Valuation Effects and External Adjustment: a Reviews*

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Abstract

This paper surveys the recent empirical and theoretical literature on valuation effects. The increase in cross-border holdings of financial assets opens the door to significant adjustments in a country's external position in response to fluctuations in asset and currency prices. Access to better data on net and gross international investment positions for a broad range of countries permits careful measurement of these 'valuation effects'. We distinguish between predictable and unpredictable valuation effects, and argue that they play separate roles in the adjustment process (for better or for worse). We discuss theoretical conditions under which predictable valuation effects can arise in equilibrium. Finally, we review the implications of growing valuation effects for the conduct of monetary policy in industrialized and emerging economies.

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1 Introduction

Ever since David Hume's (1752) price-specie flow mechanism, the question of external adjustment has been a classic issue for international macroeconomists. In 1968 Robert Mundell asked 'To what extent should surplus countries expand; to what extent should deficit countries contract?" (Mundell (1968)). The debate in those days was about the relative merits of 'expenditure switching' and 'expenditure reducing' policies, analyzed within the useful template of the Mundell-Fleming model. Subsequent research introduced microfoundations, added an explicit dynamic dimension borrowed from optimal growth theory, and highlighted the role of expectations. Throughout this process, understanding the adjustment of a country's external balances remained a key question. By the early 1980's a modern synthesis had emerged, the 'intertemporal approach to the current account'. It characterized the dynamics of external debt as the result of forward looking decisions by households, and investment decisions by firms, in market structures of varying degrees of complexity. As Obstfeld (2001) remarks:

> '[This approach] provides a conceptual framework appropriate for thinking about the important and interrelated policy issues of external balance, external sustainability, and equilibrium real exchange rates [...and shifted] attention from automatic adjustment mechanisms and dynamic stability considerations to intertemporal budget constraints and transversality conditions for maximization' (p12).

According to this intertemporal approach, a country's current account at time t, CA_t reflects expectations of changes in that country's future economic circumstances, following:

$$CA_t = -E_t \left[\sum_{s=t+1}^{\infty} R^{-(s-t)} \Delta NY_s \right] \tag{1}$$

where NY_t denotes net income (output minus investment and government expenditures), Δ is the difference operator ($\Delta NY_s = NY_s - NY_{s-1}$), R is the gross real return on a one-period

risk-free international bond, and $E_t[.]$ is the expectation operator, conditional on information available at time t. According to equation (1), countries runs current account deficits when future net income NY_s is expected to improve, and run current account surpluses when future net income is expected to deteriorate. The smoothing motive at the heart of the intertemporal approach is immediate: countries run surpluses to offset future unwelcome developments, and run deficits in anticipation of future improvements in their standard of living.

This class of models provides useful insights about short-run dynamic issues, e.g. the response to transitory and permanent shocks. Yet, in most empirical studies it falls short of explaining the dynamics of the current account (see Nason and Rogers (2006) for a recent assesment). Many empirical tests have been devised over the years. The most convincing ones -the present value tests- rely on a direct econometric verification of equation (1) using reduced-form vector autoregressions (VAR). The results often indicate that the implied current accounts –the right hand side of equation (1)– are too smooth compared to actual current accounts. In other words, the intertemporal approach accounts for only a small fraction of the movements in the current account.[1]

Recent research argues that the focus on current accounts and fluctuations in future net income is misguided. Instead, one should focus on the determinants of a country's net and gross foreign asset position. In the standard intertemporal model, the two are identical since, by definition, the change in the net foreign asset position equals the current account. In reality, however, the change in a country's net foreign asset position need not equal its current account. The reason is that the current account does not track *unrealized* capital gains arising from local currency asset price and currency movements. To be more precise,

[1]Many extensions of the basic theory have been developed over the years. Some papers have introduced time varying interest rates (e.g. Bergin and Sheffrin (2000)) or risky assets (Lucas (1982)). But most of these models either reproduce complete markets –which has many counterfactual implications and reduces the current account to an accounting device– or assume away predictable returns and wealth effects. Kehoe and Perri (2002) is a potentially interesting exception that introduces specific forms of endogenous market incompleteness. See also Kraay and Ventura (2000) and Ventura (2001) for models that allow investment in risky foreign assets with interesting empirical predictions.

define NA_{t+1} the net foreign asset position of a country at the end of period t. The change in net foreign asset position from one period to the next is given by the following accumulation equation:

$$NA_{t+1} = R_t NA_t + NX_t$$

where NX_t is the balance on goods, services and net transfers, and R_t represents the gross portfolio return on the net foreign portfolio between the end of period $t-1$ and the end of period t.[2] Adding and subtracting the net investment income balance NI_t, we obtain:

$$\begin{aligned} NA_{t+1} - NA_t &= (R_t - 1) NA_t - NI_t + NX_t + NI_t \\ &= [(R_t - 1) NA_t - NI_t] + CA_t \\ &\equiv VA_t + CA_t \end{aligned}$$

where the second line uses the definition of the current account: $CA_t = NX_t + NI_t$. The change in the net foreign position equals the current account , CA_t, plus a *valuation adjustment*, VA_t. This valuation adjustment –the term in brackets on the right hand side of the second equation– equals the capital gain on the net foreign asset portfolio: the total net return minus income, dividends and earnings distributed.[3] In many countries, this valuation component has greatly expanded in the last two decade, following the sharp surge in cross-border holdings of financial securities. This paper provides a review of the evidence on the empirical relevance of this valuation component.

This paper starts with a review of the existing literature on patterns of cross border asset holdings. In the following section, I discuss the pattern of cross border asset holdings that

[2]To be complete, the accumulation equation should also include the capital account KA_t and errors and omissions EO_t. We abstract from these components in this discussion and will bring them back in when necessary. For many countries, especially industrialized countries, capital account transactions are typically small. Errors and omissions are also excluded from the financial account in the US Bureau of Economic Analysis estimates of the US international investment position. Similarly, Errors and Omissions are reported separately in Lane and Milesi-Ferretti (2006).

[3]Technically, the net investment income balance also includes *reinvested* direct investment earnings. See Gourinchas and Rey (forthcoming 2006) for a discussion of how to treat this component.

emerges from the seminal empirical work of Phil Lane and Gian-Maria Milesi-Ferretti. I discuss the evolution over time and over countries of net and gross foreign asset positions since 1970 for industrial countries and emerging markets. I then review some evidence on the importance of valuation effects, relative to the current account, both for a large sample of countries, and also using more detailed evidence from Gourinchas Rey and Lopez (2006), for the United States, United Kingdom, Canada and Australia.

Section **??** then focuses on the case of the United States and summarizes the empirical evidence on the role of valuation effects for the external adjustment presented in Gourinchas and Rey (2006a and 2006b). This section introduces the important conceptual distinction between expected and unexpected valuation effects. It argues that –while valuation effects seem to be important– expected valuation effects may remain small for most countries besides the United States. Section **??** then turn to a discussion of the theory. It reviews some of the recent international portfolio models that give rise to unexpected and expected valuation effects. In effect, it classifies the literature into two strands: the complete markets set-up, where valuation effects are mostly unexpected and valuation terms reflect mostly the transfer payments associated with perfect risk sharing; and portfolio balance models (and their modern incarnation) where predictable valuation terms play an important role. Finally, the paper concludes with a brief review of the policy implications of valuation effects, with a special focus on emerging markets and on monetary policy.

2 Patterns of Net Foreign Assets

None of the research presented in this paper would have been possible without the huge effort in data collection of the last 15 years. While data on Balance of Payments are generally available, for the reasons discussed above, they typically don't provide accurate estimates of a countries net foreign asset position Starting in the 1980s, a number of national statistical agencies started to collect the information necessary to build estimates of net and gross external assets and liabilities at market value. For instance, the US Bureau of Economic Analysis

provides annual data on the US Net International Investment Position at market value since 1991, with data going back to 1982 (see Landefeld and Lawson (1991)). Unfortunately, data for most countries remained fragmentary.

The first important breakthrough came from the efforts at data collection initiated by the International Monetary Fund. While the fourth edition of the IMF's Balance of Payments Manual (BPM4), published in 1977, introduced the concept of international investment position, it did not present a systematic framework to measure its components. By contrast, the fifth edition of the manual (BPM5), published in (1993), provides a set of comprehensive guidelines. In subsequent years, the IMF started to report member countries International Investment Positions (IIP). While the initial coverage was limited (25 countries in 1995), it rapidly expanded through the Fund's outreach efforts. By 2002, the Fund collected information (partial or complete) on 80 countries, with annual data going back to 1980, at best.

The second breakthrough occurred with the work of Philip Lane at Trinity College and Gian-Maria Milesi-Ferretti at the International Monetary Fund. Their database on the External Wealth of Nations (EWN) first published in 1991 (Lane and Milesi-Ferretti (2001)) provided scholars with a set of very seful annual estimates of net and gross international investment positions for a sample of 67 industrial and developing countries. Importantly, their database covered the period 1970-1998, adding at least 10 years of data to the IMF IIP database (often adding much more than that since many countries in the IMF database, especially developing ones, had only partial coverage). To construct net investment position at market value, Lane and Milesi-Ferretti devised ways to estimate the valuation component VA_t from balance of payments (flows) data, auxiliary data sources on world equity returns and exchange rates, and data on external debt from the World Bank, the OECD and the BIS.[4] A major update to the dataset, released in 2006 (Lane and Milesi-Ferretti (2006)),

[4]Given the lack of data, Lane and Milesi-Ferretti (2001) estimate FDI at book value, i.e. correcting for currency fluctuations, assuming that the patter of holdings of direct investment assets mimics the trade pattern.

extends the sample to 140 countries with data until 2004.[5]

We start by reviewing the evidence on net and gross foreign asset positions that emerges from this dataset. We then focus more specifically on the importance of valuation effects in a few industrial countries where more detailed data is available.

2.1 Pattern of net foreign assets from the External Wealth of Nations.

What does the EWN dataset teach us about international investment positions? The first, well-known, fact is the dramatic increase in financial integration since 1970. Figure 1 reports a commonly used measure of financial integration, the sum of gross assets and gross liabilities normalized by output, for a sample of industrial countries and a sample of ermerging markets.[6] For the sample of industrial countries, the index of financial integration increased from 45 percent to 302 percent of output. For the emerging sample, the index increased from 15 percent to 120 percent. The log-scale of the graph reveals that the index of financial integration has increased at roughly the same pace for both industrial and emerging countries, about 6 percent p.a..

Figure 2 breaks down the series into gross assets and gross liabilities by group. The figure reveals a close match between gross assets and liabilities for industrial countries, each series growing at roughly 5.5 percent a year, from 20 percent of output in 1970 to 150 percent in 2004. Closer inspection would reveal a modest build-up in imbalances, with net foreign assets decreasing from 3.4 percent of output to -6.5 percent. By contrast, we observe a

[5]The Mark II dataset differs from the original database along three main dimensions:

- Errors and omissions are now reported separately
- Portfolio data uses data from the IMF's Coordinated Portfolio Investment Survey, when available
- Direct investment is reported at market value when available.

[6]See the appendix for a list of countries in each sample.

closing of imbalances for the sample of emerging countries. These countries are net borrowers throughout the period. Yet the ratio of gross assets to output increases from 3.4 percent to 54 percent of output (a growth rate of 8 percent p.a.) while the ratio of gross liabilities increases by from 12 percent to 66 percent (a growth rate of 'only' 5 percent p.a.).[7] Thus, despite greater access to international financial markets, there is no evidence that emerging markets could increase their net borrowing. This 'closing' of net imbalances for emerging countries is the focus of much recent literature.[8]

While financial integration seems to have proceeded at a fairly constant rate, Figure 3 reveals that individual country experiences have grown more disparate. The figure reports the cross-country dispersion in gross positions, as measured by the standard deviation of our index of financial integration. We observe a dramatic increase in this measure for the industrial countries in the sample, post 1995, from roughly 118 percent to 393 percent of output. By contrast, the pattern of cross country dispersion for emerging countries remains quite stable, around 40%. On the other hand, the same figure for net imbalances (figure 4) reveals a growing pattern of external imbalances. For both emerging and industrial countries. The cross country dispersion increased from 22 percent for industrial countries (resp. 12 percent for emerging countries) in 1970, to 51 percent (resp. 46 percent).

The next three figures characterize the change in the time-series process of gross assets and liabilities. I propose to estimate the following process:

$$\begin{aligned} \ln a_{i,t+1} &= \bar{\rho}^a_{i,t} \ln a_{i,t} + \bar{\delta}^a_{it} t + \epsilon^a_{i,t+1} \\ \ln l_{i,t+1} &= \bar{\rho}^l_{i,t} \ln l_{i,t} + \bar{\delta}^l_{it} t + \epsilon^l_{i,t+1} \end{aligned}$$

where $a_{i,t} = A_{i,t}/Y_{i,t}$ is the ratio of gross external assets to output and $l_{i,t}$ is the ratio of gross

[7] Of course, the fact that gross assets grew much faster than gross liabilities is consistent with an increase in *net* foreign liabilities (from 8 to 12 percent of output) for the emerging markets sample. The point is that net foreign liabilities increased much less than about 5 percent p.a., which would have obtained if both gross assets and gross liabilities had been growing at that rate.

[8] See Reinhart, Rogoff and Savastano (2003), for a discussion of debt intolerance, and also Gourinchas and Jeanne (2006) for a discussion of the allocation puzzle.

external liabilities to output. This specification allows for an AR(1) component, and also for a deterministic time trend that captures the gradual process of financial globalization. The AR coefficient $\bar{\rho}_{i,t}$ and the trend $\bar{\delta}_{i,t}$ are estimated by rolling regressions, with a 10 year window.[9] Figure 5 and **??** report the average serial correlation of gross asset and gross liabilities, while figures 7 and 8 report the average volatilities $\sigma_{\epsilon,t}$. Each data point represents the cross country average of the $\rho_{i,t}$ for a rolling regression over the previous 10 years (so the value in 1980 represents the coefficient estimated over 1970-1980). Figures 5 and 6 also report the two-standard deviation bands around the point estimates. We note that there does not seem to be any significant change in the serial correlation of gross positions over that period. The serial correlation remains close to 0.5, and takes similar values for gross assets and gross liabilities. By contrast, the time series volatility of log gross assets and liability positions - expressed as a percent of output - has increased significantly through the period, from about 3 percent to 12 percent of output for industrial countries and from 3 percent (resp. 5 percent) to 6 percent (resp. 9 percent) of output for emerging countries gross assets (resp. gross liabilities). This means that, over the last ten years, a one standard-deviation innovation to gross assets or gross liabilities represents between 12 and 14 percent of output for industrial countries and between 6 and 9 percent of output for emerging countries!

This increase in the time series volatility of gross foreign assets reflects the growing importance of valuation effects. This can be illustrated most dramatically by looking at a slightly different process:

$$\begin{aligned} \Delta na_{i,t+1} &= \bar{\rho}^n_{i,t} \Delta na_{i,t} + \epsilon^n_{i,t+1} \\ ca_{i,t+1} &= \bar{\rho}^c_{i,t}\ ca_{i,t} + \epsilon^c_{i,t+1} \end{aligned}$$

where $na_{i,t}$ (resp. $ca_{i,t}$) denotes the ratio of net foreign assets (resp. the current account) to GDP and Δ denotes the difference operator. Figure 9 and 10 report the standard deviation of

[9] Of course, it is rather hazardous to estimate an AR process with only 10 observations. This is meant only as an illustration of the change in the empirical process for gross assets and liabilities.

the innovations, as a fraction of GDP. Most of the increase in the time-series volatility of the change in net foreign assets can be attributed to the valuation component.[10] For industrial countries, innovations to the current account increased from 0.5 percent to 2.5 percent of output. Yet over the same period, innovations to the change in net foreign assets increased from 1.5 percent to 21.6 percent of output. Hence, between 1994 and 2004 (the last data point), innovations to the change in net foreign asset positions are up to 10 times larger than innovations to the current account. For emerging countries, the volatility of innovations to the current account remained remarkably stable –around 2 percent. Yet innovations to the change in net foreign asset increased from 2 percent to about 6.4 percent.

2.2 Deconstructing the Valuation Component: Currency and Asset Price Movements

The net foreign asset portfolio is a leveraged portfolio: it is short in domestic assets (the gross liabilities) and long in foreign assets (the gross assets). For instance, the US net foreign asset portfolio is short in US equities, US bonds, bank deposits held by foreigners, or direct investment in the US; It is long e.g. in Japanese equity, direct investment in Ireland and China, bank deposits in Switzerland, and German government bonds or UK guilds. The real total gross return on that portfolio, R_{t+1}, is defined as a weighted average of the return on gross assets and gross liabilities:

$$R_{t+1} = \mu_t^a R_{t+1}^a - \mu_t^l R_{t+1}^l$$

where R_{t+1}^a (resp. R_{t+1}^l) denotes the total real return on gross assets (resp. gross liabilities) and μ_t^a (resp. μ_t^l) represents the portfolio weight A_t/NA_t (resp. L_t/NA_t) and satisfy $\mu_t^a - \mu_t^l =$

[10] The decomposition is not exact since

$$na_{t+1} - na_t = ca_t + \left[va_t.\frac{Y_t}{Y_{t+1}} + \left(\frac{Y_t}{Y_{t+1}} - 1\right)(na_t + ca_t)\right]$$

so the difference between the two curves also reflect the second term inside the brakets. However, since growth annual rates remain quite small, this term often negligible.

1.[11] As with any leveraged portfolio, the weights μ^a and μ^l can be significantly larger then one. Hence the relatively small changes in asset prices can have a disproportionate effect on the overall net foreign asset position. To fix ideas, consider the case of the Chile. According to the Lane and Milesi-Ferretti dataset, as of 2004, gross assets represent 81 percent while gross liabilities represent 118 percent of GDP. Hence, the weights μ^a and μ^l equal -215 and -315 percent.[12] Hence a 10 excess return on gross foreign assets translates into an improvement of 21 percent in the net position, or about 8 percent of GDP![13]

Beyond the impact of asset movements, Tille (2003) and Gourinchas and Rey (2005) have emphasized the role of currency movements. To see how this might matter, we can approximate the compounded return on the net foreign portfolio as follows:

$$\begin{aligned} r_{t+1} \equiv \ln R_{t+1} &\approx \mu_t^a r_{t+1}^a - \mu_t^l r_{t+1}^l \\ &= \mu_t^a \left(\omega_t^{ah} r_{t+1}^{ah} + \omega_t^{af} r_{t+1}^{af}\right) - \mu_t^l \left(\omega_t^{lh} r_{t+1}^{lh} + \omega_t^{lf} r_{t+1}^{lf}\right) \\ &= \left[\mu_t^a \omega_t^{ah} r_{t+1}^{ah} - \mu_t^l \omega_t^{lh} r_{t+1}^{lh}\right] + \left[\mu_t^a \omega_t^{af} r_{t+1}^{af} - \mu_t^l \omega_t^{lf} r_{t+1}^{lf}\right] \end{aligned}$$

where ω^{ih} (resp. ω^{if}) represents the share of asset i denominated in home (resp. foreign) currency. The last line re-arranges the portfolio terms according to the currency of denomination of the various returns. The first term in brackets on the right hand side represents the contribution of domestic currency denominated assets, while the term in second brackets represents the contribution of foreign currency denominated assets.

To make further progress, let's write the real return on foreign currency denominated return as $r_{t+1}^{if} = \tilde{r}_{t+1}^{if} + \Delta\lambda_{t+1}$ where $\tilde{r}_{t+1}^{if}$ is a real return expressed in terms of the foreign basket of goods, and $\Delta\lambda_{t+1}$ is the rate of depreciation of the real exchange rate between t

[11] These weights are well defined as long as the net foreign position is different from 0. Even in that case, the total real return $R_{t+1}NA_t$ is well defined.

[12] To see this, note that $\mu^a = 81/(81-118) \approx -2.15$.

[13] The appendix reports the values of A/Y, L/Y and μ^a in 2004 for each country in our sample.

and $t+1$, equal to $\Delta e_{t+1} + \pi^f_{t+1} - \pi^h_{t+1}$. Substituting into the expression above, we obtain:

$$r_{t+1} = \left[\mu^a_t \omega^{ah}_t r^{ah}_{t+1} - \mu^l_t \omega^{lh}_t r^{lh}_{t+1}\right] + \left[\mu^a_t \omega^{af}_t \tilde{r}^{af}_{t+1} - \mu^l_t \omega^{lf}_t \tilde{r}^{lf}_{t+1}\right] + \left[\mu^a_t \omega^{af}_t - \mu^l_t \omega^{lf}_t\right] \left(\Delta e_{t+1} + \pi^f_{t+1} - \pi^h_{t+1}\right)$$

The term in brackets in front of $\Delta\lambda_{t+1}$ provides a measure of currency exposure of the net foreign asset position: holding everything else constant, the coefficient $\left[\mu^a_t \omega^{af}_t - \mu^l_t \omega^{lf}_t\right]$ measures the impact of a depreciation of the real exchange rate on the net foreign asset position of a country. It highlights that a measure of currency exposure must include, besides the portfolio weights, the currency weights. Unfortunately, this information is currently available only for a small number of countries. Undoubtedly, the next frontier in terms of data collection will be to compile information on the geographic and currency composition of gross portfolio holdings. In the meantime, detailed data is available for the United States, thanks to the work of Tille (2003) and Tille (2004), as well as Gourinchas and Rey (forthcoming 2006). For instance, Table 1 reports Tille (2004)'s currency decomposition for the United States in 2004. At the end of 2004, the overall net foreign position represented -21.7 percent of GDP (85 in gross assets and 107 percent in gross liabilities), with dollar weights of 35 percent on gross assets ($\omega^{ah} = 3.476/9.973$) and 95 percent on gross liabilities ($\omega^{lh} = 11.869/12.515$) Hence, the overall dollar exposure of US net foreign assets is 3.30 (obtained as (0.95*1.07-0.35*0.85)/0.21), or -71.5 percent of GDP (last column) while the foreign currency exposure is -2.3, or 49.9 percent of GDP.

How should we interpret these exposure numbers? A naive and incorrect interpretation, but capturing an important element of the discussion, would observe that with an exposure of -2.3, a 10 percent depreciation of the dollar would - holding everything else constant- create a positive wealth transfer for the United States of about 5 percent of GDP (-2.3*(-0.21)*0.1). With a GDP of about 11.733 trillion US dollar in 2004, this represents the modest sum of $585 billion. Such a wealth transfer would be of the same order of magnitude as the trade deficit for that year (5.2 percent of GDP according to the BEA).

Of course, this interpretation is incorrect precisely because everything else is not constant! If a currency depreciation is expected to deliver substantial wealth transfers to the United States, then foreigners will require some compensation in the form of higher expected local returns on dollar denominated assets, or lower expected local returns on foreign currency denominated assets. In fact, ex-ante local real returns should be expected to move in such a way as to *neutralize* the expected rate of depreciation. This arbitrage logic is precisely what stands behind the usual interest rate parity condition. Of course, important valuation effects may still arise because the exchange rate differs from its expectation. With substantial leverage, expectation errors will translate into significant valuation effects, but the important point is that these will not lead to predictable fluctuations in net foreign asset positions, and hence cannot contribute to the external adjustment process. *A contrario*, predictable valuation effects that contribute systematically to the adjustment process require significant violations from the usual parity conditions. The evidence discussed so far does not attempt to distinguish between predictable and unpredictable valuation effects, yet the discussion above indicates that this is an essential element of the analysis.

MORE TO COME....

3 Appendix: Sample Countries

Industrial Countries

Country	A/Y	L/Y	μ^a
Australia	0.82	1.46	-1.28
Austria	1.88	2.05	-10.82
Belgium	4.25	3.94	13.75
Canada	0.99	1.12	-7.93
Denmark	1.95	2.08	-15.70
Finland	1.95	2.08	-16.14
France	2.12	2.06	39.80
Germany	1.67	1.59	20.76
Greece	0.67	1.40	-0.91
Iceland	1.49	2.42	-1.60
Ireland	9.30	9.50	-47.16
Italy	1.05	1.24	-5.82
Japan	0.89	0.51	2.34
Netherlands	4.03	4.08	-69.12
New Zealand	0.67	1.59	-0.73
Norway	2.06	1.41	3.18
Portugal	1.76	2.46	-2.53
Spain	1.25	1.75	-2.56
Sweden	2.13	2.23	-22.41
Switzerland	5.71	4.40	4.36
United Kingdom	3.57	3.71	-27.08
United States	0.84	1.07	-3.71

Emerging Countries

country	A/Y	L/Y	μ^a
Argentina	0.88	1.36	-1.85
Brazil	0.28	0.78	-0.57
Chile	0.81	1.18	-2.16
Colombia	0.36	0.71	-1.03
Mexico	0.20	0.63	-0.46
Venezuela	0.89	0.73	5.33
China	0.55	0.47	6.94
India	0.23	0.34	-2.15
Indonesia	0.24	0.76	-0.46
Korea	0.53	0.57	-13.05
Malaysia	1.11	1.13	-54.37
Philippines	0.39	0.98	-0.67
Taiwan	2.07	0.65	1.46
Thailand	0.45	0.74	-1.54
Czech Republic	0.64	0.99	-1.85
Hungary	0.42	1.39	-0.43
Poland	0.32	0.85	-0.59
Russia	0.67	0.66	140.65
Israel	0.94	1.16	-4.29
South Africa	0.65	0.70	-12.77
Turkey	0.28	0.76	-0.60

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Table 1: Currency Composition of US External Positions (2004)

	Assets	Liabilities	Net $(A-L)$	(% GDP)
Total	9,973	12,515	-2,542	-21.7
US dollar	3,476	11,869	-8,393	-71.5
Foreign Currencies	6,497	646	5,851	49.9
Euro	1,784	296	1,488	12.7
UK	1,039	71	968	8.3
Canada	557	1	556	4.7
Japan	506	61	445	3.8
Switzerland	304	18	286	2.4
Other	2,307	199	2,108	18.0

$ billions; Source: Tille (2005)

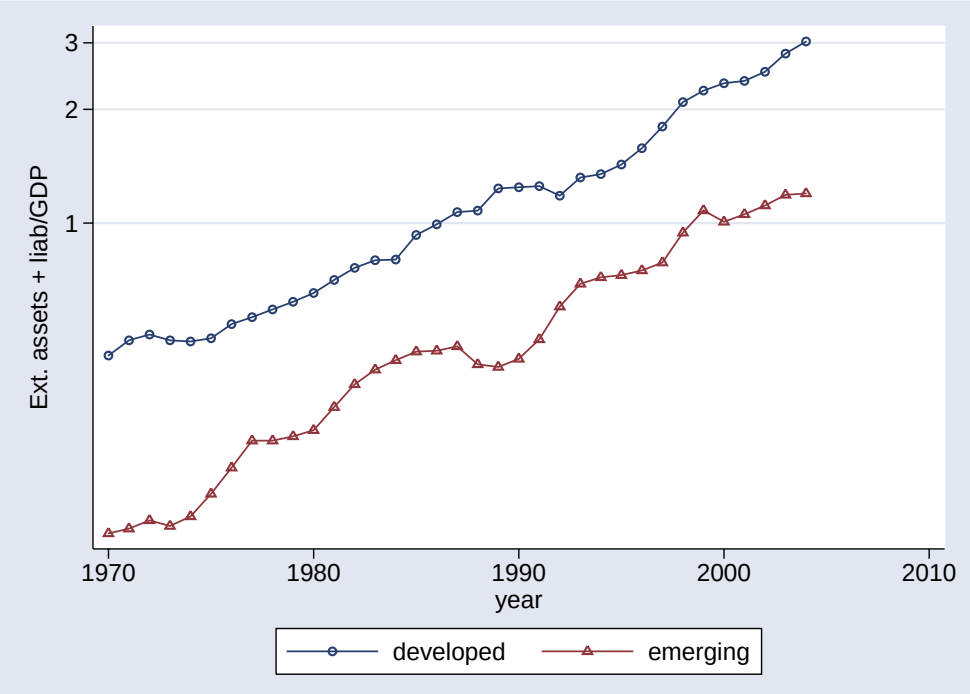

Figure 1: International financial integration: $(A+L)/Y$ (log scale).

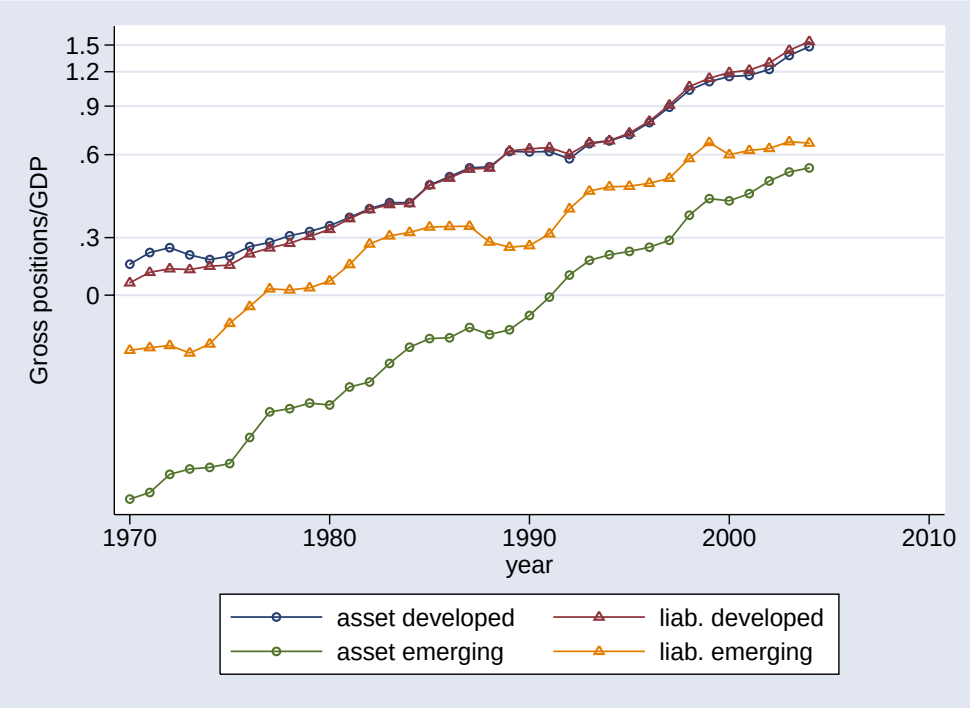

Figure 2: Gross Positions: $A/Y, L/Y$ (log scale)

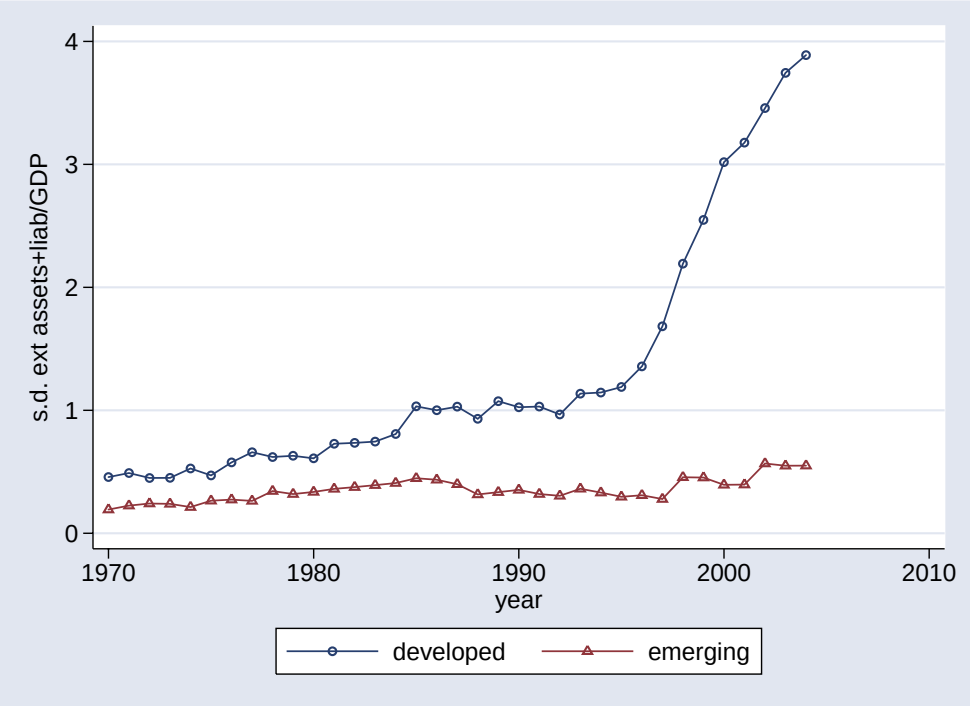

Figure 3: Cross-country dispersion in gross positions: $\sigma\left(\left(A+L\right)/Y\right)$.

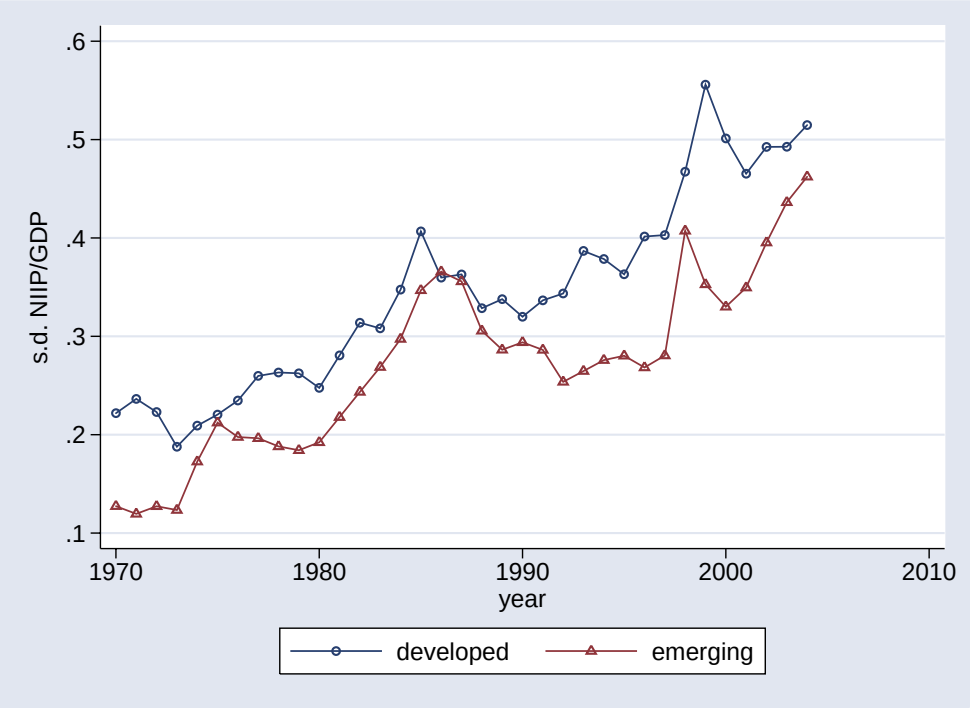

Figure 4: Cross-country dispersion in net positions $\sigma\left(\left(A-L\right)/Y\right)$

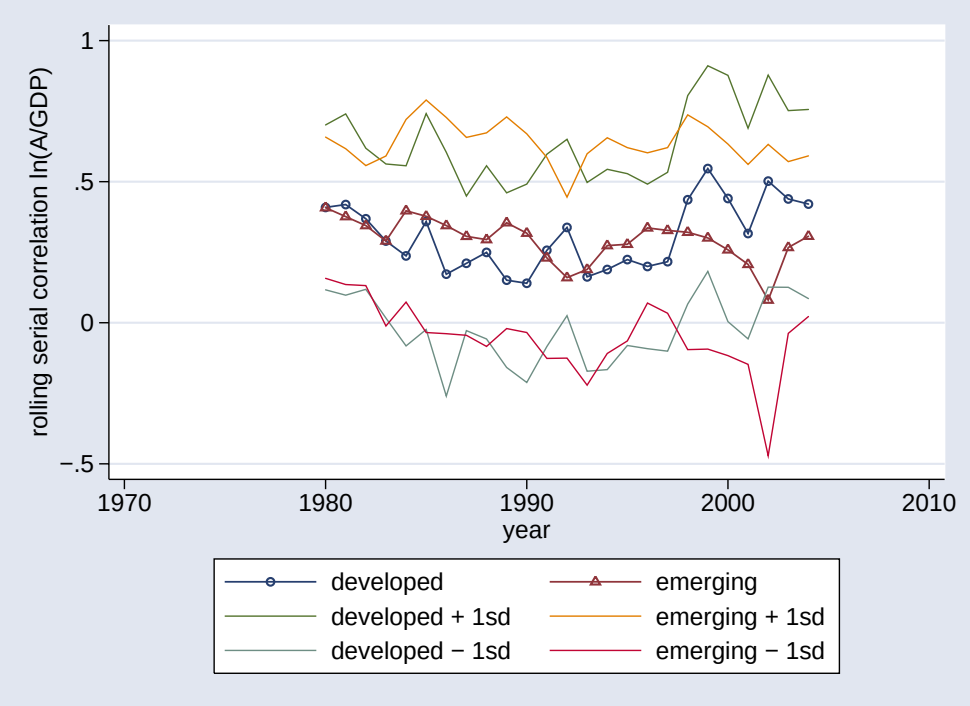

Figure 5: Serial Correlation of Gross Asset Positions ($\ln a_{i,t}$). 10-year rolling regressions.

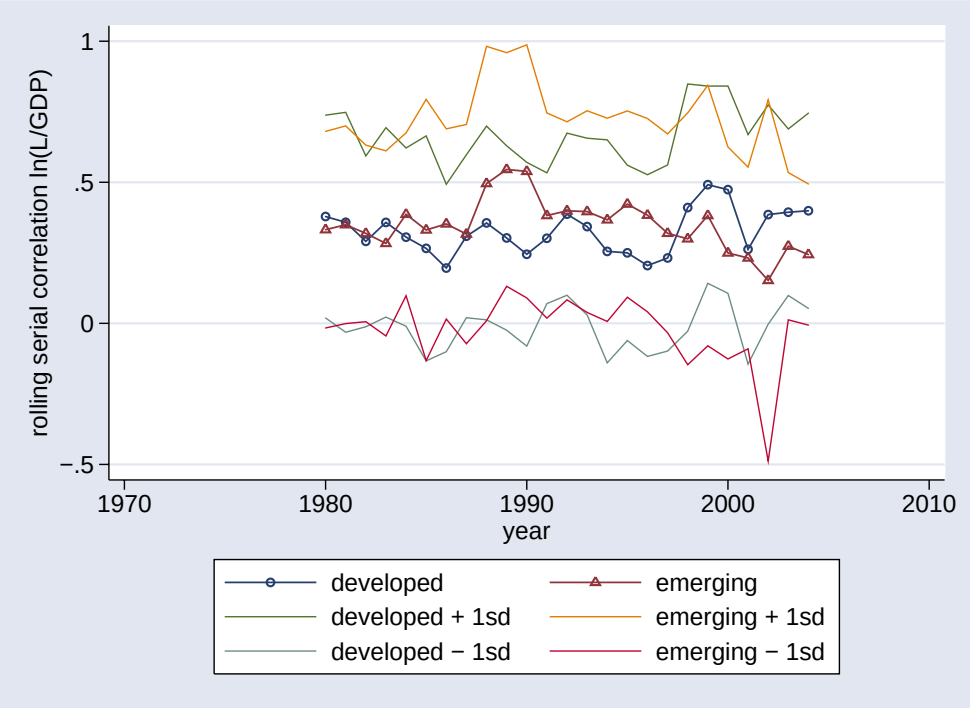

Figure 6: Serial Correlation of Gross Liability Positions ($\ln l_{i,t}$). 10-year rolling regressions.

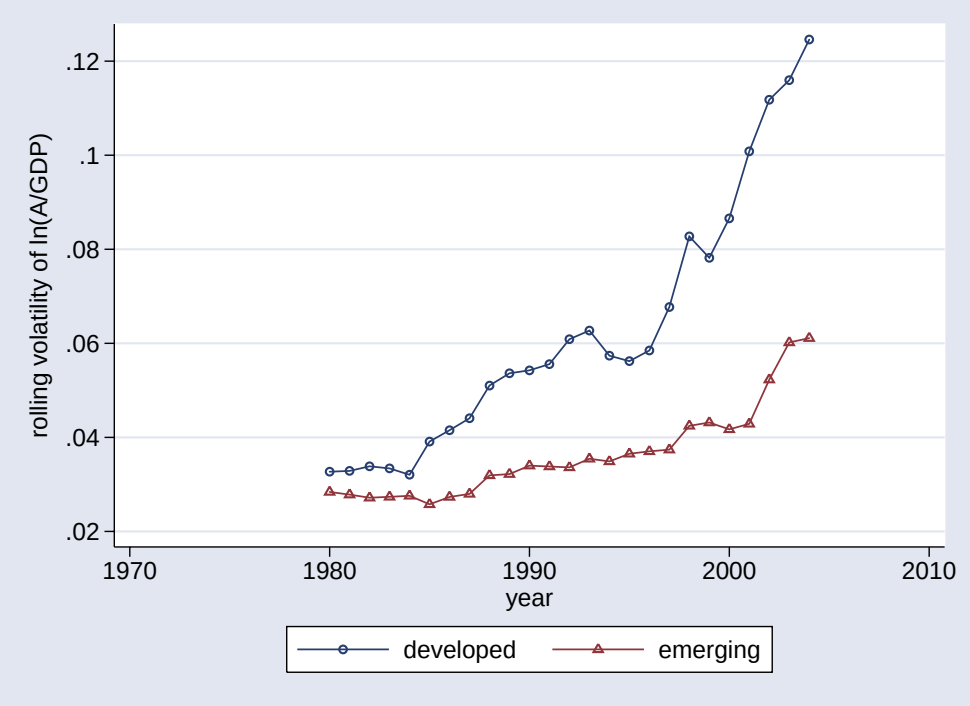

Figure 7: Volatility of (log) gross asset positions (% of GDP). 10-year rolling regressions.

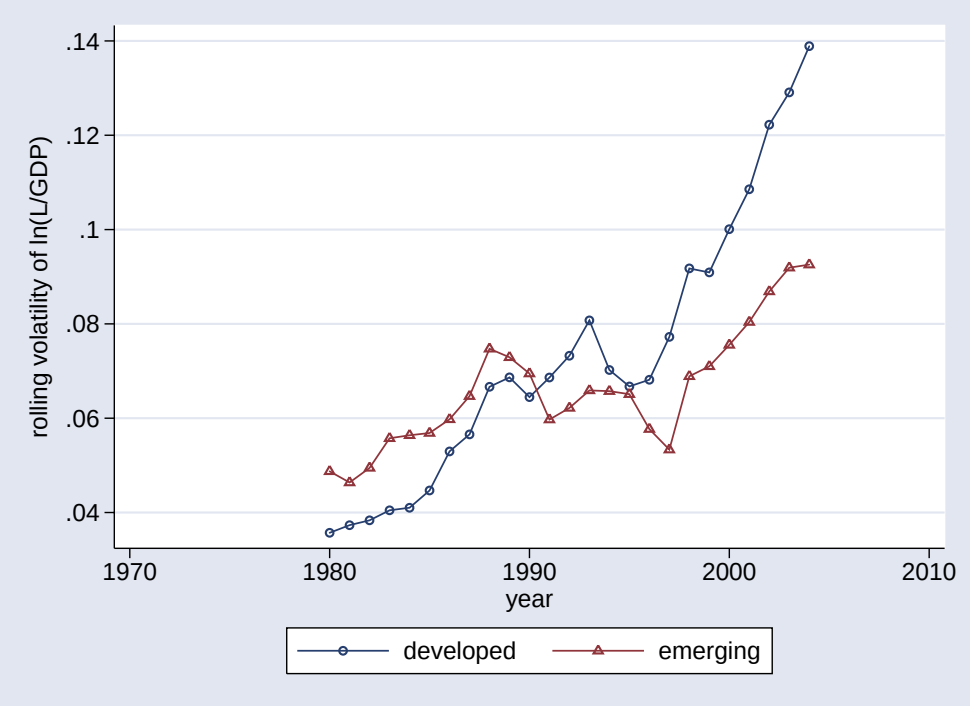

Figure 8: Volatility of (log) gross liability positions (% of GDP). 10-year rolling regressions.

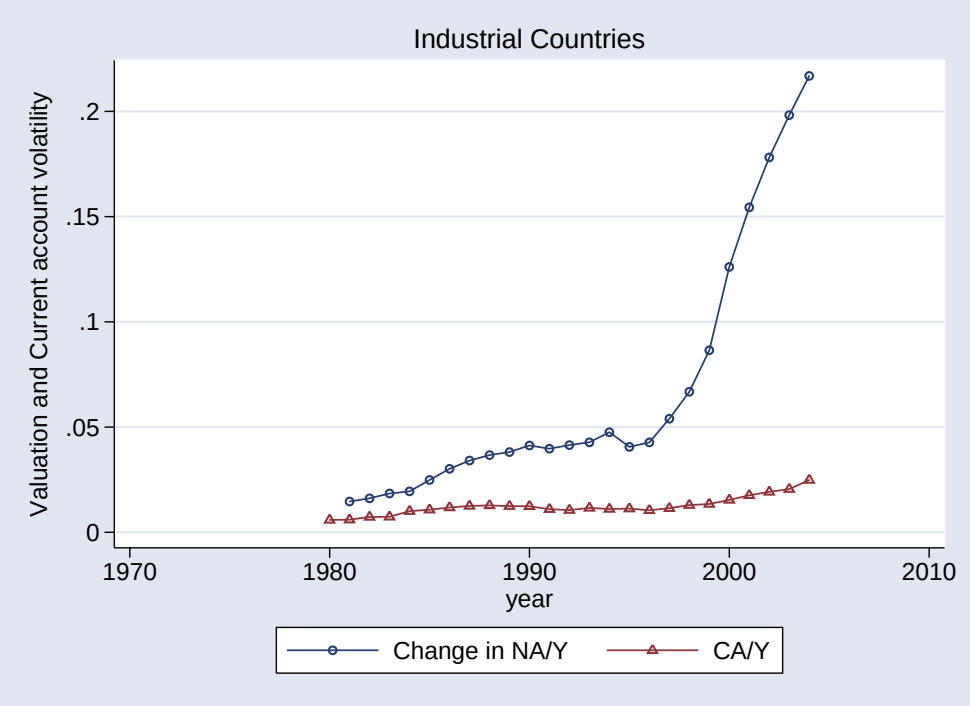

Figure 9: Volatility of the innovations to the change in net foreign assets and the current account (% of GDP), Industrial countries. 10-year rolling regressions.

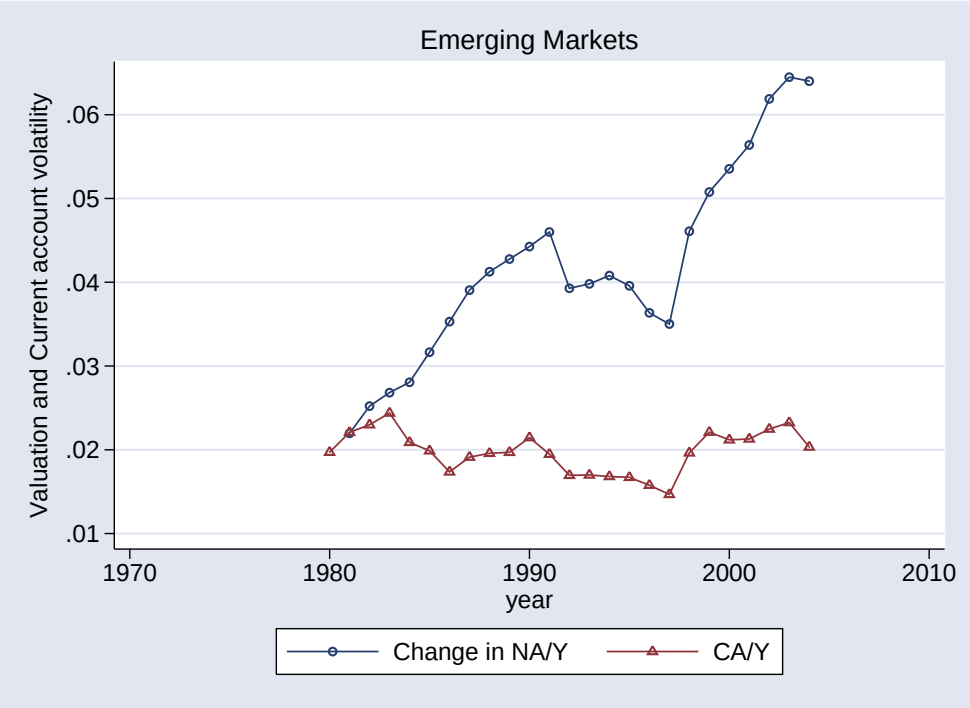

Figure 10: Volatility of the innovations to the change in net foreign assets and the current account (% of GDP), Emerging markets. 10-year rolling regressions.

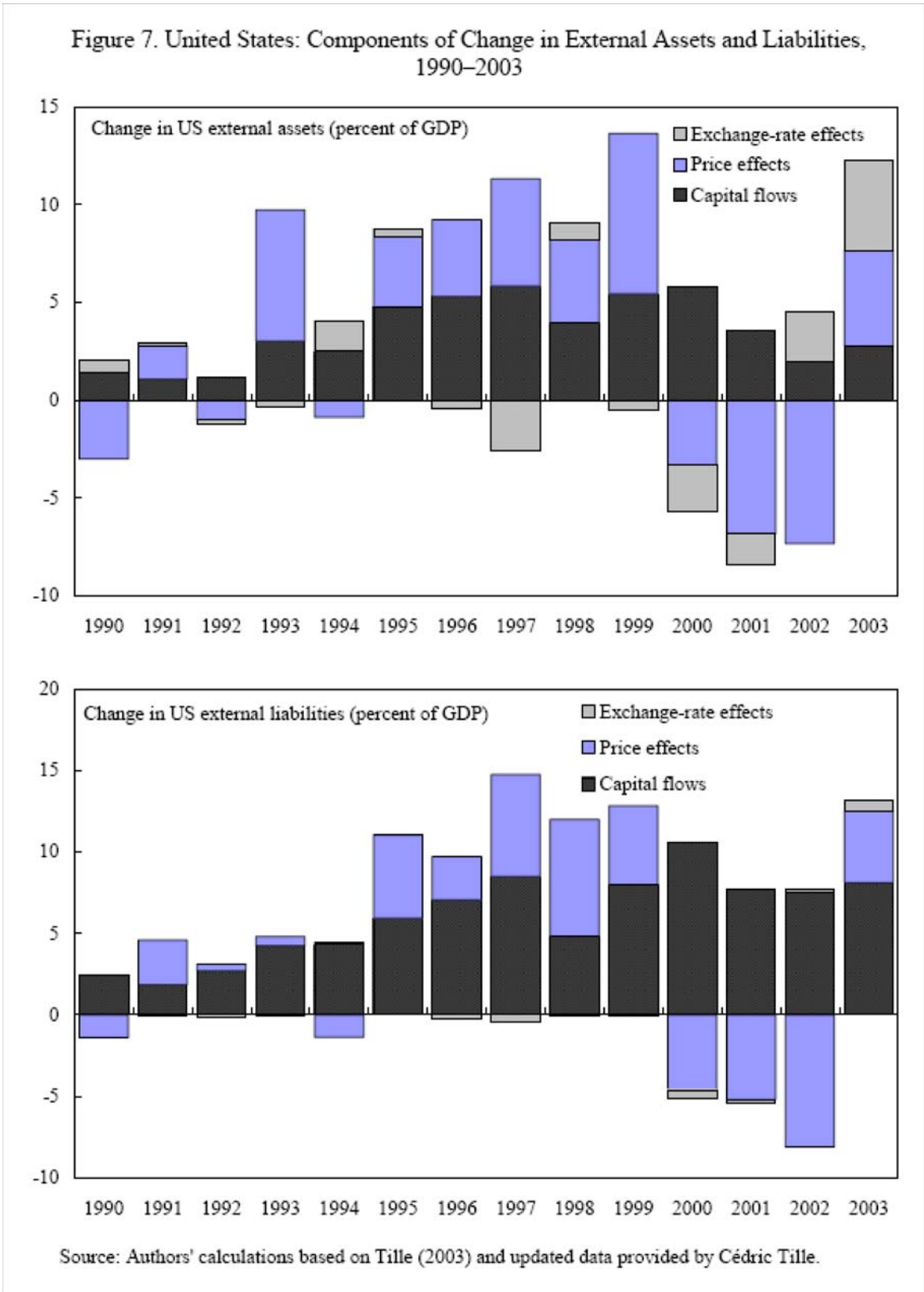

Figure 11: Change in NA, United States. Source: Tille (2003) and Lane and Milesi-Ferretti (2004).

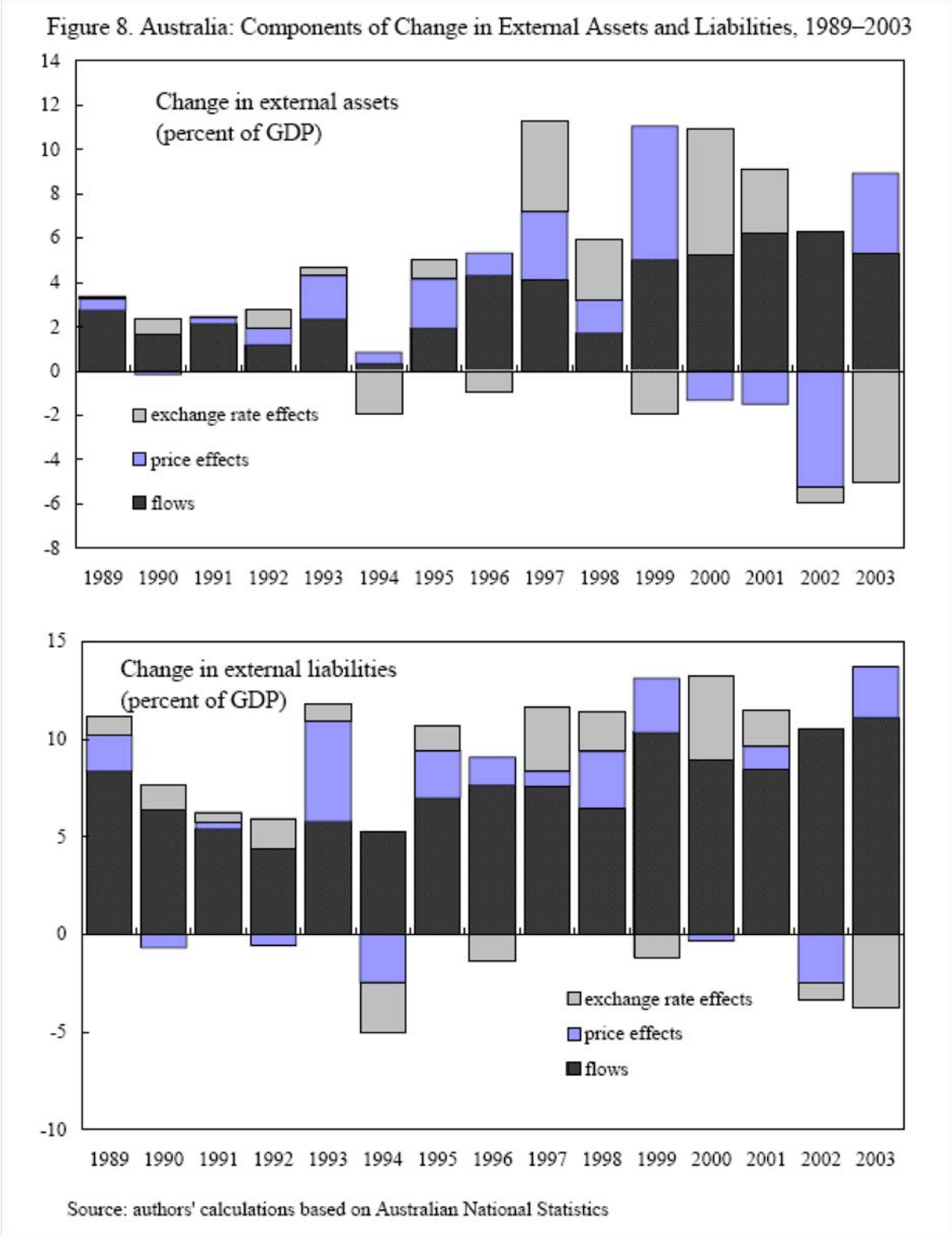

Figure 12: Change in NA, Australia. Source: Lane and Milesi-Ferretti (2004).

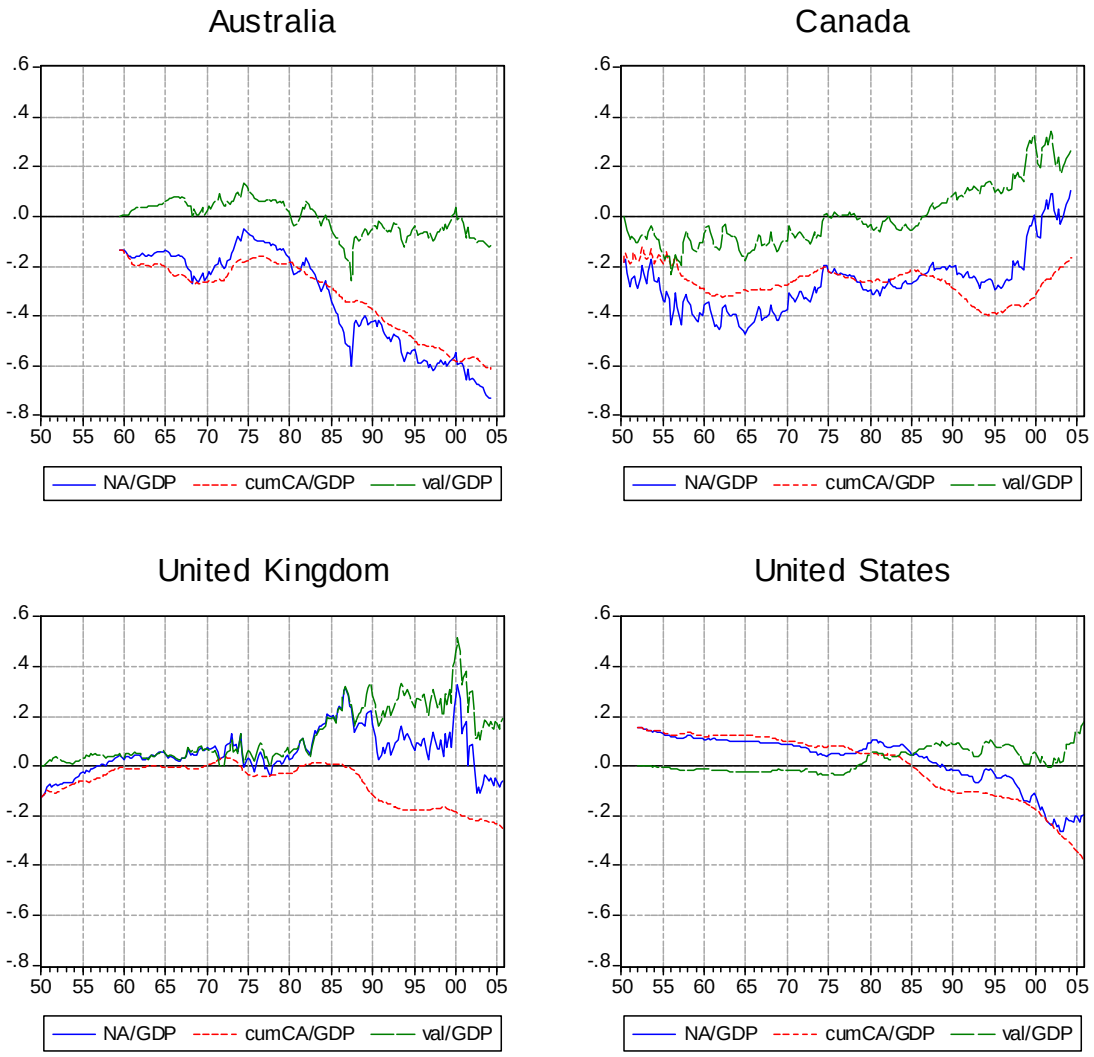

Figure 13: Valuation Component for Australia, Canada, UK and the US. Source: Gourinchas, Lopez and Rey (2006)