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GLOBAL ROLES OF CURRENCIES

by Christian Thimann

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EUROSYSTEM

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GLOBAL ROLES OF CURRENCIES[1]

by Christian Thimann[2]

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Abstract

This paper presents a new concept – the global roles of currencies. The concept combines the domestic and international (cross-border) use of currencies and therefore captures the overall importance of different currencies in a globalised economy. The measure of a currency's global role is based on the size and stage of development of the underlying economy, as well as the size and stage of development of its financial markets and the scope of financial instruments available in this currency. The paper applies the concept to 22 currencies of advanced and emerging economies. The results confirm the well-known ranking for the leading currencies – in particular the US dollar and the euro – but give considerably greater weight to currencies of emerging economies than the results obtained from the international debt market, which has so far been used as the basis for measuring the international role of currencies in capital markets. The paper also discusses this established measure in detail, arguing that in view of financial globalisation, an indicator based on currency shares in the international debt market alone represents a decreasing share of international financial market activity, as this market excludes government debt, other domestic debt and equities, which are increasingly of interest to international investors. The paper also presents an empirical application of the new global concept to examine cross-border portfolio holdings in debt and equity markets across advanced and emerging economies. It finds that the global role indicator is positively correlated with such holdings and, especially for emerging economies, fares better than the established international debt market indicator. The findings suggest a positive relationship between domestic financial development and international financial integration.

Keywords: International currencies, international finance, global capital markets

JEL Classification: F31, F33, F37, G15, E58

Non-technical summary

This paper aims at capturing the "global roles of currencies", reflecting the general importance of a given currency in the world economy, and its standing and significance in the international monetary system. This concept does not aim to distinguish between "domestic" and "international", but encompasses both dimensions and therefore carries the label "global". It assesses the overall status of a currency and its financial markets in the global economy. More precisely, the paper develops a measure of the global role of currencies based on the magnitude and stage of development of various financial market segments that are open to a given currency. The measure is based on 15 size indicators and 16 structural indicators relating to the currency's financial markets and the underlying economy. In relation to financial markets, size indicators include the amount of assets, instruments and turnover; structural indicators focus on the regulatory quality or the absence of barriers. In the case of a number of countries, especially emerging economies, international activity in some financial market segments is constrained through capital account restrictions and other barriers. The paper, therefore, also suggests an "adjusted global concept" that takes into account existing restrictions to openness.

The paper develops these indicators for 22 currencies, including the US dollar, euro, Japanese yen, pound sterling, Swiss franc, and the Australian, Canadian and New Zealand dollars, as well as 14 emerging market currencies of the main economies in Asia, Eastern Europe and Latin America. The paper thereby exposes currencies in emerging economies that have, so far, mostly been excluded from international currency concepts that are largely based on the international debt securities market. The international role of the 14 main emerging market currencies combined – given by their aggregate share in the international debt securities markets – is only 2.9%. Yet, in recent years, many emerging economies have developed their financial systems and sought to give foreign investors greater access to their local currency markets. The global role concept reflects these trends better by taking a more comprehensive approach than the established international concept. At 11.2%, the global roles of these currencies are almost four times their international role. In line with the shift in weight towards emerging market currencies, the global roles of the main currencies are somewhat smaller than their international roles in the international debt market: the weight of the US dollar shifts from 44.3% to 38.7% and the euro from 31.3% to 27.0%. By contrast, the weight of the yen rises somewhat, given the considerable size of Japan's domestic markets, from 5.3% to 8.6%.

This addresses the more policy-oriented angle relating to the international role of currencies, namely the general importance of individual currencies in the global economy. The measure developed in this paper is important for three reasons: first, it can serve as a benchmark for currency shares in portfolios that are globally diversified; second, it gives an unbiased treatment of currencies from advanced and emerging economies and can therefore put the increasing global role of emerging economies into perspective; and third, it can, over time, help to detect shifts in the international monetary and financial system, for example through financial development and opening.

1. Introduction

Policy discussions and academic contributions on the international role of currencies abound. They come in two strands. The first strand deals with the general importance of a given currency in the world economy, and its standing and significance in the international monetary system. These are the contributions that occasionally make media headlines, especially when they raise questions such as whether the dollar could lose its leading global status to the euro, why the yen has lost global importance, and if one day the Chinese renminbi could challenge one – or all three – of these currencies. The second strand of contributions focuses more narrowly on the cross-border use of currencies, analysing which currencies are used outside their home constituencies, by what type of economic agents and for what purposes.

One can usefully label the first strand as the "global role" of currencies, reflecting the standing and importance of a currency in the global economy, while the second strand can be labelled as the somewhat narrower "international role", reflecting the use of a currency outside its constituency of issuance. Empirically, both concepts can be interrelated: currencies that are used heavily outside their constituencies are more likely to play an important global role and, conversely, currencies that are globally important are likely to be used more heavily outside their own constituencies. Nevertheless, both notions are conceptually distinct; they are not necessarily driven by the same factors and do not necessarily have the same policy implications. Despite the conceptual distinction, however, both strands of the literature have so far largely used the same quantitative basis, namely the use of currencies in the international debt securities market. Although other indicators – such as shares in the foreign exchange reserves of central banks – are sometimes used as well, the respective currency shares of securities outstanding in the international debt market remain the most pertinent quantitative measure used to assess the international role of currencies in global capital markets.[1] The main objective of this paper is to demonstrate the limitations of this established measure with regard to the first strand of literature and to present a more appropriate measure for the "global role of currencies", which also gives rise to some new empirical findings and policy implications.

The international debt market represents about one-tenth of the global bond market. It comprises all debt securities issued by non-residents of a certain currency area. The largest issuers in this market are globally operating financial institutions and corporations. They choose internationally used currencies – mainly the US dollar, the euro and the Japanese yen – to finance part of their operations outside their home markets. The international debt market for US dollars is dominated by European banks and corporations, while the market for euro is dominated by investment banks and corporations from the

[1] Two measures are usually considered: a "narrow" concept, comprising only securities issued by non-residents of a certain currency area (e.g. a British bank issuing a bond denominated in euro), and a "broad" concept, which includes issuances by residents of the currency area that are considered to be "targeted" at investors abroad, whereby the "targeting" is inferred from the prospectus, the nature of the syndicate or the type of financial law applied. The narrow measure is more widely used as a benchmark since it is seen as more precise.

United States, the United Kingdom and a few other European countries outside the euro area. In the past, sovereign issuers from emerging economies were also important, but given their vastly improved financial position, only a few have been tapping this market on a large scale in recent years.

The relative importance of the international debt market in overall international activities in global capital markets is falling, as other financial markets develop and previously domestic markets open up to – and are used by – foreign investors. Therefore, the international debt market is increasingly less representative of the international importance of certain currencies. The penetration of bond and equity markets by international investors is rising, a development which is by no means driven by private sector agents alone. Both central banks in emerging economies and sovereign wealth funds have become large-scale global investors, and are mostly active in the treasury, corporate bond and equity markets of third countries. Yet the international debt market excludes the treasury market and the bulk of the corporate bond market, as these are classified as domestic markets, even if they attract significant international investor interest. Moreover, the international debt market also excludes equity markets, where the number of international activities – cross-listings of global corporations on several stock exchanges and penetration by international investors – has risen considerably in recent years. Today, the equity market makes a significant contribution to international activities and to the international role of underlying currencies.

In addition, activity in the international debt market is strongly driven by the business needs of those banks and corporations that dominate it, as well as conjunctural factors. Hence, short-term variations in the shares of individual currencies in this market hardly capture the more fundamental motives of international currency use that many investors and policy-makers are interested in and that correspond to the first strand of contributions mentioned above. Measuring actual currency use outside the issuing area properly would require a survey based on strictly comparable and comprehensive census data for the currencies of the major advanced and emerging economies. This would imply a significant extension of the IMF portfolio survey in its current form.

This paper aims to provide a quantitative concept to underpin the first strand of contributions, namely those focusing on the global role of currencies. The global concept developed in this paper aims to capture the significance of various currencies in the international financial system. This concept does not, therefore, aim to distinguish between "domestic" and "international", but encompasses both dimensions. It provides information about the overall status of a currency and its financial markets in the global economy. More precisely, the paper develops a measure of the global role of currencies based on the magnitude and stage of development of various financial market segments that are open to a given currency. The measure is based on 15 size indicators and 16 structural indicators relating to the currency's financial markets and the underlying economy. In relation to financial markets, size indicators include the amount of assets, instruments and turnover; structural indicators focus on the regulatory quality or the absence of barriers. For the underlying economy, size indicators include the

share in global GDP and trade; structural indicators relate to macroeconomic stability and the institutional environment. In the case of a number of countries, especially emerging economies, international activity in some financial market segments is constrained through capital account restrictions and other barriers. The paper, therefore, also suggests an "adjusted global concept" that takes into account existing restrictions to openness.

The paper develops these indicators for 22 currencies, including the US dollar, euro, Japanese yen, pound sterling, Swiss franc, and the Australian, Canadian and New Zealand dollars, as well as 14 emerging market currencies of the main economies in Asia, Eastern Europe and Latin America. The paper thereby exposes currencies in emerging economies that have, so far, mostly been excluded from international currency concepts because of the very low level of activity in the international debt market in such currencies. The international role of the 14 main emerging market currencies combined – given by their aggregate share in the international debt securities markets – is only 2.9%. Yet, in recent years, many emerging economies have developed their financial systems and sought to give foreign investors greater access to their local currency markets. The global role concept reflects these trends better by taking a more comprehensive approach than the established international concept. At 11.2%, the global roles of these currencies are almost four times their international role. In line with the shift in weight towards emerging market currencies, the global roles of the main currencies are somewhat smaller than their international roles in the international debt market: the weight of the US dollar falls from 44.3% to 38.7% and the euro from 31.3% to 27.0%. By contrast, the weight of the yen rises somewhat, given the considerable size of Japan's domestic markets, from 5.3% to 8.6%.

The global role indicators are then applied to examine empirically international cross-border holdings of debt and equity securities for a sample of advanced and emerging economies. The empirical findings show that in addition to standard gravity variables, the indicators of a currency's global role help to explain cross-border financial integration. Both the global role of the domestic currency and that of the third country are positively related to bilateral cross-border holdings of financial assets. A comparison between the global role and the established international role in the sub-sample of emerging economies shows that the global role outperforms the international role in explaining cross-border holdings. Hence, the empirical findings lend support to the global role concept as being relevant to understand financial integration; from a policy perspective these findings are in line with the intuitive conjecture that financial market development facilitates international financial integration.

The paper is structured as follows. Section II reviews the established concept of international currency use, analysing its appeal as well as its shortcomings. Section III develops a new concept of the global roles of currencies, applying it to 22 currencies of advanced and emerging economies. Section IV presents an empirical application of the global role concept to international cross-border holdings. Section V discusses policy issues related to international and global currency use and Section VI concludes.

2. The established concept of international currency use in capital markets

The literature on the international role of currencies in capital markets is based on two key notions. First, a clear distinction between "domestic" and "international" is made; with the literature aiming at identifying strictly what is "international" in terms of currency use, focusing therefore on the degree to which a currency is used "outside its home country or issuing area" (Chinn and Frankel, 2007; ECB, 2007). Some authors define an international currency as one that is used in "international transactions" (Kannan, 2007) or, more specifically, that is used "outside its home country by non-residents for transactions with residents of the home country or with residents of third countries" (Lim, 2006). Other authors differentiate between cross-border transactions and cross-border holdings of international assets and liabilities (McCauley, 1997), but they too aim at strictly separating between international and domestic use.

The second key concept in the literature on the international role of currencies in capital markets is the international debt market, defined as the market of issuances by non-residents of a currency area. The literature focuses on this market because it reflects the clearest delineation of international activity from domestic activity in capital markets. Accordingly, the market for equities, government bonds and non-international corporate debt are seen as domestic.

The focus on the international debt market reflects the aim to capture the international role of a currency as a financing and investment currency, a concept that is derived from the matrix of functions of money. The international version of the matrix is often attributed to Kenen (1983) but can already be found in Cohen (1971) and is reproduced in a large number of contributions, making it the main conceptual framework of intentional currency use in the academic literature (see Portes and Papaionannou, 2006; Hartmann, 1998; Chinn and Frankel, 2007).[2] The international debt market also figures prominently in the ECB's official review on the international role of the euro, even though the ECB uses a somewhat modified conceptual framework from the one used in the academic literature and also includes one global measure in overall debt markets (Table 1).

Table 1 here

The international debt securities market is still the linchpin of international currency use as far as capital markets are concerned, both in official (ECB, 2007) and academic contributions. Detken and Hartmann (2000) provide a detailed review of this market in assessing the international role of the euro. They suggest taking the share of a given currency in the outstanding stock of the international debt securities market as the headline measure of international currency use. This measure is taken up in various proposals, including the official ECB reporting on the international role of the euro. The

[2] Within this matrix, or sometimes instead of it, other concepts are used. The most frequent is the distinction between areas in which *diversification* plays a role, pointing towards two or more currencies having an international status, and areas in which *standardisation* plays a role, pointing to a single internationally used currency (see Hartmann 1998; Lim 2006).

core measure focuses only on securities issued by non-residents of the respective currency area. In mid-2007, the shares of the main currencies in this market were 44.1% for the US dollar, 31.4% for the euro, and 5.3% for the Japanese yen (Table 2). The remaining close to 20% was spread over a large number of currencies, with the pound sterling and Swiss franc having a somewhat larger role than other currencies.

Table 2 here

There is also a broader measure of international debt securities. This measure encompasses the narrow measure by adding securities that are issued by residents but that are estimated to end up in portfolios of non-residents. A security is included in the broad measure if it fulfils one of the following three conditions: (i) it is targeted at international investors (as suggested, for example, by the prospectus); (ii) it is placed by a syndicate of financial institutions of which at least one does not share the borrower's nationality; or (iii) it is governed by a law other than the domestic law. This definition is obviously not clear-cut in terms of actually delivering internationally held securities, and there is no assurance that what is targeted at international investors eventually ends up in their portfolios. This is why the literature has focused more on the narrow measure. However, both concepts cover only a fraction of the global bond market, with the narrow international concept covering 11.4% at end-2006 and the broad concept 26.8%.

In addition to size, there are a few structural issues that limit the overall usefulness of this market as a proxy for the international role of currencies.

- First, the international debt market is, to a large extent, a *US/EU phenomenon*, as these two regions together account for almost 80% of the market. In the dollar segment of the market, the EU accounts for about 60% of issuances; in the euro market, the United States and non-euro area EU countries account for close to 70%.

- Second, the international debt market is *relatively narrow in sectoral composition*, as financial institutions account for close to 80% of the market (Table 2). The remaining 20% are split between corporates on the one hand, and governments or international institutions on the other. In 2006, the top international issuers in euro were Morgan Stanley, HBOS/Bank of Scotland, Citigroup and HSBC in the group of financial institutions (issuing a total of close to EUR 30 billion), and Daimler Chrysler North America and Vodafone in the group of large corporations (issuing a total of over EUR 7 billion). The dollar market is dominated by financial institutions from the euro area and the United Kingdom.

- Third, the pattern of issuers suggests that specific *business motives* (balance sheet management, project financing and tax issues) as well as short-term cyclical factors (exchange rate forecasts and interest differentials) play an important role in international currency choice. ECB (2003) and

Siegfried et al. (2007) investigate issuer behaviour and consider that hedging exposure to foreign exchange volatility is a key driver behind issuance activity. They draw this conclusion after combining bond data with balance sheet information and observe that foreign exposures of firms, through foreign subsidiaries or M&A activities, increase the likelihood of issuing in a foreign currency. Cohen (2005) finds that expectations of exchange rate changes and interest rate differentials – hence cyclical variables – play a decisive role in international bond issuance.

In sum, the market for international debt securities, especially in the narrow definition, measures a specific aspect of international currency issuance, but captures only a small share of the respective currency's role in the global capital market. In particular, by excluding the domestic bond market and the equity market, the international debt market does not reflect important motives of international currency use and overlooks key aspects of international financial integration.[3] Such motives are more related to the size and structure of domestic financial markets and the underlying macroeconomy (Bobba et al., 2007).

Table 3 here

However, the established concept of the international use of currency is highly imprecise even in measuring cross-border use. This is confirmed by a comparison with available information on cross-border holdings of debt and equity securities (Table 3). The IMF's Coordinate Portfolio Investment Survey – although not free from reporting issues[4] – shows that USD 11.2 trillion of bonds are held across borders, far more than the total stock of international debt securities in the narrow definition (USD 7.8 trillion). At the same time, actual holdings fall far short of the broad measure of international debt securities (USD 18.4 trillion), suggesting that this measure is not in line with actual international currency use either.[5] Moreover, the IMF data show that cross-border holdings of equity securities are substantial, at USD 8.8 trillion. Omitting equities makes the results for the yen particularly biased, in which international holdings in equities are almost four times as high as holdings of debt. Hence, the established measure of international currency use is precise in accounting for such activity in a very specific and relatively narrow market segment, but does not capture the actual international use, nor the broader standing of individual currencies in the world economy.

3. A global concept of currency use

This section presents a global concept of currency use. It starts by addressing two main questions: what contribution does a "global role of currencies" concept make to understanding international monetary and financial developments and related policy issues; and, second, what should be the main ingredients of such a concept?

[3] For example, Curcuru et al. (2007), find that key policy puzzles, such as the return differential between US foreign assets and US external liabilities that has often been postulated, vanishes when returns in equity and bond markets are considered jointly and are properly accounted for.
[4] See Thomas et al. (2006) for a detailed study on cross-border equity holdings.
[5] For a discussion of the reporting challenges and the resulting imprecisions see Warnock (2007).

3.1. Motivation

As we have seen, the established notion of international roles of currencies focuses on the use of currencies outside their issuing area. This notion has often been used in a much wider context, related to the broader standing or recognition of a currency. A rising international role was seen as a rise in the importance of the respective currency in the global economy. However, the linchpin measurement of international currency use in the academic literature, based on the share in the international debt securities market, is an imprecise proxy of actual currency use outside the issuing area. In order to properly measure actual currency use outside the issuing area, a survey based on strictly comparable comprehensive census data for all of the currencies of the major advanced and emerging economies would be required. The United States conducts a census of this sort periodically, but updates it using less satisfactory data in-between updates. A few other countries conduct similar censuses, but do not coordinate the dating and coverage of their benchmark studies.[6]

But even if full information on international investment holdings by currency breakdowns were available globally, doubts would remain with regard to the significance of the distinction between "domestic" and "international" in a globalised financial system. Many economic agents in this market – in particular large financial institutions and corporations – are global actors, and it is thus evident that they are cast in a domestic/international scheme. The important role played by financial on-shore and off-shore centres illustrates the residency issue, which is often motivated by tax motives, arising in international financial statistics even today.

The established international concept of currency use based on the international debt market becomes even less pertinent when used in the wider context of international monetary and financial issues, namely whenever the global standing of a certain currency in the world economy is discussed. For the latter type of issue a "global concept" of the standing of a currency would be more appropriate. Such a concept should reflect the standing in terms of the size and stage of development of the financial markets and the instruments available in this currency, and the size and stage of development of the underlying economy. Investment decisions in global asset allocations closely link the currency choice to the overall size and development of financial markets as well as the underlying economy. Sovereign wealth funds hold equity in a certain currency because they aim to acquire a stake in the underlying firm and indirectly partake in the development of the underlying economy; central banks hold securities in a certain currency because of the liquidity of the foreign exchange markets in this currency; banks hold government paper because of the size and liquidity of the underling bond market; and investors in general hold a certain currency also reflecting confidence in the stability of its intrinsic value. Hence, such a summary measure of the global role could also be a benchmark for currency allocation in international portfolio choice.

[6] This important point has been raised by one referee.

3.2. Implementation

This section applies the global concept introduced above to the currencies of eight advanced economies and 14 emerging economies (listed in Table 4) and compares the results with the established international currency concept. In line with the earlier presentation, the global role of currencies is based on both the size and the structural characteristics of each currency's capital market and underlying economy (Tables 4 and 5, respectively). Although the choice of some indicators is *ad hoc*, they altogether they provide close match with the set of indicators used in the international finance literature of key dimension financial markets.

Size indicators

Starting with size indicators, four main markets are considered: debt securities, equity securities, interest rate derivatives and foreign exchange markets. All four markets are massive, even when compared with global GDP. At end-2006, the outstanding global volume of debt securities was USD 69.4 trillion; total stock market capitalisation amounted to USD 50.6 trillion; and the outstanding amounts of OTC interest rate derivatives amounted to USD 291.9 trillion. As a percentage of world GDP, these figures represent 144%, 105% and 606%, respectively. The size measures in terms of market volume are complemented by specific information relevant for each market segment. For example, in the equity market, the number of listed firms, the number of foreign listed companies, turnover and the recent volume of IPOs are considered (see Table 4 for more details). Moreover, the size indicators account for the weight of the economy in the global economy and its share in global trade.

Table 4 here

As expected, advanced economy currencies dominate in virtually all size components and their weight in global financial markets is well above their share in global GDP (68.5%) or global trade (47.9%). These economies account for 90% of global debt securities outstanding and 80.2% of the global stock market capitalisation. In particular, financial institutions of advanced economies are dominant debt issuers, with US financial institutions alone accounting for one-fifth of the global debt market. In advanced economies, the US dollar weight is particularly important, owing to its share in the global equity market, which is at least twice that of the euro in terms of capitalisation, number of listed companies and turnover. The second segment where the dollar stands out relative to the euro is the foreign exchange market, in which US dollar turnover is more than twice that of the euro. In the debt market, the size advantage for the dollar stems mainly from the debt of financial institutions, which is about four times as large as the debt levels outstanding for European financial institutions. The dollar also has the edge in a corporate debt market that is twice that of the euro area. By contrast, the government debt market is much more equal in size for both currencies, and in interest rate derivatives the euro segment actually exceeds that of the US dollar. From the perspective of third-country

investors, equity, foreign exchange and private issuers in the bond market are likely to be the most attractive size features of the dollar. A review of the size indicators for the Japanese yen and the pound sterling, two currencies with a considerable global role, shows how uneven the various parameters are distributed among the two. The yen dwarfs the pound in terms of the size of the underlying debt market, but this is mainly due to government debt; with regard to international debt, the pound has the larger market. In equity market terms, both currencies possess a market that is broadly comparable in size; also in FX markets their role is roughly the same.

Emerging market currencies clearly carry a far smaller weight in terms of financial market size than currencies of advanced economies. Interestingly, stock markets are more than twice as important as debt markets, with global shares of 14.6% and 6.4% respectively. Hong Kong and China combined rank fifth in global stock market capitalisation, after the United States, the euro area, Japan and the United Kingdom. Almost one quarter of globally listed firms are listed on EME stock markets, illustrating a strong numerical participation in these markets. EME markets are also relatively important in terms of raising new capital through initial public offerings (about 24%) reflecting a buoyant growth in new access to these markets and IPO activity, especially in Hong Kong but also in mainland China. Consequently, if EME currencies are to play a greater international role, this is likely to come first through stock markets, where they are a more important player than in global debt markets. The picture could shift somewhat once the renminbi becomes convertible, as outstanding government debt in China is relatively high in absolute terms and almost stands at the same level as in the United Kingdom.

Emerging market currencies play only a limited role in global derivatives markets, but they are beginning to play a more visible role in global foreign exchange markets. Together, they currently account for about 6% of global FX market turnover. Although this share appears small, the absolute amounts are often quite significant in relation to other financial markets, considering also the particularly high total turnover in the global FX market of close to USD 2 trillion per day. Moreover, it should be noted that whereas FX turnover was negligible in most EMEs until a few years ago, turnover is rising, especially in countries such as Hong Kong, Mexico and South Korea.

Structural indicators

Structural indicators may shed further light on the relatively limited role of EME currencies so far. These indicators aim at gauging the development of markets from a more regulatory point of view (Table 5). They need to be interpreted with caution, however, since they involve a significant amount of judgement, and only a few indicators are available across the sample of eight advanced and 14 emerging economies considered here.

Table 5 here

These indicators, which are based on La Porta, Lopez-de-Silanes and Shleifer (2006), the World Economic Forum's Global Competitiveness Report, the IMF and the Fraser Institute, show that the United States is seen as being particularly advanced in terms of financial market regulation (based on data available until end-2006). The US achieves higher scores than many other advanced economies in terms of disclosure, supervision and financial market sophistication. With the notable exception of Hong Kong and Singapore, most emerging market economies achieve lower scores than the United States, and the gap is generally somewhat wider in the financial market sphere than in barriers to trade in goods and financial services.

These indicators may reveal why the amount of cross-border holdings of financial securities does not exactly mirror the relative size of financial markets, as international access to financial markets may be either fostered or hampered by structural factors. Another way to capture international access is through capital account openness, which reveals another large gap between advanced economies and emerging markets (Chinn and Ito, 2006). Structural indicators mostly reflect the result of direct policy choices. This is the case for many indicators relevant for the regulation and supervision of financial markets, but also for the degree of state involvement in financial markets – for example, through government-owned or government-sponsored financial institutions. Structural indicators are important policy variables that are likely to have an impact not only on domestic financial market development but also on the role of international actors. Hence, they are the bridge to a policy approach to international currency use, which will be dealt with in Section V.

3.3. A composite indicator of the global roles of currencies: main findings

Combining the various size and structural indicators into one single indicator would yield an approximation for one measure of the global role of currencies. Of course there is no a priori and robust weighting scheme for the various components, and the aggregation is potentially even more problematic for structural indicators than for size indicators. The weights chosen broadly correspond to their role in the international finance literature, but there can of course be no rigorous determination of the weights of individual variables. Therefore, we develop a very crude approach, which is necessarily ad hoc, but may serve to illustrate some magnitude of comparison between countries. In order to do so, we construct a composite global indicator that is made up of 15 individual size indicators and 16 individual structural indicators (the individual categories and weights are listed in Tables 4 and 5). The final global roles indicator is then given by the global size indicator adjusted for the structural indicators relative to a benchmark, for which the United States is used. For example, if a currency receives a rating in the structural indicator of half compared with that of the United States, its global indicator is only half of what its size indicator alone would have suggested. The results of this exercise are summarised in Table 6 and are also compared with the traditional structural measure. What are the main findings?

Table 6

- First, emerging market currencies play a more significant global role than the international concept would suggest. Whereas in the established international concept they jointly carry a weight of only 2.9%, the global role indicator assigns them a share of 11.2%, i.e. almost four times as much. The reason is that these currencies are hardly represented in the international debt market, but nevertheless dispose of considerable overall financial markets in terms of assets, breadth and turnover, and they see their shares rising also in areas such as the global foreign exchange market. Of course, the relatively limited role in the international debt market could partly be seen as a lack of trust in the 'international role' of emerging market currencies. The fact that the global role of these currencies is still relatively limited is due to the lower stage of financial development, reflected in a smaller size of their markets vis-à-vis advanced economies, and the fact that some of them are still lagging in terms of structural development and openness.

- Second, the weight of the dollar and euro both shrink compared with their pure "international role", but their relationship – whereby the euro reaches about 70% of the dollar's value – remains unchanged. This illustrates that the international measure used so far is heavily concentrated on these two currencies. The US dollar is clearly the leading global currency, with a global share of 38.7%, well above the share of the US economy, which reflects the size and structural stage of development of US financial markets.

- Third, the Japanese yen and pound sterling switch places from an international to a global concept, as, for the latter, the larger domestic financial market in Japan plays a role, and the same holds true for the Canadian dollar and the Swiss franc. Similarly to the pound sterling, the Swiss franc is used much more internationally than its domestic markets would suggest.

- Fourth, among emerging market currencies, the Mexican peso, the Singapore and Hong Kong dollars and the Korean and Chinese renminbi stand out with a relatively significant global role. Singapore and Hong Kong benefit from the fact that in terms of financial market regulation, governance and openness, their markets are virtually as developed as those of the United States as a benchmark. The inverse holds true for the renminbi, which scores highly in size but lower in structural factors.

An adjusted global role

Not all financial markets are equally open to international investors. Restrictions exist in particular in several emerging economies, which retain capital account restrictions or other barriers to foreign participation in financial markets. To address this aspect, one can adjust the global role for the degree of openness. To keep matters relatively straightforward, we take a single index – the one developed by Chinn and Ito (2006) – but one can in theory also construct composite indices of financial market openness from various sources.

Adjusting the global role measure for the degree of openness shows that the share of emerging market currencies drops by roughly half, from 11.2% to 6.5%, which is due to the fact that, on average, the emerging markets achieve a reading on the openness index of only 45.6% of the most open markets. Nevertheless, their share remains double the share in the established concept. The drop in the global role owing to actual openness is particularly significant for countries such as China, which maintain broad capital account restrictions. By contrast, for financial centres such as Hong Kong and Singapore the result remains largely unchanged, given their openness and full integration into the international financial system.

4. Empirical application of the global role concept to cross-border holdings

We can now apply the global role measure of currency use to an empirical issue to see whether it provides valued added in the context of international finance. We choose the issue of cross-border holdings of financial assets to see whether the global role measure helps to explain some of the phenomena linked to such holdings, especially the home bias puzzle. Home bias in international portfolio allocation, reflecting the fact that cross-border portfolio holdings fall short of benchmarks derived from portfolio models, is a well-established puzzle in international finance. It is attributed to a wide range of factors, including transaction and information costs (Portes and Rey, 2005; Cai and Warnock, 2006), the quality of institutions (Burger and Warnock, 2003; Gelos and Wei, 2005), or exchange rate volatility (Fidora, Fratzscher and Thimann, 2008).

We can test whether the global role of a country's currency is linked to cross-border holdings of financial assets. We use the IMF Coordinate Portfolio Investment Survey (CPIS) database and focus on the 22 currencies of the eight advanced and 14 emerging economies for which the global role indicator has been developed in this paper. Since we use bilateral cross-border holdings, we arrive at 440 observations for the whole sample and 164 observations for the emerging market currency sample. As a further robustness check we take the whole sample excluding the two most dominant currencies, the dollar and the euro.

Let cb_{ij} be the total cross-border holdings of debt and equity securities from country i in country j for end-2006 (in USD million) as derived from the CPIS database. We then estimate standard gravity-type models to explain such cross-border holdings, including the global role of the country's currency. The four estimated equations, standardised and expressed as logarithms, are shown below. We start with the narrow model that includes only the global role of the currency of the origin country, gr_i, and that of the destination country, gr_j, in addition to a constant:

$$cb_{i,j} = \alpha + \beta_1 \cdot gr_i + \beta_2 \cdot gr_j + \varepsilon \qquad (1)$$

The results show both variables to be significant; the global role of the origin country is significant at the 1% level in all samples; that of the destination country is significant at this level for all except the emerging market sample. Comparing the size of the coefficient suggests that the global role of the origin country's currency is about twice as important as that of the destination country in explaining bilateral cross-border holdings (Table 7).

As a second step, we add standard gravity variables such as distance and dummies for common border and common language to the equation; and we add proxies for the size of both economies through GDP for countries *i* and *j* to yield further estimation equations:

$$cb_{i,j} = \alpha + \beta_1 \cdot gr_i + \beta_2 \cdot gr_j + \beta_3 \cdot dist_{ij} + \beta_4 \cdot border_{ij} + \beta_5 \cdot lang_{ij} + \varepsilon \quad (2)$$

$$cb_{i,j} = \alpha + \beta_1 \cdot gr_i + \beta_2 \cdot gr_j + \beta_3 \cdot dist_{ij} + \beta_4 \cdot border_{ij} + \beta_5 \cdot lang_{ij} + \beta_6 \cdot gdp_i + \beta_7 \cdot gdp_j + \varepsilon \quad (3)$$

The results show that the global role estimators remain broadly similar in magnitude and significance across approaches and samples, while the gravity variables carry the expected sign and are significant overall as well. The possible set of gravity variables in the literature is, of course, wider, but most are more pertinent for international trade models rather than finance.

Tables 7 and 8 here

To check robustness, we also estimate cross-border holdings in the three samples without the global role indicators. It turns out that this approach works less well for all samples, and works particularly poorly for the emerging market sample. As discussed above, these findings suggest that the global role indicators carry explanatory power for advanced economies and their international financial integration, and are particularly relevant in the context of emerging markets, where other gravity-type indicators carry limited explanatory value.

How does the global role indicator fare directly against the established measure? We compare both concepts, each combined with the standard gravity variables in Table 8. As expected the largest difference is shown in the emerging market sample, where the global role concept is significant to explain cross-border holdings, whereas the established international measure is not. This is not surprising, given that the international role measure focuses on the international debt market only, while emerging economy currencies play virtually no role. However, based on standard information criteria, there is positive support for the global role compared with the international role, as well as for the full sample, and even very strong support for the sample without the dominating currencies of the euro and the dollar. Again, this is in line with the hypothesis that for the main established currencies the international concept is not far off the global concept, whereas for other currencies the results are

significantly different. The general finding that financial development fosters international financial integration and therefore a falling home bias seems to be reasonably robust.

5. Policies

While the previous sections have provided a positive analysis of a country's global or international role, this section takes a normative perspective, reviewing the positions of key economies towards a greater global or international role of their currency, for example through financial market development and opening.

There are a number of benefits for a country if its currency is used internationally. It enlarges the scope of issuers and investors and may thus lower borrowing costs and ultimately facilitate balance of payment financing. The additional demand for money creates seigniorage revenues, and is likely to imply more business for the country's banks and other financial institutions.[7] International use of the currency will foster economic and financial integration with the rest of the world, which can boost trade and potential growth. Currency use in key markets for commodities or trade invoicing will shift exchange rate risk to third countries and insulate the economy against exchange rate fluctuations. There are even arguments that international currency use will improve a country's terms of trade through externalities and lead to an increase in the purchasing power of the currency (Kannan, 2007).[8] Finally, non-pecuniary benefits include political power and prestige.[9]

However, international currency use also entails costs. The additional demand for money is likely to raise volatility in money demand, especially if foreign shocks are unknown and different from those affecting the home country. With the advancing of statistical reporting, most central banks are able to separate out foreign demand for money, but with regard to some components, such as cash, uncertainty remains. International currency use can also have an impact on financing conditions in a way that is, at times, undesired. During his last years in office former Federal Reserve Chairman Alan Greenspan said it was a "conundrum" that long-term interest rates were so low; after his retirement he stated that the Fed "failed" to get long-term rates to rise sufficiently, largely due to foreign demand for long-term bonds (Greenspan, 2007).

Benefits and costs are not equally distributed within an economy. International currency use is likely to be of particular benefit to the financial industry, the real economy and the fiscal authority. By

[7] It is interesting to note that most business using the euro – for example, foreign exchange trading – takes place outside the euro area, specifically in London. In 2001, the volume of euro trading in London's FX markets was 125% of trading in the euro area (see the article entitled "The City of London and the international role of the euro" in the "Review of the international role of the euro", ECB, December 2003).
[8] Kannan estimates that for the euro area the benefit is 1.7%-2.1% of GDP, of which seignorage is 0.5%-0.7% of GDP.
[9] See Portes and Rey (1997) for an overview of the costs and benefits, including political considerations.

contrast, the costs, which can arise if the extent of international currency use relative to the size of the home country is high, are mainly concentrated at the central bank; they include issues such as a potentially lower control over monetary and financial aggregates, and a possible blurring of responsibilities. Therefore, it is no surprise that a central bank will, in general, be more reserved towards an international use of its currency than political authorities. All over the world central banks have a strictly domestic mandate and are accountable to a domestic constituency. No international role can compensate for missing domestic objectives and, apart from a blurry reputational gain, international currency use gives little additional gain on top of achieved domestic objectives.

What is the policy stance of authorities issuing a currency that is used internationally, and what, if any, are the structural measures adopted to support or foster its international role?

- The European Central Bank has explicitly formulated its policy stance towards the international role of the euro, which it neither fosters nor hinders and considers purely as reflecting decisions of markets and economic agents (ECB, 2001 and 2002). The ECB has not launched any technical measure to support international currency use abroad. It has amended its statistical framework to the extent possible so as to net out impacts on money demand from non-residents.[10] [11]

- The US authorities have not established an explicit policy vis-à-vis the international role of the dollar, but from actual developments and policy declarations on specific issues, one can infer that this role is appreciated. The benefits for the US economy are, in particular, the privilege of issuing securities in a currency that is globally accepted, the insulation from exchange rate fluctuations given the dollar's role as an invoicing and quotation currency, and the business opportunities for the US financial system. Hence, it is not surprising that although the authorities do not explicitly state that they are fostering the role of the dollar, they are supporting it through technical means. One example is the worldwide network of the extended custodial inventory system of cash-handling centres that facilitate the use of the US dollar abroad.[12]

The debate on dollarization in parts of Latin America in the late 1990s showed a pragmatic policy stance, based on a cost-benefit analysis.[13] At the time, US Treasury official Lawrence Summers said that "to the extent that dollarization helped to expand our large role in Latin American markets, it

[10] In general, the reporting by monetary and financial institutions in the euro area distinguishes between residents and non-residents, and the ECB also amended the reporting of money market fund shares to allow for this distinction in 2001 (see ECB Monthly Bulletin May 2001, page 9f.). Hence, the main uncertainty which remains with regard to non-resident components affecting M3 stems from currency in circulation, which – at about 8% of M3 – is not likely to have a significant impact.

[11] The policy position of the Deutsche Bundesbank was explicitly critical towards an internationalisation of the Deutsche Mark (DM). It stated that "the Deutsche Mark has acquired an international role *somewhat against the will of the Bundesbank*" (Deutsche Bundesbank, Monthly Bulletin, May 1988, p. 22; see also Mayer (1996) and Frenkel and Goldstein (1999) on this matter). The reasons for the critical attitude lay in perceived risks related to the DM being a reserve currency, including interference with money demand and limited room for manoeuvre.

[12] See Baxter (2004) and Botta (2003).

[13] See, for example, Altig (2002) "Dollarization: What's in It for US?", Federal Reserve Bank of Cleveland. For a Fed perspective, see Lambert and Stanton (2001).

might help to ensure that we continued to benefit disproportionately from their future growth" (Summers, 1999). US Treasury Secretary Rubin was also open to dollarization, provided that the "Three No's" are respected (no inclusion of a dollarized economy in monetary policy considerations; no extension of bank supervision; and no access to the Fed discount window; Rubin, 1999).

- For several years the Japanese authorities pursued structural measures to foster the international role of the yen. In 1999 the Ministry of Finance called on the Council on Foreign Exchange to develop recommendations regarding the internationalisation of the yen. The starting observation was that the international role of the yen had fallen far short of Japan's weight in the global economy and that a stronger role of the yen would create new financial service business and vitalise Tokyo's financial markets. The Council recommended a number of structural policies to open financial markets, strengthen their infrastructure and improve the regulatory environment. These matters were taken up by a "Study Group for the Promotion of the Internationalisation of the Yen", chaired by Toyoo Gyothen, President of the Institute for International Monetary Affairs in 1999/2000, again under the auspices of the Ministry of Finance. The study group focused on a comprehensive list of structural measures, which it hoped would "lead to an increase in the procurement and management of yen funds by non-residents."[14] The measures included a broad spectrum of liberalisation, transparency and infrastructure strengthening. The study group has continued to issue reports, the latest one of which was published in June 2007.

- Finally, the UK and Swiss authorities do not pursue the international role of their currencies, but actively foster the international role of their financial centres.[15] For the United Kingdom, the international role of the sterling is only secondary, as financial institutions in London are heavily engaged in foreign currency use. In fact, the international role of the euro is more significant for London than the international role of the sterling.[16] The situation is similar in Switzerland, where the authorities focus more on the development of Zurich, Geneva and Basel as international financial centres rather than on the internationalisation of the Swiss franc. Macroeconomic stability as well as a very open financial environment are seen as the essential ingredients in this regard.[17]

6. Conclusions

For centuries, currencies have been seen – beyond their economic functions – as symbols of sovereignty. Today, in an environment of globalisation, they are often seen as symbols of the economic and financial strength of economic areas in an international context. Indeed, for

[14] See www.mof.go.jp/english/if/if025a.htm for the 30 June 2000 interim report and /if043a and /if043b for subsequent reports.
[15] See, for example, Clementi (2001).
[16] A few years after the launch of the euro, 34% of UK banks' business with non-residents was in euro (compared with only 11% in sterling), and the euro accounted for 23% of the total business of UK banks. Bank of England, *Practical issues arising from the euro*, November 2002, p. 9.
[17] See, for example, Roth (1998) and Blattner (2002).

international investors who are considering exposure in foreign currencies, the economic, institutional and financial foundations of currencies are important variables in their decision-making as regards the international allocation of portfolios. This paper has argued that the size of the underlying economy, as well as the size and stage of development of its financial markets, together with the soundness of the respective governance structure, are the relevant variables in this context. The indicators used to measure size and structural developments contain information that is also relevant from a policy point of view. Policy variables included in the concept are the opening of an economy to international trade and capital flows, the development of the domestic financial market in terms of instruments, regulation and oversight, and the credibility of the overall policy framework. Therefore, the respective shares of the global role of currencies are useful indicators for global investors and the underlying components of this concept are useful indicators for policy-makers.

The approach taken in this paper is different from the established approach vis-à-vis the international roles of currencies, which focuses on cross-border use. This paper has illustrated the appeal of the most widely-established measure based on the international debt securities market, which is the relatively precise accounting of cross-border use in this specific market. However, it has also made the point that, given the global decline in financial home bias, this specific market accounts for a decreasing share of overall cross-border financial activity. Markets for government debt, corporate debt and equities are experiencing vastly greater penetration by international investors. Hence, even for cross-border use, the international debt securities market is increasingly narrow. Moreover, it is a market dominated by EU and US financial corporations, and developments in currency shares are in turn influenced by short-term considerations, including firm-specific balance sheet management and cyclical developments. Only a few of the motives underlying currency use in this market are relevant for a policy-oriented debate on the international role or international standing of currencies. Therefore, currency shares in the market of international debt securities provide some, albeit limited, insight from a policy perspective.

This paper has addressed the more policy-oriented angle relating to the international role of currencies, namely the general importance of individual currencies in the global economy. The paper has developed a measure of the global roles of currencies based on the size and structural characteristics of the underlying economy and on the size, stage of development and quality of the regulatory framework of the underlying financial markets. Such a measure is important for three reasons: first, it can serve as a benchmark for currency shares in portfolios that are globally diversified; second, it gives an unbiased treatment of currencies from advanced and emerging economies and can therefore put the increasing global role of emerging economies into perspective; and third, it can, over time, help to detect shifts in the international monetary and financial system, for example through financial development and opening. The paper has also shown that the indicators of global currency use can play a useful role in understanding cross-border financial holdings, providing support to the notion that financial development fosters international financial integration.

The concept of the global role of currencies can enhance the policy discussion on the general importance of certain currencies in the global economy. For example, as far as the US dollar is concerned, the global role concept underscores its attractiveness as the leading global currency, resulting from the economic strength and governance framework of the underlying economy and the size and stage of development of its financial markets (based on data available until end-2006). More specifically, the paper has shown that key pillars of the global role of the dollar are the size and liquidity of US equity markets, the amount of debt instruments issued by financial institutions and corporations, and the leading role of the US dollar in global foreign exchange markets and reserves.

As far as the euro is concerned, the concept developed in this paper suggests that the role of the euro will continue to rise as a result of enlargement – which will gradually add to the global economic weight of the euro area – and, more importantly, through financial development and integration within Europe. In recent years, the growing corporate bond market, the increasing role of equities in external financing and the development of the money market have been important steps in this process. The difference between the underlying financial markets available to the US dollar and the euro is particularly pronounced in the equity market and the foreign exchange market; within the debt market, the government segment is broadly comparable, but the difference is large in terms of debt issued by financial institutions. Moreover, the euro has some segments in the derivatives markets that are larger, reflecting a very advanced stage of financial development, especially with regard to derivatives on government securities that are heavily used by foreign investors.

Finally, the global role indicator sheds light on the relative standing of the currencies of emerging economies. These currencies have been largely neglected in the established analysis of the international role of currencies since they play virtually no role in global foreign exchange reserves and are not used in the international debt securities market, which is dominated by European and US financial institutions and corporations. However, owing to domestic financial market development, a strengthening of the policy and regulatory frameworks and the opening-up of markets, they are beginning to play a more significant role in the global economy than in the past.

The quantitative results of this paper show that the dollar is still the dominant global currency, followed by the euro. However, the yen and pound sterling switch ranks compared with the measure based on the international debt market and a slightly larger global role is attributed to the yen. Additionally, the Canadian dollar looks different from a global perspective: its weight in this concept is more than twice its weight in the international debt securities market. Most importantly, the group of emerging economy currencies receives a weight almost four times as high as in the international debt market, led by Mexico, Brazil and the main emerging economies in South-East Asia. The weights are still well below the economic weights of the respective economies because financial development is ongoing, but even today they suggest a non-negligible role for these currencies in internationally diversified portfolios, as well as in the international monetary and financial system more broadly.

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Table 1. The matrix of international currency use

A: Theorist's matrix	Private use	Official use
- Medium of exchange	Vehicle currency	Intervention currency
- Unit of account	Quotation currency	Anchor currency
- Store of value	Investment & financing curr.	FX reserves currency
B: Practitioner's matrix	Use in financial markets	Use in third countries
	International debt markets Foreign exchange markets	Exchange rate anchor, FX reserves
	International trade invoicing	Cash and parallel currency use

Sources: Cohen (1971), Kenen (1983) for upper panel; ECB (2002) and subsequent editions for lower panel.

Table 2. The international debt securities market in comparison (amounts outstanding at end-2006, values at current exchange rates)

	Value outstanding in USD billion	of which: US dollar (% share)	of which: Euro (% share)	of which: Japanese yen (% share)
"Narrow" measure of market[1)]	7,857	44.1	31.4	5.3
"Broad" measure of market[1)]	18,449	36.3	47.0	2.7
Issuers and market share[2)] (in %)	Share in total market	Share in USD market	Share in euro market	Share in yen market
Financial Institutions	77.8	77.2	78.6	74.3
Corporations	10.2	13.1	8.1	12.5
Governments	8.8	7.0	11.7	6.8
International Institutions	3.2	2.8	1.5	6.2

1) The narrow measure accounts for 11.4% of the total global debt market, the broad measure for 26.8%.
2) Refers to the market in the broad definition. Source: ECB 2007 and Bank for International Settlements.

Table 3. Cross-border bond and equity holdings
(end-2005, USD billions)

Panel A: Bonds

Investment from:	United States	Euro area	United Kingdom	Japan	All countries
Investment in:					
United States	…	779.6	320.0	55.1	3601.0
Euro area	296.1	…	455.4	529.8	2488.8
United Kingdom	276.9	573.5	…	74.4	1219.9
Japan	26.7	102.3	52.9	…	279.1
China	1.6	2.6	1.5	0.4	15.8
All countries	1273.4	2520.5	1297.9	1706.7	11160.5

Panel B: Equities

Investment from:	United States	Euro area	United Kingdom	Japan	All countries
Investment in:					
United States	…	668.2	270.0	192.6	1698.3
Euro area	757.4	…	307.2	71.5	1605.4
United Kingdom	537.9	357.3	…	39.5	1217.8
Japan	493.3	207.6	143.0	…	953.8
China	26.9	12.8	8.9	3.6	96.2
All countries	3317.7	1872.8	1076.0	408.6	8802.7

Note: Figures exclude intra-euro area cross-border holdings. Source: IMF (Coordinated Portfolio Investment Survey).

Table 4. Global role of currencies - selected size indicators (2006)

Indicator	Advanced Economies								Weight in composite global indicator	Total advanced (shares in	Total EME world total)
	United States	Euro Area	Japan	United Kingdom	Canada	Australia	Switzerland	New Zealand			
Size of economy									**0.33**		
Share in world GDP in current prices (in %)	27.30	21.90	9.10	5.00	2.60	1.60	0.80	0.20	(0.5)	68.5	18.9
Share in global trade (imp.+exp) (in %)	15.00	14.30	5.80	6.00	3.70	1.30	1.50	0.30	(0.5)	47.9	29.7
Size of financial markets									**0.67**		
Debt market (in bn USD) - "broad" concept									0.33		
Amounts outstanding of domestic debt									(0.67)		
Governments	6,247	5,598	6,748	835	615	97	111	20		84.0%	11.0%
Financial Institutions	13,812	3,566	986	379	254	215	98	0		91.6%	4.9%
Corporations	2,800	1,323	673	23	116	144	14	0		88.7%	8.5%
Amounts outstanding of international debt											
Governments	468	979	34	18	17	11	23	2	(0.33)	95.4%	0.2%
Financial Institutions	5,160	6,559	373	1,291	147	148	227	31		97.1%	0.9%
Corporations	873	678	63	193	8	6	16	0		97.5%	0.5%
International institutions	187	129	31	96	9	36	8	14		86.7%	3.6%
Total amount of debt securities outstanding	29,547	18,831	8,908	2,835	1,166	658	497	68		90.1%	6.3%
Amounts outstanding of international debt, by type											
Money market instruments	287	354	14	147	3	11	20	5		96.1%	2.9%
Bonds and notes	6,401	7,990	487	1,450	178	191	254	42		96.7%	0.8%
Stock market									0.33		
Market capitalisation (in bn USD, end 2006)	19,569	8,354	4,796	3,794	1,701	1,096	1,212	45	(0.5)		
as % of world market capitalisation	38.60%	16.50%	9.50%	7.50%	3.40%	2.20%	2.40%	0.10%		80.2%	14.6%
Number of listed companies	6,005	3,114	2,883	3,256	3,842	1,829	348	182	(0.1)	52.8%	23.5%
Share of foreign listed companies[1] in %	14.50	20.60	0.90	10.50	1.40	4.30	26.40	17.00	(0.1)	12.0	8.5
Average daily turnover (in mn USD)	136,252	40,877	24,493	30,046	5,107	3,411	5,564	89	(0.1)	88.4%	7.4%
Average turnover velocity (% of market capitalisation)	161.50%	136.00%	123.90%	124.80%	76.40%	88.40%	130.20%	51.60%			
New capital raised in IPOs (in bn USD)	54.5	78.6	na	55.8	9.1	12.9	2.9	0.2	(0.1)	66.0%	24.1%
Number of ETFs listed (end 2006)	340	437	13	na	33	9	61	6	(0.1)	79.3%	10.4%
Dervivates market									0.17		
OTC interest rate derivatives, amounts outstanding (in bn USD)	97,612	112,116	37,954	22,274	2,125	1,042	3,544	26	(0.33)	94.8%	0.2%
OTC interest rate derivatives, daily turnover (in bn USD)	532	656	137	172	na	na	na	na	(0.33)	88.8%	0.0%
OTC FX derivatives, amounts outstanding (in bn USD)	33,775	15,907	9,548	6,128	1,764	1,498	2,307	48	(0.33)	176.6%	1.6%
Foreign exchange (FX) market									0.17		
Share in global FX market turnover (April 2007)	43.20%	18.50%	8.30%	7.50%	2.10%	3.40%	3.40%	1.00%	(0.5)	87.4%	5.5%
Share in global FX reserves [2]	64.70%	25.80%	3.20%	4.40%	na	na	0.20%	na	(0.5)	98.3%	0.0%

Table 4 continued. Global role of currencies - selected size indicators (2006)

	Emerging Asia								Latin America			Emerging Europe & Africa			
Indicator	**Hong Kong**	**Singapore**	**China**	**India**	**South Korea**	**Malaysia**	**Thailand**	**Indonesia**	**Brazil**	**Mexico**	**Argentina**	**Russia**	**Turkey**	**South Africa**	**World**
Size of economy															
Share in world GDP in current prices (in %)	0.4	0.3	5.5	1.8	1.8	0.3	0.4	0.8	2.2	1.7	0.4	2.0	0.8	0.5	$48,245bn
Share in global trade (imp.+exp) (in %)	3.1	2.6	7.9	1.8	3.1	1.4	1.2	0.9	1.1	2.2	0.4	2.2	1.1	0.7	$24,337bn
Size of financial markets															
Debt market (in bn USD) - "broad" concept															
Amounts outstanding of domestic debt															
Governments	18	56	786	305	460	59	73	69	512	168	45	33	na	70	24,145
Financial Institutions	25	18	328	16	292	34	0	4	178	112	1	0	na	25	21,070
Corporations	8	5	70	5	258	53	36	4	6	27	0	0	na	14	5,744
Amounts outstanding of international debt															
Governments	1	0	0	0	0	0	0	0	3	0	0	0	na	0	1,627
Financial Institutions	77	19	1	0	0	0	2	1	6	7	0	2	na	9	14,348
Corporations	2	1	0	0	1	1	0	0	0	2	0	1	na	2	1,884
International institutions	3	0	0	0	0	1	0	0	1	2	0	1	na	13	588
Total amounts outstanding	135	101	1,185	326	1,011	148	112	77	707	319	47	37	na	133	69,405
Amounts outstanding of international debt, by type															
Money market instruments	22	2	0	0	0	0	0	0	0	1	0	0	na	0	875
Bonds and notes	62	19	2	0	1	1	3	1	11	10	1	3	na	23	17,571
Stock market															
Market capitalisation (in bn USD, end 2006)	1,715	384	1,145	774	834	236	140	139	710	348	51	na	162	711	50,635
as % of world market capitalisation	3.4%	0.8%	2.3%	1.5%	1.6%	0.5%	0.3%	0.3%	1.4%	0.7%	0.1%	na	0.3%	1.4%	
Number of listed companies	1,173	708	1,421	1,156	1,689	1,025	518	344	350	335	106	na	316	389	40,635
Share of foreign listed companies in %	0.7	34.9	0.0	0.0	0.0	0.4	0.0	0.0	0.9	60.6	4.7	na	0.0	7.7%	
Average daily turnover (in mn USD)	3,370	721	4,809	1,694	5,434	306	415	202	1,123	386	21	na	891	1,254	278,252
Average turnover velocity (% of market capitalisation)	62.1%	58.2%	173.3%	67.8%	171.4%	36.2%	72.7%	44.8%	45.5%	29.6%	7.2%	na	141.3%	48.9%	
New capital raised in IPOs (in bn USD)	43.0	4.8	13.8	4.5	2.9	0.3	0.5	0.4	6.0	0.9	0.0	na	0.9	0.0	324
Number of ETFs listed (end 2006)	9	13	4	5	12	1	na	na	1	58	na	na	6	9	1,134
Dervivates market															
OTC interest rate derivatives, amounts outstanding (in bn USD)	453	na	na	na	na	na	2	na	na	na	na	na	na	na	291,987
OTC interest rate derivatives, daily turnover (in bn USD)	na	na	na	na	na	na	na	na	na	na	na	na	na	na	1,686
OTC FX derivatives, amounts outstanding (in bn USD)	631	na	na	na	na	na	6	na	na	na	na	na	na	na	40,179
Foreign exchange (FX) market															
Share in global FX market turnover (April 2007)	1.4%	0.6%	0.3%	0.4%	0.6%	0.1%	0.1%	0.1%	0.2%	0.7%	na	0.4%	0.1%	0.5%	100.0%
Share in global FX reserves [2]	na	na	0.0%	na	na	na	na	na	na	na	na	na	na	na	

Sources: IMF (World Economic Outlook), World Federation of Exchanges (Annual Report 2006), BIS, ECB.

[1] Including intra-European listings.

[2] The currency shares are based on the reserves of member countries which report the currency composition of their foreign exchange reserves.

Table 5. Global role of currencies - selected structural indicators

Indicator	Weights in the composite global indicator	Advanced Economies							
		United States	Euro Area	Japan	United Kingdom	Canada	Australia	Switzerland	New Zealand
Financial market regulation	0.25								
Disclosure[1]	(0.20)	100	49	75	83	92	75	67	67
Liability[1]	(0.20)	100	44	66	66	100	66	44	44
Supervision[1]	(0.20)	90	38	0	68	80	90	33	33
Access to equity[1]	(0.20)	67	54	49	63	64	60	61	58
Financial market sophistication[2]	(0.20)	91	83	79	99	91	94	87	97
Size of state	0.25								
Property rights[1]	(0.25)	100	91	100	100	100	100	100	100
Freedom of corruption[1]	(0.25)	79	74	68	90	93	87	91	95
SOE Investment (in % of gross domestic investment)[1]	(0.25)	4	12	8	11	0	16	0	0
Share of government-owned banks (in %)[1]	(0.25)	0	29	0	0	0	12	13	0
Monetary Issues	0.25								
Central bank independence[5]	(0.50)	48	80	38	31	47	29	63	38
Inflation volatility of last 5 years (in %)[3]	(0.25)	0.73	0.07	0.44	0.47	0.34	0.44	0.24	0.63
Inflation absolute in 2006 (in %)[3]	(0.25)	3.24	2.19	0.30	2.30	2.00	3.54	1.05	3.36
Trade barriers (Goods and Finance)	0.25								
Freedom of regulatory trade barriers[4]	(0.25)	82	86	69	89	82	90	87	92
International capital market controls[4]	(0.25)	84	82	71	92	83	56	86	91
Capital account openness (Chinn and Ito, 2006, normalised to 0-100)	(0.25)	100	96.6	100	100	100	68.5	93.7	100
Freedom to own foreign currency bank account[4]	(0.25)	100	100	100	100	100	100	100	100

Table 5 continued. Global role of currencies - selected structural indicators

	Emerging Asia								Latin America			Emerging Europe & Africa		
Indicator	**Hong Kong**	**Singapore**	**China**	**India**	**South Korea**	**Malaysia**	**Thailand**	**Indonesia**	**Brazil**	**Mexico**	**Argentina**	**Russia**	**Turkey**	**South Africa**
Financial market regulation														
Disclosure[1]	92	100	na	92	75	92	92	50	25	58	50	na	50	83
Liability[1]	66	66	na	66	66	66	22	66	33	11	22	na	22	66
Supervision[1]	87	87	na	67	25	77	72	62	58	35	58	na	63	25
Access to equity[1]	55	55	na	53	50	51	42	45	41	39	32	na	50	59
Financial market sophistication[2]	100	97	54	79	83	88	74	75	66	69	56	58	71	83
Size of state														
Property rights[1]	100	100	na	60	100	80	100	60	60	60	80	na	80	60
Freedom of corruption[1]	70	99	na	25	43	36	21	1	31	20	21	na	22	44
SOE Investment (in % of gross domestic investment)[1]	0	0	na	41	24	16	15	13	22	21	10	na	37	19
Share of government-owned banks (in %)[1]	0	14	na	85	25	10	17	43	32	36	61	na	56	0
Monetary Issues														
Central bank independence[5]	na	17	60	28	37	47	21	84	46	64	79	62	85	48
Inflation volatility of last 5 years (in %)[3]	2.18	0.76	1.67	0.98	0.57	1.08	1.74	3.10	3.99	0.56	7.99	2.38	16.09	2.90
Inflation absolute in 2006 (in %)[3]	2.02	0.97	1.47	6.15	2.24	3.59	4.64	13.10	4.20	3.63	10.90	9.68	9.60	4.69
Trade barriers (Goods and Finance)														
Freedom of regulatory trade barriers[4]	93	93	62	64	74	78	70	60	57	72	60	57	64	77
International capital market controls[4]	92	81	39	43	46	42	44	37	66	57	59	39	50	49
Capital acct. openness (Chinn/Ito, 2006, norm. to 0-100)	100	100	15.2	15.2	39.0	39.0	39.0	68.5	45.3	68.5	39.0	39.0	15.2	15.2
Freedom to own foreign currency bank account[4]	100	100	50	0	100	0	0	100	50	50	100	50	100	50

Sources:
[1] La Porta, Lopez-de-Silanes and Shleifer (2006).
[2] World Economic Forum, Global Competitiveness Index.
[3] IMF, World Economic Outlook.
[4] The Fraser Institute.
[5] Crowe and Meade (2007).

Table 6. The "Global roles of currencies" based on size and structural indicators
(percentages)

		Global role measure	Adjusted global role measure	Established international role measure	Global role measure by country groups	Size indicator US=100	Structural indicator US=100	Capital account openness
Advanced economy currencies		*88.8*	*93.5*	*97.1*	*100.0*		*96.2*	*99.6*
1	US dollar	38.7	41.2	44.3	43.7	100.0	100.0	100.0
2	Euro	27.0	27.7	31.3	30.4	66.8	104.2	96.6
3	Japanese yen	8.6	9.2	5.3	9.9	25.3	89.5	100.0
4	Pound sterling	7.1	7.5	9.3	7.9	18.8	96.0	100.0
5	Canadian dollar	2.7	2.9	1.1	3.1	7.1	100.7	100.0
6	Swiss franc	2.3	2.4	3.3	2.5	5.9	97.3	100.0
7	Australian dollar	1.8	1.9	1.9	1.8	4.6	92.4	100.0
8	New Zealand dollar	0.7	0.7	0.6	0.6	1.6	89.9	100.0
Emerging market currencies		*11.2*	*6.5*	*2.9*	*100.0*		*70.5*	*45.6*
1	Mexican peso	1.9	1.4	0.1	15.7	6.7	68.6	68.5
2	Singapore dollar	1.5	1.6	0.2	14.0	4.3	96.4	100.0
3	Hong Kong dollar	1.4	1.4	0.6	13.4	4.5	87.8	100.0
4	South Korean won	1.3	0.5	0.0	12.0	4.3	81.5	39.0
5	Chinese renminbi	1.3	0.2	0.0	11.4	8.6	38.4	15.2
6	Indian rupee	0.8	0.1	0.0	6.8	2.8	70.1	15.2
7	Brazilian real	0.8	0.4	0.1	6.4	2.9	64.8	45.3
8	South African rand	0.5	0.1	0.4	4.4	1.8	70.8	15.2
9	Turkish lira	0.3	0.1	0.2	3.4	1.2	85.0	15.2
10	Malaysian ringgit	0.3	0.1	0.0	3.0	1.3	70.4	39.0
11	Russian rouble	0.3	0.1	0.0	2.6	2.1	36.5	39.0
12	Indonesian rupiah	0.3	0.2	0.0	2.6	1.0	78.1	68.5
13	Thai baht	0.3	0.1	0.0	2.2	1.1	59.3	39.0
14	Argentinan peso	0.2	0.1	0.0	2.1	0.8	79.2	39.0

Note: The global role measure comprises 15 size and 16 structural indicators of a currency's financial markets and the underlying economy (provided in Tables 4 and 5 and summarised in columns 5 and 6 of this table). The adjusted global role measure takes account of financial markets' openness (which is shown in the last column, based on Chinn/Ito, 2006, normalised to 0-100). The established international role measure is based on the currency's share in the international debt market.
Source: Author's compilation.

Table 7. Determinants of cross-border portfolio holdings across advanced and emerging market economies
(Dependent variable: total bilateral cross-border portfolio holdings according to IMF CPIS)

	Total sample				Emerging markets				Total sample without dollar and euro			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Regressors												
Global role i	0.504***	0.482***	0.423***		0.385***	0.397***	0.455***		0.487***	0.490***	0.643***	
Global role j	0.308***	0.284***	0.188***		0.128*	0.131*	0.143*		0.199***	0.200***	0.196***	
Distance		-0.158***	-0.156***	-0.1333***		-0.318***	-0.288***	-0.274***		-0.144***	-0.135***	-0.1777***
Common border		-0.022	-0.036	0.095		0.196	0.3	0.153		0.256	0.34	-0.133
Common language		0.296***	0.340***	0.526***		0.043	-0.037	0.287		0.398***	0.340***	0.482***
GDP i			0.076	0.393***			-0.187**	-0.044			-0.233***	0.198***
GDP j			0.125**	0.263***			-0.014	0.034			0.01	0.142***
Constant	-0.016	-0.113**	-0.128***	-0.194***	-0.042	-0.083	-0.073	0.087	-0.024	-0.144***	-0.133***	-0.139**
Number of Obs.	440	440	440	440	164	164	164	164	359	359	359	359
Adj. R squared	0.341	0.383	0.389	0.306	0.144	0.251	0.274	0.097	0.267	0.323	0.351	0.104
F (df)	114.66	55.60	40.96	39.82	14.67	11.95	9.77	4.48	66.21	35.13	28.62	9.27
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
Log-Likelihood			-511.84	-540.77			-202.40	-221.33			-427.84	-486.75
LR-test value (df)			57.855 (2)				37.852 (2)				117.822 (2)	

Note: The dependent variable is CBij, cross-border holdings of bonds and equity securities from country i into country j at end-2006 (source: IMF Coordinated Portfolio Investment Survey).
The total country sample includes currencies of eight advanced and 14 emerging market economies
All variables are standardised and expressed in logs; estimation is OLS; significance levels are indicated as follows: *=10%; **=5%; ***=1%.

Table 8. Determinants of cross-border portfolio holdings across advanced and emerging market economies
(Dependent variable: total bilateral cross-border portfolio holdings according to IMF CPIS)

	Total sample		Emerging markets		Total sample w/o dollar, euro	
	(1)	(2)	(1)	(2)	(1)	(2)
Regressor						
Distance	-0.156***	-0.157***	-0.288***	-0.293***	-0.135***	-0.167***
Common border	-0.036	-0.052	0.300	0.153	0.340	0.200
Common language	0.340***	0.343***	-0.037	0.222	0.340***	0.342***
GDP i	0.076	0.116**	-0.187**	-0.009	-0.233***	-0.059
GDP j	0.125**	0.138**	-0.014	0.054	0.010	0.054
Global role i	0.423***		0.455***		0.643***	
Global role j	0.188***		0.143*		0.196***	
International role i		0.385***		0.088		0.497***
International role j		0.178***		0.053		0.165***
Constant	-0.128***	-0.128***	-0.073	-0.079	-0.133***	-0.122**
Number of Obs.	440	440	164	164	359	359
Adj. R squared	0.389	0.382	0.274	0.093	0.351	0.304
F (df)	40.96	39.8	9.77	3.39	28.62	23.3
Prob > F	0.000	0.000	0.000	0.002	0.000	0.000
Log-Likelihood	-511.84	-514.30	-202.40	-220.58	-427.84	-440.405
LR-test value (df)	223.9 (7)	218.9 (7)	59.61 (7)	23.2 (7)	162.13 (7)	136.99 (7)
BIC'	-181.37	-176.36	-23.91	12.46	-120.94	-95.802
Difference of BIC'	5.00		36.35		25.14	
Support for global model	"positive"		"very strong"		"very strong"	

Note: The dependent variable is CBij, cross-border holdings of bonds and equity securities from country i into country j at end-2006 (source: IMF).
The total country sample includes currencies of eight advanced and 14 emerging market economies
All variables are standardised and expressed in logs; estimation is OLS; significance levels are indicated as follows: *=10%; **=5%; ***=1%.
BIC refers to the Bayesian Information Criterion (aka Schwarz criterion), which can be used to compare non-nested models.

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