TRÉSOR-ECONOMICS

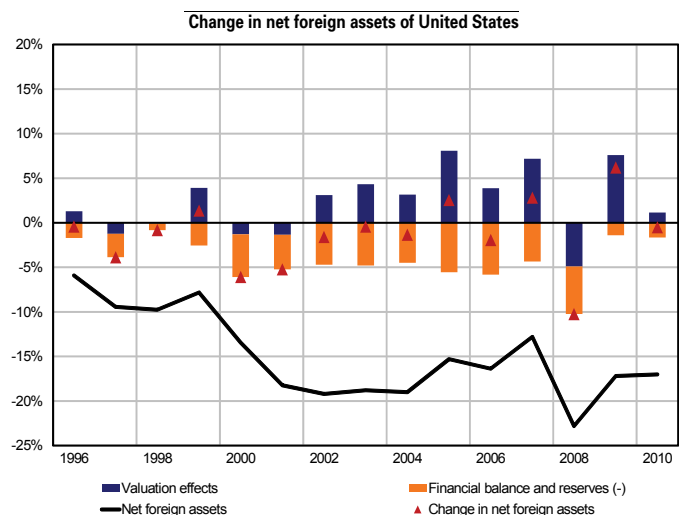**RÉPUBLIQUE FRANÇAISE**
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Does financial globalization affect the external adjustment of national economies?

- The net foreign assets (NFAs) of a country's economy are the difference between total foreign assets held by residents and total liabilities on residents by foreign creditors. An economy with negative NFAs is therefore indebted to the rest of the world. Our study focuses on the adjustment mechanisms that enable an economy to rebalance its NFAs.

- The international financial integration under way since the mid-1990s has intensified cross-border flows of financial securities, causing a sharp increase in countries' external balance sheets. This has made NFAs more sensitive to asset-price and exchange-rate fluctuations-known as "valuation effects"-and partly decorrelated NFAs from current-account movements. The United States, for example, enjoyed substantial valuation effects from the 2000s up to the 2008 economic crisis. Despite the deterioration in its current-account balance, its NFA remained relatively stable thanks to positive average valuation effects (see chart below).

- Exchange-rate fluctuations can affect the NFAs via two channels. The first is the conventional trade channel: exchange-rate movements influence the trade balance, which in turn impacts the NFAB. The second is a financial-adjustment channel, in which exchange-rate movements modify the valuation of external asset and liability stocks. In theory, assuming rational expectations and perfectly substitutable assets, price movements should offset most valuation effects due to the exchange rate.

- Econometric analysis shows, however, that the "financial adjustment channel" plays a significant role. For developed economies as well as for emerging countries, variations in asset prices offset only a part of the exchange-rate effects.

Change in net foreign assets of United States

Source: BEA, DG Trésor calculations.

- Valuation effects
- Net foreign assets
- Financial balance and reserves (-)
- Change in net foreign assets

MINISTÈRE DE L'ÉCONOMIE DES FINANCES ET DE L'INDUSTRIE

A country's net foreign assets balance (NFAB) is the difference between total foreign assets held by residents and total liabilities on residents by foreign creditors. When an economy has an excessively negative NFAB, i.e., when it is heavily indebted to the rest of the world, a currency depreciation should-in theory-enable it to improve its trade balance and, by extension, its current account, restoring NFA equilibrium.[1]
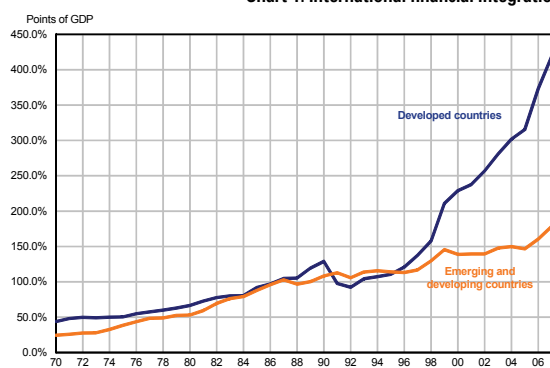
However, amid the current financial integration, the NFAB revaluations caused by variations in financial-security prices and exchange rates-called valuation effects (see box 1)-have become increasingly important. Indeed, they can potentially modify the external adjustment mechanisms tied to exchange-rate variations. Our goal here is to measure these valuation effects and better understand the external adjustment mechanisms.

1. The steady intensification of international trade in financial securities has made net foreign assets balances more sensitive to exchange-rate and asset-price movements

1.1 The size of international portfolios has been growing sharply since the mid-1990s, in parallel with an increase in current-account imbalances

Between 1970 and 1996, international financial integration (measured by the sum of external assets and liabilities in points of GDP[2]) grew steadily. In developed countries, it rose from 44% in 1970 to 120% in 1996. Emerging countries displayed a similar pattern in the period, with an increase from 25% to 113%. From 1996 on, the financial opening of developed countries grew exponentially, surging from nearly 100 to 400 points of GDP between 1996 and 2008. In emerging countries, the increase was milder (see chart 1). Meanwhile, the United States, China, and Japan experienced major current-account imbalances, as did the euro zone and oil-exporting countries[3] (see chart 2). These disequilibriums, in turn, aggravated NFA imbalances (see chart 3).

**Chart 2: Current-account balances as a percentage of global GDP**
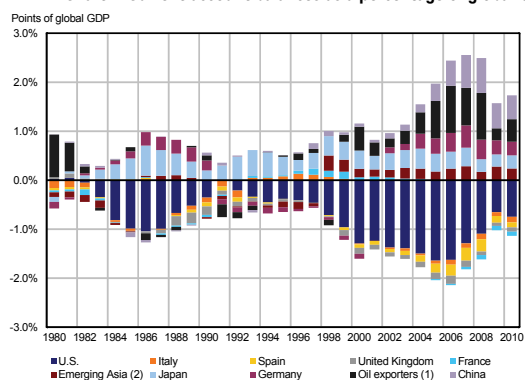
Source: IMF.

Key: (1) : Algeria, Angola, Azerbaijan, Bahrain, Brunei, Congo, Ecuador, Equatorial Guinea , Gabon, Iran, Iraq, Kuwait, Libya, Qatar, Russia, Saudi Arabia, Sudan, Syria, Trinidad and Tobago, Turkmenistan, United Arab Emirates, Venezuela, and Yemen.
2: Hong Kong, Indonesia, Philippines, Singapore, South Korea, Taiwan, and Thailand.

Chart 3: NFA imbalances as percentage of global GDP

Source: IMF.

Chart 1: International financial integration

Source: Lane et Milesi-Ferretti, External Wealth of Nations (2009).

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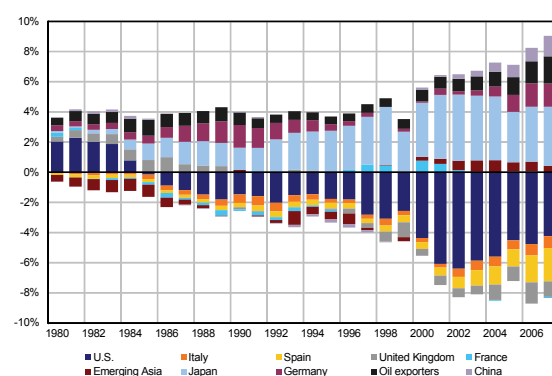
(1)   For a detailed study, see the DG Trésor working paper « La globalisation financière affecte-t-elle le processus d'ajustement extérieur des économies ? » (forthcoming).

(2)   The data on international assets and liabilities are taken from the database compiled by Philip R. Lane and Gian Maria Milesi-Ferretti. The authors use historical data from the IMF and national statistical institutions to reconstruct external-position series going back to 1970 for more than 140 countries. See The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970-2004, *IMF working paper*, 2006.

(3)   For a full discussion on trends in global imbalances, see O. Blanchard and G.M. Milesi-Ferretti, (2009) "Global Imbalances: in Midstream?," IMF staff position note, December.

1.2 Amidst this "financial globalization," the volatility of financial markets is generating massive NFA revaluations for the most integrated economies
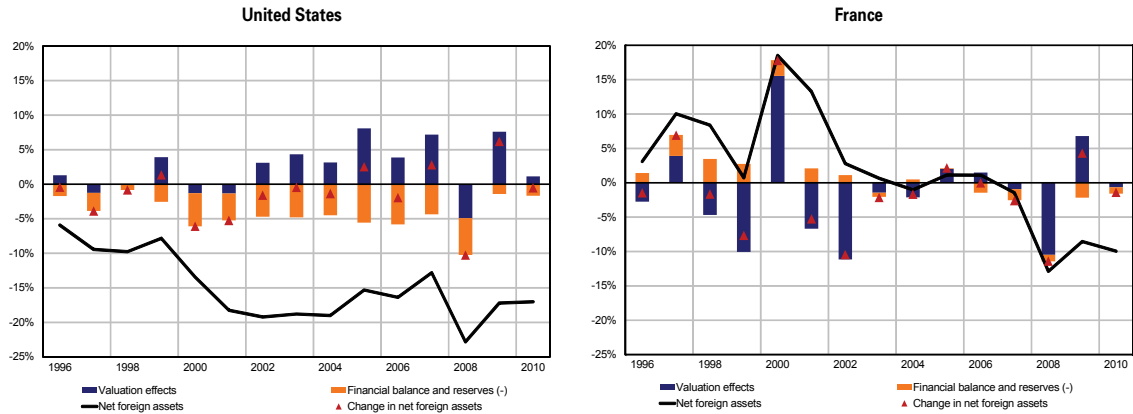
The quickening pace of financial globalization has considerably increased revaluations of external assets and liabilities due to "valuation effects" (see box 1). In some years, the revaluations have even exceeded current-account balances, shaping the year-to-year changes in NFAs. Two examples illustrate this phenomenon:

- The United States enjoyed positive valuation effects in the 2000s (see chart 4), enabling it to offset the accumulation of current-account deficits and to stabilize its NFA at

around -20 points of GDP.

- The French NFA was more volatile in the same period. France moved from a net creditor position with the rest of world to a net debtor position in 2007. Between end-2000 and end-2008, the French NFA slipped from 18.5 points of GDP to a negative 12.9 points. The NFA also registered sharp annual variations, for example from 0.7 points of GDP in 1999 to 18.5% in 2000. These wide swings are mainly due to valuation effects.[4] The financial flows recorded during the period, which shifted from net capital outflows to net inflows, did not exceed 3 points of GDP-a change too modest to explain the NFA variations.

Chart 4: Contributions of revaluations and financial flows to annual changes in NFA (points of GDP)

United States

Legend: ■ Valuation effects ■ Financial balance and reserves (-) — Net foreign assets ▲ Change in net foreign assets

Sources: BEA, DG-Trésor.

France

Legend: ■ Valuation effects ■ Financial balance and reserves (-) — Net foreign assets ▲ Change in net foreign assets

Sources: Banque de France, DG-Trésor.

Box 1: Measuring valuation effects

The net foreign assets balance measures the difference between all foreign assets held by residents and all liabilities on residents by the rest of the world.
The valuation effects consist of the revaluation of an economy's external assets and liabilities between two given years on a constant-portfolio basis. They are equal to the stock-flow difference between balance-of-payments data (flows) and NFA data (stocks). The NFA variation $(NFA_t - NFA_{t-1})$ equal to the sum of net financial flows in the period studied, i.e., to the financial account and the change in reserves booked to the balance of payments $(-FA_t)$, and capital gains (or losses) (KG_t) recorded in the period.

$$NFA_t - NFA_{t-1} = -FA_t + KG_t \text{ a}$$

An economy's net foreign assets can therefore be modified through two types of channels: (1) financial flows between residents and non-residents in the period studied (for example, purchases/sales of foreign securities by residents or purchases/sales of domestic securities by non-residents); (2) intrinsic changes in the value of financial securities (revaluation) in the portfolio or of other kinds of transactions.
We can also assess the importance of valuation gains in a country's external-debt path by their cumulative contribution over several years. Iterating (1), we obtain:

$$NFAB_t - NFAB_{t_o} = \sum_{i=t_o+1}^{t} -FA_i + \sum_{i=t_o+1}^{t} KG_i$$

a. Alternatively, we can express this equation in terms of the current-account balance, the capital-account balance, and errors and omissions. The balance of payments shows us that $CA_t + KA_t + FA_t + EO_t = 0$, with CA the currant account, KA the capital account, and EO lerrors and omissions. We can thus rewrite equation (1) as: $NFA_t - NFA_{t-1} = CA_t + KA_t + EO_t + KG_t$.

Table 1 shows the significant impact of valuation effects-often equal to that of cumulative financial flows-on NFA fluctuations in 1989-2007. **In most countries except the United States, cumulative valuation effects contributed nega-** tively to NFA changes during the period. The U.S. benefited from cumulative valuation gains of approximately 28 points of GDP. As a result, its NFA suffered a relatively minor deterioration by comparison with what it would have regis-

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(4) For example, the major revaluation of the French NFA in 2000 is due to a strongly negative revaluation of foreign direct investment (FDI) in France. Banque de France data show that the FDI stock held by non-residents in France fell from €595 bn in 1999 to just €420 bn in 2000, as against FDI inflows of €47 bn in 2000. As a result, the FDI stock in France was revalued by a negative €221 bn between 1999 and 2000.

tered absent the revaluation effects. This "American exception" is often attributed to the dollar's privileged status in the international monetary system,[5] which allows the U.S. to borrow at low cost in its own currency and invest abroad in riskier assets offering higher average yields.

Table 1: Change in NFA between 1989 and 2007

	Net foreign assets balance 1989	Change in NFA 1989-2007	Contribution of financial-account balances	Contribution of capital gains	Other (normalization via GDP)
United States	−4.4	−11.1	−41.7	28.0	2.6
United Kingdom	9.8	−30.1	−21.5	−2.4	−6.2
France	2.6	−2.6	9.5	−11.0	−1.1
Germany	22.1	5.9	28.1	−11.8	−10.4
Italy	−5.1	−16.5	−7.7	−11.6	2.8
Japan	10.0	38.1	45.6	−5.3	−2.2

Source: IMF, External wealth of nations II, DG Trésor calculations.

Key: How to read this table: In 1989, U.S. NFA was equal to −4.4 points of GDP. Between 1989 and 2007, it deteriorated by 11.1 points of GDP. This deterioration was mainly due to an accumulation, in that period, of net capital inflows equal to 41.7 points of 2007 GDP and an accumulation of capital gains equal to 28 points of 2007 GDP.

Lastly, while annual NFA fluctuations were closely correlated with current-account balances between 1971 and 1990, the pattern has not persisted in more recent years (see table 2). This weaker correlation is due to the growing impact of valuation effects. These are stronger in developed countries, which have accumulated more gross assets and liabilities.

Table 2: Correlation $\rho\left(\frac{\Delta NFA}{GDP},\frac{CA}{GDP}\right)$ by period and by country

Country group	1971-1990	1991-2010
Developped	0.61	0.26
Emerging	0.54	0.46
Developing	0.46	0.34

Source: Obstfeld (2012) from Lane and Milesi-Ferretti database.

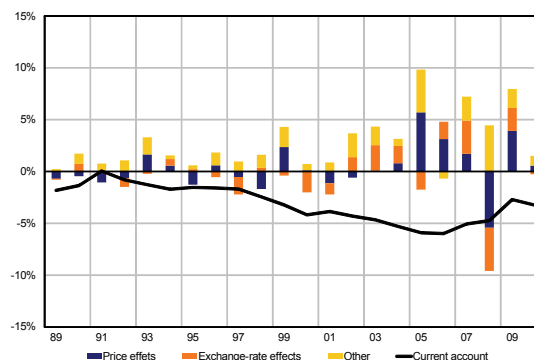### Box 2: Breakdown between exchange-rate effects and price effects: the case of the United States

The U.S. Bureau of Economic Analysis (BEA) publishes an annual breakdown of valuation effects into exchange-rate effects, price effects, and other volume changes.[a]

In the United States, the average order of magnitude of capital gains due to price movements slightly exceeds that of exchange-rate effects: their absolute value for the period averaged 1.6 points of GDP versus 1.3 points of GDP for exchange-rate effects. Also, the share of "other" contributions calculated by the BEA is significant, sometimes matching exchange-rate and price effects combined.

Between 2005 and 2007, the U.S. NFAs was revalued several times because of positive price movements. This was a period when the prices of foreign securities held by U.S. residents rose more steeply than the prices of U.S. securities held by non-residents. In 2008, the world financial crisis hit foreign securities more heavily than U.S. securities. U.S. external assets therefore lost far more value than liabilities, entailing strongly negative price effects of around 5 points of GDP.

Chart 5: Breakdown of valuation effects in the United States between exchange-rate effects and price effects, 1989-2010

Sources: Lane and Sambaugh database; DG Trésor.

As regards exchange-rate effects, the dollar's gradual depreciation vis-à-vis the main financial partners of the U.S. generated large positive exchange-rate effects in 2001-2007 (except for 2005). In 2008, by contrast, the dollar's appreciation-due to the crisis-generated "flight to quality"-resulted in negative exchange-rate effects of approximately 4 points of GDP.[b]

a. Since 2005, the Banque de France has also been publishing the stock-flow breakdown of NFA changes between two periods. See, for example, the Bank's 2010 annual report on the balance of payments and the net foreign assets.
b. Gourinchas, Rey, and Govillot (2010) interpret the change in U.S. valuation effects as a reflection of the country's role in the international monetary system. When the global economy is in a normal growth scenario, the U.S. offers a safe investment for the rest of the world. In exchange, it enjoys valuation gains on its external portfolio. By contrast, in a period of global stress, as in 2008, the U.S. pays an insurance premium to the rest of the world in the form of negative valuation gains. See Pierre-Olivier Gourinchas, Helene Rey and Nicolas Govillot, (2010). "Exorbitant Privilege and Exorbitant Duty," IMES *Discussion Paper Series*.

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(5) The capital gains recorded by the U.S. are studied in detail in two articles by P.O. Gourinchas and H. Rey: "International Financial Adjustments" and "From World Banker to World Venture Capitalist: US External Adjustment and the Exorbitant Privilege" (2007).

2. The structure of an economy's international portfolio and its currency mix explains the sign and size of the valuation effects channeled through the exchange rate

2.1 The currency mix of a country's international balance sheet determines the sensitivity of its NFA to the exchange rate

The IMF Balance of Payments and International Investment Position Manual[6] offers **a breakdown of valuation effects into three components:**

(i) **exchange-rate effects**, which consist in the revaluation of financial securities due to variations in the currencies in which they are denominated.

(ii) **price effects**, which consist in the revaluation of financial securities due to changes in their prices.

(iii) a third component representing the other volume changes that cannot be explained either by a transaction or by price or exchange-rate revaluations.[7]

The sign of exchange-rate effects depends directly on the structure of an economy's external balance sheet. The reason is that the impact of exchange-rate variations is confined to securities denominated in foreign currencies. In the extreme case of an economy whose assets consist entirely of securities denominated in foreign currencies and liabilities denominated entirely in domestic currency, a depreciation of the domestic currency will improve the NFAB, because the value of the assets expressed in that currency will rise whereas the value of the liabilities will remain constant.

From the data on the currency structure of an economy's external assets and liabilities[8] and NFA data, we can construct a sensitivity indicator, SENSt, to measure NFA response to exchange-rate variations.[9] The indicator's sign shows the impact of a bilateral exchange-rate movement on the net foreign assets balances-all other things being equal (*ceteris paribus*). As we have defined it, the indicator of an economy's sensitivity to the exchange rate will be positive when its external balance sheet comprises more assets than liabilities denominated in foreign currency. In that case, an exchange-rate depreciation will have a positive impact on the NFA. It is important to note that the impact of exchange-rate variations on the NFAB is given here "all other things being equal." This is because the final (ex-post) impact of an exchange-rate variation will also depend on price movements combined with exchange-rate movements (see part 3).

2.2 Since the early 1990s, the international portfolio structure of emerging countries has been converging toward that of developed countries, reflecting a decrease in foreign-currency debt and the implementation of foreign-reserve accumulation strategies

The exchange-rate sensitivity indicator is higher in developed countries than in emerging or developing countries (see table 3). This reflects the developed countries' capacity to borrow in national currency and the fact that their NFAs are, on average, larger than those of emerging countries. For the euro-zone countries, the introduction of the single currency affected the sensitivity index by converting in a single year (between 1998 and 1999) the securities held between member countries from assets denominated in foreign currency to assets in domestic currency. In France, assets denominated in domestic currency jumped from 20 points of total assets in 1998 to 58.5% in 1999, while the proportion of French external liabilities denominated in foreign currency fell from 29% to 19%. On balance, the introduction of the euro lowered the exchange-rate sensitivity index for the French NFAB, because the proportion of French foreign assets converted from securities denominated in foreign currency to securities denominated in domestic currency exceeded the proportion of French foreign liabilities that had to undergo the same conversion.

Table 3: External-portfolio structures in 1991 and 2008

	1991			2008		
	Sensitivity indicator	Financial integration (points of GDP) $\dfrac{A_t + L_t}{GDP_t}$	Gain in point of GDP if 10% depreciation (ceteris paribus)	Sensitivity indicator	Financial integration (points of GDP) $\dfrac{A_t + L_t}{GDP_t}$	Gain in point of GDP if 10% depreciation (ceteris paribus)
Developed countries	**0.0%**	**155.0**	**0.8**	**12.2%**	**640.6**	**7.4**
United States	18.0%	77.2	1.4	26.3%	278.8	7.3
United Kingdom	14.9%	343.2	5.1	13.7%	931.0	12.7
France	13.4%	128.3	1.7	9.1%	582.2	5.3
Emerging countries	**−25.1%**	**147.6**	**−0.1**	**10.2%**	**276.3**	**7.3**
Emerging countries (excluding Hong Kong and Singapore)	**−30.2%**	**75.9**	**−2.1**	**7.4%**	**139.3**	**1.4**
South Africa	0.6%	51.5	0.0	28.7%	174.6	5.0
Brazil	−13.6%	49.4	−0.7	−1.9%	102.7	−0.2
Mexico	−31.7%	71.9	−2.3	1.1%	83.7	0.1
China	17.7%	19.9	0.4	45.2%	67.5	3.0

Source: IMF, External wealth of nations II, DG Trésor calculations.

How to read this table: In 1991, the United States had a sensitivity indicator of 18%, i.e., as a proportion of the sum of its total gross assets and liabilities, the difference between assets and liabilities denominated in foreign currency was 18%. The sum of its total gross assets and liabilities stood at 155 points of GDP. All other things being equal, a 10% depreciation of the dollar against all its partner currencies would have generated positive valuation effects that would have improved the U.S. NFA by 1.4 points of GDP.

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(6) Balance of Payments International Investment Position Manual, 6th Edition, IMF.

(7) Its many possible causes include: conversion of securities (such as convertible bonds), changes in economy of residence, reclassifications (for example, monetization of gold, in accounting terms), and debt cancellation.

(8) Lane and Shambaugh (2010) have built a nearly exhaustive database on the currency composition of the portfolios of 117 countries for the period 1990-2004: "Financial exchange rates and currency exposures," *The American Economic Review*.

(9) The indicator is the difference between the share of assets denominated in foreign currency and the share of liabilities denominated in foreign currency weighted respectively by the share of gross assets and the share of gross liabilities in the total portfolio. For a detailed description of the indicator, see the DG Trésor working paper « La globalisation financière affecte-t-elle le processus d'ajustement extérieur des économies ? » (forthcoming).

The most striking observation, however, is the change in the sensitivity indicator for emerging countries. On average, their indicator moved from a strongly negative 25.1% in 1991 to a positive 7.3% in 2008. Of the 22 emerging countries in the sample, 18 had a negative indicator in 1991 but only 8 did in 2008. This significant shift in the structure of emerging countries' international securities portfolios in the past two decades is due to two factors: the drive to reduce debt denominated in foreign currency, and the implementation of development strategies based on the accumulation of current-account surpluses, which imply less deteriorated NFAs. These new development strategies were adopted in response to the financial and currency crises experienced by certain emerging economies in the 1980s and 1990s, whose severity was aggravated by the fact that most of these countries had borrowed in foreign currency (see box 3).
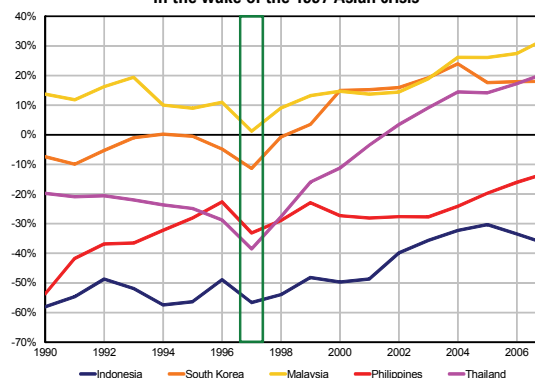

Box 3: **Change in structure of external portfolios of South-East Asian emerging countries in the wake of the 1990s crisis**

In 1997, after several years of robust economic growth, several South-East Asian countries suffered a balance-of-payments crisis. When the crisis erupted, these countries were heavily indebted in foreign currency, particularly in dollars. After 1997, these economies rebalanced their international portfolios.

This had two consequences. First, their external borrowings decreased-particularly for Malaysia and Thailand-because of the shift toward growth models based on exports and the accumulation of foreign-exchange reserves. Second, certain countries such as South Korea and Thailand reduced their share of liabilities denominated in foreign currency. This major change illustrates the general trend in the portfolio structure of emerging countries between the early 1990s and the mid-2000s.

Chart 6: Change in exchange-rate sensitivity indicator in the wake of the 1997 Asian crisis

Sources: Lane et Sambaugh database, DG Trésor calculations.

Chart 6 shows this currency recomposition of NFAs. The exchange-rate sensitivity indicators are plotted for Indonesia, Malaysia, Thailand, South Korea, and the Philippines. We see that, after 1997, sensitivity increased and even turned positive in Thailand, South Korea, and Malaysia.

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3. Exchange-rate valuation effects represent an additional adjustment channel with respect to the conventional trade adjustment channel. However, the price variations concomitant with exchange-rate variations can obstruct or even neutralize this second channel

The exchange-rate effects described in Part 2 constitute a potential adjustment channel for net foreign assets. However, when agents expect an exchange-rate variation, they reallocate their international portfolios. This should entail variations in asset prices. Theoretically, in the case of fully integrated international financial markets, and assuming risk-neutral investors who want to maximize their portfolio yields, these price variations should neutralize the exchange-rate effects.

3.1 To have an impact on the net foreign assets and so contribute to the external adjustment, exchange-rate effects must not be fully offset by price effects

If a country has a positive exchange-rate sensitivity indicator (more assets than liabilities denominated in foreign currency), a currency depreciation should produce positive valuation effects (gains) for its NFAB. As a result, in addition to the improvement in the trade balance due to the currency depreciation, the net foreign assets should strengthen thanks to the valuation gains.[10] **The exchange-rate effects could thus offer an additional adjustment mechanism to supplement the conventional mechanism provided by the trade channel.**

However, exchange-rate effects will impact the NFA if they are not offset by price movements that neutralize them. An exchange-rate variation that generates capital gains on a country's NFAB is equivalent to a transfer of wealth from the rest of the world to the country. If international investors expect the transfer, they should accordingly demand a form of compensation via asset-price movements in the opposite direction to that of exchange-rate movements. This is an international arbitrage mechanism similar to that of the interest rate parity (IRP) condition.

We can therefore make two assumptions about the existence of the financial-adjustment channel:

- Expected exchange-rate movements entail variations in international asset prices that fully offset them. The financial channel is neutralized by these compensatory price effects.

- The expected exchange-rate variations are not fully offset by price variations. Consequently, there is a limit to international arbitrage, and a part of the exchange-rate effects is ultimately passed on to the NFAB. This demonstrates the existence of a second adjustment channel in addition to the conventional trade channel.

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(10) Conversely, in a country with a negative sensitivity indicator, i.e., with fewer assets than liabilities denominated in foreign currency, a depreciation would generate negative exchange-rate effects that would deteriorate the NFA and thus undermine an adjustment via the trade balance.

In practice, international arbitrage is limited because international assets are imperfectly substituable.[11] For various reasons-such as liquidity differences, credit risk, financial regulations, and asset managers' internal models-the evidence suggests that demand for international assets is not determined solely by yield gaps adjusted for exchange-rate expectations.

Moreover, certain financial securities included in the NFA are subject to revaluations due to the exchange rate but not to prices. As a result, they are intrinsically excluded from arbitrage mechanisms. This is the case with the "other investments" category of the NFA, which notably comprises loans and bank deposits. Lastly, we should note that the mechanism underlying IRP rests on expectations of future exchange rates. Unexpected shocks therefore generate exchange-rate effects that are not offset by price effects.[12]

3.2 An econometric analysis shows that exchange-rate effects are partly transmitted to the NFA, indicating the existence of a financial adjustment channel. However, the transmission of exchange-rate effects to the NFA is weaker in developed countries than in emerging and developing countries

Empirically (see box 4), the impact of exchange-rate effects on the NFA varies with the development level. In emerging economies, exchange-rate effects are very weakly offset by price effects. By contrast, the compensation appears to be significant in developed countries.

This may be due to a greater substitutability of financial assets traded between developed countries, which would explain the weaker transmission of exchange-rate effects to NFAs. Financial markets in developed countries have far more liquidity and depth than their counterparts in emerging countries, making it easier to arbitrate between asset classes. Furthermore, the investment preferences of the central banks of emerging countries (the largest investors in volume terms) are generally determined by asset liquidity and safety criteria more than by potential yields.[13] In consequence, their behavior cannot be easily explained in terms of arbitrage.

In addition, the external balance sheets of developed economies comprise a larger share of financial securities in equity form (shares or FDI), which are intrinsically more exposed to price revaluations than debt securities such as bonds, trade credits, loans and borrowings, and bank deposits.[14] Price effects therefore play a greater role in developed countries, which may explain the lesser pass-through effects of exchange rates on NFAs.

NFA adjustments via the exchange rate are therefore stronger when we take into account not only the trade channel but also exchange-rate effects. In the short term, a depreciation has an instant effect on the NFA via revaluations, whereas an improvement in the trade balance has a more gradual effect. However, we should remain cautious in interpreting the exchange-rate channel, especially because of the strong variability of price effects.[15] While several academic studies and the estimates reported here emphasize the existence of a financial adjustment channel for the NFA, a better understanding of the interactions between price effects and exchange-rate effects remains necessary.[16]

Arthur SODE,

Léonardo PUPPETTO

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(11) The imperfect substitutability of international assets is a hypothesis used to build models in which the parity condition is not fully met. One of the advantages of these models, which are more realistic, is that they make it possible to describe financial phenomena observed empirically, such as valuation effects. This class of models, introduced by Kouri (1982), was recently used to describe the external adjustment dynamics of the U.S. current account. See especially Olivier Blanchard, Francesco Giavazzi, and Filipa Its, (2005). "The U.S. Current Account and the Dollar," *NBER Working Paper* 11137.

(12) For a full description of the differences between expected and unexpected value effects, see P.O Gourinchas (2008), "Valuation Effects and External Adjustment: a Review."

(13) An expected depreciation of the currencies in which their securities are denominated (dollar or euro, for example) does not entail a reallocation of their portfolios. Therefore, the negative exchange-rate effects on their securities are not offset by positive price effects.

(14) The explanation is that most debt assets are not exposed to exchange-rate effects because they are booked in the balance of payments at face value and not at market value (which, in most cases, does not exist). Examples include trade credits, loans, borrowings, and bank deposits. As a result, they are also sheltered from price effects.

(15) In their 2012 study, "Risk Sharing Through Capital Gains," Balli et al. show that capital gains in Finland are mainly influenced by their price-effect component, which in turn is almost totally determined by the variations in the Nokia share price. This specific feature was notably responsible for NFA revaluations exceeding 80 points of Finnish GDP. See Faruk Balli, Sebnem Kalemli-Ozcan, and Bent E Sørensen (2012), "Risk Sharing Through Capital Gains," *Scandinavian Journal of Economics*.

(16) Recent studies seek to provide some initial answers by endogenizing the composition of international portfolios. For a review of the literature on the latest theoretical advances concerning this type of model, see, for example Anna Pavlova and Roberto Rigobon (2010), International Macro-Finance, *NBER Working Paper* 16630.

Box 4: **Impact of exchange-rate effects on NFA by development level**

The database compiled by Lane and Shambaugh (2009) gives details on the currency composition of the external balance sheets for a large panel of countries. We can use it to calculate the exchange-rate effects caused by the variation in bilateral exchange rates (see box 4). To test whether these exchange-rate effects pass through to capital gains-and so to the NFA-we estimated the following equation for the period 1990-2007[a] :

$$KG_{i,t} = \alpha_i + \beta_i VAL_{i,t}^{XR} + \varepsilon_{i,t} \qquad (1)$$

With $KG_{i,t}$ the capital gains realized by country i in year t, expressed as a percentage of GDP, and $VAL_{i,t}^{XR}$ the exchange-rate effects recorded by country i in year t, also expressed as a percentage of GDP. A zero β_i coefficient indicates that the exchange-rate effects are not passed on to capital gains, i.e., that there is a mechanism for offsetting exchange-rate variations. Lane and Shambaugh (2009) estimate this equation for the period 1990-2004, with similar results.[b]

By contrast, a β_i coefficient significantly different from 0 indicates that the exchange-rate effects are passed on to capital gains and can therefore potentially contribute to the economy' external adjustment.

Table 4: Estimation results

Type of country	Number of countries in sample	Percentage of sample with significantly non-null coefficient	Mean β_i coefficient
Developed	23	25%	0.38
Emerging	23	63%	0.68
Developing	33	72%	1.01

Source: DG Trésor calculations.

The results differ with the country's development level. For the developed countries, only 25% of the 23 economies for which we estimate the equation display a significantly non-null coefficient. The proportion is higher among emerging and developing countries, at 63% and 72% respectively. The mean coefficients estimated for the emerging countries (0.68) and developing countries (1.01) also exceed that of the developed countries (0.38). This means that, on average, if we take an exchange-rate effect equal to one point of GDP, one-third is transmitted to the NFA of a developed country, and two-thirds to the NFA of an emerging country.

These estimates suggest that exchange-rate effects represent a major adjustment channel. For example, at end-2010, the U.S. external position stood at –17 points of GDP. To reduce its external debt via the trade channel, the U.S. would need to generate trade surpluses. With a trade deficit of 3.4 points of GDP, this would require a real depreciation of the dollar of probably more than 30% (between 1985 and 1990, the U.S. moved from a trade deficit of 3.2% to equilibrium, with a real depreciation of the dollar of around 30% during the same period). Via the financial channel, a simple nominal depreciation of 5% would allow the U.S. to instantly reduce its external debt by approximately 1.5 points of GDP.

$$\left(SENS_t \times \frac{A_t + L_t}{GDP} \times (-0,05) \times \beta \text{ developed} = 26,7\ \% * 297,7\ \% * (-5\ \%) * 0,38 = 0,015 \right).$$

a. If a IRP condition is partly met, a rapid calculation shows that the beta coefficient is biased, positively if the exchange-rate sensitivity is positive, negatively if the exchange-rate sensitivity is negative. See the DG Trésor working paper « La globalisation financière affecte-t-elle le processus d'ajustement extérieur des économies ? » (forthcoming).
b. We lengthened the estimation period used by Lane and Shambaugh (2009) by assuming that the currency compositions of the external balance-sheets remained constant at their 2004 values during the period 2005-2007.

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