Feasible Limits for External Deficits and Debt

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Abstract

Large current account deficits and foreign debt levels remain a source of concern for international financial markets and policymakers. Yet, exactly what an "excessive" external deficit or liability position for an advanced economy is at any time has never been adequately defined. This article addresses the question by proposing new methods for assessing the proximity of current account deficits and the associated foreign debt to their upper bounds. It contends that productive investment fundamentally sets the feasible limit for current account deficits, whereas the capital to output ratio ultimately sets the foreign debt to GDP limit. Benchmark estimates for the United States, Australia, New Zealand and the United Kingdom, advanced economies that have borrowed heavily since 1990, reveal external deficits have usually been well within limits, although recent United States experience is an exception.

KEYWORDS: current account deficit, external debt, maximum limits

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INTRODUCTION

Current account imbalances and external liability positions across major trading areas have grown markedly over recent decades. Major advanced borrower economies currently include the United States, Australia, New Zealand and the United Kingdom whose external deficits are largely funded by high saving economies in East Asia, especially Japan and China, and the European Union.

Financial markets and policymakers worry that sizeable external deficits and debt levels are unsustainable because an economy may be incapable of servicing its external obligations when unsustainable limits have been reached due to inadequate domestic saving. As economies approach such limits, they are exposed to sudden shifts in investor sentiment that may precipitate currency and financial crises and reduce economic growth.[1]

Such developments have obvious macroeconomic implications as they affect financial stability, business conditions and industry competitiveness, although the form of the capital inflow may also be relevant in assessing external vulnerability. In particular, direct foreign investment, being long term by nature, is relatively more stable than indirect or portfolio capital inflows that may quickly reverse.

Sudden reversals of international portfolio investment experienced by East Asian economies in 1997-98 for instance imposed short-term economic, social and political costs through large exchange rate depreciations, financial distress, higher domestic interest rates, lost output increased unemployment and higher inflation. For this reason, external imbalances and debt levels feature prominently in empirical studies of the primary causes of currency crises, although to date no consensus exists on their explanatory power.[2]

U.S. Federal Reserve Chairman Alan Greenspan (2004) in discussing the implications of the record United States current account deficit suggests that: "There is no simple measure by which to judge the sustainability of … current account deficits or external claims that need to be serviced." Several authors have nonetheless argued that an economy's external deficit is "excessive" if it approaches five per cent of its GDP (see Milesi-Ferreti and Razin 1996, Summers 2000 and Freund 2000). Freund (2000), for instance, has shown that, since 1980, the median high deficit recorded in OECD economies before current account reversals was around five per cent of *GDP*. In some countries, double-digit

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1 See International Monetary Fund (2002) and Mann (1999, 2002) and Fischer (2003).
2 Berg and Patillo (1998), and Esquival and Larrain (1998), Radelet and Sachs (2000) suggest that external imbalances significantly contribute to currency crises, whereas Frankel and Rose (1996), Calvo (2000), Summers (2000) and Edwards (2001) conclude the opposite.

deficits as a proportion of *GDP* were reached before turning around, mostly without attendant crises.

However, the five per cent sustainability limit, also popular with financial market participants, has never been justified analytically, and seems arbitrary in light of the scope for much larger differences between the domestic saving and investment rates of advanced and emerging economies. In the gold standard era from the 1870's to World War 1 known as 'la belle epoch,' current account deficits regularly exceeding ten per cent of *GDP* were associated with high growth rates in New World economies (Edelstein 1982). For instance, Canada experienced a current account deficit of some thirteen per cent of GDP between 1910 and 1913. More recently, Iceland and Portugal ran external deficits of over ten per cent each in 2000 without adverse consequences.

A substantial body of econometric evidence inspired by Feldstein-Horioka (1980) shows that domestic saving and investment correlations remain considerably higher than would be expected in a world characterized by perfect capital mobility. The corollary is that as capital mobility increases further with greater financial globalisation, the correlation between saving and investment should fall and saving–investment imbalances accordingly rise to levels not previously experienced.

Numerous authors have interpreted the notion of external sustainability by invoking intertemporal precepts (see, for instance Milesi-Ferreti and Razin 1996, and Edwards 2001). This has involved testing current account movements to see if they meet a solvency requirement based on permanent income approaches to consumption and saving. However, no study to date has primarily focused on investment rather than consumption to define the upper limits that current account deficits and foreign debt levels may reach relative to *GDP*. Nor has any attempt been made to ascertain an economy's proximity to such bounds at any particular time.

Contrary to policy perceptions, modern theoretical approaches to current account determination do not imply that deficits *per se* are problematic. For instance, the intertemporal approach to the external accounts (Sachs 1981, 1982, Frenkel and Razin 1996, Obstfeld and Rogoff 1996 and Makin 2003), based on saving-investment behavior and well founded expectations, suggests that current account imbalances essentially arise through the equalization of discrepant expected rates of return on capital across borders. Moreover, in theory, external deficits can improve economic welfare by raising consumption possibilities and national income.

This article further examines the significance of external account imbalances with reference to the links between saving, investment, external debt servicing and national income. It is structured as follows. The second and third sections analyse the macroeconomic conditions that define feasible limits for

current account deficits, and for foreign debt to *GDP* levels, respectively. In preview, this theory suggests that the quantum of productive domestic investment essentially defines the feasible limit for current account deficits at any time, whereas an economy's capital to output ratio ultimately sets the limit for its foreign debt to *GDP* ratio. The next section then ascertains the proximity to feasible limits of select advanced economies that have experienced significant external deficits and debt levels by comparing actual and estimated limits since 1990. The final section presents qualifications and conclusions.

FEASIBLE CAD LIMITS

For an advanced economy, a limit on persistent foreign borrowing conceivably exists when an economy's domestic saving shrinks to zero. Beyond that point, additional foreign borrowing must fund additional consumption. This can not continue indefinitely, so the economy is inevitably unable to cover the total costs on invested foreign capital.

The following analysis explores and extends this basic solvency condition. However, in so doing, it abstracts from complications that arise, especially for developing economies, from the intermediation of funds between foreign lenders and ultimate domestic borrowers through the economy's banking and finance sector. Such financial sector problems, beset developing countries far more than advanced economies and are specifically related to the phenomena of adverse selection, where very poor credit risks obtain foreign loans, and moral hazard, where domestic borrowers undertake excessively risky activities.

The basic solvency condition for an advanced external debtor economy requires that the difference between domestic production, net of capital stock depreciation, and household consumption plus government spending, $Y_{t+1} - (C_{t+1} + G_{t+1})$, be at least sufficient to meet the servicing costs of foreign debt, $r^* F_t$. That is,

$$Y_{t+1} - (C_{t+1} + G_{t+1}) \geq r^* F_t \tag{1}$$

Net national output exceeds national income in debtor economies according to:

$$Y^n_{t+1} = Y_{t+1} - r^* F_t \tag{2}$$

where Y is net national output and Y^n is national income net of external debt servicing costs. Recalling (1), this can be rewritten as

$$Y^n_{t+1} - C_{t+1} - G_{t+1} \geq 0 \tag{3}$$

or $\qquad S_{t+1}^{n} \geq 0$ (3a)

since the left side of (3) defines S^{n}, net national saving after external debt servicing.

      This fundamental solvency condition has implications for the size of the current account deficit, which over any period equates to the economy's saving-investment imbalance:

$$CAD = I - S$$ (4)

      The critical point beyond which a national problem arises is when residents' aggregate net saving disappears at $S_{t+1}^{n} = 0$. Beyond this point, the domestic economy has to borrow externally to fund consumption in excess of income. In the national balance sheet, increased foreign liabilities in the form of debt are no longer matched by the accumulation of real capital, as when foreign finance incrementally funds domestic investment for given positive saving[3]. External funding of consumption is unsustainable because no future income is attributable to any excess of consumption over present income.[4] On the contrary, higher foreign debt incurred has to be serviced, which reduces future income. Accordingly, this suggests there is a maximum feasible current account deficit, $CAD_{MAX\ t}$, that can be reached. It is simply defined by private investment undertaken by profit maximizing firms, net of capital depreciation

$$CAD_{MAX\ t} = I_{t}.$$ (5)

Figure 1 illustrates how a CAD solely defined by investment is theoretically sustainable. The horizontal axis of this 45^{0} diagram (see also Makin 2004) measures net national product, the output of final goods and services, made available for sale at home and abroad less capital depreciation. It also measures national income defined as net output less income paid abroad. Assuming a given labor force, real output expands as the capital stock increases.[5]

      The vertical axis measures private consumption (C), public spending (G), private investment (I), national saving (S) and the current account balance. Total spending, or absorption (Alexander 1952), in period t is the vertical sum of $C_{t} + G_{t} + I_{t}$, comprising expenditure by resident entities on domestic and

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3 A key currency country may however be able to fund excess consumption temporarily due to its reputation.
4 This condition is consistent with the No Ponzi Game condition that must be satisfied for intertemporal solvency.
5 Alternatively, the analysis can be undertaken by expressing national accounting aggregates in per worker terms with the same results.

Figure 1 - The Maximum Feasible Current Account Deficit
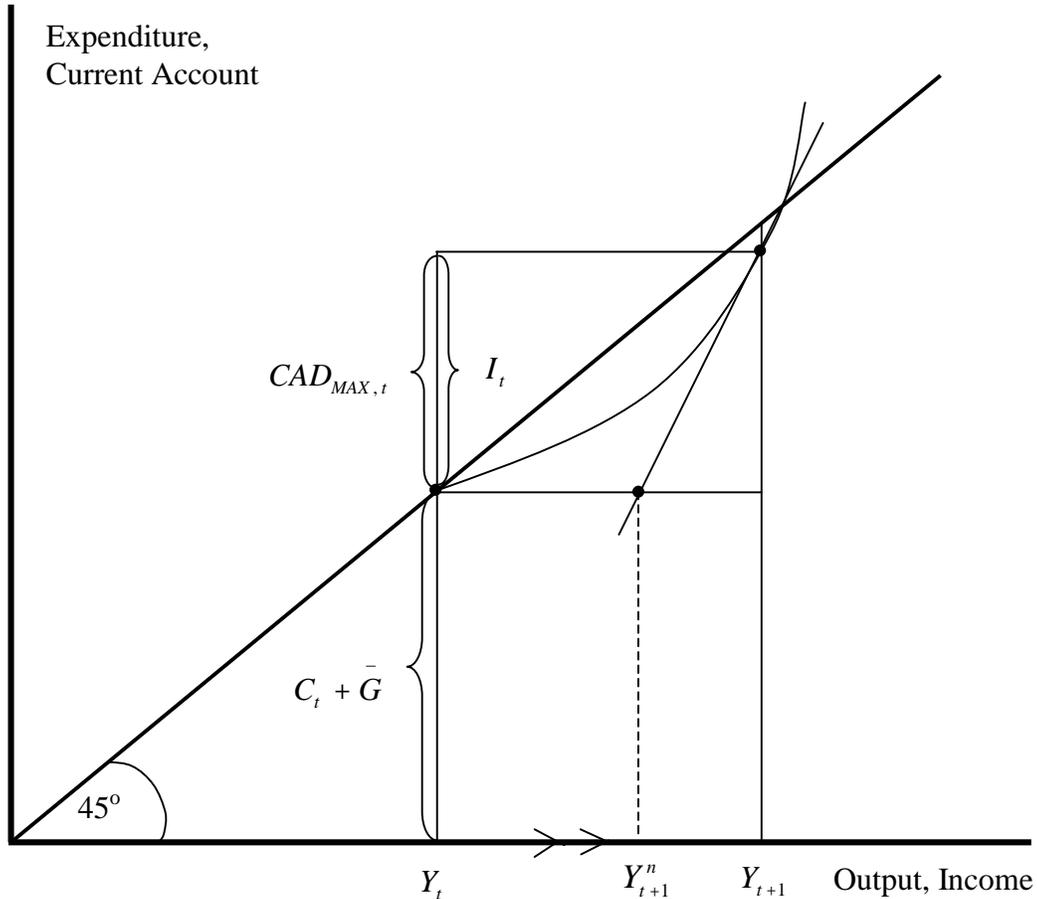
imported goods and services, and where G_t represents government expenditure in the nature of consumption which detracts from national saving. Hence, excess national expenditure over output and income of Y_t determines the current account deficit from the basic national accounting identity

$$Y_t = C_t + G_t + I_t - CAD_t. \tag{6}$$

Equivalently, CAD_t is the excess of investment, I_t, over national saving, S_t, at that same income level, assuming the pre-existing stock of foreign debt is zero. For a given value of output determined in period t, national saving varies as private and public consumption rise or fall. Normally, $Y_t - C_t - G_t = S_t > 0$.

However, if $Y_t = Y_t^n = C_t - G_t$, then $S_t = 0$, as shown at the point on the 45^0 directly above national income.

Private investment, net of capital stock depreciation, is governed by an investment opportunities frontier (Fisher 1930) to convey how additional capital expenditure in one period enlarges national output and income in the next.

$$Y_{t+1} = Y_t + g(I_t) \qquad (7)$$

Investment depends positively on capital productivity, reflected in the slope of the investment opportunities frontier, and negatively on the exogenous world interest rate. Assuming static exchange rate expectations and abstracting from other risk factors that limit capital mobility, the exogenous world interest rate also determines the domestic interest rate, r.

Additional net investment undertaken by rational forward looking agents and the associated rise in external liabilities enables higher subsequent production of Y_{t+1}. National income of Y_{t+1}^n is less than Y_{t+1} since the capital inflow in period t must be serviced at the given interest rate. In the figure, by geometry,

$$Y_{t+1} - Y_{t+1}^n = r^* CAD_t \qquad (8)$$

The increase in national income attributable to CAD_t is $Y_{t+1}^n - Y_t$. Some of this additional income will be saved if consumption is proportional to income. This saving may be used to amortize debt or fund domestic investment in period $t+1$.

In sum, the current account deficit enables faster economic growth of national output and national income than otherwise, provided the return on foreign-funded capital exceeds the external debt servicing cost even at the maximum limit. Moreover, this analysis implies that an external deficit approaching its feasible limit can be narrowed directly through a reduction in government spending.

FEASIBLE EXTERNAL DEBT LIMITS

The maximum feasible *CAD* also suggests an upper bound for an economy's *CAD* that has a stock counterpart for foreign debt. The dynamic equations are:

$$F_{t+1} = F_t + CAD_{t+1} \qquad (9)$$

$$K_{t+1} = K_t + I_{t+1} \qquad (10)$$

where (9) and (10) are simply accounting relations that combine flows and stocks intertemporally. Let k denote the economy's present capital-output ratio:

$$k_t = \frac{K_t}{Y_t} \tag{11}$$

Assume dynamic stability is characterized by a stable foreign debt to income ratio:

$$\frac{F_{t+1}}{Y_{t+1}} = \frac{F_t}{Y_t} \qquad or \quad F_{t+1} = \frac{Y_{t+1}}{Y_t} F_t \tag{12}$$

For a given capital to output ratio,

$$k_{t+1} = k_t \Rightarrow \frac{K_{t+1}}{Y_{t+1}} = \frac{K_t}{Y_t} \Rightarrow \frac{Y_{t+1}}{Y_t} = \frac{K_{t+1}}{K_t} \tag{13}$$

Rearranging (10)

$$K_{t+1} - K_t = I_{t+`1} \tag{14}$$

Substituting (9) into (12), and using (13)

$$F_t + CAD_t = \frac{K_{t+1}}{K_t} F_t \tag{15}$$

$$CAD_{t+1} = F_t \left(\frac{K_{t+1}}{K_t} - 1 \right) \tag{16}$$

Substituting (14),

$$CAD_{t+1} = \frac{F_{t+1}}{K_t} (K_{t+1} - K_t) \tag{17}$$

$$CAD_{t+1} = (I_{t+1}) \frac{F_{t+1}}{K_t} \tag{18}$$

Since $CAD_{MAX\ t} = I_t$,

$$CAD_{MAX\ t+1} = (I_{t+1}) \frac{F_t}{K_t} = CAD_{MAX\ t+1} \frac{F_t}{K_t} \tag{19}$$

Hence,

$$\frac{F_t}{K_t} = 1 \ \text{ or } \ F_t = K_t \tag{20}$$

This means that a continuous series of maximum feasible *CADs* eventually results in foreigners holding claims to the economy's entire capital stock. Consequently, the maximum feasible limit in terms of the foreign debt to GDP ratio is ultimately equal to *k*, the capital-output ratio.

BENCHMARK ESTIMATES FOR ADVANCED BORROWER ECONOMIES

The foregoing theory suggests straightforward empirical measures for assessing how close deficit and indebted economies are to their limit values. In the case of current account imbalances, it implies that, ceteris paribus, economies with an external deficit may be able to tolerate a rise up to the extent of their positive net saving. Put differently, for given domestic investment opportunities domestic consumption could increase to eliminate net saving, thereby allowing domestic capital accumulation to be fully funded by foreign saving.

Charts 1-4 plot estimates of maximum feasible deficits for four advanced economies - the United States, the United Kingdom, Australia and New Zealand - that have experienced significant current account deficits as a proportion of *GDP* since the 1990's. In the charts based on IMF national and external accounts data, the vertical distance between the value of actual deficits and maximum feasible deficits is equivalent to national saving, net of income paid abroad. The data reveal that external deficits recorded over this period were generally well below feasible limits.

The exceptions however are the current United States deficit[6], the Australian deficit of 1991, and the New Zealand deficits 1991-1992 (when recorded deficits exceeded estimated limit values). As these economies suffered major recessions during these periods, it is likely that foreign saving temporarily funded excess domestic public and private consumption, consistent with the consumption-smoothing role that the current account deficit may play in the short run[7], but from which this article has largely abstracted.

It is also likely that recorded net saving data are understated in advanced economies to the extent that national accounting convention treats most public expenditure on education and health as consumption. Yet, such spending may

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6 Godley and Izurieta (2002) provide an alternative perspective on the sustainability of the US deficit.

7 See Ghosh and Ostry (1995) and Mansoorian (1998).

alternatively be perceived as investment in human capital, and if re-classified as such in the national accounts, would yield higher measures of national saving. This would mean recorded saving rates and hence feasible limits would be higher than shown in the charts.

With regards to feasible foreign debt limits, we saw above that these were ultimately determined by the capital to output ratio, a readily available statistic for many debtor economies. For advanced economies, the k ratio ranges between 2.5-3.0. This implies a feasible upper limit for the external debt to GDP ratio of approximately 250-300 per cent for advanced economies. On the other hand, emerging economies tend to have lower k ratios, suggesting their maximum feasible limits are accordingly lower.

QUALIFICATIONS AND CONCLUSION

Current account imbalances and external liability positions across major trading areas have changed markedly over past decades in many advanced and emerging economies. Yet, an unresolved question about external deficits and debt is what fundamentally determines the bounds of sustainability. This article has aimed to answer that question by proposing feasible limits that current account deficits and external debt levels may reach based on capital-theoretic relationships.

In summary, it contends that a feasible limit is reached for an economy's current account deficit when its net domestic saving reaches zero. Beyond this point, the economy would be borrowing externally to fund consumption in excess of its national income that would not be persistently possible. Hence, an economy's productive investment opportunities alone set a feasible upper limit for the external deficit. The economy's capital-output ratio then ultimately sets the limit of its foreign debt ratio.

These limits are only supposed to be broadly indicative however and are subject to qualification. For instance, by focusing on saving, investment, national income, the capital stock and foreign debt, this article has abstracted from the state of the economy's financial system and the role it plays as the conduit for channeling domestic and foreign saving to the most productive investment opportunities.

In reality, information problems, such as asymmetric information between ultimate borrowers and lenders may prevent the optimal allocation of saving. In turn, this implies the additional income generating capacity of foreign funded capital accumulation may not be as strong as theory suggests. Developing and emerging economies that experience large external deficits are also more vulnerable to sudden capital flow reversals than advanced economies, if foreign

Chart 1 - United States
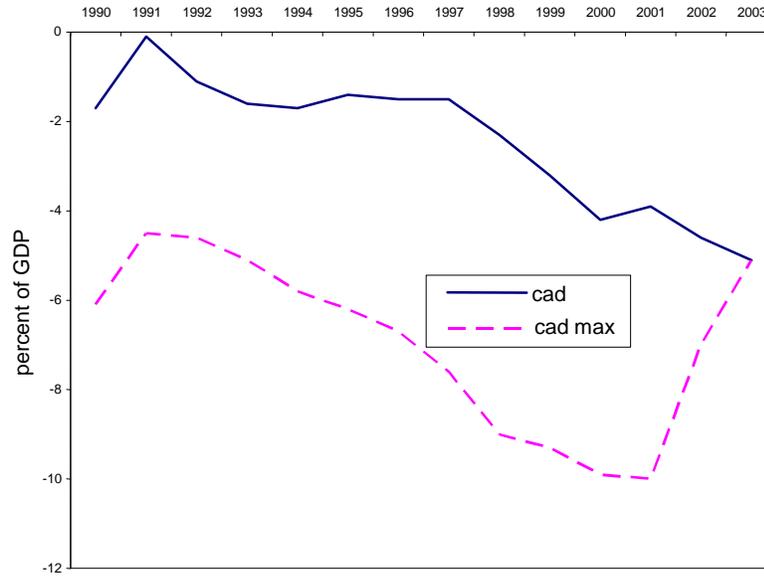
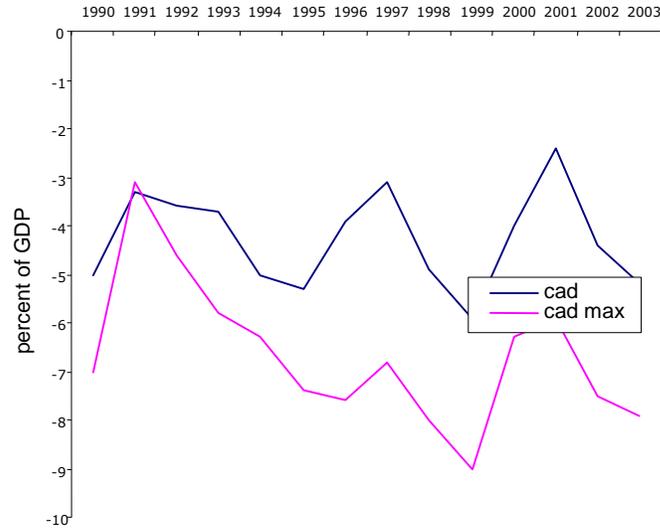Data source: IMF *International Financial Statistics*, 2004, *IMF World Economic Outlook,* September 2003.

Chart 2 - United Kingdom
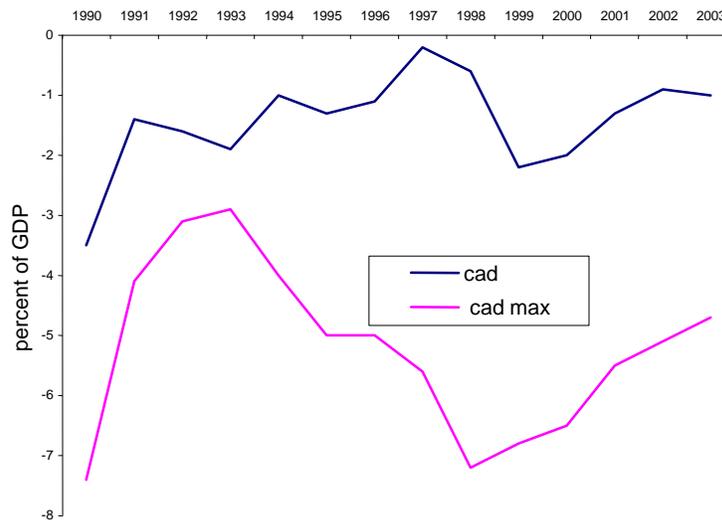
Data source: IMF *International Financial Statistics*, 2004, *IMF World Economic Outlook,* September 2003.
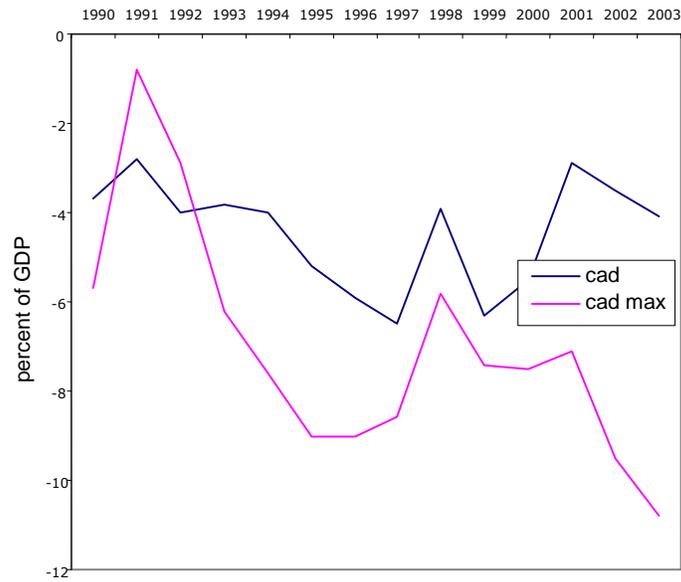
Chart 3- Australia

Data source: IMF *International Financial Statistics*, 2004, *IMF World Economic Outlook,* September 2003.

Chart 4 - New Zealand

Data source: IMF *International Financial Statistics*, 2004, *IMF World Economic Outlook,* September 2003.

investors perceive their financial systems as poorly developed with inadequate prudential supervision.

Furthermore, by focusing on saving and investment rather than exports and imports as the measure of external imbalance, the modeling approach outlined above has abstracted from the relative share of tradables relative to non-tradables in the economy. Obviously, the greater the proportion of GDP that entails tradable goods, the easier it would be for an economy to increase its current credits by a significant amount. For this reason, the ratio of the deficit to current credits provides useful supplementary information about the external position.

The above factors imply that the proposed limit measures for *CAD*'s and foreign debt may overstate the bounds of external sustainability, especially for emerging economies. At the same time however, the proposed maximum *CAD* measure may understate the feasible limit as it does not allow for consumption smoothing during recessions, a phenomenon unsustainable beyond the short term.

Nonetheless, the suggested limits would seem to improve on scant existing means to assess external sustainability, such as the arbitrary five per cent of *GDP* rule. They enable assessment of how near actual current account deficits and external debt levels are to unsustainable values, especially for advanced economies experiencing greater financial globalisation and international capital mobility. More information about the feasibility of external positions may improve exchange rate forecasting by financial markets and enable policymakers to make better judgements when setting fiscal and monetary policies.

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