Fear of Sudden Stops:
Lessons from Australia and Chile

by

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Abstract

Latin American economies are exposed to substantial external vulnerability. Domestic imbalances and terms of trade shocks are often exacerbated by sudden financial distress. In this paper we explore ways of overcoming external vulnerability drawing lessons from a detailed comparison of the response of Chile and Australia to recent external shocks and from Australia's historical experience. We argue that in order to understand sudden stops and the mechanisms to smooth them, it is useful to highlight and then draw a distinction between two dimensions of investors confidence: *country-trust* and *currency-trust*. While these two dimensions are interrelated, there are important distinctions. Lack of country-trust is a more fundamental and serious problem behind sudden stops. But lack of currency-trust may both be a source of country-trust problems as well as weaken a country's ability to deal with sudden stops. We discuss steps to improve along these two dimensions of investors' confidence in the medium run, and policies to reduce the impact of country-trust and currency-trust weaknesses in the short run.

1   Introduction

Latin American economies are exposed to substantial external vulnerability. Domestic imbalances and terms of trade shocks are often exacerbated by sudden financial distress. In this paper we explore ways of overcoming external vulnerability, drawing lessons from a detailed comparison of the response of Chile and Australia to recent external shocks and from Australia's historical experience.

Why Australia? While it is much more developed than Latin America, it has several structural features that make it similar to several countries in the region. Through its history it has been exposed to many external shocks due to large swings in its terms of trade – commodities make up a large share of its exports (over 95 per cent in 1900 and still around 60 per cent). Moreover, Australia has had long episodes of significant external deficits, which have often been at the centre of the policy debate. For example, in May 1986 the then Treasurer (Finance Minister) Paul Keating said that Australia risked becoming a 'Banana Republic' if it did not address its declining international competitiveness which had led to substantial current account deficits and growing external indebtedness. Despite these similarities, external shocks have had much milder macroeconomic consequences in Australia.

Why Chile? Because on one hand Chile is arguably the most advanced economy in Latin America in terms of institutional development and macroeconomic stability, and in this sense the closest to Australia. But the responses to similar real external shocks in Australia and Chile have been dramatically different. Australia can rely on access to international capital markets to smooth these shocks. In contrast shifts in the supply of external funds often exacerbate the effects of real shocks in Chile. By comparing two countries that are otherwise fairly similar we can isolate those factors that make a significant difference to international capital market linkages.

We start Section 2 with a comparison of the strikingly different responses of Australia and Chile to the Asian-Russian crisis. In doing so we discuss the role played by capital flows and exchange rate concerns. We conclude that fear of a capital flow reversal appears to be a more significant ingredient in Chile's poor macroeconomic performance than fear of an exchange rate crisis. But we also note that the absence of a well developed currency-derivative market exacerbated capital outflows from the domestic banking system in the face of increased exchange rate uncertainty.

Section 3 summarises our conclusions from this comparison. We highlight the importance of drawing a distinction between two dimensions of investor confidence: *country-trust* and *currency-trust*. Currency-trust describes the degree of confidence foreign investors have in holding assets denominated in the currency of the particular country. It indicates investors believe currency movements will not be used to expropriate their investment but also that the central bank has enough control over the currency that random shocks are unlikely to lead to perverse exchange rate dynamics. In this way currency-trust is seen to be related to the concept of inflation credibility. Country-trust describes the degree of confidence foreign investors have more generally in

the country, incorporating the commitment of the country to repay debts, corporate governance, the financial system and the economic stability of the country. Importantly, country-trust means that there is no need for highly specialised knowledge to invest in the country (for example about government and institutions).

We then sketch policy recommendations for a country with limited country-trust and currency-trust. We discuss the importance of developing external insurance mechanisms that are largely independent of domestic government actions and the idiosyncrasies of the local economy. In doing so, we place in a broader perspective the concerns of the 'original sin' literature. This literature highlights the fact that some countries are unable to insure externally by borrowing in their own currency, a narrower concept than currency-trust. The way around 'original sin' is to insure through a different contingency, and we suggest several examples. It is also clear that the most fundamental problem for these economies is not 'original sin' *per se*, but insufficient country-trust, the initial reason for demanding insurance. This section then discusses how the development of a domestic currency-derivative market is key to reducing the role played by domestic banks in exacerbating capital outflows during external shocks. It closes by advocating a macroeconomic policy framework that is indexed to the contingency used in the external insurance arrangement.

In Section 4 we outline the economic history of Australia over the past century in order to extract lessons on how to build country-trust and currency-trust. For currency-trust we highlight the role of a solid inflation record and a clear policy framework. The development of a deep domestic bond market with currency as its main risk, followed by the fostering of a local-currency derivatives market, were also important. For country-trust we stress the importance of a clean sovereign default history and the development of a healthy domestic banking sector. Section 5 concludes by extracting lessons for Latin America more broadly, including highly dollarised economies.

2 Similar Shocks, Different Responses: Australia versus Chile 1997–99

In this section we characterise the different performance of Australia and Chile during the Asian-Russian crisis. Although these economies faced similar external real shocks, Australia continued to grow strongly while Chile suffered a severe slowdown. The main factor behind the different responses is the behaviour of capital flows. We characterise the nature of these flows, the key role played by the respective banking systems and derivatives markets. We also dismiss a few traditional fear-of-floating explanations. In concluding the section we highlight the key differences between these two economies in terms of country-trust and currency-trust.

2.1 The Asian-Russian Crisis in Chile and Australia

Chile experienced a substantial slowdown following the 1998 deterioration in its terms of trade and external demand (as measured by trading partner GDP growth) shown in Figure 1. The current

account deficit narrowed to 0.5 per cent of GDP in 1999, down from an average of 3 per cent over the previous decade and a peak above 5 per cent before the slowdown (Figure 2). Annual growth fell a full 8 percentage points below the average of the previous decade, to −1 per cent, by 1999. Despite facing similar external shocks, higher foreign borrowing by Australia financed the temporary drop in income. The current account deficit doubled from around 3 per cent of GDP at the beginning of 1997, and growth was actually higher than average in both 1998 and 1999.

Following the negative external shock, the Central Bank of Chile (CBCh) set out to minimise the nominal devaluation and rein in the current account deficit, by implementing contractionary monetary policy. Interest rates on loans rose substantially in 1998 – the top panel in Figure 3 shows the jump from pre-shock levels of 8 per cent to over 18 per cent and an average of 11 per cent for 1998. At the same time, the CBCh intervened in the foreign exchange market – selling close to US\$3 billion in reserves between 1997 and 1999. This reluctance to let the exchange rate play the stabilising role suggested by traditional open-economy models is fairly common among economies that exhibit 'fear-of-floating' (Haussman, Panizza and Stein 2001; Calvo and Reinhart 2002).

The reaction of the Reserve Bank of Australia (RBA) was essentially the opposite of that of the CBCh. After interest rates were cut twice in mid 1997 they were then held constant until the end of 1998 when they were cut once more (the target cash rate – the RBA's policy instrument – averaged 5.4 per cent in 1997, 5.0 per cent in 1998 and 4.8 per cent in 1999). In addition, the RBA did not attempt to counteract the substantial depreciation of the Australian dollar.[1] By mid 1998 the nominal effective exchange rate had depreciated by 15 per cent from its level at the beginning of 1997. In contrast, by mid 1998 the effective Chilean peso exchange rate was back at the early 1997 level, having *appreciated* slightly through 1997.[2] The bottom panel of Figure 3 shows that in real terms the contrast is even more extreme – a 15 per cent depreciation for the Australian dollar versus a 5 per cent appreciation for the peso.

There is no question that the stark difference in the reactions of the respective monetary authorities played a role in the relative performances of these two economies. However, stopping there does not recognise that these responses were the result of substantially different pressures. While Australia had little concern for a sudden stop, Chilean authorities were extremely worried by that possibility. In fact, the sudden stop had already started in Chile at the time of the monetary contraction, and fears for a catastrophe in emerging markets could be felt from Washington to Santiago.[3] The change in external financing conditions faced by Chile in late 1997 and 1998 is

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[1]The RBA did intervene, notably in mid 1998 when there was seemingly large amounts of speculative activity, but was certainly willing to allow the currency to depreciate.

[2]We use the IMF effective exchange rates for comparability. The depreciation of the Australian dollar based on the RBA's Trade Weighted Index, which uses different weights, over this period was less than 5 per cent.

[3]Of course, with the benefit of hindsight, it is likely that the response of the Chilean monetary authority was excessive. Caballero and Krishnamurthy (2003) argue that optimal monetary policy is countercyclical even if that does little to reduce the real impact of the sudden stop once it takes place. This does not lessen our assertion that the conditions faced by the two central banks were very different, and that the main reason behind this difference is in the actual and expected behaviour of capital flows.

evident in Figure 4, which shows the spread between the returns on Chilean corporate bonds and the rates on US treasury bills. The spread on Chilean bonds rose by more than half in 1997 and then doubled in 1998. Moreover, the price of Chilean debt in secondary markets is likely to understate the constraints faced by Chile following the Asian and Russian crisis, as primary markets were effectively closed during this period.

2.2   The Role of Capital Flows

In the latter part of the Asian-Russian crisis and its immediate aftermath, the period 1998–99, net capital flows behaved very differently in these two countries. For Australia, net inflows in US dollar terms were higher than their 1990–97 average, as seen in Figure 5.[4] For Chile, net inflows were lower by around 5 per cent of GDP in 1998, and remained below average for the rest of our sample.

It is the behaviour of net capital flows that is ultimately important from a macroeconomic perspective. However, it is useful to analyse gross inflows and outflows to shed light on the factors behind the Chilean net capital flow reversal. Following the Asian-Russian crisis, gross capital inflows into both Chile and Australia increased. As seen in Table 7, in Chile most of the rise in inflows in 1998–99 relative to the previous three years came in the form of *foreign direct investment* (FDI). In Australia, on the other hand, there was a large rise in the *other investment* category of the capital account, which is mostly foreign loans. An important part of this is rising bank debt, although the non-financial sector also borrowed directly from abroad. This highlights that the similarity in the behaviour of gross capital inflows to Australia and Chile is misleading: it is likely that Chile had to sell heavily discounted assets to obtain funding, while Australia could borrow at non-fire-sale international rates.

The second and more significant difference between the two economies is the behaviour of gross outflows. While outflows from Australia shrank in 1998–99, in Chile there was a rise in outflows in both of these years. Following the terms of trade shock, Chilean residents shifted their portfolios towards foreign assets. The outflows were particularly large in 1999, amounting to over 15 per cent of GDP.

A substantial part of the net capital outflow from Chile in this period can be explained by the behaviour of two groups of institutional investors: pension fund management companies (AFPs) and banks (especially foreign resident banks). This can be seen in Figure 6, which plots the net international investment position of the Chilean private sector. AFPs are a significant part of the Chilean capital market. In 1999 they controlled assets worth close to 50 per cent of GDP, at a time when equity market capitalisation was 100 per cent of GDP and private bank credit around 60 per cent of GDP. Pension funds increased the share of foreign assets in their portfolio substantially over the period 1998–99. Starting from levels close to 1 per cent in 1997, Figure 7 shows the share of foreign assets in AFP portfolios rose to above 10 per cent in 1999 – an increase

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[4]Unlike output and terms of trade we look at deviations from the period 1990–97 because 1990 marks the return of capital inflows to emerging markets.

equivalent to 5 per cent of GDP.[5] The rising share of foreign assets coincides with widening legal limits on foreign asset holdings. This makes it difficult to determine whether the higher share of foreign assets is the result of changes in the optimal portfolio or the lifting of regulatory constraints. However, the increase in the share of foreign assets was larger than the regulatory change. This suggests that unfortunate timing on behalf of the pension regulators is at most a partial explanation for Chile's capital outflows.

Rather than smoothing the loss of international liquidity from the terms of trade shocks, Chilean banks exacerbated it by joining in the capital flow reversal. Figure 8 plots the evolution of gross foreign assets as a share of total assets for domestic and foreign-owned banks. While all banks increased their positions in foreign assets, the shift in foreign-owned banks' portfolio was more pronounced, rising to over 6 per cent in 1999.[6] However, this was not a permanent shift. By the end of 2002 the share of gross foreign assets in banks' portfolios was close to its initial level. In contrast, in Australia over the same period there was no jump in banks' foreign assets as a proportion of total assets. Rather, there was a continuation of the upward trend that began in the early 1990s.

2.3 Exchange Rate Defence

Some observers have focused on the exchange rate defence aspect of the contractionary monetary policy of the CBCh. It was not until September 1999 that Chile abandoned its exchange rate band (which had been narrowed since the initial shock) and allowed the peso to float freely against the US dollar. As we discussed above, this was not the case for Australia, which did not base its policy on a defence of the currency. Why would policy makers in Chile be more concerned than Australia about a depreciation?

2.3.1 Unlikely (conventional) explanations

The first conventional explanation has been the fear of *high inflation pass-through.* There were concerns that a nominal devaluation would lead to a jump in prices, so at best a brief real depreciation, and in the case of a highly indexed economy like Chile to a period of prolonged inflation. Figure 3 suggests that, *ex-post*, this was not the case. The real exchange rate did depreciate substantially and inflation did not pick up. In fact, inflation in 1997 was above 6 per cent while average inflation during the period 1998–02 was only 3.7 per cent. Furthermore, empirical estimates for Chile and Australia suggest a similar degree of pass-through. For Chile, Garcia and Restrepo (2001) find that pass-through is approximately 0.3 after 8 quarters, and even lower if there is a positive output gap (as happens with a negative terms of trade shock).[7] Long-run pass-through in Australia is esti-

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[5]The rising share of foreign assets is not a result of the depreciation of the peso. This is evident from in the line in Figure 7 that plots the share of foreign assets adjusting for changes in the dollar/peso exchange rate.

[6]See Caballero (2002) for a more extensive discussion of this point.

[7]For example, when there is an exogenous output gap of 2 per cent pass-through is below 0.115.

mated to be around 0.3, and close to 0.2 after 8 quarters (Dwyer and Leong 2001), not substantially lower than in Chile.

The second concern was that, because of the private sector's unhedged *dollarised liabilities*, a devaluation could have a negative impact through balance sheet effects. The perception was that inflated liabilities would activate collateral constraints leading to reductions in output and investment. If firms or the government are exposed to significant currency mismatches, then the expansionary Mundell-Flemming effects of a real devaluation will be offset by the negative balance sheet effects of dollar debt.[8] In addition, if foreign debt is denominated in a foreign currency, then a real devaluation will increase the local-currency value of required factor payments, aggravating any existing liquidity shocks. However, existing data suggest that unlike some neighbouring Latin American economies, currency mismatches (at least in the conventional sense) were not a severe problem in Chile. This does not imply that Chile would not benefit from a further reduction of its 'original sin'.

We start by looking at currency mismatches at the aggregate level. Table 1 shows that Chile's net and gross liabilities, as a proportion of GDP, were significantly lower than Australia's in 1997. The structure of these liabilities also differs. Chile had more FDI, both as a share of GDP and as a share of total liabilities. Outstanding debt, on the other hand, made up a smaller share of Chilean net and gross foreign liabilities. Table 1 also shows that banks play a larger role in intermediating capital inflows in Australia than they do in Chile. In Australia, gross foreign liabilities in the banking sector were over 24 per cent of GDP, while in Chile banks' foreign liabilities were less than 4 per cent of GDP. Firms in Chile wishing to access international capital must do so directly – either through FDI or by issuing debt or shares – not through the banking sector. More generally, BIS data suggest that in all of Latin America, direct borrowing by non-bank sectors from foreign banks is a larger source of financing than bank-to-bank lending. We return to this issue later, and explore possible explanations and implications.

However, statistics on total foreign debt do not completely summarise currency mismatch. They ignore both the currency composition of debt and the response of income to exchange rate fluctuations. With this in mind, in Table 2 we build an aggregate measure of currency mismatch for Chile, Australia, and for a sample of other Latin American and small open developed economies. Cross-country data on the currency composition of total external debt are not available, so it is not possible to construct exact measures of total foreign-currency external debt. Instead, we use the measure of 'original sin' from Eichengreen et al (2003) as a proxy for the share of foreign debt denominated in foreign currency. To take into consideration differences across countries in openness and the size of the tradable sector – and hence the effect of real exchange rate on income – our measure of mismatch is the ratio between our estimates of foreign-currency external debt and total

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[8]There is extensive theoretical literature on this issue. See for example Krugman (1999a, 1999b), Aghion, Bachetta and Banerjee (2001) and Cespedes, Chang and Velasco (2001). Empirical results are less abundant and categorical, see Bleakley and Cowan (2003).

exports. The ratio of foreign-currency debt over exports is lower in Chile than in any other country in our sample, and less than half the average of other Latin American economies. Other measures of mismatch reported in Table 2 – such as net debt liabilities, and net debt liabilities including international reserves, as a fraction of exports and of GDP – all suggest that Chile's aggregate currency mismatch was relatively low on the eve of the Asian-Russian crisis.[9]

It is not only aggregate currency exposure that is important. The distribution of dollar-denominated contracts *within* the economy is also likely to determine the effects of a devaluation on output, and so the optimal monetary policy response to a terms of trade shock. Existing evidence suggests that currency mismatches were not a severe problem within the Chilean economy. According to a recent report by the Chilean Finance Ministry, gross central government debt denominated in US dollars was 13.5 per cent of GDP in 1996.[10] The net exposure of the central government balance sheet to a devaluation was even lower, since the Chilean government held foreign-currency denominated assets worth 5.5 per cent of GDP.

Data from publicly listed firms suggest that liability dollarisation within the Chilean private sector was not a severe problem either. Figure 9 reports average levels of liability dollarisation for a sample of firms from eight Latin American economies. Both the average and median shares of US dollar debt in total debt for Chilean firms were among the lowest in the region. Whereas the median share of foreign-currency debt in total debt of a publicly listed firm in Chile was less that 5 per cent, the median shares in Argentina, Peru and Uruguay were all above 60 per cent. Table 8 suggests that, in addition to being relatively low (compared to neighbouring economies), dollar-denominated liabilities in Chile were concentrated among firms in the tradable sector. This was not the case in Argentina.

To look in more detail at the extent to which firms were 'matching' the currency compositions of their debt and income we use firm-level data to estimate the determinants of liability dollarisation in Chile. Table 3 reports the results of estimating Equation (1) on a sample of accounting data from 270 publicly listed firms for December 1997:

$$d_i^* = \alpha_o + \alpha_1 tradable_i + \alpha_2 \left(x/s\right)_i + \alpha_3 size_i + z_i b + \varepsilon_i \tag{1}$$

where for firm i, d_i^* is the ratio of dollar-denominated debt to total liabilities, *tradable* is a dummy for firms operating in the agricultural, mining or manufacturing sectors, x/s is the ratio of exports to total sales, firm *size* is measured as $ln(total\ assets)$ and z is a matrix of additional firm controls detailed in the table. The estimated coefficients confirm that dollar debt is 7 per cent higher in the tradable sector, and 13 per cent higher in exporting firms. The share of dollar debt is also higher for larger, and so presumably less credit constrained, firms.[11] These results imply there is a

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[9]Note that these measures of mismatch overstate the sensitivity of Australia's indebtedness to currency movements as Australia has a large foreign-currency asset position on derivative contracts, as detailed in Section 2.3.2.

[10]Source: 'Informe Estadisticas de la Deuda Publica', Ministerio de Hacienda Chile.

[11]Similar results are found by Bleakley and Cowan (2003), and Cowan (2002).

'matching' of the currency compositions of firm income and liabilities, so that the negative balance sheet effects of a devaluation will be partly offset by rising peso income.[12] Indeed, a recent study by Benavente et al (2003) for Chilean firms over the period 1990–2000 finds that publicly listed firms holding dollar debt do not invest significantly less than their 'peso-indebted' counterparts following a devaluation.

We also use firm-level data from Bloomberg to compare the dollarisation of liabilities in Chile and Australia. Since direct data on liability dollarisation are not available for both economies, using firms' income statements we derive a measure of currency mismatch from the exchange rate losses as:

$$\frac{fx\ loss_{it}}{a_{it}} = \frac{(d_{it}^* - a_{it}^*)}{a_{it}}\Delta e_t = m_{it}\Delta e_t \tag{2}$$

where d_{it}^* is dollar debt, a_{it}^* is dollar denominated assets, a_{it} is total assets, all in local currency, and Δe_t is the nominal depreciation. This allows us to construct m_{it}, a measure of currency mismatch, using firm-level data on $\frac{fx\ loss_{it}}{a_{it}}$ and aggregate data on depreciations. As seen in Table 4 we find similar average values of m_{it} for listed firms in Australia and Chile. Note that this measure does not take account of off-balance sheet hedging of foreign-currency liabilities. We would expect such hedging to be of greater significance in Australia because of the larger currency derivative markets and the substantial aggregate asset position in foreign-currency derivative contracts outlined in Section 2.3.2. However, what is evident in the raw data is that in both countries currency mismatch, as measured by m_{it}, is higher for firms in the tradable sector. This suggests that firms in Australia also match the currency income of their net foreign liabilities to that of their income stream.

In conclusion, neither pass-through nor dollarisation of liabilities are strong reasons to support the view that the main concern of the CBCh was, or should have been, the stabilisation of the exchange rate *per se*.

2.3.2 A role for the exchange rate: banks and derivatives

In Chile there was one clear reason to defend the exchange rate that did not exist in Australia: banks have limited ability to hedge currency risk.

As we discussed in the preceding section, Australian banks have played an important role in intermediating capital inflows. Importantly exchange rate risk is not passed on to the domestic borrowers – as has often been the case in emerging markets – nor is it taken on by banks themselves. Rather, banks hedge their net foreign-currency liabilities using derivatives. This is an important point: as discussed in Section 4.2.3, Australia has a highly developed currency derivative market which allows exchange rate risk to be separated from loan decisions (credit risk). Small firms, likely to be more dependent on bank credit and more vulnerable to currency mismatches, can therefore

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[12]For comparison purposes we carry out a similar set of regressions for Argentina. We find that the currency 'matching' that we see in Chile does not take place in Argentina. Not only is average dollar debt considerably higher in Argentinean firms, but it is distributed equally between tradable and non-tradable sectors.

access international capital markets through loans in Australian dollars from the banking sector.

The contrast with Chile, in which banks did not intermediate foreign capital either before or during the crisis, is stark. Furthermore, following the external shocks in 1997, Chilean banks contributed to capital outflows by increasing their holdings of foreign assets. Chilean banks did not have the means to unload the (explicit or implicit) exchange rate risk. So it is conceivable that exchange rate uncertainty was partly responsible for their role in capital outflows. Moreover, this was exacerbated by foreign resident banks whose measures of performance may be more directly linked to foreign currency. It is also conceivable that the CBCh was concerned with this potential link.

The difference in the development of the derivative markets in Australia and Chile is highlighted in the survey conducted by the Bank of International Settlements (BIS 2002), summarised in Table 5. Total derivative turnover relative to GDP, a measure of derivative market coverage and liquidity, is more than one order of magnitude larger in Australia than it is in Chile. Derivative turnover with non-financial agents, which is probably a better measure of firms' use of derivatives to cover exchange rate positions, is also substantially higher in Australia. The same BIS survey also shows that more Australian dollar trading takes place off-shore, which is suggestive of larger net holdings by foreigners.[13]

Table 5 also compares Australian and Chilean currency derivatives markets to a broader sample of countries from the BIS survey. These data suggest that the derivatives market in Australia is large even by developed economy standards. Relative to GDP, trade and capital flows, total turnover in Chile is higher than in the other Latin American economies included in the survey, but lower than other emerging markets (this is also true using data for 1998, the survey closest to the Asian-Russian crisis). However, compared to other emerging markets, Chile does have fairly large derivative turnover with non-financial agents.

To assess whether Chile has an underdeveloped derivatives markets we run a very simple cross-country regression relating derivative turnover from the BIS survey to variables that capture the degree of financial development, openness and overall level of development. Specifically we estimate:

$$Fx = \alpha_0 + \alpha_1 y + \alpha_2 trade + \alpha_3 fdev + \alpha_4 emu + \mu \tag{3}$$

on the sample of countries included in the 2001 BIS survey. In this specification Fx is currency derivative turnover in 2001 scaled by nominal GDP, y is per capita income on a PPP basis for the period 1996–00, $trade$ is the ratio of exports + imports to GDP and $fdev$ is the ratio of private bank lending to nominal GDP (a measure of financial development). Figure 10 plots the fitted values of turnover from this regression against observed turnover. The estimated coefficients are reported in Table 9. As expected, turnover is positively correlated with openness, income per capita and financial development. The estimated coefficient on the emu dummy, which indicates countries that

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[13]Close to two-thirds of turnover in Australian is cross-border. None of Chile's turnover is cross-border (BIS 2002).

have adopted the Euro, is negative as expected, although not significant at conventional confidence intervals. Other measures of exchange rate volatility and importance of commodities in exports we tried were all insignificant. Interestingly, turnover in Chile is not significantly below the predicted value. Derivative turnover in Australia is larger than predicted. It is interesting that South Africa and Poland, outliers in this regression, are also outliers in the Eichengreen et al (2003) measure of original sin.

These results – while tentative in that they do not account for endogeneity of the right-hand side variables – suggest that the size of the Chilean derivative markets is broadly consistent with its overall level of development, openness and financial development. Therefore, one should not expect that a very rapid growth of Chile's currency derivatives market will take place, absent a deliberate set of policies aimed at boosting these markets.

We turn now to understanding how the Australian private sector uses the derivatives market to hedge currency risk. According to a recent Australian Bureau of Statistics/RBA survey (ABS 2001 and RBA 2002), derivatives have a large impact on Australia's overall foreign-currency exposure. While resident enterprises (including general government) had a net liability position in foreign-currency debt of A$164 billion they also had a net A$85 billion asset position in foreign-currency denominated derivative contracts. This implies that approximately half of the foreign-currency debt position is hedged.[14] Unfortunately, it is not possible to trace who ultimately holds the other side of the net hedging position of the Australian government and private sector (i.e. who has taken on the Australian dollar currency risk through derivatives). What we can say is that since the domestic financial system in Australia is denominated solely in Australian dollars, it is not the case that Australian households are effectively holding the other side to these positions, leaving foreign residents as the remaining candidates. The high share of off-shore turnover in total turnover, seen in Table 6, also points in this direction.

The same study shows that foreign-currency exposure was largest (relative to total net foreign liabilities) in the non-financial private sector and in the government. Banks have a relatively small exposure considering the size of their foreign exchange liabilities. Banks are by far the largest holders of gross and net positions in foreign-currency derivative contracts in Australia.

It would seem that the currency derivatives market in Australia plays two key roles. First, it allows banks to decouple credit from exchange rate risk. In doing so it plays an important part in the intermediation of capital inflows by the banking sector, allowing a broader range of Australian firms access to international capital markets. Second, it provides a mechanism for external insurance against events that depreciate the Australian dollar by effectively reducing total foreign borrowing indexed to foreign currencies. We will return to these two aspects below.

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[14]This measure of foreign-currency 'exposure' ignores the elasticity of export revenue to exchange rate fluctuations and substantial foreign equity asset holdings of A$228 billion. Indeed accounting for foreign equity assets, in 2001 Australia had a net foreign-currency asset position of A$149 billion

3 Taking Stock and Short-Run Recommendations

Why do countries like Australia and Chile respond so differently to similar shocks? And what can the Chiles of the world do to react more like Australia? We split our answer to these questions in two parts. In this section we explain the role of country-trust and currency-trust in recent shocks and, taking these as given, discuss policy options for countries like Chile. In the following section we look more closely at the experience of Australia over the 20th century, to extract lessons on how to build country-trust and currency-trust that may be relevant for emerging market economies.

3.1 Why So Different?

There are at least three ingredients that helped Australia, and not Chile, during the recent episode: (i) Australia had no concern (at least in relative terms) with capital flow reversals; (ii) Australia could count on *ex-ante* external hedging against to exchange rate fluctuations; and (iii) Australian banks had access to a deep currency derivatives market to insulate themselves (and their borrowers) from exchange rate fluctuations. We discuss these in turn.

3.1.1 No fear of sudden stop in Australia

The first ingredient is due to country-trust. In Chile there was widespread fear of a capital flow reversal. Net capital outflows could lead to a balance of payments crisis, that would turn out to be much more costly than the contraction brought about by high interest rates. Contractionary monetary policy was seen as a way of reducing the need for external financing (by reducing domestic absorption) and the extent of the capital flow reversal (by sending a pragmatic signal to investors). This perception went beyond the CBCh since resident banks and other private agents also were taking aggressive precautionary measures. While the fear of a sudden stop may have been a consideration for Australia at the time, the degree of concern was surely much lower.

Chile's inflation target is generally perceived to be credible and so the exchange rate could probably have been allowed to float more freely than it did during the Asian-Russian crisis. It is also possible that a significant part of the adjustment of the AFPs was a once and for all portfolio adjustment to an unfortunately timed regulatory change. But there seems little hope that sudden stops and the expectation of sudden stops will suddenly disappear. Copper continues to be Chile's 'bellwether' for foreign investors, who are primarily specialists subject to a variety of shocks. Recent research on 'institutional' determinants of contagion confirms this view, by linking financial contagion to characteristics of *developed* economy markets and investors. A country like Chile may be 'contaminated' by a crisis event in another emerging market economy if they both belong to a particular asset class (Rigobon 2001), borrow from the same banks (Van Rijckeghmen and Weder 2000) or share a set of overexposed mutual funds (Broner and Gelos 2003). While Chile may have come a long way in overcoming other aspects of its financial fragility, it seems unlikely that it will be able to insulate itself *completely* from shocks to its external supply of funds in the

near future simply because of 'specialists' and 'neighbourhood' effects.

3.1.2 Exchange rate based insurance and 'original sin'

The second ingredient is due to both country-trust and currency-trust. Foreigners are willing to hold assets denominated in Australian dollars. This provides an implicit insurance arrangement for Australia in which resources are automatically transferred to Australia when a terms of trade shock results in a depreciation.

Note that this – and only this – is what is behind the 'original sin' literature. While important, it should be apparent that this is not the only ingredient behind external crises in emerging markets. It is not even likely to be the main ingredient in most cases. Australia did not develop currency-trust until the mid 1980s, or at least did not use it before then as an insurance arrangement since it did not have a floating currency.[15] Foreigners did not start holding Australian local-currency debt until the 1980s, as described in see Section 4.2.2.

Furthermore, Chile needs external insurance more than Australia does, precisely because the direct terms of trade shocks are amplified by the resulting contraction in the supply of external funds. So 'original sin' is a more serious problem for Chile than for Australia. But importantly, 'original sin' is not the primitive problem behind the need for substantial insurance; the problem is a lack of country-trust.

3.1.3 Decoupling of risks

The third ingredient, currency hedging for banks, is based on currency-trust. Banks are highly leveraged institutions that can manage idiosyncratic credit risk but not exchange-rate volatility risk (or other aggregate risks). Faced with a supply of funds in a foreign currency, a bank has three options. The first is to lend in the local currency, and take on exchange rate risk directly. The second is to pass on the exchange rate risk to its borrowers, and in doing so take on the credit risk of borrowers with a currency mismatch. The third is to off-load exchange rate risk to other investors. Such investors could be domestic investors that are less leveraged than banks, or foreign investors willing to take on local-currency risk. If the banking sector is unable to off-load the exchange rate risk without taking on credit risk, then external shocks that raise the volatility of the exchange rate lead either to a withdrawal of the banks from local lending or to an increase in financial fragility.

In both Australia and Chile domestic savings are in the local currency and so banks only have to deal with currency mismatches when borrowing from abroad. In Australia the deep currency derivatives market allows banks to hedge the currency risk inherent in borrowing from abroad in foreign currency and lending to domestic firms in Australian dollars. They can decouple their

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[15]Strictly, currency-trust could play an important insurance role even under a fixed parity since it could allow agents to modify out-of-equilibria scenarios and therefore prevent some perverse outcomes. However, this still would require that there is extensive contracting with foreigners in local currency.

lending activity from exchange rate risk. In Australia, currency-trust is combined with country-trust as foreigners take some of this exchange rate risk. However, Chilean banks are not able to hedge exchange rate risk and so they refrain from intermediating foreign funds. In addition, external shocks that raise the volatility of the exchange rate leads to a natural withdrawal of banks from local lending.

The case of highly dollarised banking systems, such as Argentina or Peru, provides a more dramatic example of the difficulties for banks of not being able to decouple exchange rate risk from credit risk. Banks in these economies are hard pressed to find even domestic agents willing to take on currency risk. As a result of this (and prudential regulation limiting accounting mismatches) they end up passing on the exchange rate risk to their borrowers. Clearly the first step for these economies must be to understand and address the factors that drive the decision of domestic investors to save almost exclusively in US dollars.

In the absence of other mechanisms to remove exchange rate risk, some countries fix the exchange rate to eliminate this risk for key investors, such as banks. Argentina's strategy during the 1990s could be thought of in these terms. Dollarised economies effectively operate in this fashion as well. Of course, fixing the exchange rate involves other costs. These include the possibility that domestic positions become even more mismatched in the process, thereby increasing the fragility of the economy. Except for extreme circumstances, fixing the exchange rate is unlikely to be the most efficient mechanism to unbundle (micro) credit and aggregate shocks risks.

3.2 What Can Be Done Given Weak Country-trust and Currency-trust?

Credibility can not be bought and so even in the best of circumstances, improvement in country-trust and currency-trust are likely to be gradual. In this section we discuss three sets of policies aimed at ameliorating the effects of low levels of country-trust and currency-trust. The first two of these seek to develop markets for contingent instruments that reduce the cost of external and internal insurance. The third – contingent macroeconomic policy – seeks to improve the private-sector incentives to take adequate precautions against external crises, i.e. to purchase this insurance.

3.2.1 External insurance

'Original sinners' have no currency-trust with foreigners, hence they cannot use exchange rate fluctuations as an insurance mechanism. Unfortunately, these countries need external insurance even more than countries such as Australia since terms of trade shocks are leveraged many times by the sudden stops associated with their weak country-trust.

These countries should then look for external contingent contracts that are not dependent on domestic policy actions, or even on understanding the workings of the particular country. But such contracts should be highly correlated with sudden stops and external shocks. Good examples of these variables are the price of copper for Chile, the price of oil and an index of US activity for

Mexico, the high-yield spread in the US for most emerging markets, and so on.[16]

Importantly, such instruments would provide the needed insurance regardless of the exchange rate system and degree of fear of floating. External insurance is effectively separated from the exchange rate, thus breaking the connection between low currency-trust and limited external insurance.

3.2.2 Domestic insurance

Affected countries want to prevent banks, especially foreign-owned, from cutting back their lending in the face of exchange rate risk. They need a mechanism that will allow banks to decouple their lending activity from explicit or implicit exchange rate risk. Even if a country has limited external currency-trust, it is often the case that there is an opportunity to efficiently redistribute currency risk among domestic agents. For example, given much of their consumption and expenses are in nontradable goods domestic households, especially those with foreign assets, are likely to be willing to absorb some of the exchange rate risk. So it is important to develop the domestic currency derivatives markets to help domestic agents offset their opposing currency hedging needs and to enable banks to offload this risk onto willing residents. In time, with the gradual evolution of currency-trust, foreigners will begin to participate in this market and absorb more exchange rate risk. Interestingly, as we will describe in Section 4.2.3, a key first step for developing these markets seems to be to develop a domestic currency bond market. It also appears that this can be done quicker with public bonds than with private bonds.

Of course, in economies with limited domestic currency-trust, such as in the heavily dollarised economies, there is limited scope for such developments. In effect, dollarisation of domestic liabilities is an extreme form of the absence of a market to transfer the differential risks associated to exchange rate fluctuations.

3.2.3 Contingent macroeconomic policy

As we will discuss in the next section, clear and credible macroeconomic policies are key in the long-term process of building both country-trust and currency-trust.

In addition to adopting standard good practices on inflation targeting and structural fiscal mechanisms, authorities in emerging markets ought to analyse the interaction between these practices and the sudden stop mechanism. For example, Caballero and Krishnamurthy (2003, 2004) show how indexing inflation targeting and foreign exchange interventions to the same contingencies that are behind the external insurance discussed above, can be used to improve the private sector's incentives to take adequate precautions against external crises.

The key is to avoid providing – or generating the perception of – *free* exchange rate insurance to the private sector. Free insurance could come directly from the government, or from potential

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[16]See Caballero (2003) and Caballero and Panageas (2003).

lenders through low expected returns due to the illiquidity of domestic markets during crises. A countercyclical monetary policy, while limited in terms of its aggregate demand impact, can help alleviate the incentive problems caused by free insurance and the optimal injection of international reserves during external crises.

Of course, economies that lack domestic currency-trust cannot afford to use monetary policy, and its impact on exchange rates, as an incentive mechanism. Such countries may have to resort to taxing short-term capital inflows and imposing tight liquidity ratios on foreign borrowing. These are costly measures that ought to be recognised as yet another cost of lacking monetary credibility.

4   Building Country-trust and Currency-trust: Lessons from Australia

4.1   Overview

This section describes how Australia has, in the period since the federation of the colonies in 1901, gradually developed currency-trust and country-trust. Section 4.2 outlines the development of currency-trust through a clean inflation history, and the exchange rate not being unduly influenced by the government. It also highlights the roles that the emergence of a government bond market and later currency derivative market have played in transferring currency risk. Section 4.3 then considers the development of Australia's country-trust through a history free of defaults and the development of financial institutions.

In 1901 Australia was small, with just 3.8 million people, and had only been settled by Europeans for a little over 110 years. But thanks to large increases in wool production and the discoveries of gold after 1850 Australia was already relatively rich.[17] Governments had little stabilising role in the new country with government expenditure just 10 per cent of GDP.

Australia has always been relatively open, given its distance from trading partners, and subject to large external shocks as a result of its dependence on commodity exports. At Federation exports were around 20 per cent of GDP. The main exports were wool (42 per cent), minerals (26 per cent), wheat (6 per cent) and meat (7 per cent). On numerous occasions the terms of trade, shown in Figure 11, has doubled or halved, transmitting large shocks to the real economy. For example, the terms of trade doubled in the early 1920s leading to sustained high growth in the early part of the decade. But the subsequent reversal in commodity prices in the late 1920s is credited with triggering the Great Depression in Australia. The sensitivity to external shocks is also evident with the Korean war induced commodity price boom – notably in wool (with a five-fold price increase from May 1949 to March 1951) and metals. The surge in demand precipitated a dramatic pick-up

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[17]At the turn of the century GDP per capita was around 90 per cent of the levels in the US and the UK. Prior to the severe 1890s recession in Australia GDP per capita was around 40 per cent greater than the US (Maddison 2003).

in inflation with the resulting restrictive policies combining with a sharp reversal in the terms of trade to precipitate a short-lived recession.

As seen in Figure 13 Australia has tended to have a large demand for foreign financing with the current account often averaging around 4 per cent of GDP. However, over the course of the century, but mainly in the latter half, Australia has become somewhat less susceptible to external real shocks through a diversification in production and exports, and of its trading partners. Commodities still constitute approximately 60 per cent of exports, but the breadth of commodities contrasts with the earlier dependence on wool and gold. Agriculture has declined from being one-quarter of total output to around 3 per cent. Mining declined in importance after the 19th century gold rushes, from 10 per cent to 2 per cent of GDP by 1950, but other mineral discoveries has since seen it grow to around 5 per cent. Manufacturing grew strongly over the first half of the century so that by around 1950 its share in GDP was similar to other developed economies. There has been a gradual shift in economic relations away from Europe, and the UK in particular, toward the US and, more recently, Asia. At Federation 70 per cent of Australia's trade was with the UK, now it is around 5 per cent. Meanwhile trade with Asia has increased from around 10 per cent of total just after World War II (WWII), to over half now.

4.2 Development of Currency-trust

4.2.1 Inflation policies and outcomes

Inflation performance clearly plays a large role in developing currency-trust. If a country has a history of expropriating wealth from foreign investors through inflation they are much less likely to trust the currency. Controlling inflation has generally been a fairly high priority of Australian government policy. The result, as seen in Figure 12, has been mostly moderate inflation, averaging 4 per cent over the century, and rarely greater than 10 per cent. Indeed in the 102 years since Federation Australian inflation has only exceeded 20 per cent in one year. In contrast, inflation in Chile has been greater than 20 per cent in approximately half the years in this period.

Various policies have been used to control inflation with centralised wages, a pegged exchange rate, restrictive fiscal and monetary policies, and even tariff policy, all playing a role at some time. This commitment goes some way to explaining currency-trust in Australia.

The monetary regime in Australia over its first 100 years can be roughly divided into quarters. For the first three-quarters Australia had a fixed exchange rate, though for the first quarter this was a consequence of the banking system rather than official policy. In the middle part of the century, and particularly in the third quarter, while the exchange rate was fixed, some independence of monetary policy was possible due to the existence of capital controls. In the final quarter of the century the exchange rate became more flexible and consequently monetary policy more independent.

The government's need for funds during World War I (WWI) led the Treasury (Finance Min-

istry), who at the time were responsible for currency issuance, to quadruple the money supply over the course of the war. A consequence of this short burst of money growth was that the powerful and conservative banking sector became vehemently opposed to excessive monetary expansion. Indeed it was the private banks who imposed parity of the Australian pound with sterling up to 1931, believing it was fundamental to a sound banking system. A balance of payments crisis in 1929–30 resulted in the peg breaking. The Commonwealth Bank, the government-owned trading bank and precursor to the RBA, took control of the exchange rate and set the official exchange rate at A£1.25.

This peg held for 36 years, when there was a small depreciation. One year earlier, in 1966, the Australian currency was decimalised. The peg was switched to the US dollar in 1971 and then to a trade weighted basket of currencies in 1974. From 1976 it became a more flexible crawling peg subject to daily adjustment. Monetary policy was then directed by the publication of projections for M3. In 1985 this was replaced by a flexible 'checklist approach' to the formulation of monetary policy.[18]

In 1983 sharp capital inflows precipitated the float of the Australian dollar. While the RBA has intervened in the foreign exchange market since then, it has done so to minimise overshooting rather than target particular values of the exchange rate. In fact the Australian dollar is considered among the most cleanly floating currencies. Importantly for the development of currency-trust the clean float means that investors can be confident that the authorities will not deliberately pass currency risk onto foreign investors. Indeed the exogeneity of currency risk is demonstrated by the close correlation the Australian dollar has had with commodity prices over the floating era (Chen and Rogoff 2003). The Reserve Bank of Australia adopted an inflation target, of 2–3 per cent on average over the course of the cycle, in 1993.

Australia had a centralised wages system for much of the past century. Wage setting was done by an independent arbitration court but wages policy has nonetheless often focused on controlling inflation outcomes and boosting economic performance. Wages were indexed in several episodes, though indexation never contributed to high inflation becoming entrenched as it has in some other countries. Indeed the concern that indexation could lead to high inflation led to the modification or abolition of indexation on several occasions. For example, following the depreciation in 1985 indexation was discounted by 2 percentage points to avoid a price-wage spiral.

The result of this commitment to controlling inflation over the first half of the century was moderate, though volatile, inflation. Short bursts of inflation following the end of WWI and during WWII did not last more than a few years.

The first episode of significant inflationary pressure followed WWII. Pent-up demand led to inflation accelerating to just under 10 per cent by the end of the decade. Increased commodity export earnings from the Korean war boom, along with untimely policy changes, precipitated a

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[18]The checklist consisted of inflation, the nominal exchange rate, interest rates, the balance of payments, monetary aggregates and the general state of the economy.

sharp spike in inflation in 1950–51, peaking at 25 per cent.[19] But high inflation was not sustained so that this episode if anything demonstrated a commitment to moderate inflation aiding the development of currency-trust. The collapse in the terms of trade and export volumes, combined with tightened fiscal policy in late 1951, contributed to a short recession in 1953 with inflation returning to single digit rates.

The 1970s oil shocks further increased already rising inflation. Pagan (1987) describes the contractionary monetary and fiscal policies of the 1970s as an 'inflation first' focus. It was thought growth could only resume once inflation was controlled. However, inflation remained stuck around 8-10 per cent. The attempt to reduce inflation in the 1980s with wages policy, the *Prices and Incomes Accord*, was somewhat successful according to Hughes (1997). Though as Carmichael (1990) notes, it was probably less so than hoped. Inflation, while less than 10 per cent, was still seen to be too high. After the large fall in inflation in the early 1990s recession, policy makers took the opportunity to lock in low inflation with the RBA adopting an inflation target in 1993. Since then the inflation rate has averaged around $2\frac{1}{2}$ per cent, the middle of the inflation target.

4.2.2 The government debt market

Development of currency-trust also requires that foreign investors can take on local-currency risk on terms with which they are comfortable. Typically this will mean taking on the simplest form of local-currency risk – that is absent of default risk and other forms of risk. If sovereign risk is low, the government debt market can fill this role, and so play a crucial role in inducing foreigners to hold the local currency. In this section we outline the development of the Australian government bond market in order to draw out lessons on establishing a liquid debt market in which foreigners will comfortably participate.

The issuance of government debt began in earnest in the last quarter of the 19th century as the colonial governments undertook greater spending on public infrastructure. Mauro, Sussman and Yafeh (2000) show that from 1875 to 1905 the value of Australian government bonds trading in London increased more than five-fold. Their share of total government bonds in that market increased from 1.4 per cent to 5.6 per cent. By Federation the Australian states already had outstanding debt equal to their combined GDP. The Commonwealth Government did not issue debt until 1911, and apart from substantial issuance in the two World Wars, the Commonwealth did not have big increases in indebtedness, as seen in Figure 14. The states remained responsible for the majority of Australian government debt.

At the turn of the century just 15 per cent of the states' outstanding debt had been issued into the domestic market, with the remainder issued in London (in sterling). The colonies had easy access to the London capital markets and were able to borrow on favorable terms with low interest

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[19]Contributing policy changes include an increase in the legislated minimum wage, the relaxation of price controls, and the effective depreciation resulting from the devaluation of sterling in September 1949.

rates and long maturities.[20] These favorable terms, and the small supply of domestic savings, led the governments to favour issuing debt in London. New South Wales and the Commonwealth made the first major forays into the New York market between 1925–28, when access to the London market was restricted. Thereafter, abstracting from periods when one or the other market was closed, both sources of international funds were used.

The first sharp increase in Australian government indebtedness after Federation occurred in WWI. The Commonwealth Government ran large fiscal deficits to cover war costs (total government deficits averaged 12 per cent of GDP during WWI). While the government increased taxes and monetised part of the deficit, it also issued substantial new debt. With the London market all but closed much of the new debt was issued in the domestic market, and so in domestic currency. Total government debt had increased to almost 125 per cent of GDP by the end of the war. After the war the Commonwealth Government issued more debt abroad, taking advantage of longer maturities and a larger supply of funds. This resulted in an increase in the proportion of Commonwealth debt domiciled abroad.

For much of the Great Depression era debt markets it was not possible to issue new debt. Rather, most of the increase in the ratio of debt to GDP seen in Figure 14 is the result of the 30 per cent decline in nominal GDP. The Commonwealth Government again issued large amounts of debt in WWII. As in WWI, this was mostly in the domestic market due to the effective closure of international markets. Repeating the post WWI patterns, the Commonwealth Government turned to the international market for its financing after WWII, leading to a decline in the proportion of Commonwealth debt issued domestically.

What is striking in Figure 14, is that the State governments' move toward domestic issuance was gradual through the century, despite large fiscal shocks. This suggests the domestic bond market was progressively developing with the states taking advantage of the cheaper domestic funds as the market grew large enough.[21] Indeed the fact that interest rates on domestic government debt tended to be lower than those on foreign debt suggests that, apart from the benefits of longer maturity available abroad, governments tended to borrow abroad because of the small size of the domestic market. By the late 1970s almost all of the States' debt outstanding debt was domiciled domestically, in Australian dollars.

In the second half of the century the ratio of government debt to GDP declined fairly steadily. This was largely due to strong economic growth, though smaller government deficits played some part.

It was not until the 1980s that foreigners began to hold Australian dollar denominated debt.

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[20]The British *Colonial Stock Act of 1900* enabled many trust funds to purchase Dominion bonds, giving the Dominions an even greater advantage over many domestic borrowers. Australian governments were able to issue long-dated debt from early on. In 1913 their fixed-maturity debt had an average maturity of just under 18 years, while 6 per cent of debt had been issued as perpetuities.

[21]An alternative interpretation is offered by Bordo at al (2003). They argue that the development of the domestic market for government bonds accelerated in those periods in which international markets were closed.

Australian government foreign borrowing had always been in foreign currencies. Australian dollar debt (issued in the domestic market) had always been held by domestic residents. In 1980 less than 1 per cent of this domestic debt was held by foreign residents. However, over the late 1980s and early 1990s the proportion of Commonwealth debt held by non-residents rose, even as the government rebalanced its issuance to Australian dollar denominated debt. Many commentators, including Stebbing (1994), have attributed foreigners' decision to hold Australian-dollar debt to the financial deregulation that started in the late 1970s. Deregulation reduced the captive market for government debt and made yields market determined. The resulting higher yields on Australian bonds were then more attractive to foreign investors. Since the mid 1990s around one-third of Commonwealth debt, all of which is now denominated in Australian dollars, has been held by foreigners.

4.2.3 The development of currency derivative markets

Another key to establishing currency-trust is that domestic agents are able to spread foreign-currency risk to those most able to bear it. This is facilitated by a currency derivative market. The derivative market also provides an additional avenue for foreigners to take on pure local-currency risk. Indeed foreign investment in the bond market and foreign holdings of derivative exposures require the same willingness to hold domestic-currency risk. In this sense, the capability to develop credible money and bond markets would seem to be a prerequisite for an active derivatives market. As described in Section 2.3.2 there is a very active Australian dollar derivative market. In this section we outline how this market was established.

From 1939 the Commonwealth Bank provided forward cover to domestic residents engaging in international trade. Following the breakdown of Bretton Woods in 1971 growing exchange rate volatility increased the demand for currency hedging. The official market was highly restrictive; it could only be used by domestic residents within 7 days of incurring a currency need from international trade. This left residual demand for hedging from capital flows, and for speculation and arbitrage. A foreign-currency futures contract started trading on the Sydney Futures Exchange (SFE) in 1980 after being initially proposed almost a decade earlier. A broker-based non-deliverable hedging market, which brought together two companies with opposite future currency needs grew in size from the mid 1970s, with turnover ultimately reaching levels similar to the physical market. So the market for currency risk was developing prior to the float of the Australian dollar.

The RBA ceased to provide forward cover around the time of the float of the Australian dollar in December 1983. Domestic trading banks began to provide this service in their own right. The experience gained through the 1970s, and the significant knowledge of commodity derivatives, helped the market to grow. The existence of a liquid yield curve assisted pricing derivatives of any maturity. Continuing financial deregulation and increased financial sophistication saw the currency derivative markets grow steadily through the 1980s. The growth in the currency derivative market was also underpinned by the spot market for the Australian dollar being highly liquid from

shortly after its float. By 1991 the turnover in foreign exchange swaps involving the Australian dollar exceeded that in the spot market, as seen in Figure 15.[22] Anecdotal evidence suggests the participation of foreigners followed shortly after their participation in the government debt market.

4.3 Development of Country-trust

4.3.1 Default history

Demonstrating the commitment to repay debt, especially foreign debt, is important in developing country-trust. Australia has a long history of nurturing this trust with no experiences of default by the Federal or State governments. This record was not achieved easily. Notably in the Great Depression Australia had large debts and was subject to large shocks. Indeed, Australia was one of few countries heavily indebted at the outset of the Depression that did not subsequently default. We outline this experience to demonstrate the commitment required to develop country-trust.

Debt servicing costs rose in the late 1920s, doubling to almost 30 per cent of export revenue, due to the growing debt and slowing exports. By 1929 New York was no longer lending to Australia and loans from London had a substantially shorter maturity.

Premier Lang of the state of New South Wales (NSW) proposed renegotiation of external debt, so that the interest on war debt be halved to the rate charged to Britain by the US, and the abandonment of the gold standard. His plan was rejected by the state premiers, while the proposal of Treasurer (Finance Minister) Theodore was vetoed by the government-owned but semi-independent Commonwealth Bank on the grounds it was inflationary. After substantial deliberation, the 'Premiers' Plan' was signed in 1931. It cut government expenditure by 20 per cent, increased taxes and duties, and cut domestic bank interest rates and the interest paid on existing domestic, but crucially not foreign, debt.[23] The Premiers' Plan was significantly contractionary at the worst possible time but, as Schedvin (1970) notes, such drastic action was felt necessary to avoid default on government debt.

Default was seen to be a real possibility and the largest state, NSW, didn't meet interest payments on overseas debt from April to June 1931. However, the Commonwealth Government and Commonwealth Bank were keen to protect the rating of Australian governments and, because of the centralised structure of government borrowing, made the interest payments on behalf of NSW.[24] The Commonwealth Government withheld revenue from NSW to compensate for the missed interest payments. Largely because of this episode, Premier Lang was dismissed in 1932 by the

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[22]The pick-up in swaps toward the end of the 1990s is exaggerated somewhat by the RBA's use of swaps to conduct open market operations in the face of declining liquidity in government securities markets.

[23]The conversion of domestic government debt to lower interest rates was voluntary but a large propaganda campaign led to 97 per cent of borrowers taking up the new loans with longer maturities and interest rates reduced by $22\frac{1}{2}$ per cent. The 3 per cent of 'dissenters' ended up having their debt compulsorily converted.

[24]The Loan Council, formed in 1923, facilitated the coordination of government borrowing. The Council was formalised later in the 1920s with government debt amalgamated and state debt explicitly guaranteed by the Commonwealth.

state Governor.

4.3.2 Development of institutions

The quality of institutions and stability of the financial system play a key role in establishing country-trust. The structure of many institutions in Australia were adopted from Britain. In particular Australia has a stable bi-cameral political system and an independent judiciary. This framework and good governance have enabled the development of sound legal and bankruptcy procedures. For example, Australia ranks very high in the *Legal Structure and Security of Property Rights* component of the *Economic Freedom of the World* report (Gwartney and Lawson 2003). Indeed Australia's ranking has steadily increased over the past three decades, to being equal first in 2001, while Chile's is much lower (equal forty-fifth). Related to legal structure, transparent and thorough accounting standards also work to instil confidence in foreign investors and so contribute to the development of country trust.

The stability of the financial system is also crucial. In particular the development of a stable banking system in Australia has assisted in developing country-trust. As we discussed in Section 2.3.2 banks also play an important role in using currency-trust and currency derivatives to smooth external shocks through foreign borrowing.

Schedvin (1970) argues that the banking crisis of the 1890s, in which most banks suspended payments and had to restructure, shaped banks' conservatism thereafter. Despite this crisis, the financial system was highly developed at Federation following the rapid economic growth in the second half of the 19th century. Indeed it was not far behind the US and UK, and well ahead of Latin American countries; bank assets were already 70 per cent of GDP, while those of all financial institutions were 107 per cent of GDP, and M3 was around 60 per cent of GDP. The total financial sector was relatively stable over the 80 years after Federation, with total assets fluctuating between 80 and 100 per cent of GDP. Financial deregulation through the 1980s, discussed by Battellino and Macmillan (1989), led to the rapid expansion of the financial sector with total assets to GDP more than doubling over twenty years.

5   Concluding Remarks: Lessons for the Region at Large

In this paper we have distinguished between two inter-related dimensions of investors' confidence, country-trust and currency-trust. Doing so assists us to extract from the experiences of Australia and Chile lessons on how to improve the resilience of Latin America to external shocks. Chile is a good starting point because it has already resolved most other forms of instability, and hence it allows us to isolate the external problem more cleanly. It is then possible to discuss how additional constraints, such as extensive dollarisation or very weak monetary credibility modify or limit the set of policies available.

There are several lessons for those economies that have only limited monetary credibility problems with residents. In building country-trust, the experience of Australia reinforces the obvious: a long history of sound institutions and non-opportunistic policies are important. Much of Australia's trust was generated by experiencing several substantial external shocks without defaulting. Clearly this was not the easy course of action at the time, and populist options – such as that of Premier Lang during the Great Depression – must have been tempting. But Australia did not behave myopically, and the rewards could not be clearer today. This contrasts with Argentina, a country with similar potential at the beginning of the 20th century. Another central pillar in Australia's external trust appears to be a solid and conservative banking system, which learned the lessons of the banking crises at the end of the 19th century. These banks play a key role today in intermediating external resources into Australia, particularly when external conditions deteriorate.

Building currency-trust is also mostly a matter of common sense. It requires a good history of inflation, and a clear framework governing monetary policy and the exchange rate. Inflation has been under control for most of Australia's history – at least relative to Latin American standards. Recently the clean float has contributed substantially to the external holding of Australian dollar denominated instruments, a trend that dates back only to the 1980s. Today currency movements in the Australian dollar have a large exogenous component related to movements in commodity prices and the terms of trade. Therefore, not only is currency risk 'exogenous' to Australian policy makers, but it is also highly correlated with the price of commodities, which is a widely marketed risk. In contrast, Cashin, Cespedes and Sahay (2002) fail to find a significant correlation between a similar index of commodity prices and the real exchange rate in Chile (at least over the 1980–2001 period). This is surprising, given that if anything commodities make up an even larger share of Chile's exports.[25] One explanation for the lack of correlation in Chile lies in domestic policies. In the early 1980s the exchange rate was fixed, while later the exchange rate was subject to bands. The narrowing and widening of exchange rate bands during the turmoils of the end of the 1990s is another example of intervention. The Chilean peso risk then has a larger 'endogenous' component than Australian dollar risk. It is then subject to the usual concerns about moral hazard, time inconsistency, and so on. This makes it easier for Australians to find willing external buyers for Australian dollar risk. Not only is the risk 'exogenous' to Australian policy makers, but it is also highly correlated with the price of commodities, for which substantial futures markets exist. In a sense, the problem is not that the Chilean peso has been a commodity currency, but that commodities have played a relatively small part in peso-fluctuations. In recent years Chile has begun moving to an Australian-style commodity price driven free float.

Sound and clear macroeconomic policies are not enough. Foreign investors need a liquid market in which they can take on currency risk with only limited exposure to other risks, such as credit risk. Countries with sound public finances can do this by developing a domestic public bond

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[25] For the period 1990–99, for example the commodities included in the index amount to 58 per cent of total exports in Chile and 54 per cent in Australia.

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market in domestic currency (which could be indexed to the CPI, such as with Chile's Unidad de Fomento).[26] Initially, as in Australia, these bonds will have high premia and the country must be willing to pay that cost. It is also likely that initially most of the holding will be done by domestic institutions which are less concerned with currency risk. Over time, if appropriate macro policies are implemented, as the country develops currency-trust foreigners be enticed by the high yields and will progressively hold a larger share of these bonds. The currency premia should then fall to 'reasonable' levels.

It is only a step from the adoption of sound monetary and exchange policies, and the development of a good set of benchmark bonds, to the development of a currency-derivatives market. Initially, such development may reduce foreign exposure to currency risk since foreigners may increase their participation in the local bond market but unload the currency risk. Assuming the country does develop currency-trust, this will only be a transitory cost. This cost is likely to be more than offset by the benefits of increased participation by foreigners in domestic financial markets and enabling domestic banks to eliminate currency-mismatch risk from their books. This should reduce the destabilising role played by banks during external shocks in Latin America.

There are several measures that can be undertaken to reduce external vulnerability while these institutions and markets are developing. In particular, external insurance can be designed to be indexed to contingencies that are highly correlated with external shocks, but are not under the direct control of the country and so subject to moral hazard, for example commodity prices. Only this incomplete form of insurance is possible when there is a lack of currency-trust and country-trust. Complete insurance, for example linked to domestic GDP or the local currency, can only be obtained when both kinds of trust exist. Over time, as trust is built, the mix of external insurance can be gradually shifted toward contingencies that include some endogenous factors, such as the local currency or GDP.

Similarly, the macroeconomic policy framework should not only be made as transparent and consistent as possible, but also it should be used to align private incentives with the aggregate risks that private decisions generate. Such objectives can be achieved, for example, by indexing specific macroeconomic policies to the same contingencies used to build external insurance. For example, faced with a temporary shortage of foreign currency, it is optimal for the central bank to inject international reserves into the domestic economy. However, if private sector agents expect that this policy will be used in a crisis, and therefore anticipate the exchange rate will be stable, they will engage in excessive foreign currency borrowing. Hence, injections of international reserves during crisis periods should be accompanied by an expansion of the domestic money supply. By doing so, the central bank prevents the free insurance aspect of a strong exchange rate defence, but is still able to relax the international financial constraint faced by the private sector.

Most of these recipes also apply to dollarised economies, or economies where lack of monetary

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[26]Note that the external insurance required is against shocks that depreciate the real exchange rate, not inflationary shocks per se. This is the reason UF instruments would work as well.

credibility with residents is widespread. This is true even though in such cases there is no hope of using monetary policy to provide adequate private incentives, or developing extensive derivative markets. These aspects of the plan need to be substituted in the transition by costlier measures such as taxes on certain capital inflows and large international liquidity ratio requirements for domestic banks. Similarly, the development of a domestic debt market in local currency is likely to be too expensive to develop quickly, without being preceded by a clear effort to develop sound institutions and implement a transparent and credible macroeconomic policy program. Once these are implemented, there is no ready substitute for the passage of time. On the other hand, these economies have all the more reason to accelerate the development of external insurance mechanisms as described above, which may even be developed and fostered in domestic markets to improve the allocation of risks among residents.

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Figure 1: External Shocks

Figure 1: External Shocks

1
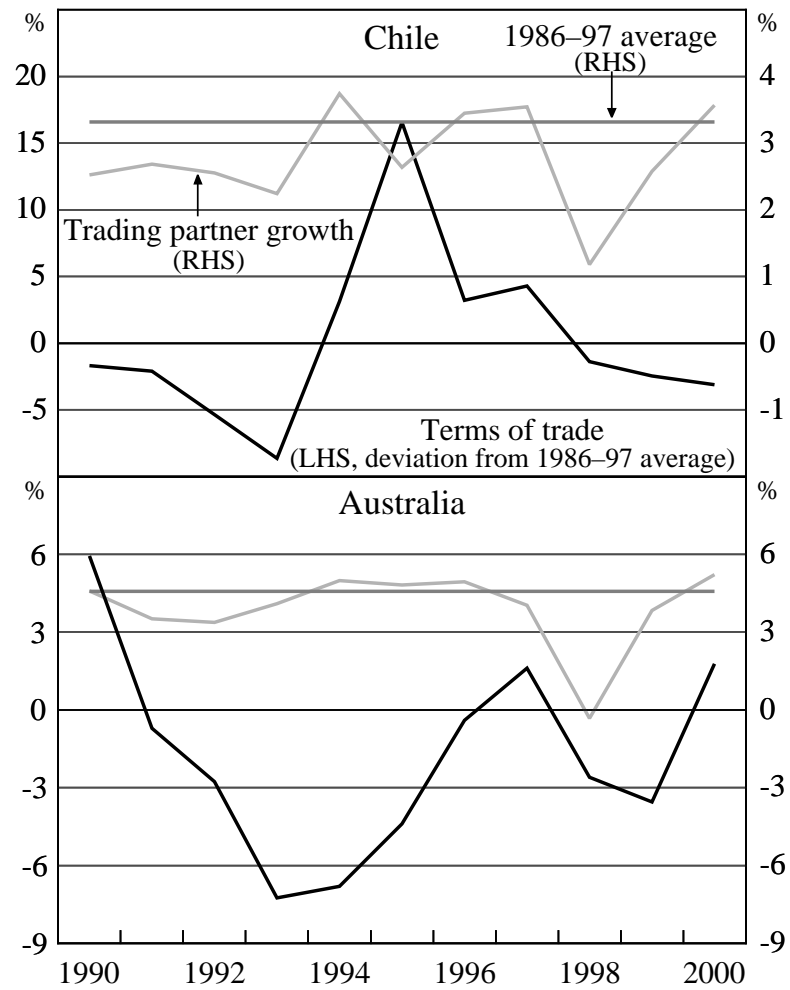
Figure 2: GDP and Current Account Deficit
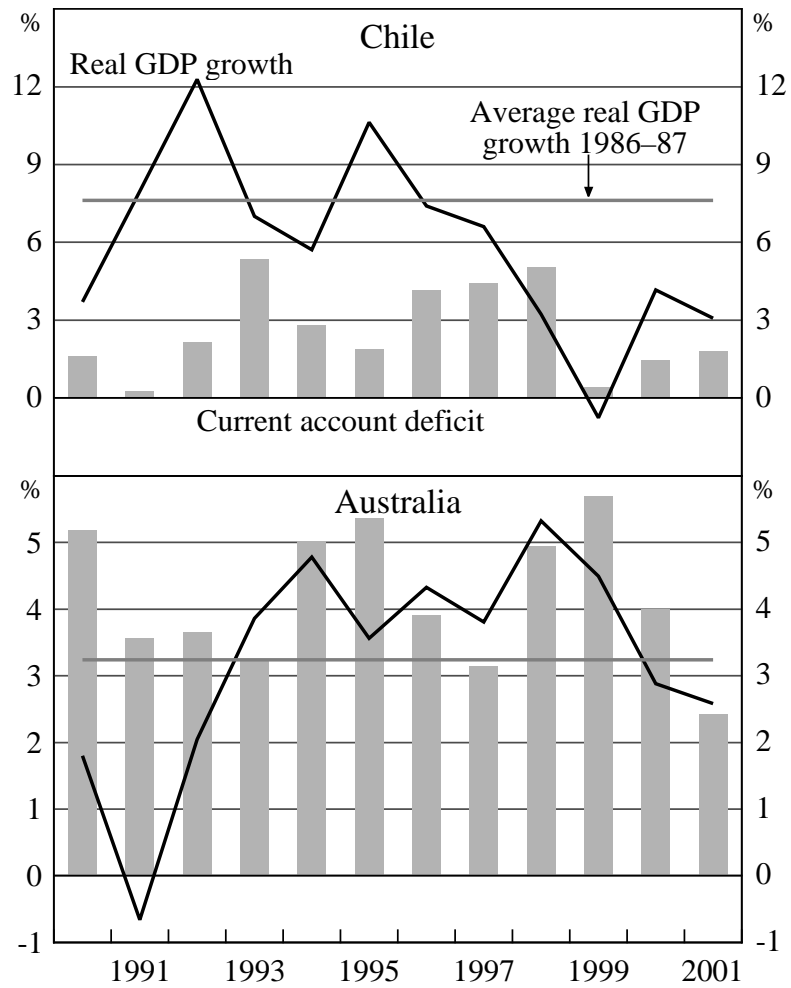
Figure 3: Interest Rates and the Real Effective Exchange Rate 1990-02

Interest rates

%

16

12

Chile 90-day loan rate

8

4

Australia 90-day bank bill rate

Index

Real exchange rates
1995 = 100

120

Australian dollar

110

100

90

Chilean peso

80

70

1990   1993   1996   1999   2002
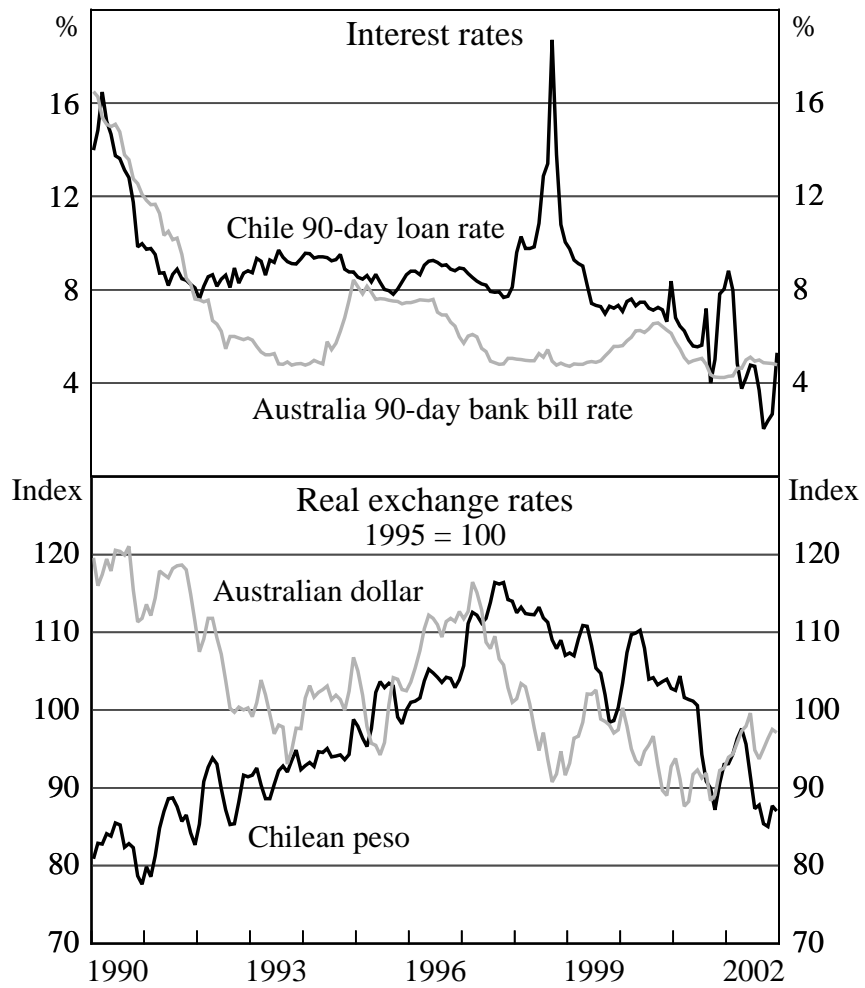
Figure 4: Chilean corporate risk premium
Spread over T.Bills (basis points)
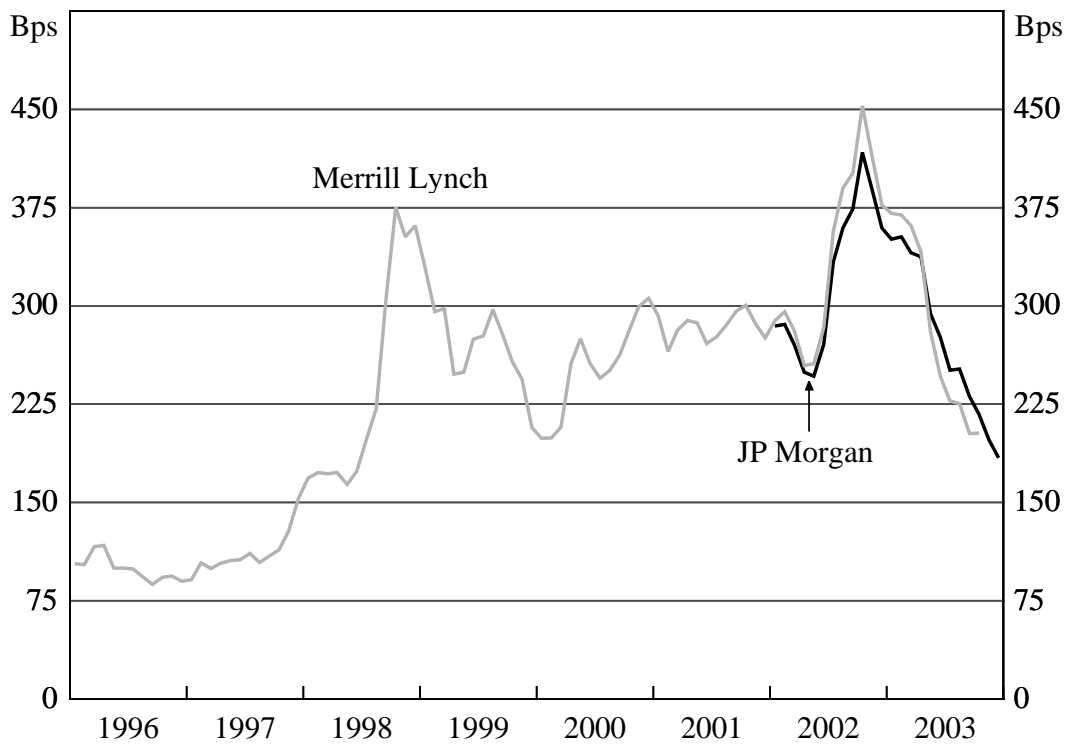
Figure 5: Capital flows
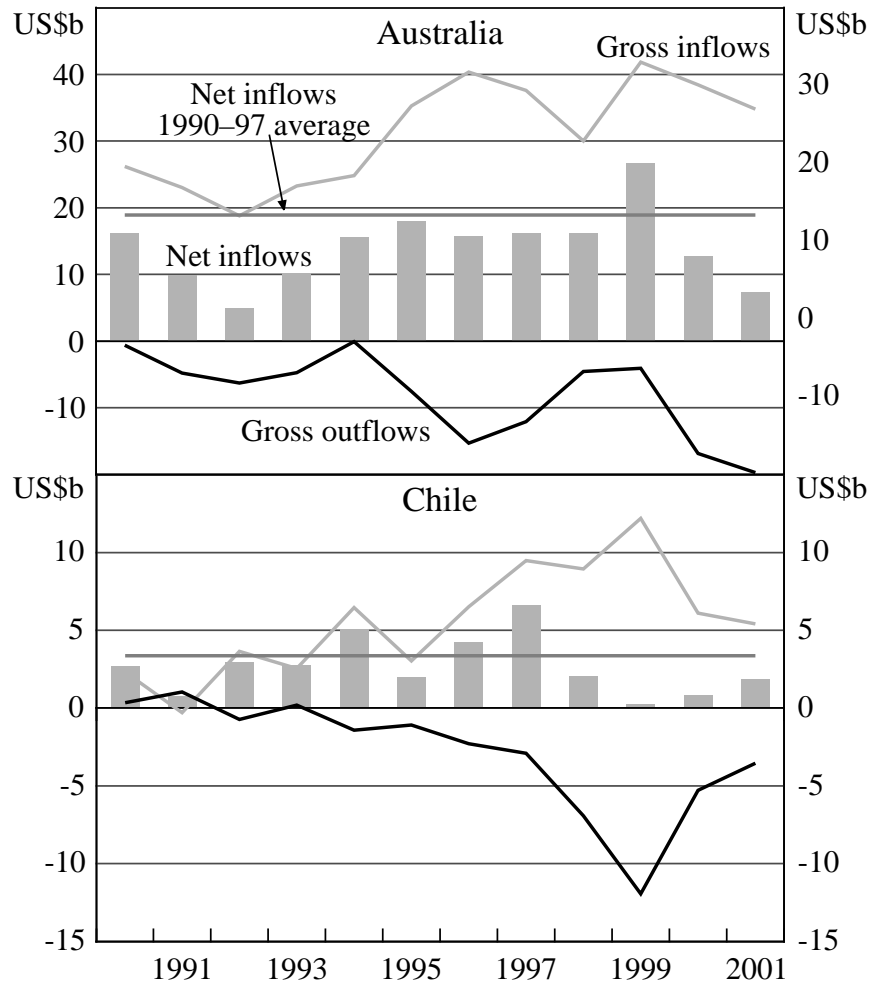
Figure 6: Net International Investment Position Chilean Private Sector
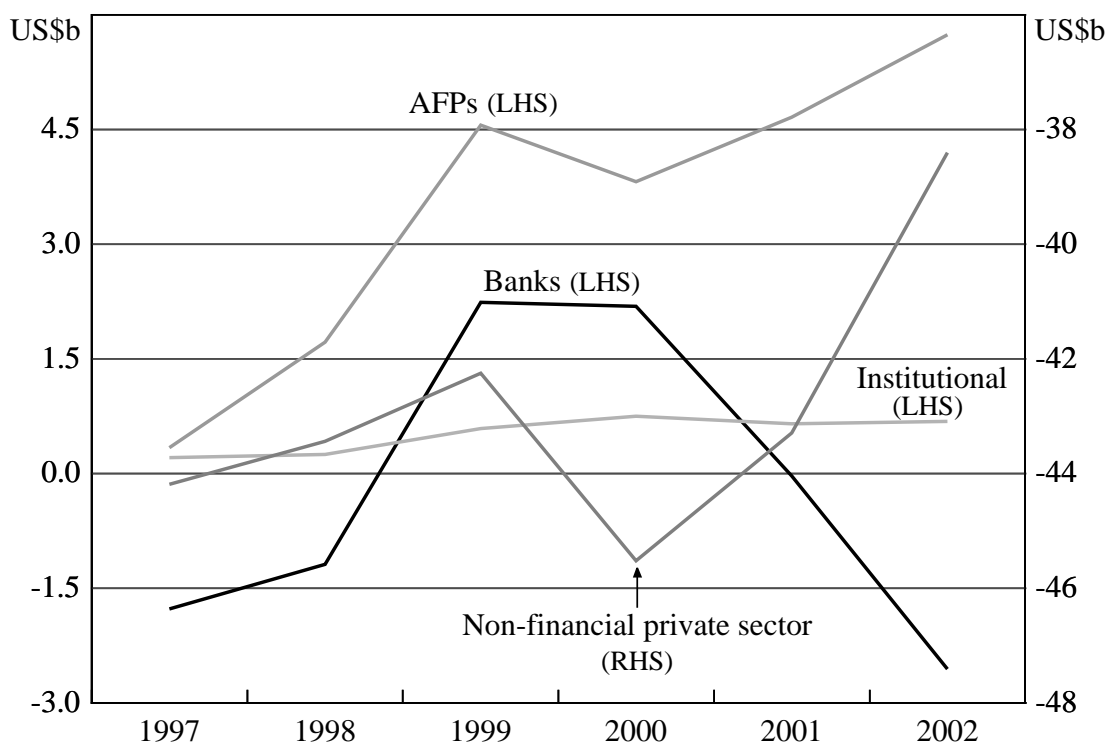
Figure 7: Foreign Assets Holdings of Chilean Pension Funds

1997 exchange rate –
per cent of total assets

Legal limit –
per cent of total assets

Per cent
total assets

Per cent of GDP

% 20 16 12 8 4 0

1996   1998   2000   2000   2002
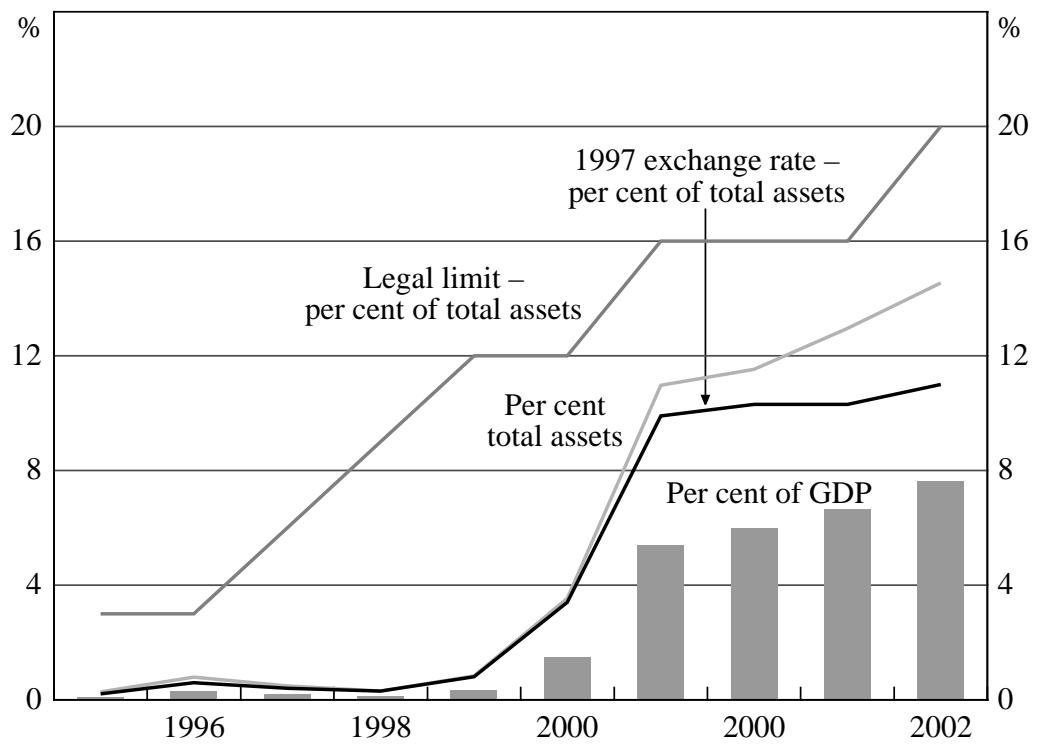
Figure 8: Banks: Foreign assets as a proportion of total assets
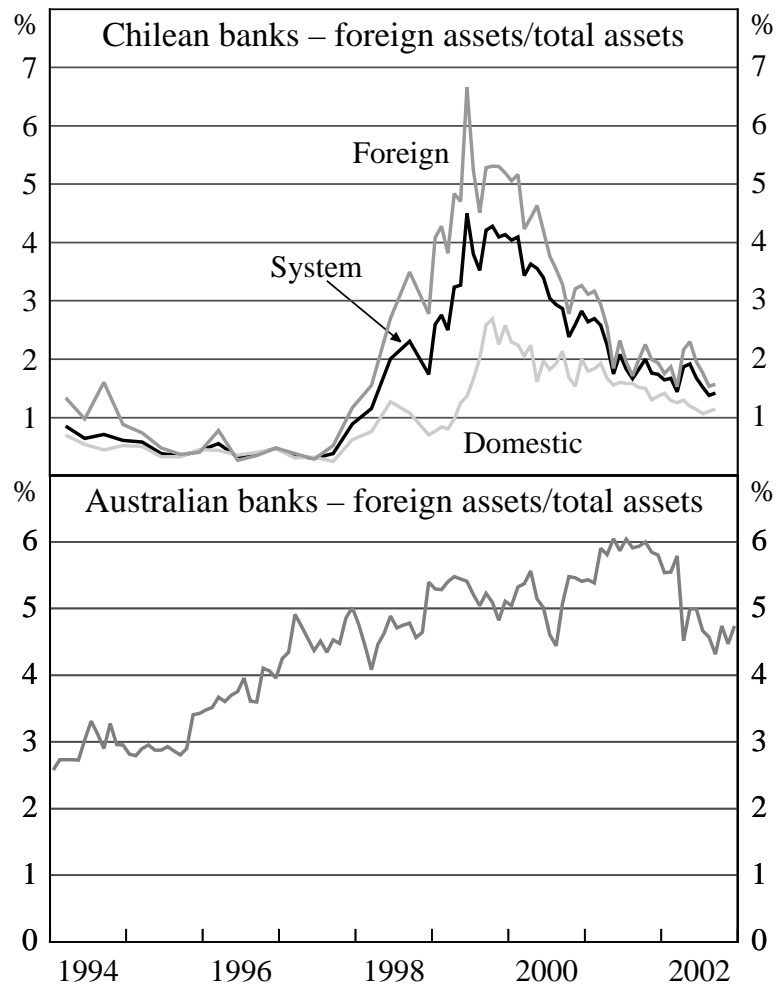
Figure 9: Share of Foreign Currency Debt over Total Debt
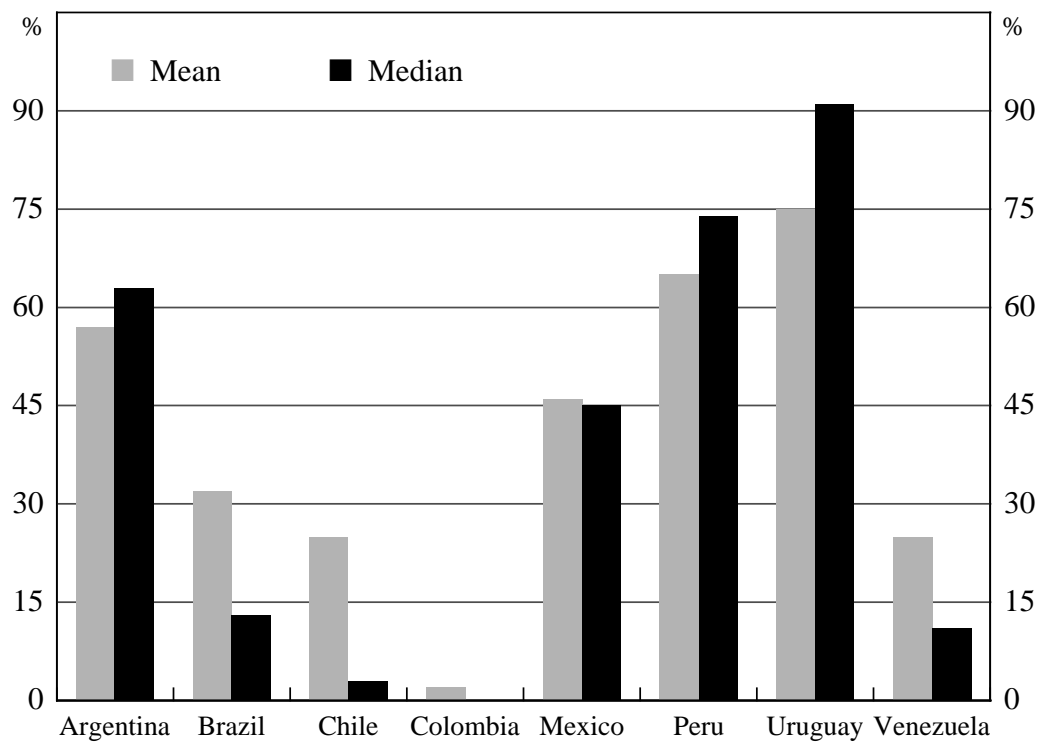
Figure 10: The Australian Economy: Real

Real GDP growth

% ... %

Terms of trade
2001/02 = 100

Index ... Index

Trade
Per cent of GDP

% ... %

Exports

Trade surplus

1904   1924   1944   1964   1984   2004

Figure 11: The Australian Economy: Nominal

CPI inflation

Exchange rates

A$ per pound sterling

A$ per US dollar

Interest rates

Bond yields

Retail bank rates

1904   1924   1944   1964   1984   2004
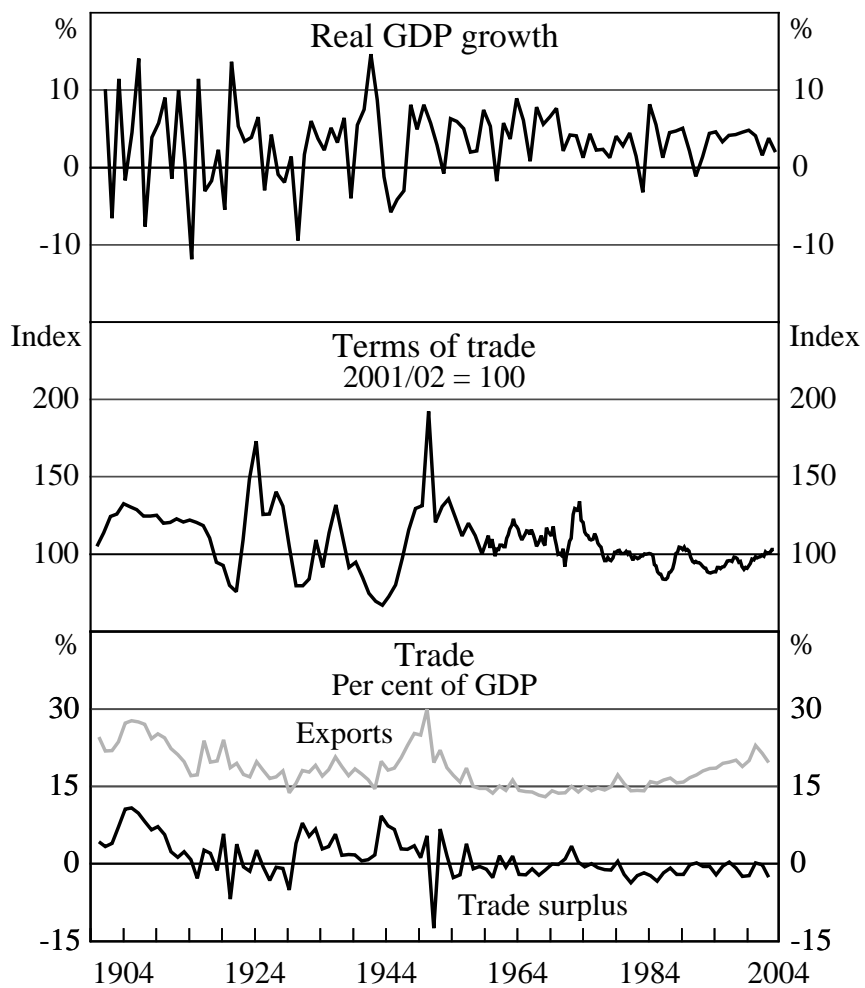
Figure 12: Australian current account
per cent of GDP

Figure 13: Australian Government Debt

13

Figure 14: Australian dollar turnover in the Australian foreign exchange market
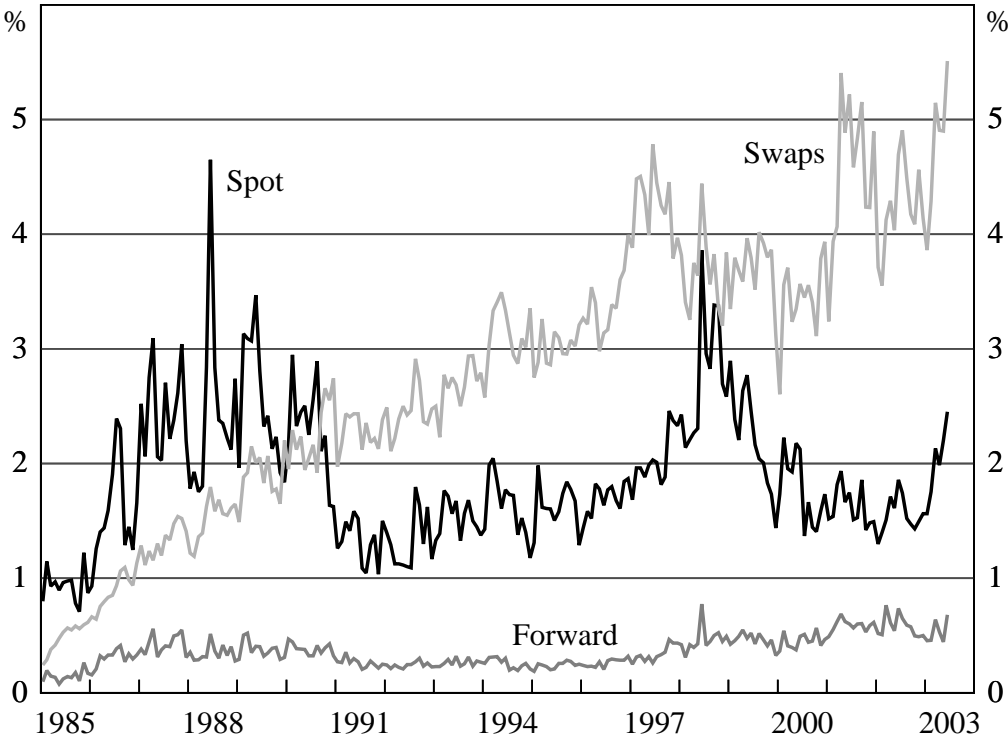
Table 1: International Investment Position 1997
per cent of nominal GDP

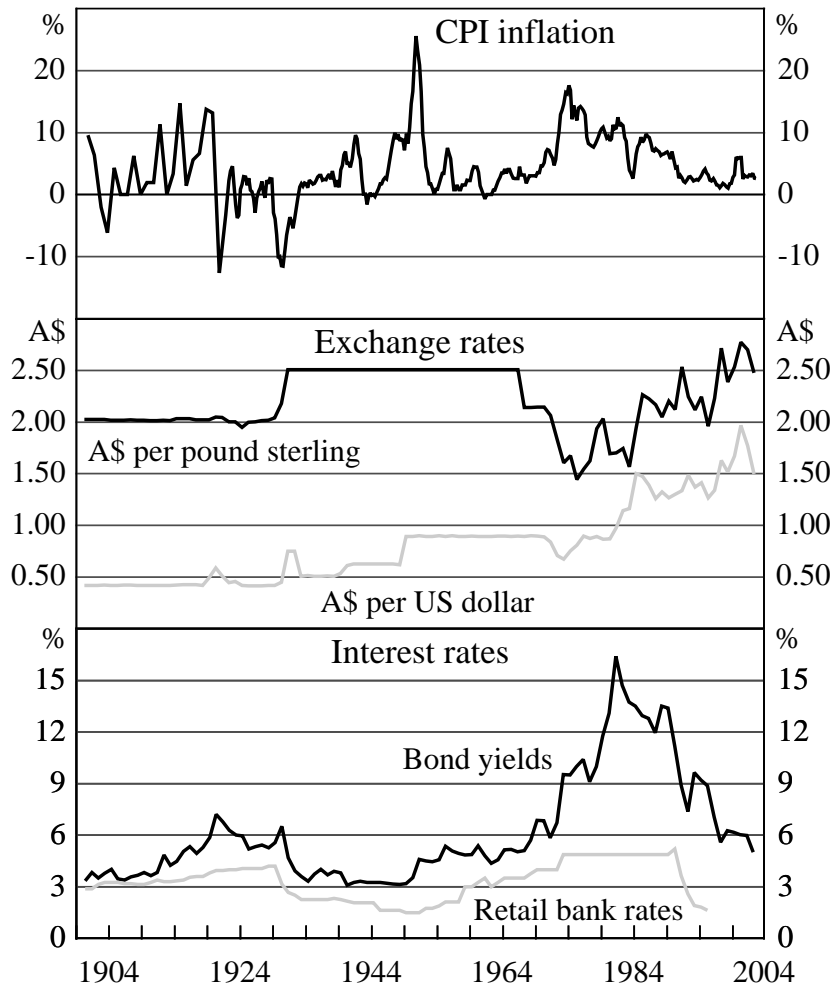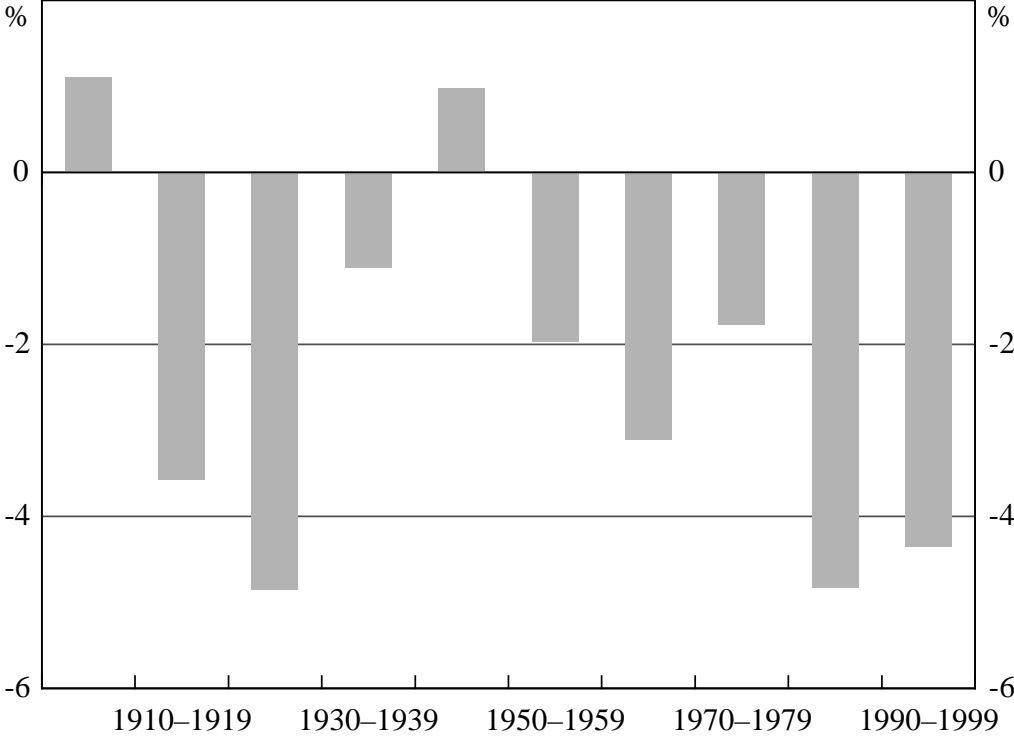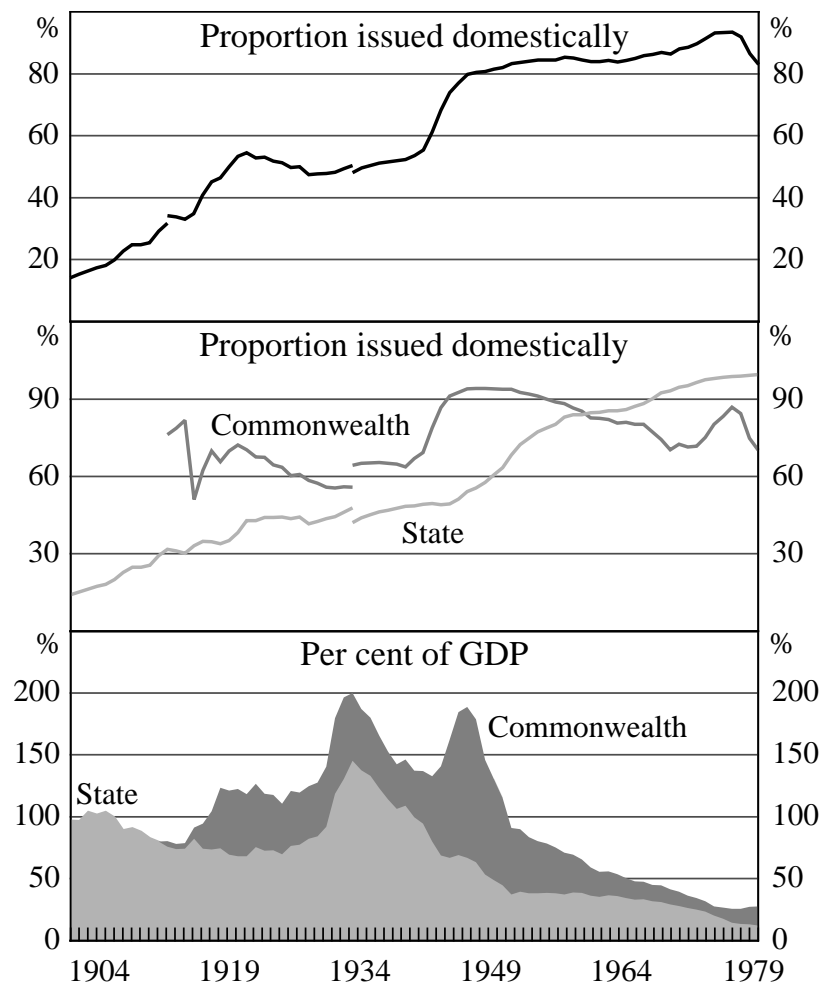|	Chile			Australia		
	Gross Assets	Gross Liabilities	Net Liabilities	Gross Assets	Gross Liabilities	Net Liabilities
Private sector:						
Banks						
Debt	1.4	3.0	1.6	4.8	22.3	17.6
Portfolio Equity	0.0	0.6	0.6	0.1	2.5	2.4
Non financial private sector						
Debt	11.6	21.6	10.0	4.6	18.9	14.3
Portfolio Equity	1.1	8.0	6.9	7.7	12.6	4.9
FDI	6.2	41.7	35.5	16.5	28.9	12.4
Private Sector						
Debt	13.1	24.6	11.6	9.4	41.2	31.8
Portfolio Equity	1.1	8.6	7.5	7.8	15.1	7.3
FDI	6.2	41.7	35.5	16.5	28.9	12.4
Total	20.3	74.9	54.6	33.7	85.3	51.5
Government						
General Government	0.6	5.8	5.2	0.3	8.8	8.5
Central Bank	22.1	0.2	−21.9	4.3	0.0	−4.3
Total	22.7	6.0	−16.7	4.6	8.8	4.2
Total	43.0	80.9	37.9	38.4	94.1	55.7

Memo items:

	Chile	Australia
Share of private sector offshore bonds in local currency :	100	76
Share of public sector offshore bonds in local currency :	100	63
Share of foreign currency deposits in total deposits :	3.5	-

Sources: Central Bank of Chile, IMF (2003) Balance of Payment Statistics and International Financial Statistics. Bond currency composition data is from Eichengreen et al (2003), share of foreign deposits is from De Nicolo et al (2003).

Notes: Debt = portfolio debt + loans + commercial loans + currency and deposits. General Government corresponds to Central Government plus Other Public Sector.

Table 2: External Debt 1997 (Selected Countries)

	as a per cent of GDP			
	Total foreign debt D*	Total foreign debt in foreign currency D*US$	Net foreign debt in foreign currency D*US$ − A*	Net foreign debt in foreign currency minus reserves D*US$ − A* − R*
Chile	27	27	13	−9
Australia	47	34	23	19
New Zealand	60	57	47	40
Canada	70	57	30	27
Israel	53	53	35	15
LAC	70	70	23	8

	as a per cent of exports			
	Total foreign debt D*	Total foreign debt in foreign currency D*US$	Net foreign debt in foreign currency D*US$ − A*	Net foreign debt in foreign currency minus reserves D*US$ − A* − R*
Chile	125	125	61	−41
Australia	291	209	142	116
New Zealand	280	266	218	187
Canada	206	168	87	79
Israel	238	238	157	68
LAC	299	295	140	57

Source: IMF (2003) International Financial Statistics, BIS, and World Bank (2002) World Development Indicators.

Notes: D* (total foreign debt) = debt securities liabilities + other investment liabilities. D*US$ (foreign debt in foreign currency) = D* adjusted by the share of external debt in foreign currency from Eichengreen (2003). D*US$ - A* (net foreign debt in foreign currency) = D*US$ minus foreign assets, where assets are defined as the sum of debt securities assets and other investment assets. D*US$ - A* - R* (net foreign debt in foreign currency minus reserves) = D*US$ - A* minus reserves. The data of liabilities and assets were extracted from IFS International Investment Position. LAC (Latin American countries) includes: Argentina, Colombia, Costa Rica, Panama, Peru, Uruguay and Venezuela.

Table 3: Firm Level Determinants of Dollar Debt in Chile 1997

	dependent variable: dollar liabilities / total liabilities		
	(1)	(2)	(3)
tradable sector dummy	0.134***	0.117**	0.072
	(0.043)	(0.046)	(0.048)
export dummy			0.134***
			(0.051)
exports / sales		0.290**	
		(0.120)	
size (ln[assets])	0.053***	0.057***	0.047***
	(0.008)	(0.009)	(0.083)
Obs	232	232	232
R^2	0.22	0.29	0.25

Source: Author's calculations based on data from Cowan and Kamil (2004).

Notes: Robust standard errors reported in parenthesis. Sample includes publicly listed firms only. ***, *** and * indicate significance at 1, 5 and 10 per cent levels respectively.

Table 4: Firm Level Currency Mismatch Australia and Chile

	Derived mismatch m_{it} (per cent)			
	Australia		Chile	
	Mean	Median	Mean	Median
Non Tradeable	−1.19	0.00	0.33	0.13
Tradeable	5.50	0.00	4.85	2.31
Total	2.38	0.00	3.00	1.13

Source: Authors' calculations base on Bloomberg data.

Note: Derived mismatch is foreign currency liabilities net of foreign currency assets as a ration of total assets.

Table 5: Turnover in derivative markets, 2001

	Chile	Australia	Latin America	Emerging excluding Latin America	Developed excluding Australia	*Chile (1998)*
Derivative turnover as a per cent of:						
spot currency turnover	0.4	3.1	0.5	1.2	2.5	*0.6*
trade flows	4.4	78.1	2.1	6.7	32.3	*3.2*
trade + capital flows	3.3	58.2	1.7	10.0	23.3	*2.5*
GDP	2.2	25.1	0.7	5.4	27.4	*1.5*
Derivative turnover with non financial agents as a per cent of GDP	0.4	1.6	0.1	0.3	1.8	*0.1*

Sources: Authors' calculations based on the BIS Triennial Central Bank Survey (BIS 2001); IFS (2003) International Financial Statistics and World Bank (2002) World Development Indicators.

Notes: Trade flows are the sum of exports and imports; capital flows are the sum of gross capital inflows and gross outflows. Total turnover corresponds to total transactions of currency derivatives contracts in the foreign exchange and over-the-counter (OTC) markets with domestic and foreign agents, net of double accounting. Derivative turnover with domestic non-financial counterparts excludes turnover between reporting agents, between reporting agents and other financial institutions and between agents and non-financial counterparts abroad. Emerging economies are those in the lower and middle income groups of the World Development Indicators 2002.

Table 6: Australian Foreign Currency Exposure by Sector
June 2001, A$ billion

	Financial Sector					
Instrument	Banks	RBA & CBAs(a)	Other financial corps	General govern- ment	Other resident sectors	Total all sectors
FC denominated financial debt						
assets	−69.8	−36.9	−33.6	−5.5	−10.6	−156.5
liabilities	186.5	8.8	61.4	4.1	60.1	321.0
Net position on debt	116.7	−28.1	27.8	−1.4	49.5	164.5
Principal of FC derivative contracts						
in a bought position	−435.3	−11.3	−69.8	−0.4	−31.7	−548.4
in a sold position	325.8	32.1	61.8	8.9	34.9	463.4
Net position on derivatives	−109.5	20.8	−8.0	8.5	3.2	−85.0
Net position on debt unhedged after derivatives	7.2	−7.4	19.8	7.2	52.6	79.5
Foreign equity assets	−30.7	0.0	−84.0	0.0	−113.9	−228.5
Foreign Currency Exposure	−23.4	−7.4	−64.1	7.2	−61.2	−149.0

Source: Australian Bureau of Statistics.
Notes: (a) CBAs: State and Territory Central Borrowing Authorities

Table 7: Composition of Gross Capital Inflows
US$ million

	Chile			Australia		
	1994−97	1998−99	2000−01	1994−97	1998−99	2000−01
By type of inflow:						
FDI	3.9	6.9	4.1	7.7	5.9	8.3
Portfolio Equity	0.9	0.6	−0.3	5.4	8.4	4.6
Portfolio Debt	0.4	1.2	1.0	11.3	3.7	12.2
Other Investment	1.1	2.0	1.0	2.3	10.0	3.4
By type of agent:						
Government Debt	−0.8	0.0	0.2	3.2	−3.4	−2.2
Bank Equity	0.1	0.1	0.0	0.4	1.4	1.3
Other Equity	0.5	0.5	−0.3	5.0	6.9	3.3
Bank Debt	−0.4	−0.3	0.1	11.2	13.7	11.6
Other Debt	3.2	3.4	1.7	−0.8	3.4	6.2
FDI	3.5	6.4	4.1	7.7	5.9	8.3

Source: IMF (2003), Balance of Payment Statistics.

Table 8: Currency Composition of Debt 1997

| Sector (ISIC) | Tradable, Non-tradable | Dollar Debt / Total Debt | | | |
| | | Chile | | Argentina | |
		mean	median	mean	median
Agriculture	T	0.32	0.21	0.65	0.82
Mining	T	0.34	0.09	0.73	0.85
Manufacturing	T	0.37	0.31	0.53	0.62
Electricity, Gas and Water	NT	0.21	0.00	0.63	0.74
Construction	NT	0.00	0.00	0.51	0.55
Trade	NT	0.22	0.17	0.49	0.61
Transport, storage and communications	NT	0.32	0.13	0.54	0.62
Financing, Insurance, Real Estate and Business Services	NT	0.15	0.00	0.81	0.76
Community, Social and Personal Services	NT	0.00	0.00	0.37	0.33
Tradable		0.40	0.38	0.56	0.63
Non-Tradable		0.15	0.00	0.58	0.63
Total		0.24	0.02	0.57	0.63

Source: Authors' calculations based on data from Cowan and Kamil (2004).

Notes: For both Chile and Argentina tradable firms are those in Agricultural, Mining and Manufacturing sectors. For Chile the sample is 237 publicly listed firms. For Argentina the data set includes 202 non-financial firms (publicly traded companies, publicly held but no publicly traded companies and privatized companies).

Table 9: Explanators of Derivative Turnover

Specification	Dependent variable ln(derivatives turnover / GDP)						
	1	2	3	4	5	6	7
Income per capita (PPP) 1995-2000	0.095*** (0.025)	0.108*** (0.028)	0.132*** (0.022)	0.154*** (0.026)	0.127*** (0.021)	0.127*** (0.022)	0.125*** (0.022)
(Exports + Imports) / GDP	0.713** (0.349)	0.713** (0.349)	0.844** (0.355)	0.382 (0.587)	0.960*** (0.344)	1.102*** (0.357)	1.054*** (0.354)
Private lending / GDP	1.015* (0.604)	0.912 (0.614)					
Dummy EMU membership		−0.461 (0.501)					
Gross capital flows / GDP			0.107 (0.441)				
Commodities share of exports				−0.011 (0.012)			
Dummy for commodity currency					0.410 (0.747)		
Years with floating exchange rate (1995-2000)						0.074 (0.078)	
Dummy for floating exchange rate in 2000							0.212 (0.385)
R²	0.549	0.558	0.54	0.782	0.526	0.54	0.533
Observations:	46	46	46	15	47	46	46

Source: Authors' calculations based on data from BIS (2002), IMF (2003), International Financial Statistics, World Bank (2002), World Development Indicators, Cashin et al (2001) and Levy-Yeyati et al (2003).