

Offermanns, Christian J.; Pramor, Marcus

**Working Paper**

## The CFS international capital flow database: A user's guide

CFS Working Paper, No. 2007/24

**Provided in Cooperation with:**

Center for Financial Studies (CFS), Goethe University Frankfurt

*Suggested Citation:* Offermanns, Christian J.; Pramor, Marcus (2007) : The CFS international capital flow database: A user's guide, CFS Working Paper, No. 2007/24, Goethe University Frankfurt, Center for Financial Studies (CFS), Frankfurt a. M., <https://nbn-resolving.de/urn:nbn:de:hebis:30-48557>

This Version is available at:

<https://hdl.handle.net/10419/25525>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



---

No. 2007/24

**The CFS International Capital Flow Database:  
A User's Guide**

Christian Offermanns and Marcus Pramor

---





## Center for Financial Studies

The *Center for Financial Studies* is a nonprofit research organization, supported by an association of more than 120 banks, insurance companies, industrial corporations and public institutions. Established in 1968 and closely affiliated with the University of Frankfurt, it provides a strong link between the financial community and academia.

The CFS Working Paper Series presents the result of scientific research on selected topics in the field of money, banking and finance. The authors were either participants in the Center's Research Fellow Program or members of one of the Center's Research Projects.

If you would like to know more about the *Center for Financial Studies*, please let us know of your interest.

A handwritten signature in black ink, appearing to read "Jan Pieter Krahenen".

Prof. Dr. Jan Pieter Krahenen

A handwritten signature in black ink, appearing to read "Volker Wieland".

Prof. Volker Wieland, Ph.D.



CFS Working Paper No. 2007/24

**The CFS International Capital Flow Database:  
A User's Guide\***

Christian Offermanns<sup>1</sup> and Marcus Pramor<sup>2</sup>

Original Version: July 2006  
This Version: August 2007

**Abstract:**

This paper documents the methodology underlying the construction of a global database of gross foreign asset and liability positions for 153 countries over the period 1970 to 2004 and illustrates some key data characteristics. The data cover both inflows and outflows of capital and thus allow for an assessment of the degree of international financial integration. In addition to net foreign asset stocks, we also provide details on the composition of the main asset and liability categories, namely the foreign direct investment, equity investment and debt components. Finally, we report on valuation changes as one of the main sources of discrepancy between transaction-based capital flow data and stock values of investment positions. The dataset is available for download at [www.ifk-cfs.de/fileadmin/downloads/data/cfs-icfd.zip](http://www.ifk-cfs.de/fileadmin/downloads/data/cfs-icfd.zip).

**JEL Classification:** F21; F34; F32

**Keywords:** Net Foreign Assets; Valuation Adjustment; International Financial Integration

\* This paper is part of a research project with Michael Binder, whom we thank for valuable advice at all stages of the project, funded by the Center for Financial Studies (CFS) and the Deutsche Bundesbank. All remaining errors and omissions are our own.

1 Frankfurt University and Deutsche Bundesbank; email: [offerman@wiwi.uni-frankfurt.de](mailto:offerman@wiwi.uni-frankfurt.de)

2 Center for Financial Studies; email: [pramor@ifk-cfs.de](mailto:pramor@ifk-cfs.de)

# 1 Introduction

Economic interaction has become an increasingly international phenomenon characterized by markedly growing flows of trade and capital. As international payments and investment positions claim a growing share of both corporate and national balance sheets, they also inevitably impact domestic financial variables and the level and composition of economic activity. This development demands appropriate consideration in both theoretical and applied research, and it is to this end that we have endeavored to properly capture and report international capital and financial flows and international investment positions. This user's guide is intended to describe and explain the data series reported in the corresponding data file, which can be found at <http://www.ifk-cfs.de/fileadmin/downloads/data/cfs-icfd.zip>.

We provide information not only on the size of the external investment position on a gross and net basis, but also on its composition according to asset class, as far as data availability permits. Total assets and liabilities are hence consistently built up as the sum of their components, i.e. foreign direct investment (FDI), equity, and debt. In addition, international reserves are included on the asset side, after subtracting gold holdings since the latter do not constitute a liability of any counterpart. To provide an indicator of the relative magnitude of the international investment position of each country we also include a series for gross domestic product (GDP).

While this data set is based both on flows as reported in the balance of payments and on international investment position stock data, only stock data are presented. Due to the conceptual equivalence of flows and the corresponding changes in stocks, no information is lost by only reporting the international investment position. Apart from the effect of inadvertent accounting errors and omissions, however, there will be a discrepancy between flows and increments in stock variables resulting from changes in the valuation of flow balances brought forward from prior periods. In fact, one of the main contributions in compiling this database is the appropriate adjustment of flow figures that re-establishes the conceptual equivalence. Through complementing reported international investment position figures with valuation-adjusted flows, we are able to cover a larger number of countries and obtain longer data series than either concept by itself could provide.

The database has significantly benefited from pioneering work by Sinn (1990) and was conceptually inspired by Lane and Milesi-Ferretti (2001). Lane and Milesi-Ferretti (2006) now offer a data set of similar coverage.

## 2 Data Sources

A variety of data sources has been drawn upon in compiling this data set. We present annual estimates of gross and net international capital stocks for 153 countries over the period 1970-2004. Our main source is the International Financial Statistics (IFS) online database by the International Monetary Fund (IMF), which provides the data series of the Balance of Payments Statistics (BOPS) and the International Investment Position (IIP). For the net foreign assets (NFA) position only, the IIP series are complemented through data points taken from Sinn (1990) for the period 1970-1987. Debt stock figures for developing countries are taken from the World Bank's Global Development Finance (GDF) database since these numbers are generally not available from the IIP series of the IFS.

For GDP, the primary data source is the World Bank's World Development Indicators database due to its comprehensive coverage. These series are complemented by data points taken from the IFS.<sup>1</sup> Time series for the consumer price index (CPI) that enter the calculation of valuation adjustments to flow data are obtained from the IFS. Similarly, trade-weighted real exchange rates of partner countries vis-à-vis the U.S. are calculated using trade data from the IMF's Direction of Trade Statistics and bilateral nominal exchange rates (period averages) from the IFS.

Equity indices, which also enter the calculation of valuation adjustments, are primarily taken from Morgan Stanley Capital International. Additional national and regional indices are obtained from Standard & Poor's, Nomura, Datastream, FTSE, Global Property Research, or directly from national stock exchanges. For Japan, the UK, and the U.S., separate world equity indices are used that omit the domestic country in each case. Tables providing more details on the source data series are shown in Appendix A.

## 3 Construction of Stock Data

### 3.1 Gross Asset and Liability Components

The guiding principle in building this database has been to obtain estimates of gross foreign asset and gross foreign liability components whenever data quality permits. Not only do these components allow the calculation of total foreign assets and total foreign liabilities, but they can also provide important information on a country's financial structure and changes in economic activity.

---

<sup>1</sup>Subsequently, some missing GDP observations were filled through data points from the recently published Lane and Milesi-Ferretti (2006), who generally rely on many different data sources. The same holds for the NFA series of Hong Kong, in which the new data points replace BOPS as the basis for complementing Sinn (1990) and IIP data. For details on the construction procedure, see the following section.

To this end, the different data sources are employed according to a consistent pecking order. When the level of detail in the reporting of individual asset and liability components is high enough, stock data from the IIP section of the IFS are used. However, IIP series are generally available only from the 1980s onwards and may omit too many of the individual components, in which case a calculation of total assets and total liabilities would not be meaningful. In these instances, the IIP-based series are extrapolated by use of the corresponding flow data from the BOPS, provided the latter benefit from a more comprehensive data coverage. In cumulating flow data, valuation adjustments need to be made to ensure consistency with the IIP series as the value of flow balances brought forward will change over time. Valuation adjustments will be specific to individual asset and liability classes, as described in detail in the following subsection.

The asset and liability series for FDI and equity ( $EQ$ ) conform with the IIP classifications. Debt assets ( $DEBTA$ ) are the sum of the IIP categories portfolio debt assets, other assets, and, if applicable, financial derivative assets. Debt liabilities ( $DEBTL$ ) are analogously calculated from portfolio debt liabilities, other liabilities, and financial derivative liabilities. Since these IIP series are frequently not available for developing countries, external debt figures from the GDF database are used in these cases. Instead of the IIP series reserve assets, we use the alternative IFS stock series total reserves minus gold ( $RES^*$ ) since gold holdings do not constitute a liability of any counterpart. Hence, our measures of gross foreign assets ( $GFA$ ) and gross foreign liabilities ( $GFL$ ) are constructed as follows:

$$GFA_{it} = FDIA_{it} + EQA_{it} + DEBTA_{it} + RES_{it}^*, \quad (1)$$

$$GFL_{it} = FDIL_{it} + EQL_{it} + DEBTL_{it}. \quad (2)$$

Note that unlike the gross foreign assets and gross foreign liabilities figures directly reported by the IIP, we employ strict criteria for determining whether the number of individual components available permits the calculation of dependable total foreign assets and total foreign liabilities figures. These aggregates are calculated only if all of the three components FDI, equity and debt are simultaneously available on both the asset and the liability side. However, even when meaningful gross asset and liability estimates cannot be calculated from the available data series, it may nonetheless be possible to construct a net foreign asset position as outlined below.

### 3.2 Valuation Adjustment

When flow data are used to extrapolate stock positions, the change in value of the balances brought forward needs to be added to the flow figure in every period. Since the value of different components of the international investment position is determined by different factors, these differences also need to be reflected in

the calculation of valuation adjustments. While any attempt of such “marking to market” will necessarily be imperfect, neglecting it altogether would not only be wrong on conceptual grounds but could also lead to severe distortions in practice. In some cases the valuation effect may more than offset the contribution of the flow figure for that period, thereby not only altering the magnitude but also the sign of the change in the corresponding stock position.

For this purpose, we follow the lead provided in Lane and Milesi-Ferretti (2001) and calculate comparable valuation adjustments. Equity assets (domestic holdings of foreign equity shares) are adjusted by changes in the MSCI World Index  $m$ , assuming that equity investment abroad is allocated according to the world portfolio that is approximated by this index.<sup>2</sup> Decomposing the change in the stock as above into

$$\Delta EQA_{it} = DEQA_{it} + \Delta V(EQA)_{it}, \quad (3)$$

where  $\Delta$  is the first difference operator and  $DEQA_{it}$  refers to the inflow of equity assets into country  $i$  in period  $t$ , we take the change in the value of the stock as

$$\Delta V(EQA)_{it} = \left( \frac{m_t}{m_{t-1}} - 1 \right) EQA_{i,t-1} + \left( \frac{m_t}{\sqrt{m_t m_{t-1}}} - 1 \right) DEQA_{it}, \quad (4)$$

taking into account that  $m_t$  refers to end-of-period values whereas flows are assumed to be evenly distributed over the year and hence adjusted for the average index value of  $\sqrt{m_t m_{t-1}}$ .

Equity liabilities (foreign holdings of domestic equity shares) are adjusted by changes in domestic (or regional) stock market indices  $m_i$  in the same vein as equity assets, with

$$\Delta EQL_{it} = DEQL_{it} + \Delta V(EQL)_{it}, \quad (5)$$

$DEQL_{it}$  denoting the flow of equity liabilities to country  $i$  in period  $t$ , and

$$\Delta V(EQL)_{it} = \left( \frac{m_{it}}{m_{i,t-1}} - 1 \right) EQL_{i,t-1} + \left( \frac{m_{it}}{\sqrt{m_{it} m_{i,t-1}}} - 1 \right) DEQL_{it}. \quad (6)$$

FDI assets are adjusted for changes in the real trade-weighted Dollar exchange rate of country  $i$ 's trade partners,  $\tilde{q}_{it}$ ,

$$\Delta FDIA_{it} = DFDIA_{it} + \Delta V(FDIA)_{it}, \quad (7)$$

where  $DFDIA_{it}$  is the inflow of FDI assets into country  $i$  (i.e. an outflow of capital) in period  $t$ .  $\Delta V(FDIA)_{it}$  is the change in the value of the FDI asset stock as of the end of period  $t - 1$  during period  $t$ , with

$$\Delta V(FDIA)_{it} = \left( \frac{\tilde{q}_{it}}{\tilde{q}_{i,t-1}} - 1 \right) FDIA_{i,t-1}, \quad (8)$$

---

<sup>2</sup>Note that for the U.S., Japan and the UK, we use an index that excludes the respective home country.



where

$$\tilde{q}_{it} = \exp \left\{ \sum_{j=1}^N \ln \left( \frac{CPI_{jt}}{CPI_{US,t}} \cdot s_{jt} \right) \cdot \tilde{w}_{ijt} \right\}, \quad (9)$$

$CPI$  is the consumer price index, and  $s_{jt}$  is country  $j$ 's exchange rate in U.S. Dollar per unit of domestic currency. The weight  $\tilde{w}_{ijt}$  is calculated as a predetermined moving average of country  $i$ 's trade (i.e., the sum of exports,  $EXP$ , and imports,  $IMP$ ) with country  $j$  relative to country  $i$ 's total trade for each year, or specifically

$$\tilde{w}_{ijt} = \frac{1}{\tau} \sum_{s=t-\tau}^{t-1} w_{ijs} \quad (10)$$

where

$$w_{ijs} = \frac{EXP_{ijs} + IMP_{ijs}}{\sum_{k=1}^N EXP_{iks} + IMP_{iks}} \quad (11)$$

and the span is set to  $\tau = 3$ .

We thus assume that a country's foreign direct investment flows are in line with its trade pattern, and that changes in the foreign direct investment position that country  $i$  holds in country  $j$  are due to changes in the relative price of consumption goods between country  $j$  and the U.S. as well as changes in the value of country  $j$ 's currency relative to the U.S. Dollar.

FDI liabilities are adjusted in the same vein, using country  $i$ 's real Dollar exchange rate  $q_{it}$ , such that

$$\Delta FDI_{it} = DFDIL_{it} + \Delta V(FDIL)_{it}, \quad (12)$$

where  $DFDIL_{it}$  denotes the inflow of FDI liabilities into country  $i$  (i.e. a capital inflow) in period  $t$ , and the change in the stock value is defined as

$$\Delta V(FDIL)_{it} = \left( \frac{q_{it}}{q_{i,t-1}} - 1 \right) FDIL_{i,t-1}, \quad (13)$$

with

$$q_{it} = \frac{CPI_{it}}{CPI_{US,t}} \cdot s_{it}. \quad (14)$$

Finally, we infer changes to the stock of international reserves excluding gold holdings ( $RES^*$ ) from the difference between the change in official reserves ( $\Delta RES$ ) according to IIP and recorded reserve flows ( $DRES$ ):

$$\Delta V(RES^*)_{it} = \Delta RES_{it} - DRES_{it}. \quad (15)$$

Since debt figures from the GDF database are available as stock data only, separate series for valuation adjustments cannot be obtained.

### 3.3 Net Foreign Asset Position

When we derive separate total asset ( $GFA$ ) and total liability ( $GFL$ ) estimates from individual components as described above, the calculation of the net foreign asset (NFA) position is straightforward:<sup>3</sup>

$$NFA_t = GFA_t - GFL_t. \quad (16)$$

Whenever this method is not feasible due to a lack of observations for gross figures, the following option may be available. Sinn (1990) had compiled an earlier database on NFA positions that covers 145 countries for the period from 1970 to 1987. This supplementary source is used to complement the data points calculated from total asset and total liability numbers. In most instances, combining these two sources will result in a data gap in the middle of the series. The remaining gap can, however, be filled through interpolation based on the other supplementary source, viz. valuation-adjusted flow figures. This last approach is also used when only one of the two aforementioned NFA sources is available, in which case the valuation-adjusted flow figures are used for extrapolation instead of interpolation.

In using flow figures from the BOPS, we exploit the fact that the sum of domestic balances on current and capital account over a particular period will amount to the change in the international investment position of that economy, provided that the valuation adjustments of all international investment components are taken into account. Since both flows and international investment positions in this database are classified in accordance with the fifth edition of the Balance of Payments Manual (BOPM) published by the IMF, it is worth noting that there have been some changes in definitions relative to earlier editions of the BOPM in order to harmonize the reporting practice with the System of National Accounts. Most importantly, what had formerly been known as the “capital account” has been redesignated as the “capital and financial account”. As a consequence, the current account balance ( $CA$ ) and the balance on capital account ( $KA$ ) within the capital and financial account do not conceptually offset each other any longer, instead the sum of the two represents the net lending (or net borrowing) of an economy.<sup>4</sup> Therefore, the final adjusted flow figure is computed as

$$CA_t^* = CA_t + KA_t + \Delta NV_t, \quad (17)$$

where  $\Delta NV_t$  represents the sum of available net valuation changes of asset and liability components,

$$\Delta NV_t = \Delta V(FDIA)_t - \Delta V(FDIL)_t + \Delta V(EQA)_t - \Delta V(EQL)_t + \Delta V(RES^*)_t. \quad (18)$$

---

<sup>3</sup>In the following, we will omit the country subscript  $i$  for notational convenience.

<sup>4</sup>Additional changes, particularly in the definition and reporting of transfers, have also altered the scope of the current account, so the redesignated terms are not directly comparable to their corresponding former definitions.

We derive the valuation changes  $\Delta V(\cdot)$  by constructing purely flow-based series for each component both with and without valuation adjustments, and computing the difference between the adjusted and the unadjusted estimates. Since the absolute level of balances brought forward determines the size of the valuation adjustment, we anchor the flow-based series through the earliest available IIP stock figure. When this starting value is preceded by one or more of the available BOPS data points, an initial value for the flow-based series is computed by extrapolating the IIP starting value backwards with and without valuation adjustments, respectively.

As a consequence, the adjusted current account balance provides an alternative estimate on the change in NFA which can be used to fill the gaps induced by missing observations. However, in the case of interpolation, we need to ensure that the interpolated segment meets its two attachment points. Therefore, the flow-based increments in the NFA position are scaled as follows. Observing stock data for  $NFA_t$  and  $NFA_{t'}$ , with  $t < t'$ , and observing the valuation-adjusted current account,  $CA_s^*$ , with  $s = t + 1, t + 2, \dots, t'$ , we obtain the missing values for NFA between  $t$  and  $t'$  as

$$NFA_s = NFA_t + \sum_{r=t+1}^s CA_r^* + d_{t',t}, \quad s = t + 1, t + 2, \dots, t', \quad (19)$$

where  $d_{t',t} = \frac{1}{t'-t}(NFA_{t'} - NFA_t - \sum_{s=t+1}^{t'} CA_s^*)$ . Missing values at the beginning or at the end of the sample are filled in the same manner by using extrapolation, i.e. with  $d_{t',t} = 0$ .

The NFA position of a country may deviate from the difference between gross foreign assets and liabilities calculated from individual components. Let us denote stock data which are based on the aggregation of components and the respective component itself by an asterisk. Then we have

$$NFADIFF_t = NFA_t - NFA_t^*,$$

where  $NFA_t^*$  is computed as the difference between

$$GFA_t^* = FDIA_t^* + EQA_t^* + DEBTA_t^* + RES_t^*$$

and

$$GFL_t^* = FDIL_t^* + EQL_t^* + DEBTL_t^*.$$

To adjust the underlying gross stock figures accordingly, we distribute the difference across components to obtain estimates that are consistent with net figures. Hence, we apply the following scheme:

$$GFA_t = GFA_t^* + w_{A,t} \cdot NFADIFF_t, \quad GFL_t = GFL_t^* - w_{L,t} \cdot NFADIFF_t,$$

where<sup>5</sup>

$$w_{A,t} = \frac{|GFA_t^* - RES_t^*|}{|GFA_t^* - RES_t^*| + |GFL_t^*|}, \quad w_{L,t} = 1 - w_{A,t}.$$

The gross stock figures of the components are adjusted in the same manner, computing assets as

$$\begin{aligned} FDIA_t &= FDIA_t^* + w_{FDIA,t} \cdot (w_{A,t} \cdot NFADIFF_t), \\ EQA_t &= EQA_t^* + w_{EQA,t} \cdot (w_{A,t} \cdot NFADIFF_t), \\ DEBTA_t &= DEBTA_t^* + w_{DEBTA,t} \cdot (w_{A,t} \cdot NFADIFF_t), \end{aligned}$$

with

$$w_{FDIA,t} = \frac{|FDIA_t^*|}{|GFA_t^* - RES_t^*|}, \quad w_{EQA,t} = \frac{|EQA_t^*|}{|GFA_t^* - RES_t^*|}, \quad w_{DEBTA,t} = 1 - w_{FDIA,t} - w_{EQA,t},$$

and liabilities as

$$\begin{aligned} FDIL_t &= FDIL_t^* - w_{FDIL,t} \cdot (w_{L,t} \cdot NFADIFF_t), \\ EQL_t &= EQL_t^* - w_{EQL,t} \cdot (w_{L,t} \cdot NFADIFF_t), \\ DEBTL_t &= DEBTL_t^* - w_{DEBTL,t} \cdot (w_{L,t} \cdot NFADIFF_t), \end{aligned}$$

with

$$w_{FDIL,t} = \frac{|FDIL_t^*|}{|GFL_t^*|}, \quad w_{EQL,t} = \frac{|EQL_t^*|}{|GFL_t^*|}, \quad w_{DEBTL,t} = 1 - w_{FDIL,t} - w_{EQL,t}.$$

The consistency adjustment ensures that the relations (1), (2) and (16) hold.

The valuation-adjusted current account described above may not only be used for interpolation of gaps in the NFA position, it also permits the construction of an entire NFA series based on BOPS flow figures. In that case,  $CA^*$  is cumulated over time:

$$NFA_t^{CF} = NFA_{t-1}^{CF} + CA_t^*. \quad (20)$$

The initial value for this cumulative flow series is the earliest available stock figure for NFA, which we take from Sinn (1990).

---

<sup>5</sup>For conceptual reasons, assets and liabilities are also affected by negative transactions (e.g. realized holding losses, repayments) and by difficulties in attributing transactions to residents vs. non-residents. Therefore individual components and hence GFA and GFL could turn negative. However, this occurs in a few cases only.

## 4 Data Characteristics

The increase in international capital flows and stock positions clearly marks a global trend, nonetheless it is necessary to distinguish between different developments across different groups of countries. For this purpose, we will distinguish between three groups of countries, based on their degree of economic development and in accordance with the World Bank classification.<sup>6</sup> The group of “industrial countries” includes “high-income OECD countries”, while “emerging markets” captures “high-income non-OECD countries” and “upper-middle income countries”. The third group, “developing countries”, consists of “lower-middle or low income” countries.

Figure 1 shows the development of gross asset and liability positions over time for these country groups.<sup>7</sup> Industrial countries (Figure 1(a)) display a strong growth of capital stocks for all categories, amounting to an increase in the group’s NFA/GDP mean ratio from about 50% in 1970 to more than 250% in 2003. We combine the other two groups, which are summarized in Figure 1(b) and display a similar trending behavior. However, they experienced strong flows of capital already at the beginning of the sample until the 1980s, comprising mostly debt liabilities, which is of course partly due to the major role of foreign credit in many developing countries’ government budgets.<sup>8</sup> In addition, there has been a big increase also in FDI liabilities. Altogether, capital stock positions of non-industrial countries built up mainly after the sequence of financial crises that occurred in the 1990s when markets regained confidence in the stability of their financial system.

Figure 2 compares the differences in relative NFA positions between different country groups over time. The series of aggregate NFA scaled by aggregate GDP (Figure 2(a)) show that industrial countries have gradually moved from a slightly positive to a slightly negative position over time. In contrast, emerging markets rose to a period of positive balances lasting from the mid-1970’s to the mid-1980’s from an otherwise negative position, while developing countries started from a visibly negative position and experienced minor further deterioration over time. However, the series are all contained within a relatively close range, with only moderate dispersion and no discernible trends. The means of individual NFA/GDP ratios (Figure 2(b)) instead document larger differences between country groups. As these series give equal weight to all group members and are not dominated by large economies, they better reflect developments affecting the majority of countries within a given group. Based on group means, industrial countries exhibit an almost entirely negative position over the sample period, while both the rise and the subsequent fall experienced by

---

<sup>6</sup>See <http://go.worldbank.org/D7SN0B8YU0>, as of April 26, 2006.

<sup>7</sup>Subfigures (a) and (b) are based on the series for 22 industrial countries and 48 non-industrial countries, respectively, as all other countries do not have sufficiently complete component series.

<sup>8</sup>Note that data points prior to 1980 are only available for a small number of these countries such that the representation would be severely distorted by including these observations.

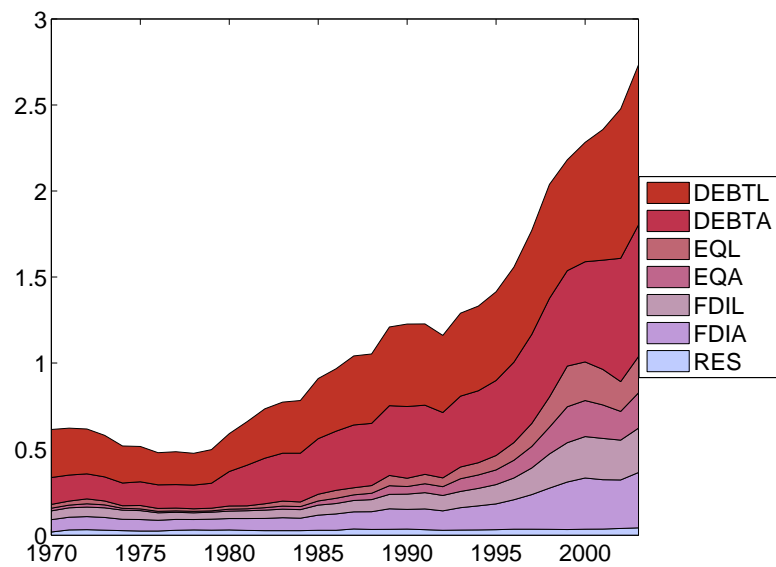
emerging markets are much more pronounced. Developing countries still start from a similar negative position, but display a substantial deterioration throughout the 1980's with further subsequent decline and no major trend reversal. Subfigure (a) also documents the fact that aggregate NFA of all countries is different from zero, which is well-known under the designation "world NFA discrepancy".

Tables 1 and 2 display the degree of commonality in different measures of capital flows. For both industrial and non-industrial countries, the outcomes are very similar to the figures presented in Lane and Milesi-Ferretti (2001, 2006). The left column of each table shows the correlation between the current account balance and the change in net foreign assets. Since most of the difference between the flow figure and the increment in the stock series is caused by the change in the value of the previous period's stock balance, this number can also be interpreted as a measure for the impact of valuation adjustments. In countries with high correlation coefficients the effect of valuation changes is relatively low and vice versa. On average, the figures for non-industrial countries are higher than for industrial countries. However, one has to bear in mind that this partly reflects the lack of appropriate indices for valuation adjustments in these countries rather than less volatile asset prices.

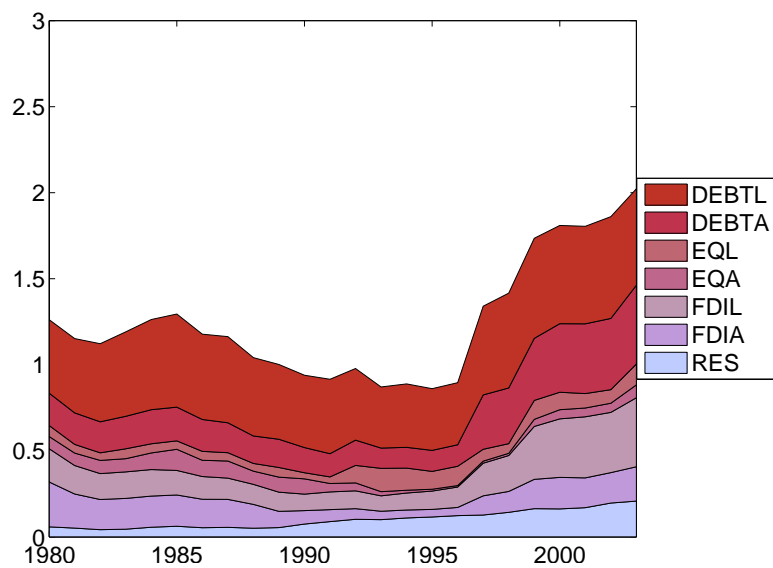
The right column of both tables shows the correlation between the two measures of capital flows constructed by using the different approaches outlined in Section 3.3. Here, a high correlation coefficient indicates a high degree of empirical equivalence between accumulated flows and extrapolated stocks. Although the correlation figures are usually larger than those in the left column, especially for industrial countries, the correlation in many cases is still far from unity.

In a last step, we separately identify each country's net debt and net equity (including FDI) position in the most recent period available (Figure 3). For the group of industrial economies, this comparison reveals that the majority of countries display a positive net equity, but a negative net debt asset position, with a net equity-net debt correlation coefficient of  $-0.16$ . So it would seem that from a national perspective, external borrowing is used for maintaining a foreign equity portfolio. Both emerging markets and developing countries instead virtually always show a negative net equity balance, in the vast majority of cases coupled with negative net debt assets. However, among emerging markets there is a positive correlation of  $0.27$  between the two asset categories, while for developing countries the correlation is  $-0.37$ . This suggests that depending on the stage of development, countries either face a trade-off between debt and equity financing or are allowed to use the two instruments as complements.

Figure 1: Sum of Gross Asset and Liability Stocks

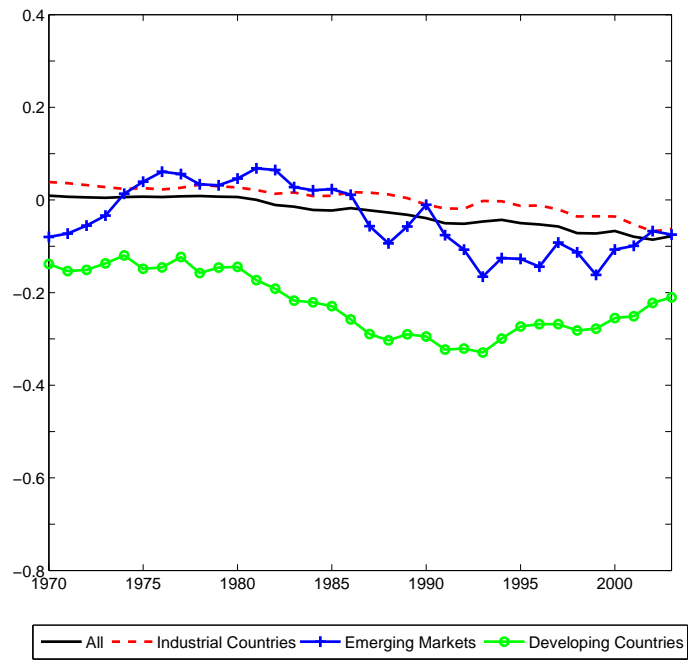


(a) Industrial Countries, 1970 – 2003

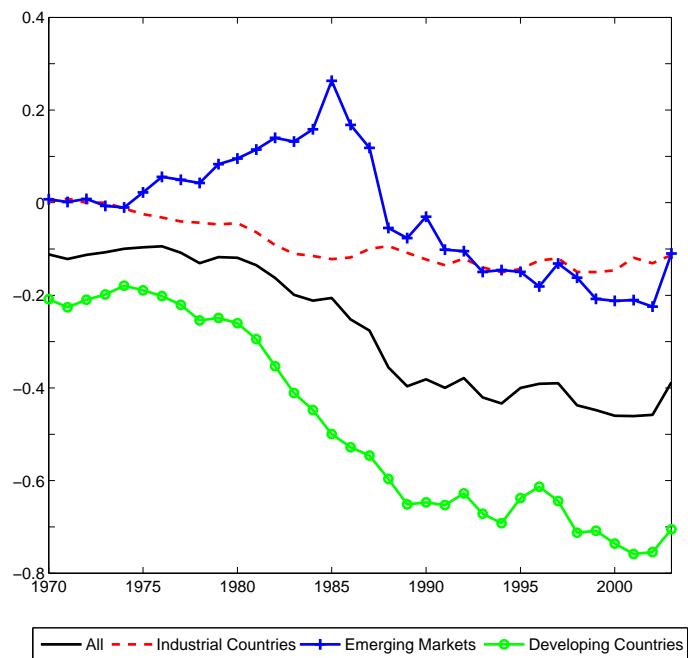


(b) Non-industrial Countries, 1980 – 2003

Figure 2: Net Foreign Assets



(a) Aggregate NFA/Aggregate GDP



(b) Mean of NFA/GDP Ratios



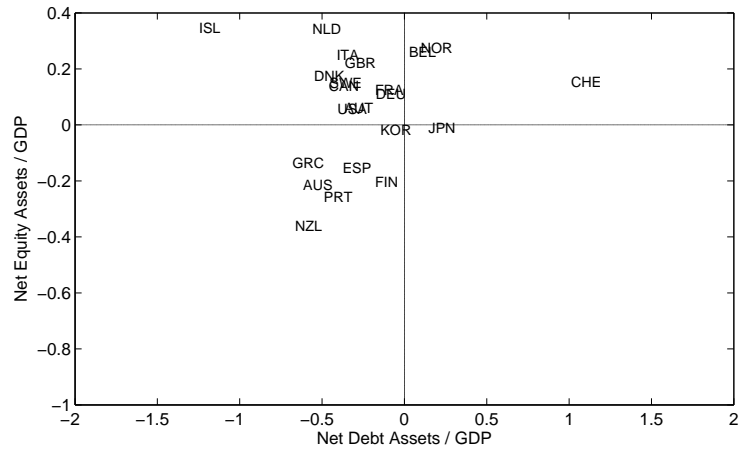
Table 1: Correlations: Industrial Countries

| Country     | $\text{corr}(CA, \Delta NFA)$ | $\text{corr}(\Delta NFA^{CF}, \Delta NFA)$ |
|-------------|-------------------------------|--|
| USA         | 0.50                          | 0.88                                       |
| UK          | 0.33                          | 0.57                                       |
| Austria     | 0.44                          | 0.38                                       |
| Denmark     | 0.70                          | 0.61                                       |
| France      | 0.43                          | 0.31                                       |
| Germany     | 0.72                          | 0.19                                       |
| Italy       | 0.51                          | 0.59                                       |
| Netherlands | -0.18                         | -0.10                                      |
| Norway      | 0.99                          | 0.99                                       |
| Sweden      | 0.56                          | 0.49                                       |
| Switzerland | 0.00                          | -0.19                                      |
| Canada      | 0.71                          | 0.77                                       |
| Japan       | 0.47                          | 0.87                                       |
| Finland     | 0.14                          | 0.98                                       |
| Greece      | 0.64                          | 0.64                                       |
| Iceland     | 0.30                          | 0.42                                       |
| Portugal    | 0.58                          | 0.69                                       |
| Spain       | 0.30                          | 0.85                                       |
| Australia   | 0.40                          | 0.86                                       |
| New Zealand | 0.11                          | 0.59                                       |
| Korea       | 0.92                          | 0.92                                       |
| Mean        | 0.46                          | 0.59                                       |

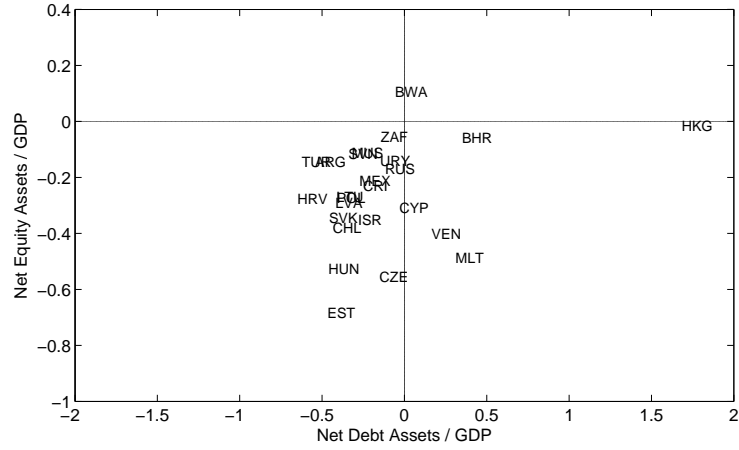
Table 2: Correlations: Non-industrial Countries

| Country                 | $\text{corr}(CA, \Delta NFA)$ | $\text{corr}(\Delta NFA^{CF}, \Delta NFA)$ |
|-------------------------|-------------------------------|--|
| Argentina               | 0.65                          | 0.84                                       |
| Bangladesh              | 0.48                          | 0.48                                       |
| Bolivia                 | 0.52                          | 0.52                                       |
| Brazil                  | 0.33                          | 0.87                                       |
| Bulgaria                | 0.56                          | 0.88                                       |
| Cameroon                | 0.20                          | 0.20                                       |
| Chile                   | 0.66                          | 0.63                                       |
| China                   | 0.89                          | 0.89                                       |
| Colombia                | 0.84                          | 0.84                                       |
| Costa Rica              | 0.50                          | 0.50                                       |
| Ecuador                 | 0.85                          | 0.85                                       |
| Egypt                   | 0.82                          | 0.82                                       |
| Guatemala               | 0.79                          | 0.79                                       |
| Hungary                 | 0.56                          | 0.78                                       |
| India                   | 0.80                          | 0.81                                       |
| Indonesia               | 0.66                          | 0.66                                       |
| Israel                  | 0.60                          | 0.77                                       |
| Jordan                  | 0.81                          | 0.81                                       |
| Kenya                   | 0.69                          | 0.69                                       |
| Malaysia                | 0.64                          | 0.64                                       |
| Mexico                  | 0.31                          | 0.31                                       |
| Morocco                 | 0.71                          | 0.71                                       |
| Nicaragua               | 0.75                          | 0.75                                       |
| Nigeria                 | 0.79                          | 0.79                                       |
| Pakistan                | 0.86                          | 0.86                                       |
| Paraguay                | 0.80                          | 0.80                                       |
| Peru                    | 0.70                          | 0.63                                       |
| Philippines             | 0.70                          | 0.77                                       |
| Poland                  | 0.69                          | 0.75                                       |
| Romania                 | 0.79                          | 0.84                                       |
| Saudi Arabia            | 0.98                          | 0.98                                       |
| Singapore               | 0.23                          | 0.38                                       |
| South Africa            | 0.08                          | 0.42                                       |
| Syria                   | 0.87                          | 0.87                                       |
| Thailand                | 0.89                          | 0.89                                       |
| Tunisia                 | 0.24                          | 0.34                                       |
| Turkey                  | 0.28                          | 0.66                                       |
| Uruguay                 | 0.23                          | 0.23                                       |
| Venezuela               | 0.83                          | 0.84                                       |
| Mean over 129 countries | 0.65                          | 0.67                                       |

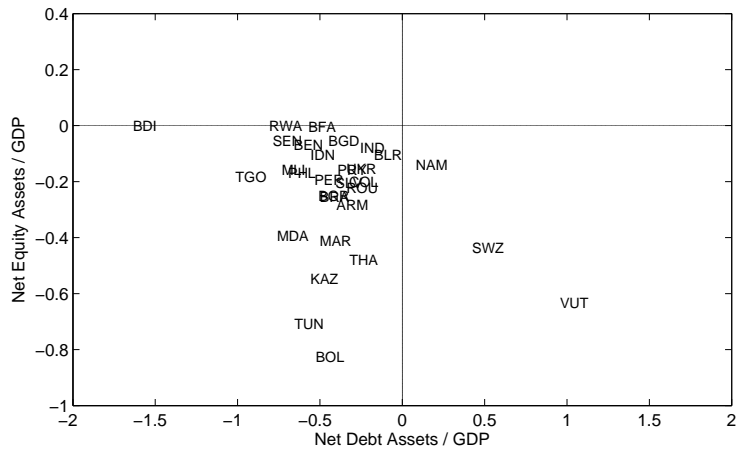
Figure 3: Debt/Equity Distribution



(a) Industrial Countries



(b) Emerging Markets



(c) Developing Countries

# Appendix

## A Tables

Table A.1: Source Variables

| Name   | Code          |
|--|---------------|
| Balance of Payments Statistics (BOPS), flow data:    |               |
| CURRENT ACCOUNT, N.I.E.                              | xxx78ALDZF... |
| CAPITAL ACCOUNT, N.I.E.                              | xxx78BCDZF... |
| DIRECT INVESTMENT ABROAD                             | xxx78BDDZF... |
| DIR. INVEST. IN REP. ECON., N.I.E.                   | xxx78BEDZF... |
| PORTFOLIO INVESTMENT ASSETS                          | xxx78BFDZF... |
| PORTFOLIO INVESTMENT LIAB., N.I.E.                   | xxx78BGDZF... |
| PI EQUITY SECURITIES ASSETS                          | xxx78BKDZF... |
| PI EQUITY SECURITIES LIAB                            | xxx78BMDZF... |
| PI DEBT SECURITIES ASSETS                            | xxx78BLDZF... |
| PI DEBT SECURITIES LIAB                              | xxx78BNDZF... |
| FINAN DERIVATIVES: ASSETS                            | xxx78BWDZF... |
| FINAN DERIVATIVES: LIABIL                            | xxx78BXDZF... |
| OTHER INVESTMENT ASSETS                              | xxx78BHDZF... |
| OTHER INVESTMENT LIAB., N.I.E.                       | xxx78BIDZF... |
| NET ERRORS AND OMISSIONS                             | xxx78CADZF... |
| RESERVE ASSETS                                       | xxx79DBDZF... |
| International Investment Position (IIP), stock data: |               |
| FIN ACCT TOTAL ASSETS: EPS                           | xxx79AADZF... |
| FIN ACCT TOTAL LIAB: EPS                             | xxx79LADZF... |
| DIRECT INVESTMENT ABROAD: EPS                        | xxx79ABDZF... |
| DIRECT INV IN REP ECONOMY: EPS                       | xxx79LBDZF... |
| PORTFOLIO INVESTMENT ASSETS: EPS                     | xxx79ACDZF... |
| PORTFOLIO INVESTMENT LIAB: EPS                       | xxx79LCDZF... |
| PI EQUITY SECURITIES ASSETS: EPS                     | xxx79ADDZF... |
| PI EQUITY SECURITIES LIAB: EPS                       | xxx79LDDZF... |
| PI DEBT SECURITIES ASSETS: EPS                       | xxx79AEDZF... |
| PI DEBT SECURITIES LIAB: EPS                         | xxx79LEDZF... |
| FINAN DERIVATIVES: ASSETS                            | xxx79ALDZF... |
| FINAN DERIVATIVES: LIABIL                            | xxx79LLDZF... |
| OTHER INVESTMENT ASSETS: EPS                         | xxx79AFDZF... |
| OI BANKS ASSETS: EPS                                 | xxx79AIDZF... |
| OI GEN GOVT ASSETS: EPS                              | xxx79AHDZF... |
| OI MON AUTH ASSETS: EPS                              | xxx79AGDZF... |
| OI OTH SECT ASSETS: EPS                              | xxx79AJDZF... |
| OTHER INVESTMENT LIAB: EPS                           | xxx79LFDZF... |
| OI BANKS LIAB: EPS                                   | xxx79LIDZF... |
| OI GEN GOVT LIAB: EPS                                | xxx79LHDZF... |
| OI MON AUTH LIAB: EPS                                | xxx79LGDZF... |
| OI OTH SECT LIAB: EPS                                | xxx79LJDZF... |
| RESERVE ASSETS: EPS                                  | xxx79AKDZF... |

Table A.1: Source Variables (continued)

| Name   | Code                |
|--|---------------------|
| International Financial Statistics, stock data:          |                     |
| TOTAL RESERVES MINUS GOLD                                | xxx.1L.DZF...       |
| World Bank, Global Development Finance 2005, stock data: |                     |
| TOTAL DEBT STOCKS  | xxxDTDOD-<br>DECTCD |
| IMF Direction of Trade Statistics, flow data:            |                     |
| EXPORTS FOB  | xxx70..DZDxxx       |
| IMPORTS CIF  | xxx71..DZDxxx       |

Table A.2: List of Variables

| Name                | Description   |
|---------------------|---|
| IMFCODE             | Numerical country code (IMF)  |
| ISO3CODE            | Alphanumerical country code (3-digit ISO)   |
| COUNTRY             | Name of country   |
| DATE                | Year of observation   |
| GDP                 | Nominal GDP in Million U.S. Dollar  |
| NFA                 | Net foreign asset (NFA) position  |
| DVNFA               | Change in valuation of net foreign assets as the sum of valuation changes of components |
| NFA <sup>CF</sup>   | NFA position calculated from adjusted cumulative current account                        |
| DVNFA <sup>CF</sup> | Valuation change in cumulative current account: Sum of valuation changes of components  |
| CCA                 | Cumulative current account  |
| GFA                 | Gross foreign assets  |
| GFL                 | Gross foreign liabilities   |
| FDIA                | Foreign direct investment (FDI) assets, stocks consistent with NFA                      |
| DVFDIA              | Change in valuation of consistent FDI asset stocks                                      |
| FDIL                | FDI liabilities, stocks consistent with NFA   |
| DVFDIL              | Changes in valuation of consistent FDI liability stocks                                 |
| EQA                 | Equity assets, stocks consistent with NFA   |
| DVEQA               | Changes in valuation of consistent equity asset stocks                                  |
| EQL                 | Equity liabilities, stocks consistent with NFA  |
| DVEQL               | Changes in valuation of consistent equity liability stocks                              |
| DEBTA               | Debt asset stocks consistent with NFA   |
| DEBTL               | Debt liability stocks consistent with NFA   |
| RESGOLD             | Reserves minus gold   |

Table A.3: List of Countries

| Name                     | Code |
|--------------------------|------|
| Afghanistan              | AFG  |
| Algeria                  | DZA  |
| Antigua and Barbuda      | ATG  |
| Argentina                | ARG  |
| Armenia                  | ARM  |
| Australia                | AUS  |
| Austria                  | AUT  |
| Bahamas                  | BHS  |
| Bahrain                  | BHR  |
| Bangladesh               | BGD  |
| Barbados                 | BRB  |
| Belarus                  | BLR  |
| Belgium                  | BEL  |
| Belize                   | BLZ  |
| Benin                    | BEN  |
| Bolivia                  | BOL  |
| Botswana                 | BWA  |
| Brazil                   | BRA  |
| Bulgaria                 | BGR  |
| Burkina Faso             | BFA  |
| Burundi                  | BDI  |
| Cameroon                 | CMR  |
| Canada                   | CAN  |
| Central African Republic | CAF  |
| Chad                     | TCD  |
| Chile                    | CHL  |
| China                    | CHN  |
| Colombia                 | COL  |
| Congo, Republic Of       | COG  |
| Costa Rica               | CRI  |
| Côte d'Ivoire            | CIV  |
| Croatia                  | HRV  |
| Cyprus                   | CYP  |
| Czech Republic           | CZE  |
| Czechoslovakia           | CZS  |
| Denmark                  | DNK  |
| Dominica                 | DMA  |
| Dominican Republic       | DOM  |
| Ecuador                  | ECU  |
| Egypt                    | EGY  |
| El Salvador              | SLV  |
| Equatorial Guinea        | GNQ  |
| Estonia                  | EST  |
| Ethiopia                 | ETH  |
| Fiji                     | FJI  |
| Finland                  | FIN  |
| France                   | FRA  |
| Gabon                    | GAB  |

Table A.3: List of Countries (continued)

| Name        | Code |
|-------------|------|
| Gambia      | GMB  |
| Germany     | DEU  |
| Ghana       | GHA  |
| Greece      | GRC  |
| Grenada     | GRD  |
| Guatemala   | GTM  |
| Guyana      | GUY  |
| Haiti       | HTI  |
| Honduras    | HND  |
| Hong Kong   | HKG  |
| Hungary     | HUN  |
| Iceland     | ISL  |
| India       | IND  |
| Indonesia   | IDN  |
| Iran        | IRN  |
| Iraq        | IRQ  |
| Ireland     | IRL  |
| Israel      | ISR  |
| Italy       | ITA  |
| Jamaica     | JAM  |
| Japan       | JPN  |
| Jordan      | JOR  |
| Kazakhstan  | KAZ  |
| Kenya       | KEN  |
| Korea       | KOR  |
| Kuwait      | KWT  |
| Latvia      | LVA  |
| Lebanon     | LBN  |
| Lesotho     | LSO  |
| Liberia     | LBR  |
| Libya       | LBY  |
| Lithuania   | LTU  |
| Luxembourg  | LUX  |
| Madagascar  | MDG  |
| Malawi      | MWI  |
| Malaysia    | MYS  |
| Maldives    | MDV  |
| Mali        | MLI  |
| Malta       | MLT  |
| Mauritania  | MRT  |
| Mauritius   | MUS  |
| Mexico      | MEX  |
| Moldova     | MDA  |
| Morocco     | MAR  |
| Myanmar     | MMR  |
| Namibia     | NAM  |
| Nepal       | NPL  |
| Netherlands | NLD  |

Table A.3: List of Countries (continued)

| Name                     | Code |
|--------------------------|------|
| Netherlands Antilles     | ANT  |
| New Zealand              | NZL  |
| Nicaragua                | NIC  |
| Niger                    | NER  |
| Nigeria                  | NGA  |
| Norway                   | NOR  |
| Oman                     | OMN  |
| Pakistan                 | PAK  |
| Panama                   | PAN  |
| Papua New Guinea         | PNG  |
| Paraguay                 | PRY  |
| Peru                     | PER  |
| Philippines              | PHL  |
| Poland                   | POL  |
| Portugal                 | PRT  |
| Qatar                    | QAT  |
| Romania                  | ROU  |
| Russia                   | RUS  |
| Rwanda                   | RWA  |
| Samoa                    | WSM  |
| Saudi Arabia             | SAU  |
| Senegal                  | SEN  |
| Seychelles               | SYC  |
| Sierra Leone             | SLE  |
| Singapore                | SGP  |
| Slovak Republic          | SVK  |
| Slovenia                 | SVN  |
| Solomon Islands          | SLB  |
| Somalia                  | SOM  |
| South Africa             | ZAF  |
| Spain                    | ESP  |
| Sri Lanka                | LKA  |
| St. Lucia                | LCA  |
| St. Vincent & Grenadines | VCT  |
| Sudan                    | SDN  |
| Suriname                 | SUR  |
| Swaziland                | SWZ  |
| Sweden                   | SWE  |
| Switzerland              | CHE  |
| Syrian Arab Republic     | SYR  |
| Taiwan                   | OAN  |
| Tanzania                 | TZA  |
| Thailand                 | THA  |
| Togo                     | TGO  |
| Trinidad and Tobago      | TTO  |
| Tunisia                  | TUN  |
| Turkey                   | TUR  |
| Uganda                   | UGA  |



Table A.3: List of Countries (continued)

| Name                 | Code |
|----------------------|------|
| Ukraine              | UKR  |
| United Arab Emirates | ARE  |
| United Kingdom       | GBR  |
| United States        | USA  |
| Uruguay              | URY  |
| Vanuatu              | VUT  |
| Venezuela            | VEN  |
| Zambia               | ZMB  |
| Zimbabwe             | ZWE  |

## References

- Lane, P.R. and Milesi-Ferretti, G.M. (2001). The External Wealth of Nations: Measures of Foreign Assets and Liabilities for Industrial and Developing Countries. *Journal of International Economics*, 55:263–294.
- Lane, P.R. and Milesi-Ferretti, G.M. (2006). The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970 – 2004. Working Paper, International Monetary Fund.
- Sinn, S. (1990). Net External Asset Positions of 145 Countries: Estimation and Interpretation, in: Siebert, H. (Ed.), *Kieler Studien*, Tübingen: Mohr, Vol. 234.

## CFS Working Paper Series:

| No.     | Author(s)  | Title  |
|---------|--|--|
| 2007/23 | <b>Michael Binder</b><br><b>Christian Offermanns</b>   | International Investment Positions and Exchange Rate Dynamics: A Dynamic Panel Analysis                              |
| 2007/22 | <b>Howard Kunreuther</b><br><b>Alexander Muermann</b>  | Self-Protection and Insurance with Inter-dependencies  |
| 2007/21 | <b>Wolfram J. Horneff</b><br><b>Raimond H. Maurer</b><br><b>Olivia S. Mitchell</b><br><b>Michael Z. Stamos</b> | Money in Motion: Dynamic Portfolio Choice in Retirement  |
| 2007/20 | <b>Bea Canto</b><br><b>Roman Kräussl</b>   | Electronic Trading Systems and Intraday Non-Linear Dynamics: An Examination of the FTSE 100 Cash and Futures Returns |
| 2007/19 | <b>Maria Kasch-Haroutounian</b><br><b>Erik Theissen</b>  | Competition between Exchanges: Euronext versus Xetra   |
| 2007/18 | <b>Günter W. Beck</b><br><b>Volker Wieland</b>   | Money in Monetary Policy Design under Uncertainty: A Formal Characterization of ECB-Style Cross-Checking             |
| 2007/17 | <b>Günter W. Beck</b><br><b>Volker Wieland</b>   | Money in Monetary Policy Design under Uncertainty: The Two-Pillar Phillips Curve versus ECB-Style Cross-Checking     |
| 2007/16 | <b>Silvio Colarossi</b><br><b>Andrea Zaghini</b>   | Gradualism, Transparency and Improved Operational Framework: A Look at the Overnight Volatility Transmission         |
| 2007/15 | <b>Annamaria Lusardi</b><br><b>Olivia S. Mitchell</b>  | Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education Programs           |
| 2007/14 | <b>Jean Boivin</b><br><b>Marc P. Giannoni</b><br><b>Ilian Mihov</b>  | Sticky Prices and Monetary Policy: Evidence from Disaggregated U.S. Data   |

Copies of working papers can be downloaded at <http://www.ifk-cfs.de>