CHAPTER 1

EXTERNAL POSITIONS AND POLICIES
Online Annexes

Online Annex 1.1. COVID-19–Related External Balance Assessment Adjustments[1]

The COVID-19 crisis has significantly affected external positions, with current account balances in many cases changing substantially more in 2020 than in 2019. To assess underlying external positions in 2020, additional adjustments to the External Balance Assessment (EBA) model estimates are needed beyond the standard cyclical adjustments—those for movements in domestic and foreign output gaps and in the terms of trade (see Cubeddu and others 2019)—to strip out transitory factors related to the impact of the crisis on hard-hit economic sectors. This annex explains how these adjustments were estimated for the 2020 external sector assessments reported in Chapter 3 and summarized in Chapter 1.

The IMF staff identified four main adjustments related to the impact of the crisis on specific economic sectors that were applied across economies in an evenhanded and multilaterally consistent way. These adjustors relate to the impact of the crisis on (1) the travel services balance (including tourism) due to restrictions on international travel; (2) oil balances, reflecting the sharp impact of the crisis on oil prices and oil volumes traded; (3) trade in medical products triggered by the health emergency; and (4) the shift in household consumption composition from services to durables and other consumer goods. In addition, more country-specific adjustors related to the COVID-19 crisis were also included, as described in what follows.

Oil and Travel Adjustors

To inform the design of EBA adjustors to the current account in 2020 associated with the impact of the crisis on the travel services and oil sectors, the analysis estimates the historical relationship between the EBA cyclically adjusted current account balance and travel services and oil balances, respectively, after controlling for the effect on the current account balance through the relative output gap and terms of trade. The following relationship is estimated using annual data for 1986–2019 for the sample of economies included in the EBA exercise:

$$y_{i,t} - y_{i,t-1} = \alpha_i + \lambda_t + \beta_1 x_{i,t} + \beta_2 z_{i,t} + \gamma \text{Controls}_{i,t} + \varepsilon_{i,t}\,, \qquad (1.1.1)$$

where

- $y_{i,t}$ is the EBA cyclically adjusted current account balance for economy i in year t, in percent of GDP.
- α_i and λ_t are economy and time fixed effects, respectively.
- $x_{i,t}$ is the change in the travel services balance in percent of GDP based on *World Economic Outlook* (WEO) historical data.
- $z_{i,t}$ is the change in the oil balance in percent of GDP based on WEO historical data.
- $\text{Controls}_{i,t}$ contains additional controls (three lags of the change in the current account, the output gap, and the change in the terms of trade).

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- $\varepsilon_{i,t}$ is an unexplained residual.

A two-stage least squares strategy is used to estimate equation (1.1.1) to address endogeneity issues regarding the comovement of the current account, oil, and travel services balances (see Online Annex Table 1.1.1 for details). The estimated coefficients suggest that the impact effect of a 1 percent of GDP rise in the travel services balance on the current account is about 0.75 percent of GDP, while the effect of a rise in the oil balance is somewhat higher (0.90 percent of GDP). The effect being less than 1 is consistent with the notion that the current account adjusts by less than the direct impact of the shock, reflecting associated adjustments in domestic demand and substitution effects. These results are based on using and averaging across alternative estimation methods and specifications (such as the inclusion of additional controls and instruments; see Online Annex Table 1.1.1).[2]

The resultant travel services adjustment to the current account in 2020 is computed based on (1) the estimated relationship between changes in travel services balances and the current account in equation (1.1.1); and (2) the projected transitory COVID-19 impact on the travel services balance in 2020. The baseline assumption was that the impact would fade over the medium term. This assumption was modified in economies where IMF staff projections assume that the impact is more persistent. Online Annex Figure 1.1.1 and Online Annex Figure 1.1.2 present the estimated impact on the current account in percent of GDP and in US dollars, respectively; Online Annex Table 1.1.2 presents the associated EBA *adjustors* to the current account in percent of GDP (equal to the estimated impact, but with the opposite sign). The impact across economies is highly asymmetric, with economies with substantial exports of tourism, such as Spain, Thailand, and Turkey, having large negative current account impacts and positive impacts spread more evenly over economies.

The oil shock adjustor for the underlying current account is calculated in a similar way. It is based on (1) the estimated historical relationship in equation (1.1.1); and (2) the temporary component of the unexpected change in oil balances in 2020. Unexpected changes are computed in comparison with pre-pandemic (January 2020 WEO *Update*) IMF staff forecasts. The temporary component is computed by comparing the revisions to forecasts for 2025 and 2020. If the shock to the 2020 oil balance is entirely transitory, there should be no change in the forecast for 2025. The analysis subtracts the change in the oil balance projection for 2025 from the change in the projection for 2020. As for the travel services shock, the effects are found to be highly asymmetric, with particularly large negative current account impacts for oil exporters, such as Russia and Saudi Arabia (Online Annex Figure 1.1.1 and Online Annex Table 1.1.2).

Trade in Medical Products

The COVID-19 medical emergency has caused an unusual level of exports and imports of medical products, with implications for current account movements in 2020. To quantify the impact, the analysis considers UN Comtrade export and import data for the list of COVID-19–related medical products taken from WTO (2020), which covers pharmaceuticals, medical supplies, medical equipment, and personal protective equipment. The values of imports and

[2]Similar results arise when equation (1.1.1) is (1) estimated separately for changes in the travel services and the oil balances; (2) when focusing only on either large tourism or oil exporters; and (3) when using Cook's distance to reduce the influence of outliers.

exports are calculated at the Harmonized System six-digit subheading level for 92 separate subheadings.

The export data are adjusted to subtract foreign value added (intermediate goods imports) using Organisation for Economic Co-operation and Development (OECD) Trade in Value Added (TiVA) data. The resulting foreign intermediate goods subtracted from the export data are added to the imports for each economy considered in the analysis. These intermediate imports are also allocated to exporters based on total goods trade export shares for 2020 from the IMF WEO database, with the shares computed to add to 100 percent for the sample of economies considered, which cover those included in the EBA and/or *External Sector Report* exercises. The reallocation of such intermediate goods to exporters has only a modest influence on the results. Finally, the analysis computes the associated change in net exports in 2020 compared with 2019 for economies with the necessary Comtrade data. The estimated positive net effect on the current account is particularly large for medical goods exporters such as China and Malaysia (Online Annex Figure 1.1.1).

Household Consumption Composition Shift

The pandemic has shifted the composition of household consumption from services toward durables and other consumer goods. In advanced economies, the composition shift has generally been toward both durable and nondurable consumer goods, while in emerging market and developing economies the shift away from services has been less pronounced and has come with a larger share of nondurables consumption. The calculation for this adjustor focuses on the shift in consumption *composition* as opposed to the overall level of consumption, which declined in 2020 but whose impact on the current account is already reflected in the standard EBA cyclical adjustment.

The impact on imports is estimated based on a comparison of (1) the level of durables, nondurables, and services consumption that would have occurred in 2020:Q2–Q4 based on their 2019:Q2–Q4 shares in private consumption and the evolution of total private consumption in 2020; (2) the actual level of durables, nondurables, and services consumption in 2020; and (3) the import content of durables, nondurables, and services consumption. The latter is available for the United States from a study by the Federal Reserve Bank of San Francisco staff (Hale and others 2019). For other economies, this estimate of import content is scaled, based on the percentage of foreign value added in domestic demand (from the OECD's TiVA data set) compared with the United States. Quarterly data are available for 14 advanced economies and 7 emerging market and developing economies. For economies with missing data, the shift in the shares in consumption categories in 2020 is based on the advanced economy and emerging market and developing economy averages, respectively.

The impact of the associated rise in imports on economies' exports is based on (1) the sum of the impact on imports of durable, nondurable, and services household consumption across economies; and (2) the share of each economy's exports in total exports. The share in total exports for durable goods is based on UN Comtrade data, defined by the UN Classification by Broad Economic Categories (BEC) 61 ("Consumer goods not elsewhere specified, durable"). The share of total exports for nondurable goods and the import content of services is based on

data for trade in goods excluding oil. The analysis avoids double-counting with the travel adjustor by excluding the share of foreign travel from the consumption of services. It also avoids double-counting with the oil and medical goods adjustors by excluding the share of fuel and of pharmaceutical and other medical products, respectively, from the consumption of nondurables. Overall, the largest net positive and negative estimated current account impacts are, in US dollars, for China and the United States, respectively (Online Annex Figure 1.1.2).

Other Factors

Other, more idiosyncratic factors associated with the COVID-19 crisis (reported in Online Annex Figure 1.1.1, Online Annex Figure 1.1.2, and Online Annex Table 1.1.2) relate to the income balance, the gold balance, and remittances. Economies with large foreign direct investment liabilities experienced increases in their income and current account balances due to lower dividend payments to foreign investors on their external liabilities (Australia, Poland). In other cases, increased global demand for gold (a safe asset in times of heightened global risk aversion) led to temporary increases in gold exports for gold producers (South Africa, Thailand) and temporary current account decreases for gold imports (such as Switzerland). Fluctuations in remittances were deemed important in Mexico and, to a lesser extent, in Malaysia. Overall, these additional more idiosyncratic factors were relatively small as a share of world GDP.

Online Annex Table 1.1.1. Current Account Balance versus Travel and Oil Balances: Historical Relation

Dependent Variable: Change in Cyclically Adjusted Current Account Balance (Percent of GDP)

Method	2SLS		GMM	
Change in Travel Balance/GDP	0.80*** (0.24)	0.79*** (0.24)	0.73*** (0.24)	0.73*** (0.24)
Change in Oil Balance/GDP	0.91*** (0.20)	0.92** (0.28)	0.89*** (0.20)	0.94*** (0.27)
Lags of Change in CA	3	3	3	3
Output Gap and TOT	NO	YES	NO	YES
Economy and Year FE	YES	YES	YES	YES
Observations	1,248	1,247	1,246	1,246
R-squared	0.23	0.23	0.22	0.22

Note: The table reports point estimates and robust standard errors in parentheses. ***, **, and * indicate statistical significance at the 1,5, and 10 level, respectively. 2SLS denotes two-stage-least-squares estimates with the change in travel services exports and oil exports relative to GDP instrumenting the change in the travel services balance and oil balance relative to GDP, respectively. GMM denotes generalized method of moments estimates with the following instruments: current and one-year lagged values of the change in travel services exports relative to GDP, the change in oil exports relative to GDP, real GDP partner (trade-weighted) growth, the output gap and the change in the terms of trade. All regressions include a dummy variable for China after 2014 to reflect accounting changes in the travel services balance. CA = current account; FE = fixed effect; TOT = terms of trade.

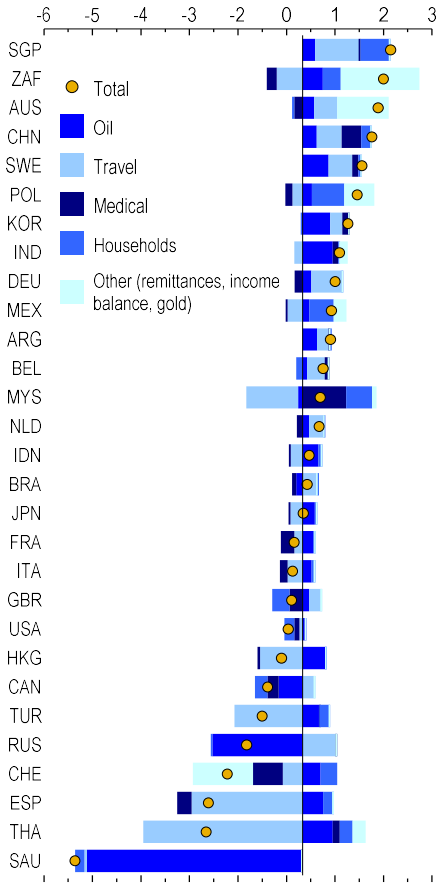
Online Annex Table 1.1.2. ESR Economies. Summary of COVID-19 Adjustments

(in percent of GDP)

Economy	Oil	Travel	Household consumption composition	Medical	Other	Total
Argentina	-0.2	-0.3	0.0	0.0	0.0	**-0.5**
Australia	-0.1	-0.5	0.1	0.2	-1.2	**-1.7**
Belgium	0.1	-0.4	0.1	-0.1	0.0	**-0.3**
Brazil	0.3	-0.3	0.0	0.1	0.0	**0.1**
Canada	0.6	-0.3	0.3	0.3	0.0	**0.8**
China	-0.1	-0.5	-0.2	-0.4	0.0	**-1.2**
Euro Area	-0.1	0.2	0.0	0.1	0.0	**0.2**
France	-0.1	0.2	-0.1	0.3	0.0	**0.4**
Germany	-0.1	-0.7	0.0	0.2	0.0	**-0.6**
Hong Kong SAR	-0.4	1.0	0.0	0.1	0.0	**0.6**
India	-0.6	0.2	0.0	-0.1	0.0	**-0.6**
Indonesia	-0.2	0.3	-0.1	0.0	0.0	**0.0**
Italy	0.0	0.4	-0.1	0.2	0.0	**0.4**
Japan	-0.1	0.3	0.0	0.1	0.0	**0.3**
Korea	-0.5	-0.3	0.0	-0.2	0.0	**-0.9**
Malaysia	0.3	1.2	-0.6	-1.0	-0.1	**-0.2**
Mexico	0.0	0.4	-0.6	0.0	-0.3	**-0.5**
The Netherlands	0.0	-0.3	0.0	0.1	0.0	**-0.2**
Poland	-0.1	0.3	-0.7	0.2	-0.7	**-1.1**
Russia	2.1	-0.9	0.0	0.0	0.0	**1.1**
Saudi Arabia	5.3	0.1	0.2	0.0	0.0	**5.6**
Singapore	-0.1	-1.0	-0.7	0.0	0.0	**-1.9**
South Africa	-0.4	0.6	-0.4	0.2	-1.8	**-1.8**
Spain	-0.3	2.6	-0.3	0.3	0.0	**2.4**
Sweden	-0.4	-0.5	-0.1	-0.2	0.0	**-1.2**
Switzerland	-0.3	0.5	-0.4	0.7	1.4	**1.9**
Thailand	-0.5	3.7	-0.3	-0.2	-0.3	**2.4**
Turkey	-0.2	1.6	-0.3	0.0	0.0	**1.1**
United Kingdom	0.0	-0.3	0.3	0.3	0.0	**0.3**
United States	0.1	0.1	0.2	0.2	0.0	**0.5**

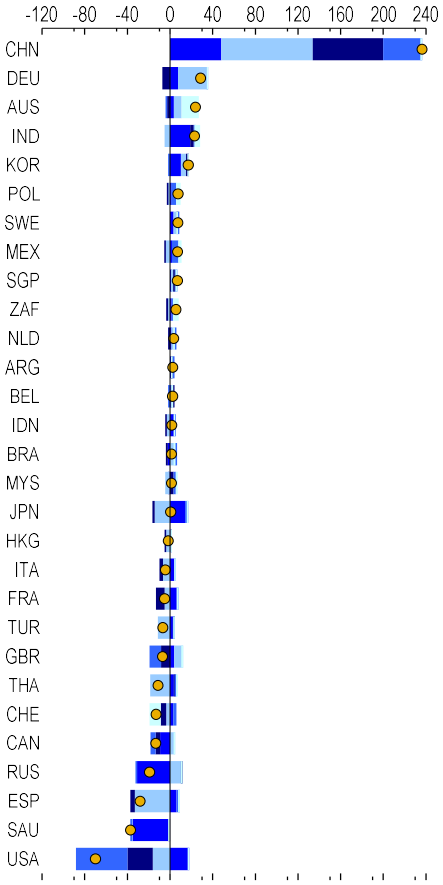
Note: Table reports adjustors to the current account, which equal the estimated impact on the current account but with the opposite sign.

Online Annex Figure 1.1.1. Estimated Effect of COVID-19 Factors on the Current Account, 2020
(Percent of GDP)



Sources: IMF, *World Economic Outlook*; and IMF staff calculations.
Note: Data labels use International Organization for Standardization (ISO) country codes.

Online Annex Figure 1.1.2. Estimated Effect of COVID-19 Factors on the Current Account, 2020
(Billions of US dollars)



Sources: IMF, *World Economic Outlook*; and IMF staff calculations.
Note: Data labels use International Organization for Standardization (ISO) country codes.

Online Annex 1.2. The COVID-19 Crisis and "Downhill" Flow of Capital[1]

Standard economic models suggest that capital should flow from capital-abundant rich economies to capital-scarce poorer ones in search of a higher return. Consequently, richer economies should—all else equal—on average run current account surpluses and lend capital to poorer economies that should run current account deficits. Such a "downhill" flow of capital from richer to poorer economies occurred during the decade following the global financial crisis. However, the COVID-19 crisis appears to have slowed this flow. Poorer economies have seen, on average, positive revisions to their current account balances compared with pre-pandemic forecasts, while richer economies have on average seen unexpected downward revisions to their current account balances. This development largely reflects richer economies having larger downward revisions in their public sector saving-investment balances that more than offset upward revisions to their private sector saving-investment balances.

Downhill Flows (2010–19)

During the decade following the global financial crisis there was a well-documented downhill flow of net capital from richer to poorer economies (Boz, Cubeddu, and Obstfeld 2017; McQuade and Schmitz 2017; Obstfeld 2021).[2] There was a strong and positive systematic association between per capita income and current account balances. Estimates of the relationship between the current account balance and (log) per capita income (lagged) during 2010–19 for a global sample of economies suggest that there was a doubling in per capita income associated with a 1.02 percentage point of GDP rise in the current account balance (Online Annex Table 1.2.1, column 1). The finding of a downhill flow during this period is robust to eliminating outliers using Cook's distance and also to the exclusion of the two largest countries from the sample (China and the United States—dropping these two economies strengthens the finding of downhill flows).

A Persistent Slowdown in Downhill Flows (2020–25)

The COVID-19 crisis has led, on average, to larger upward revisions to current account balances for poorer economies than for richer economies compared with pre-pandemic forecasts (Online Annex Table 1.2.1, column 2). The forecast error for the current account balance in percent of GDP in 2020 compared with the January 2020 WEO forecast is negatively correlated with the initial (2019) log of purchasing-power-parity GDP per capita for a global sample of 192 economies. The estimated slope coefficient (–1.05) implies that a doubling in income per capita is associated with a 1.05 percentage point of GDP reduction in the current account balance compared with pre-pandemic forecasts, in stark contrast with the previous decade. Despite this average result, for a number of lower-income and middle-income countries, there were sharp declines in current account balances, especially for those with significant exports of oil or of travel services (Online Annex Figure 1.2.1, panel 1). Excluding China and

[1]This annex was prepared by Cian Allen.

[2]This reserved more than a decade of net uphill flows in the lead-up to the global financial crisis (Gourinchas and Jeanne 2013; Alfaro, Kalemli-Ozcan, and Volosovych 2014).

the United States from the analysis decreases the coefficient only modestly (in absolute terms) to −0.99 (the estimate remains statistically significant at the 1 percent level). The relationship between per capita income and the observed current account balance in 2020 is negative but not statistically significant.

Repeating the analysis for forecasts for 2021 yields a slope coefficient of −0.80, and the slope flattens progressively toward zero for subsequent years. This result suggests a persistent slowdown in expected downhill flows that is, however, expected to fade over time, with a gradual return to the pattern expected before the pandemic.

The negative coefficient on current account revisions mainly reflects the larger declines in government saving in richer economies, which more than offset rises in private saving. The negative association between the public sector's saving-investment revisions and per capita income (−3.06) more than offsets the private sector's positive coefficient (2.10) (Online Annex Table 1.2.1, columns (3)–(4)). Decomposing further into gross public and private saving and investment, Online Annex Figure 1.2.1 shows that compared with previous forecasts, the results for public saving–investment balances are almost entirely driven by lower public saving rather than by higher investment in richer countries than in poorer ones. For private saving–investment balances, the results reflect mainly higher private saving in richer economies, as well as, to a lesser extent, a decline in private investment. These results also are robust to excluding China and the United States from the sample.

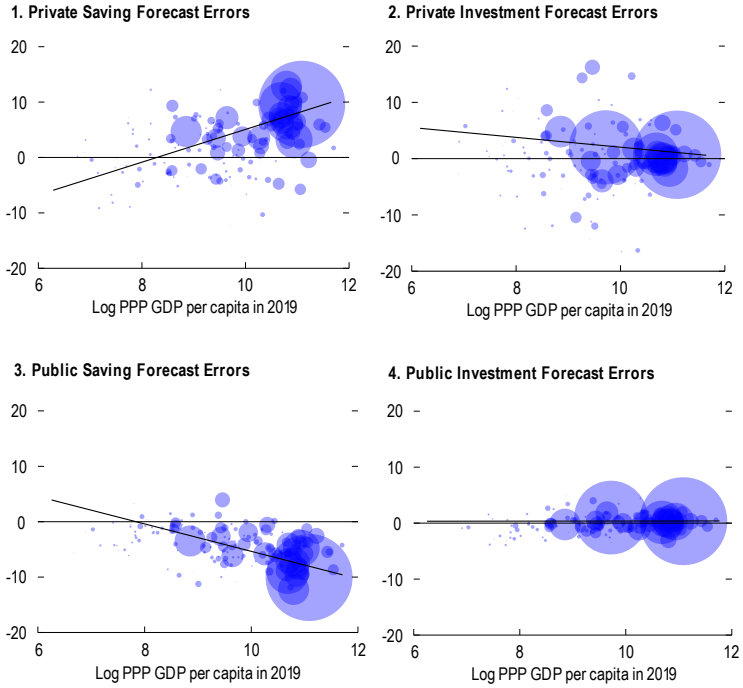
Overall, these patterns imply an uphill flow of capital from poorer to richer economies, relative to previous forecasts, highlighting the uneven impact and policy responses during the pandemic across country income groups.

Online Annex Table 1.2.1. Saving-Investment (Percent of GDP) vs. (Log) Per-capita Income

	(1)	(2)	(3)	(4)
	Current Account	Current Account (forecast errors)	Private Saving-Investment (forecast errors)	Public Saving-Investment (forecast errors)
Period	2010-2019	2020	2020	2020
Log PPP GDP per capita	1.018***	-1.050***	2.104***	-3.055***
	(0.369)	(0.204)	(0.624)	(0.596)
Time fixed effects	Yes	No	No	No
Observations	1883	192	147	150

Note: Robust standard errors are in parentheses. Observations weighted by nominal GDP.
*Significant at 10 percent; **significant at 5 percent; ***significant at 1 percent.

Online Annex Figure 1.2.1. Income Levels and Current Account Forecast Errors, 2020
(Percent of GDP)



Sources: IMF, *International Financial Statistics*; IMF, *World Economic Outlook* (WEO); and IMF staff calculations.
Note: Forecast errors are defined as outcomes minus January 2020 WEO *Update* forecast. Bubble sizes are proportional to US dollar GDP. PPP = purchasing power parity.

Online Annex 1.3. Computing Valuation Effects[1]

The role of valuation effects in the dynamics of the external position can be expressed using the following accounting framework. Changes in net foreign asset (NFA) positions between period t – 1 and t are equal to

$$NFA_t - NFA_{t-1} = CA_t + VAL_{FX,t} + VAL_{P,t}, \quad (1.3.1)$$

where CA_t denotes the current account, $VAL_{FX,t}$ are currency-induced valuation effects, and $VAL_{P,t}$ are valuation effects due to changes in asset prices. Given that it is possible to calculate $VAL_{FX,t}$, $VAL_{P,t}$ is obtained as a residual from the accounting identity (1.3.1).[2]

VAL_{FX} can be further decomposed into currency-induced valuation effects from external equity positions, VAL_{FX}^{EQ}, external debt positions, VAL_{FX}^{D}, and other positions, which include foreign exchange reserves, VAL_{FX}^{OT}.[3] Following Lane and Shambaugh (2010), the currency-induced valuation effects are calculated as $VAL_{FX,t}^{c} = \%\Delta I_t^{F,c}(A_{t-1}^{c} + L_{t-1}^{c})$, where c denotes the asset class and includes equity, debt, or other positions, $\%\Delta I_t^{F,c}$ is the percentage change in the net financial exchange rate index in period t for asset class c, and A_{t-1}^{c} (L_{t-1}^{c}) denote assets (liabilities) of asset class c. In turn, the financial exchange rate is calculated as $I_t^{F,c} = I_{t-1}^{F,c}(1 + \sum \omega_{j,t-1}^{F,c} \%\Delta E_{j,t})$, where $\%\Delta E_{j,t}$ is the percentage change in the bilateral end-of-period nominal exchange rate between the currency of a given country and the foreign currency j between $t-1$ and t, $\omega_{j,t-1}^{F,c}$ is the net financial weight between a given country and currency j in period $t-1$ for asset class c. This is calculated as $\omega_{j,t-1}^{F.c} = \omega_{j,t-1}^{A,c} s_{t-1}^{A,c} - \omega_{j,t-1}^{L,c} s_{t-1}^{L,c}$, where $\omega_{j,t-1}^{A,c}$ ($\omega_{j,t-1}^{L,c}$) are the proportion of assets (liabilities) of asset class c denominated in foreign currency j, $s_{t-1}^{A,c} = \dfrac{A_{t-1}^{c}}{A_{t-1}^{c} + L_{t-1}^{c}}$, and $s_{t-1}^{L,c} = \dfrac{L_{t-1}^{c}}{A_{t-1}^{c} + L_{t-1}^{c}}$.

[1]The author of this annex is Luciana Juvenal.

[2]Therefore, any errors or discrepancies are included in VAL_p.

[3]Equity positions include direct investment equity and portfolio equity. Debt positions include portfolio debt, direct investment debt, and other investment.

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