excess burden of taxation due to a restoration of tax smoothing (Giavazzi and Pagano (1990)). Unemployment in Israel began to increase, however, two years after the stabilization program.

During the 1960s the Korean economy was characterized by rapidly rising savings, investment and exports. Foreign borrowing was used to supplement domestic savings in financing investment, which was the key element in the growth-oriented strategy of the Korean government. The current account deficit averaged ... percent, and the ratio of foreign indebtedness to GDP rose rapidly, especially in the second half in the decade, reaching 28 percent by 1970.1/

In the wake of the first oil shock, Korean foreign indebtedness rose sharply, because of the high dependence of the country on imported energy and raw materials. The policy response of the government was to continue with the growth-oriented strategy, while foregoing monetary stability. Thanks to the high growth rate in 1976-78 (CHECK) the foreign debt to GDP ratio remained at around 32 percent. The second oil shock hit the Korean economy at a particularly delicate juncture. It coincided with a period of political instability, following the assassination of President Park, and with a bad harvest, and was following a period of real exchange rate appreciation, due to high domestic inflation coupled with a fixed nominal exchange rate vis-à-vis the US dollar. The current account deficit, which had averaged 6 percent during the 1970s, rose to 10 percent in 1980 as household savings declined sharply (Collins and Park (1989)). A deep recession and a large nominal devaluation, it caused an increase in the ratio of foreign debt to GDP to 44 percent in 1980, 49 percent in 1981 and 52 percent in 1982, following the large rise in world interest rates in the wake of the debt crisis.

The policy response to these external shocks was different from the one adopted at the time of the first oil shock. Namely, the government relied on tight monetary and fiscal policy and to a large nominal exchange rate adjustment. Their objective was a sharp reduction in the foreign debt to GDP ratio. By 1984, the government had succeeded in eliminating inflation and fiscal imbalances, and the current account deficit was reduced to less than 2 percent of GDP. During this period, investment and economic growth remained strong, unlike in other highly indebted countries after the debt crisis. The decline in the current account deficit therefore reflected a large increase in savings. As pointed out by Collins and Park (1989), this increase in savings was due to a rebound in household savings, while government savings remained high and corporate savings were a stable fraction of GDP.

The second half of the eighties was characterized by more favorable external developments, such as the fall in the price of oil and the depreciation of the dollar, and by a more flexible exchange rate policy, characterized by a large real depreciation until 1986, and by a sharp

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1/ The figuress for net indebtedness are smaller, but are not available on a consistent basis for the whole period under examination. See Sakong (1993).

appreciation thereafter. The current account showed large surpluses in the years 1985-89, averaging 5 1/2 percent of GDP, allowing the government to pre-pay a large portion of the external debt. By the end of the decade, the foreign debt to GDP ratio was down to 14 percent in 1989, also thanks to rapid economic growth.

What lessons can be drawn from the Korean experience? The policies pursued in the wake of the first oil shock eventually led to a loosening of monetary (and fiscal ??) policy and to an overvalued real exchange rate. The second oil shock occurred in a period of political instability, which made it more difficult for the government to react as rapidly as it had done in the past. After the recession of 1980, the policy response was swift and comprehensive, acting on the monetary, fiscal and exchange rate side. Remarkably, the share of investment in GDP continued to grow during this period, while the savings rate, after a decline in the period 1977-82, rose very sharply, overtaking investment and allowing a reduction in the external debt burden. Interestingly, the increase in public savings in the 1980s was not offset by a decline in private savings. During this period, Korea was characterized by the presence of capital account restrictions, and by pervasive constraints on household borrowing, both for house purchases and other purposes.

Korea's exchange rate policy after the second oil shock stands in contrast with the one pursued by other heavily indebted developing countries. The real appreciation of the late seventies was interrupted by the terms-of-trade shock and a large devaluation in 1980. The real exchange rate was allowed to appreciate by about .. percent between 1981 and 1983, as a complement to tight monetary policy geared towards inflation reduction. After 1983, the real exchange rate was allowed to depreciate substantially, in order to generate the large trade surpluses necessary to an early repayment of foreign debt.1/

Fluctuations in current account imbalances did not reflect changes in public savings, that were remarkably high throughout the period. The large current account deficits of 1979-80 reflected a decline in private savings, and the ensuing rapid adjustment was characterized by a rebound in savings, with investment remaining relatively stable.

During the 1970's, faced with the situation that banks were poor saving mobilizers because most of the deposit rates have been held artificially low, and bad loan decisions were made by banks wherby large number of nonperforming assets were created, Korea begun to develop nonbank financial institutions and

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1/ It is also interesting to observe that Korea's current account imbalances were financed through foreign borrowing, rather than through foreign direct investment or other forms of equity. It should also be noted that in the period when foreign indebtedness was being accumulated, overall equity flows from industrial to developing countries were rather small; in particular, the flow of "petrodollars" was mostly channelled through large international banks. Therefore, the low reliance on foreign equity did not single Korea out among other countries with persistent current account deficits during the same period.

securities markets. If in 1970 the banking institutions accounted for 82% and 78% of the deposit market and loan market, respectively, by 1982, these deposit and lending shares fell to 64% and 62%, respectively (see Soon (1993)). A law was enacted in 1972 to induce firms that received bank loans over a specific amount to go public and issue stocks, and various tax incentives were provided. Accordingly, by the early 1980s, the Korean financial sector managed to sustain the tight monetary and fiscal policies that were pursued in response to the external shocks.[INCOMPLETE/but need to cut]

VI.6 *Mexico*

The experience of Mexico during the last 2 decades is particularly interesting because the country experienced three balance of payments crises driven by large current account imbalances (1976, 1982 and 1994), which we will refer to as Mexico I, II and III. It is interesting to observe that each crisis occurred in an election year, although -- with the exception of 1988 and 1994 -- the country had basically a one-party system. The "political cycle" is also reflected in the path of the real exchange rate, which tends to appreciate in election years, with an adjustment after the election.

VI.6.a Mexico I

The Mexican economy experienced a long period of sustained economic growth and low, stable inflation during the post-WWII period. Between 1958 and 1972 economic growth averaged 6.7 percent, inflation never rose above 6 percent and fiscal imbalances were moderate ((Buffie (1989)). Throughout this period, the exchange rate *vis-à-vis* the dollar was fixed. The economy was fairly closed, with a relatively underdeveloped export sector and a "modestly protectionist" trade regime by the standards of LDCs (Buffie (1989)). The beginning of the 1970s saw a shift in economic policy which led to an increasingly important role for the public sector. Public expenditure rose from 20 percent of GDP in 1971 to 32 percent in 1976, reflecting in particular the growing importance of state-owned enterprises. During this period, inflation accelerated, reaching double digits in 1973. The resulting real exchange rate appreciation, together with the large increase in public sector investment, induced rapid growth of imports, especially intermediate inputs and capital goods, while exports stagnated. This caused a rapid accumulation of external debt.

In 1976 the exchange rate peg collapsed because of the mounting balance of payments pressures; the peso was devalued by almost 100 percent, import controls were imposed and, later in the year, an agreement on a stabilization package was reached with the IMF. The fiscal deficit was reduced in 1977, and real fixed capital formation declined as the price of imported capital goods was raised by a series of currency devaluations.

VI.6.b Mexico II

The policy stance changed again as a result of the increase in the amount of proven oil reserves increased from 6.4 billion barrels in 1975 to 16 billion barrels in 1977. As a result, the constraints on foreign borrowing were lifted as foreign banks started to compete to lend to Mexico on very attractive terms. On the domestic policy front, public expenditure once again increased dramatically from 29.5 percent of GDP in 1977 to 41.3 percent in 1981, with state-owned enterprises taking an important role in public investment. During 1978-81 public and private investment rose rapidly, and growth was above 8 percent. Private savings rose rapidly, but public sector savings experienced a significant decline; this, together with the investment boom, was reflected in large current account deficits (over 6 percent of GDP in 1981. As a result, external debt doubled in dollar terms during the period .....

Although domestic inflation exceeded 20 percent, the nominal exchange rate was being devalued at a rate of 9 percent per year, resulting in a large real appreciation. During 1981 it became clear that the earlier assumptions regarding the rate of increase of oil export revenues were unrealistic. This fuelled speculation that the peso would be devalued, causing massive capital flight. To stem the drain of foreign exchange reserves, the government increased its external borrowing by over 20 billion dollars; the terms of the debt, however, began to worsen with an increase in the spreads over LIBOR (at a time when the LIBOR itself was increasing) and a shortening of maturity.

The crisis worsened in 1982, as a result of external shocks (such as the increase in world real interest rates and the world recession) and increasing fiscal imbalances. A 40 percent devaluation of the peso in February stemmed capital flight only briefly, and the government had to borrow an additional 5.7 billion dollars in medium-term, syndicated loans. In August a dual exchange rate system was established. Shortly thereafter, dollar deposits at Mexican commercial banks were converted into pesos at an unfavorable exchange rate, and on September 1 the banking system was nationalized. During the last four months of the year, there was a de facto moratorium on foreign debt service, until a December agreement with foreign commercial banks to reschedule $23 billion of debt amortization was reached.

In 1983, the new De la Madrid administration implemented a drastic adjustment plan, characterized by a fiscal contraction, a lifting of previously adopted trade restrictions, and a reduction in real wages. The turnaround in the current account was immediate -- it registered a surplus, although this came at a heavy price. Output contracted by over 5 percent in 1983, with public and private investment falling drastically.

Aside from external shocks, what were the key aspects of the 1982 Mexican crisis? 1/

i) real exchange rate appreciation: between 1977 and 1981, Mexico's real effective exchange rate appreciated by ... percent. This appreciation stimulated a boom in imports, that increased ..., much faster than oil exports. The perceived unsustainability of the exchange rate led to large capital flight during the years preceding the crisis, as well as in the following years.

ii) large fiscal imbalances; Unlike Chile, in Mexico most of the debt accumulation reflected public sector external borrowing. The increase in public expenditure during the late seventies and early eighties was extremely large, and it came on top of another large increase in the early seventies. Furthermore, it financed not only increased public investment, but also growing public consumption. Notwithstanding the large revenue increase coming from oil, total revenues failed to keep up with expenditures, causing large fiscal deficits to emerge. The government's external position was worsened by the fact that public sector external borrowing went to finance not only fiscal imbalances, but also private capital flight, as foreign exchange reserves were rapidly depleted.

iii) misperceptions regarding oil wealth: policy design in Mexico was based on an overoptimistic assessment of future oil prices; when the expected price increases failed to materialize, the government did not introduce alternative measures to limit fiscal imbalances.

iv) Weakness of the financial system. The Mexican system was characterized by financial repression, that had the main purpose of facilitating the financing of public sector deficits. It was also a channel for capital flight, which was one justification for the nationalization of the banking system following the debt crisis.

VI.6.c Mexico III

The Mexican economy experienced large structural changes towards the end of the 1980s: a change in monetary and fiscal policy stance was followed by restructuring of the external debt, privatization, and trade liberalization. The results of these changes were remarkable: economic growth averaged 3 1/2 percent in the period 1989-92, inflation fell from 160 percent in 1987 to

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1/ Some observers (Diaz-Alejandro (1984) attributed the debt crisis mainly to external factors, and underline that several distinguished commentators (and the commercial banks themselves) argued that there was nothing to be worried about because the current account deficits were financing higher public and private investment. Indeed, the macroeconomic performance between 1978 and 1981 was very good, with high growth an rapid increases in public and private investment.

single digits in 1993, the overall balance of the public sector improved by 13 percentage points of GDP, foreign debt declined in relation to GDP from 50 percent in 1988 to 22 percent in 1992, thanks to the debt restructuring agreement, real exchange rate appreciation and economic growth. The disinflation process was undertaken using the exchange rate as a nominal anchor: in real effective terms, the exchange rate appreciated by over 60 percent from the end of 1987 to the end of 1992. The banking system, that had been nationalized in 1983, was privatized during 1991 and 1992.

In the aftermath of the debt restructuring agreement, Mexico regained access to international capital markets: net capital inflows increased dramatically in the period 1990-1993, totalling over $90 billion (an average of 6 percent of GDP per year), or roughly one fifth of all net inflows to developing countries (IMF, 1995b). Net foreign direct investment during this period was about $17 billion, or around 4.5 percent of 1993 GDP. In contrast to the period prior to the debt crisis of 1992, most of the inflows occurred in the form of portfolio investment (a total of over $60 billion). Between 1991 and 1993, $22 billion flowed into the Mexican stock market.

Gross domestic investment recovered from around 19 percent of GDP in 1987 to close to 23 percent in 1992. Notwithstanding a large increase in government savings, however, national savings fell sharply, reaching the low level of 16 percent of GDP in 1992. As a result, the current account deficit reached 6.8 percent of GDP in 1992. This capital account surplus, however, was more than sufficient to finance the deficit: foreign exchange reserves rose from $6 billion in 1988 to $19 billion in 1992. Imports grew rapidly throughout the period, as did non-oil exports: total export growth had larger fluctuations, with rapid growth in 1988-89 and modest increases in 1991 and 1992.

During 1993, the Mexican economy experienced a slowdown, with output growth falling below 1 percent and investment declining to 20.6 percent of GDP.1/ The current account deficit remained large, at 6.4 percent, as national savings continued to decline. In 1994, however, the economy recovered, with output growing at 3.5 percent, sustained by rapid export growth (over 14 percent in dollar terms). Imports, however, continued to grow more rapidly, and the current account deficit widened to 8 percent of GDP. 1994 was a turbulent year, characterized by a series of domestic and external shocks, and a change in the policy stance in the run-up to the August 1994 presidential election. The peasant revolt in Chiapas in January, the assassination of the ruling party's presidential candidate Colosio in March and the increase in US interest rates in the early part of the year caused loss of confidence in

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1/ The investment slowdown was related to the decision o thew authorities to raise interest rates in early 1993, in order to contain the expansion in aggregate demand; later in the year, uncertainties about NAFTA may also have played a role.

international financial markets and a reversal in capital flows. The real exchange rate depreciated by .. percent, as ... The Central Bank sterilized the impact of the loss of reserves on money supply. Subsequently, reserves remained fairly stable until November, as capital inflows resumed somewhat during the third quarter.

Between March and October, the authorities reacted to an increase in the interest differential between peso- and dollar-denominated short-term public debt (Cetes and Tesobonos, respectively) by changing the debt composition. The share of dollar-denominated Tesobonos in total government debt outstanding increased from 6 percent at the end of February to 50 percent at the end of November.

The crisis unfolded very quickly. At the end of November tensions resurfaced on foreign exchange markets, and the Bank of Mexico lost reserves. The fluctuation band of the peso was widened by 15 percent on December 19 in an attempt to stem foreign exchange pressures. This was, however, insufficient. The peso reached the new edge of the band within 2 days, and reserves were drained trying to maintain the exchange rate at the band's edge. On December 22, it was announced that the peso would be allowed to float against the US dollar. The crisis was very severe: the peso lost another .. percent by the end of the year. Notwithstanding an international rescue package put together at the end of January, 1995 has been a very difficult year for the Mexican economy, with widespread bankruptcies, generalized financial distress and a sharp decline in economic activity.

There are several, to some degree complementary, explanations of the Mexican crisis.1/ It was not clear that the crisis was one of overall sustainability of external imbalances. Indeed, the foreign debt to GDP and the debt to exports ratio (34.7 percent and 184 percent CHECK respectively) were not excessively high by historical terms and also in comparison with other heavily indebted middle income developing countries. Furthermore, fiscal policy, a clear culprit of the previous two Mexican crises, had been producing budget surpluses for the past four years. It has been argued that the use of the peso as a nominal anchor in the disinflation process had led, in the presence of sticky prices, to overvaluation and large current account deficits, that were ultimately unsustainable. According to this view, an exchange rate correction was overdue (see, for example, Dornbusch and Werner (1994) and Dornbusch, Goldfajn and Valdes (1995)). The domestic political shocks and the external shocks simply exposed the vulnerability of the Mexican economy.

Dornbusch et al. recognize that the current account deficit and the real exchange rate appreciation were, at least to some degree, the logical consequence of the productivity increases facilitated by the implementation of

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1/ See IMF (1995a) for an early assessment of these explanations.

large market-oriented reforms, the access to NAFTA, the reduction of inflation and of the size of the public sector. In this context, the increase in permanent income would lead private agents to raise their consumption level, as in the textbook intertemporal model of the current account (Razin (1995)). The increase in output would take some more time to surface because of the lags associated with investment and the intersectoral reallocation of resources induced by trade liberalization and changes in relative prices. The issue is to what degree the real appreciation reflected a misalignment.

An alternative, but possibly complementary view, stresses policy inconsistencies that emerged in 1994: in particular, the monetary policy stance and the management of the public debt. Once capital inflows stopped in the second quarter of 1994, because of the increase in US interest rates and political events in México, reserves started to drop because of the current account deficit. The sterilization of reserve losses by the Bank of Mexico, however, prevented interest rates from exerting an impact on the direction of capital flows and, through a dampening of economic activity, on the current account balance.1/ Furthermore, the large conversion of short term domestic currency- into short-term dollar-denominated public debt (see, for example, Sachs, Tornell and Velasco (1995) and Calvo and Mendoza (1995)) implied an increasing stock of short-term liabilities denominated in foreign exchange that could be "redeemed" at the central bank in exchange for reserves.

What were the fundamental factors behind this crisis? Exports, still low as a fraction of GDP,2/ were going strongly in 1994, albeit not as much as imports, but the national savings rate had declined to very low levels (13.7 percent). Furthermore, there is general consensus that the exchange rate was overvalued, at least to some degree, although there is less agreement on what would have been the appropriate way to "unwind" the overvaluation. Finally, the banking system was having difficulties. This is important because increases in domestic interest rates to stem reserve losses were likely to further weaken banks. The impending election made it more difficult to undertake policy adjustments in response to the series of severe domestic and external shocks that hit the economy during 1994.

[INCOMPLETE]

VII. POLICY LESSONS

1/ The reluctance of the monetary authorities to raise domestic interest rates was due to the fragile situation of the banking system, characterized by a large fraction of bad loans, and a mismatch between the maturity structure of assets and liabilities. However, a drastic increase in interest rates was later forced upon the authorities by the currency crisis.

2/ The ratio of exports to GDP in Mexico is different depending on whether it is calculated using national income accounts or balance of payments statistics (as reported in International Financial Statistics). Using the former, the ratio of exports of goods and services to GDP was .. percent in 1994. Using the latter, it was .. percent.

The main lesson that we draw from these episodes is that it is necessary to consider a combination of factors, rather than single variables, in order to gauge the likelihood that persistent imbalances will be sustainable. Table 1 provides a set of sustainability indicators for the various country episodes.

A first factor, directly related to solvency, is the implied resource transfer needed to prevent the external debt to output ratio from rising. This resource transfer is equal to the debt service ratio, adjusted for growth and real exchange rate changes (equation (6)). In the crisis episodes we examined, this measure of the external burden was indeed high with respect to the other episodes.

A second factor which seems to play an important role is the ratio of exports to GDP. Countries that successfully adjusted after experiencing large current account imbalances, such as Korea, Ireland and Israel, had a large export share. By contrast, the export to GDP ratio was lower in Mexico (especially in 1982) and in Chile, although it should be pointed out that exports were rising rapidly prior to all three crisis episodes considered (Mexico II and III; Chile).1/ This finding is in line with results presented in Sachs (1985), who compares East Asian and Latin American countries at the time of the debt crisis. The finding is theoretically plausible -- the shift in resources needed to achieve sustained trade surpluses is easier in countries with a large traded goods sector, and the vulnerability to trade disruptions in case of default is larger.

A third factor is the real exchange rate. The three crisis episodes we consider are all characterized by an appreciated real exchange rate (with respect to historical averages) in the period leading up to the crisis. The appreciation was accompanied by very rapid growth of imports. It is interesting to note that an exchange rate devaluation was undertaken by all countries under consideration -- for some it was forced by events, while for others it was preventive.

A fourth factor is the savings ratio, which was very low (and declining) in Mexico 1994 and, especially, in Chile in the run-up to the crisis. Savings were also low in Ireland and Israel, but their export ratios were considerably higher. Economic theory suggests that, for a given current account deficit, high savings are an indicator of intertemporal solvency and, therefore, creditworthiness, because they imply high investment and therefore an enhanced capacity to repay debt in the future. Furthermore, the necessary adjustment during a crisis does not require to reduce investment to very low levels. It is interesting to observe that, in both Chile and Mexico III the low savings rates were not attributable to public sector imbalances, but rather to high

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1/ It is interesting to point out that Chile's successful recovery after the crisis was characterized by a rapid increase in the export ratio, that rose from ?? in 1982 to ?? in 1994.

private sector consumption. In both Ireland and Israel the low savings rates reflected large public sector imbalances; these experienced a dramatic turnaround as a result of the adjustment process. In Korea the savings rate was higher than in the other countries we consider. Finally, in Australia the savings rate is low with respect to other countries in our sample.

A fifth factor, the fiscal policy stance, does not seem to play a defining role that would allow us to systematically signal crisis episodes ahead of time. In Chile and in Mexico III the current account deficits prior to the crisis were not associated with large fiscal imbalances, while they were in Mexico II. It is important to point out, however, two aspects. First, the crises entailed, ex-post, a large fiscal cost for the government in the form of bailouts of banks and firms, as well as the shouldering by the budget of private external debt. Second, among our "good" episodes, the turnaround in external accounts in Israel and Ireland came as a result of a policy shift in which fiscal consolidation played a major role.

A sixth factor is the degree of political instability or uncertainty. This played a role in all three Mexican external crises: 1976, 1982 and 1994 were all electoral years in Mexico. In all these cases, signs of a possible crisis were already surfacing, but the imminence of an election made the government reluctant to undertake severe adjustment measures. In Korea, the 1980 recession was probably accentuated by the difficult political situation following the assassination of President Park; in Israel 1984 was an election year, and the economic policy stance was considerably loose, leading to a larger fiscal deficit and further acceleration of inflation. The successful adjustment in 1985 was undertaken by a "national unity" government. In Ireland, the fiscal adjustment in 1982 was made more difficult by instability in the governing coalition. Interestingly, the successful adjustment of 1987 was undertaken by a minority government, albeit with general political support. In Chile, political instability did not play a role.

A seventh factor is the composition of capital inflows. Australia has relied more heavily on equity than the developing countries we have examined, and Ireland has received substantial inflows of foreign direct investment. This implies that the risk of domestic and external shocks is shared between foreign investors and the country, reducing the vulnerability of the external position. Furthermore, in countries such as Ireland and Australia, that have a more developed bond market, a significant fraction of external debt is denominated in domestic currency, making them less vulnerable to a real exchange rate changes. Another aspect of foreign currency debt obligations that has played an important role is the determination of the interest rate. At the time of the debt crisis, most of the external debt in Mexico and Chile (but not in Korea) was at a floating interest rate, making the external position more vulnerable to interest rate shocks.

Finally, an eighth factor is the quality of financial intermediation and especially the fragility of the banking system. This factor played an important role in all the crises we have considered, and made the adjustment process more painful. Weaknesses in banking system supervision, distortions in the incentive structure of banks, and lack of competition within the banking sector and from nonbank financial institutions imply inefficiencies in the intermediation of external funds associated with large current account deficits. For a given size of current account imbalances, these inefficiencies make the economy more vulnerable to changes in foreign investors' sentiment or other shocks.

VIII. CONCLUDING REMARKS

Persistent current account imbalances are often viewed as a sign of weakness, implying a need for policy action. Economic theory suggests, however, that intertemporal borrowing and lending are a natural vehicle to achieve faster capital accumulation, a more efficient allocation of investment, and the smoothing of consumption. In this paper we have considered to what degree persistent current account imbalances can be taken as a signal of a potential "hard lending", or crisis ahead. We have argued that traditional sustainability measures, based only on the notion of intertemporal solvency, may not be always appropriate, because they sidestep the issue of a country's willingness to repay its external obligations and the related issue of foreign investors' willingness to continue lending on current terms. We have therefore proposed an alternative notion of sustainability that emphasizes these two issues, in addition to pure solvency.

We have considered a list of operational indicators that can help shed light on the sustainability of external imbalances. In the light of these considerations, we have examined the experiences of a number of countries that ran persistent current account imbalances, some of which experienced an external crisis. A formal econometric analysis, while desirable, is difficult at this stage because of the number and nature of the episodes and the indicators being considered. We have nonetheless distilled from the case studies a number of stylized facts that could help evaluate the sustainability of external imbalances.

We conclude that a specific threshold on persistent current account deficits (such as 5 percent of GDP for 3-4 years) is not *per se* a sufficiently informative indicator of sustainability. The size of current account imbalances should be considered in conjunction with exchange rate policy and structural factors, such as the level and composition of external liabilities, the degree of openness and the composition of trade, the level of savings and investment. Persistent current account deficits should flash a red light if the export sector is small, debt service is large, savings are low, the

financial sector is dominated by banks under weak supervision, and equity financing is small.

APPENDIX II

Balance of payments crisis: two examples

In a seminal paper, Krugman (1979) showed how a sudden attack on foreign exchange reserves can force the abandonment of a fixed exchange rate in a country running a monetary policy inconsistent with the peg. Furthermore, his explanation does not rely on any form of irrationality in foreign exchange markets: the crisis is simply the natural resolution of a fundamental inconsistency in economic policy setting. We draw on Calvo (1995) to illustrate an extension of the basic Krugman framework that focuses on the possibility of a "double attack" -- a run on external debt and on foreign exchange reserves.

Consider an economy that is financing budget deficits with external indebtedness, without any recourse to monetary expansion:

$$\dot{b}_t = d_t + i^* b_t \qquad (16)$$

where b_t is external debt, d_t is the primary budget deficit (assumed to be constant), i^* is the foreign interest rate and a dot over a variable indicates its time derivative. Debt is assumed to have instantaneous maturity.1/ All variables are expressed in real terms (denominated in foreign currency), and PPP holds.

The country is endowed with a stock of foreign exchange reserves R_0 and maintains a fixed exchange rate. Without loss of generality, reserves are assumed to earn no interest.2/ Since domestic credit is not expanding, there is no change in the stock of foreign exchange reserves as long as the peg is maintained. However, with foreign debt growing without bounds (see equation (5)), the budgetary situation is ultimately unsustainable.3/ This implies the need for a "policy switch" at some point in the future. With perfect foresight and in the absence of default on foreign liabilities, the policy switch must occur before foreign liabilities, b_t, exceed foreign exchange reserves, R_0. Otherwise, the country would be unable to meet its external liabilities if a sudden run on its (short-term) debt happens. It is assumed that the only source of revenue the government can rely on to service/repay the debt is seigniorage. Given PPP, the country cannot use the inflation tax without abandoning the peg.

Could an attack occur at the time the stock of short-term foreign debt equals foreign exchange reserves? It is easy to understand that this cannot be the case. The reason is that once inflation becomes positive there is a discrete drop in money demand. Domestic residents holding "excess" money balances will want to convert them into foreign exchange reserves, analogously to bond holders, but would be unable to do so if reserves cover the redemption of short-term debt only. This implies that reserves at the time of the attack have to cover both bond redemption and the sellout of excess money balances. Thus, the attack will take place before debt reaches the level R_0. Indeed, there will be a "double attack" on foreign exchange reserves, driven by a debt run and conversion of domestic money balances. While the former has no effect

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1/ The term d_t can alternatively be interpreted as the primary deficit (surplus) plus debt service on long-maturity foreign debt (consols). in this case, b would represent short-term foreign indebtedness.

2/ If the interest rate earned on foreign exchange reserves is below i*, results would be analogous. If reserves earn the same interest rate as short-term debt, a crisis will eventually occur if the present discounted value of the flow of primary deficits d/i* exceeds initial reserves R_0, so that the government is fundamentally insolvent.

3/ In the Krugman case, the analogue to the growth of debt is the constant decline in reserves driven by the expansion of domestic credit.

on the money supply (since it involves a repayment of foreign liabilities through a reduction in the consolidated public sector's foreign assets) the latter involves a reduction in the money supply, since the central bank "buys back" domestic money in exchange for its remaining stock of foreign exchange reserves.

Let T be the time of the attack. Equilibrium in the money market requires the drop in money demand to equal the contraction in the money supply, which is given by the initial stock of foreign exchange reserves net of bond redemption, $R_0 - b_T$:

$$R_0 - b_T = L(i^*) - L(i^* + \pi) \tag{17}$$

where π is the rate of inflation (and of exchange rate depreciation) after the country abandons the peg. How is π determined? Clearly the inflation rate must allow the government to raise enough seigniorage to finance its budgetary needs, so that

$$\pi L(i^* + \pi) = d \tag{18}$$

Using equations (6) and (7) it is possible to determine the level of debt at the time of the attack b_T and the post-attack inflation rate π.1/ Equation (5) can then be used to pin down the timing of the attack T.

In the simple model we have presented, the balance-of-payments crisis is a reflection of a fundamental fiscal imbalance. The "unpleasant monetarist arithmetic" (Sargent and Wallace (1981)) implies that eventually debt liabilities that are not covered by regular taxation have to be monetized, which implies that the exchange rate peg is ultimately not sustainable. This fiscal imbalance has been temporarily financed by current account deficits, and the fiscal crisis comes together with an inability to roll over maturing external debt.

A second example is due to Atkeson and Rios-Rull (1995). In their model government and consumers face limits on their international borrowing as a result of risk of default inherent in international capital markets. If the private sector perceives an increase in its permanent income, because for example of structural reforms, trade deficits will ensue, and at some point private and public sectors hit their international borrowing constraints. When these international borrowing constraints are reached, the inflow of international capital stops. At this point the sale of central bank's stock of foreign exchange reserves is the only way that the country can continue to finance its trade deficits. In other words, when the international borrowing constraints bind, the private sector will sell to the central bank its holdings of government debt in exchange for the country's international reserves.Consequently, the central bank,left with only limited policy options, has to abandon the exchange rate pegging, raise the rate of interest, and the country's trade balance moves into a surplus. [RE-DRAFT]

1/ We are implicitly assuming that equation (7) has a unique solution for π; that is, the economy is on the left side of the Laffer curve.

Appendix II

Derivation of the Balassa-Samuelson Effect

In this appendix, we derive the Balassa-Samuelson effect (equation (7)). Denote the wage and rental rates by W and R respectively, and assume that the production functions in the traded and nontraded goods sectors have the following Cobb-Douglas form:

$$Y_T = A_T K_T^{1-\alpha} L_T^{\alpha} \tag{19}$$

$$Y_N = A_N K_N^{1-v} L_N^{v} \tag{20}$$

where A_T, K_T and L_T (A_N, K_N and L_N) are respectively the productivity level and the capital and labor inputs in the production of traded (nontraded) goods. From the production functions (25) and (26) and the profit-maximizing conditions we obtain

$$W^T = \alpha A^T \left(\frac{K^T}{L^T}\right)^{1-\alpha}.$$

$$R^T = (1-\alpha) A^T \left(\frac{K^T}{L^T}\right)^{-\alpha}.$$

$$W^N = v A^N \left(\frac{K^N}{L^N}\right)^{1-v}.$$

$$R^N = (1-v) A^N \left(\frac{K^N}{L^N}\right)^{-v}.$$

Intersectoral factor mobility implies

$$W^T = P W^N. \tag{C.5}$$

$$R^T = P R^N. \tag{C.6}$$

The international mobility of capital implies

$$R^T = R^*, \tag{C.7}$$

where R^* is the world rate of interest.

Substituting (C.2) into (C.7) to solve for K^T/L^T, we get

$$\frac{K^T}{L^T} = \left(\frac{(1-\alpha)A^T}{R^*}\right)^{\frac{1}{\alpha}}. \qquad (C.8)$$

Substituting (C.4) and (C.7) into (C.6) yields

$$\alpha A^T\left(\frac{(1-\alpha)A^T}{R^*}\right)^{\frac{1-\alpha}{\alpha}} = P\nu A^N\left(\frac{(1-\nu)A^N P}{R^*}\right)^{\frac{1-\nu}{\nu}}. \qquad (C.9)$$

Substituting (C.8) into (C.1) and (C.9) into (C.3) and the resulting expressions into (C.5), we have

$$\frac{K^N}{L^N} = \left(\frac{(1-\nu)A^N P}{R^*}\right)^{\frac{1}{\nu}}. \qquad (C.10)$$

Taking logs and collecting terms, we get

$$\frac{p_N}{p_T} = \frac{\nu}{\alpha}a_T - a_N + \nu\left(\frac{1-\nu}{\nu} - \frac{1-\alpha}{\alpha}\right)r^* + constant. \qquad (C.11)$$

Define the (log of) the domestic price index as

$$p = \beta p_T + (1-\beta)p_N \qquad (32)$$

where β is the share of traded goods in the price index. Indicating foreign variables with a star, we can express the real exchange rate as follows:

$$p + e - p^* = s = (p_T + e - p_T^*) + (1-\beta)[(p_T - p_N) - (p_T^* - p_N^*)] \qquad (33)$$

where we have assumed for simplicity that the share of traded goods in the price index and the technological parameters are the same in the rest of the world. Taking the time derivatives of (38) and (39) and assuming a constant world rate of interest, we finally obtain

$$\epsilon = \dot{d} + (1-\beta)[(\frac{v}{\alpha}\hat{a}_T - \frac{v^*}{\alpha^*}\hat{a}_T^*) - (\hat{a}_N - \hat{a}_N^*)] \qquad (34)$$

from which equation (7) in the text is derived.

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Table 1: Sustainability Indicators

	Australia 1990-94	Chile 1979-81	Ireland 1979-81 (1984-86)	Israel 1982-84	Korea 1977-79	Mexico II 1979-81	Mexico III 1991-93
CA Balance*	-4	-8.6	-4 (-12)	-7	-7	-5	-7
Savings*	16.5	9	15 (18)	15	26	21	14
Investment*	20.5	17	19 (30)	20	33	26	21
Exports*	19	20	37 (50)	33	31	11.5	16.5
Debt/GDP**	36	50 (78)		46	52	53	35
Debt Service Burden	2.1	6/11		4.0	5.8	7	
Fiscal Balance*	-5		-9 (-11)	-13		-8	
Real Exchange Rate * 1/	81	108	92	103.5	103.5	122	113
Political Uncertainty		-	-	Post election	yes	election	yes election
Financial Structure	strong	weak	strong	fair	fair	very weak	very weak

* Average level during the three years preceding the crisis or policy shift.

** Year preceding the crisis (crisis year)

1/ 100 is the historical mean.