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ASIA-EUROPE: THE THIRD LINK

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Asia-Europe: The Third Link

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Non-technical summary

This paper provides an overview of the relative weight of Europe and East Asia in the context of the world economy and it assesses interdependence between the two regions. The prime motivation of the paper is that linkages between Europe and East Asia remain frequently underestimated. While the "third link" between them is in many respects as important as the linkages between the two regions and North America, it is too often regarded only as of secondary importance.

Our main findings are the following:

1. *Economic weights. In spite of large population differences, East Asia (ASEAN + 3), Europe (EU + Switzerland) and North America (NAFTA) represent almost equal shares (one fourth each) of world GDP at PPP exchange rates and comparable shares of world trade. North America and Europe however still supply higher shares (one third each or more) of global financial assets.*
2. *Trade integration within Europe is significantly closer than within the other two regions; however trade integration within East Asia is growing very rapidly while it has stalled within the North American region. Vis-à-vis the rest of the world, East Asia's trade openness (not counting trade within the region) is twice higher than North America's. Europe's openness lies in between.*
3. *Financial integration within Europe has increased dramatically in the last decade, with a near-tripling of the cross-border asset holdings-to-GDP ratio. Nothing similar has happened within the other two regions, in spite of discussions on financial and monetary integration within East Asia. However East Asia's financial openness to the rest of the world has doubled and nearly matches those of Europe and North America. Being long on equity and short on debt, North America plays the role of the "venture capitalist of the world". East Asia plays the mirror role.*
4. *Trade interdependence. For both North America and Europe, trade interdependence with the East Asian partner has become more important than interdependence with the other Western partner.*
5. *Financial interdependence. North America remains the main financial hub. In comparison, Europe's financial relationship with East Asia is underdeveloped.*
6. *Trade linkages. East Asia's high levels of export to North America and Europe as a proportion of its GDP make it highly dependent on growth in the two partner regions. Trade within the region may accelerate rather than cushion the slowdown.*
7. *Financial linkages. Potential bank losses in Europe amount to two-third those of American banks, but those of Asian banks are negligible. The financial channel therefore matters for Europe, much less so for East Asia.*

8. *Exchange rates. The effective exchange rate between East Asia and North America is markedly less volatile than Europe's effective exchange rates vis-à-vis the other two regions.*
9. *Europe and Asian exchange rates. For Europe, East Asian dollar pegs have the advantage of containing the depreciation of the dollar in the short run but at the cost of an eventually lower dollar in the long run.*
10. *Wealth transfers. Financial integration makes the wealth effects of exchange rate changes more and more significant. A 10% North American depreciation results in a transfer from Europe (two third) and East Asia (one third) amounting to 1.6% of the combined GDP of the three regions. The cumulative effect of exchange rate movements from 2001 to mid-2008 was a wealth transfer from Europe to North America of the order of magnitude of 5% of the combined GDP of the three regions (4% of world GDP).*

1. Introduction

The prevailing view of the world economy is strikingly polarised. Analyses of macroeconomic linkages and transmission channels routinely represent the world with the US at the centre and other regions, among which Asia and Europe, at the periphery. Asia and Europe are obviously regarded as important players, but mainly in interaction with the US rather than with each other. In recent assessments of the short-term economic outlook, the US is still widely seen as the driving force behind the global business cycle. The same bias has been apparent in discussions about exchange rates, as China, Japan, and the euro area have been discussing the relationship between their currencies and the US dollar separately without paying much attention to their bilateral relationships until the end of 2007[2].

From innovation leadership to the issuance of the world's premier currency there are several objective reasons why the US economy still plays a leading economic role in the world and our intention is not to dispute this reality. But this reality cannot justify retaining an outdated or distorted view of international interdependence. Policymakers in Asia and Europe need to take the full measure of the international role of their economies and of their corresponding global responsibilities.

Our aims in this paper are:

- to provide an objective assessment of the weight and interdependence of the major regions;
- to investigate the Asia-Europe relationship in the context of the world economy;
- to contribute to current discussions about the global repercussions of the financial turmoil;
- to shed light on the implication of growing cross-border assets and liabilities between the three regions.

To this end we adopt a deliberately stylised view of the world economy and look at broad regions instead of countries. This overlooks many disparities within regions but has the advantage of allowing a consistent and tractable approach to trade and financial linkages in the context of scarce global supply of energy and food commodities.

The paper is organised as follows. We start in section 2 from a decomposition of the world economy into four regions (North America, East Asia, Europe and the Rest of the World) and we assemble a number of stylised facts about their size and openness. We turn to bilateral linkages in section 3, looking separately at trade and financial linkages to investigate how the three main regions interact with each other. We take up the transmission of shocks in section 4 and the implications of exchange-rate adjustments in section 5. Section 6 offers conclusions. Sections 2 and 3 are mainly descriptive and can be skipped by uninterested readers.

[2] Pisani-Ferry (2008) discusses Europe's long-standing indifference to the renminbi and the factors behind it.

2. A map of the world

In recent times, Europe, North America and East Asia have gone through (much-discussed) parallel regional integration processes. In Europe, the process has involved a series of continuous institutional investments into the deepening of the European Union and its successive enlargement to new member countries[3]. Major recent steps have included the creation of an integrated market for goods and to a lesser extent for services; the introduction of a common currency for a subset of countries within the EU; and enlargement to twelve new members, including ten former communist countries. Institutional integration has been shallower in North America, where the North American Free Trade Agreement (NAFTA) was a one-off step and does not involve any major transfer of sovereignty to the supranational level. In East Asia, cooperation remains in many ways even more informal, but unlike in North America there is a momentum towards closer integration and cooperation, with stepwise initiatives on the trade, capital markets and monetary fronts[4]. However all three regions have undergone economic transformation as a consequence of the intensification of intraregional trade and investment.

For the analysis of global interdependence, it is therefore appropriate to start from a decomposition of the world economy into four regions:

- East Asia (defined as ASEAN + 3) [5]
- Europe (defined as the 27-strong European Union[6] + Switzerland)
- North America (comprising the US, Canada and Mexico), and
- The Rest of the World (ROW).

Choices here are straightforward. The inclusion of Switzerland in the European region is justified by the fact that this country follows most EU rules and serves as a financial centre for its residents. We could have included other European countries in the region, especially the current candidates to the EU, but this would not have changed the picture significantly as those are mostly small countries[7]. NAFTA membership is a natural criterion for inclusion in the North American region and here again, adding Central American countries would have not made much difference. The same applies to the use of ASEAN+3 membership as a criterion for East Asia. The one major choice that is clearly specific to our approach (and justified by the fact that we are mainly interested in the other three regions) is that we have lumped together South America, South Asia, the Middle East, Africa and Oceania in a single ROW region.

[3] See Mongelli, Dorrucci and Agur (2007) for a synthetic account of institutional integration in Europe.

[4] Park and Wyplosz (2008) provide an up-to-date account of the monetary and financial integration in East Asia.

[5] ASEAN (Association of South East Asian Nations) member countries include Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam. To that group, we add China, Japan and the Republic of Korea.

[6] The EU member countries include Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, and the United Kingdom.

[7] For an overview of the economic relationship between the EU and its periphery see Sapir (2007).

a. Weights

As regards their weight in the world economy, East Asia, Europe and North America exhibit both similarities and differences (Table 1). On the one hand, the three regions are very similar as regards their weight in world production and trade. Each accounts for about one fourth of world GDP at PPP exchange rates and for between one fifth and one fourth of world trade (excluding trade within the region). On the other hand, differences in population size are considerable, with East Asia's population still on the rise and accounting for more than twice that of Europe and North America combined. This simple fact has straightforward implications for Asia's share of world food and energy consumption.

Table 1: The four world regions

In percent of world total; data for 2006

	East Asia	Europe	North America	Rest of the World
Population	32	8	7	53
GDP (current exchange rates)	20	31	32	17
GDP (PPP exchange rates)	24	24	26	26
Industrial production*	34	24	29	13
Share of FT 500 market cap#	17	33	40	10
Supply of fin. assets¨ ***	19	33	37	11
Demand for fin. assets¨ *** ~	21	33	35	11
Trade in goods¨¨	23	23	19	35
Energy production**	20	9	21	52
Energy demand**	26	17	25	34
Co2 emissions***	29	15	25	31
Cereal production°	24	15	21	40
Cereal demand°°	26	15	16	43

Source: The Conference Board and Groningen Growth and Development Centre, *Total Economy Database, 2007*; IMF, *World Economic Outlook* and *International Financial Statistics*, 2008, McKinsey Global Institute, *Mapping Global Capital Markets*, 2008; UNIDO, *Industrial Statistics*, 2008; Financial Times; IEA and FAO. Calculations by authors, and by Nicolas Véron (Bruegel) for the shares of FT Global 500.

Notes: [#] Share of companies headquartered in each region in the aggregate FT Global 500 market capitalisation. [¨] Sum of equity securities, private debt securities, government debt securities and bank deposits, [~] Computed as Supply of fin. assets + Net foreign assets, [¨¨] Intra-regional trade excluded [*] World Manufacturing VA in constant 2000 USD, [**] 2004, [***] 2005, [°] 2001-2003, [°°] Consumption + Imports + Other uses and stocks.

All three regions are energy-dependent, most clearly for Europe. They trade manufactured goods for energy with the rest of the world, whose energy surplus accounts for almost one-fifth of total energy demand. For food, all regions are closer to balance.

Turning to financial markets, Europe and North America are still much bigger players than East Asia. Each accounts for one third of the global market[8]. In addition, North America is a net supplier of assets to the rest of the world, the counterpart being East Asia. Global finance is therefore still centred on the US and Europe. However it is worth noting that East Asia's share in global financial assets is commensurate to its share in world GDP (at current prices). The truly underdeveloped region is the rest of the world, with only 11% total world assets. The situation is the opposite for food and energy production where the rest of the world is the key supplier with respectively 40% and more than 50% of the world output.

Finally, it is worth noting that the share of East Asian companies within the FT's Global 500 has increased rapidly in the last decade. Whereas this share was markedly inferior to the region's share in world GDP in 1996, it is now commensurate with it, as it is for Europe. It remains higher for North America, but has been declining rapidly, largely because of the depreciation of the US dollar.

One should bear in mind that these aggregate measures of weight overlook by definition differences in the degree of heterogeneity within the three regions. Indeed, East Asia stands out not only as a poorer region than Europe and North America (GDP per capita at PPP value is $4,600 in East Asia; for Europe and North America it is respectively $30,000 and $35,000); but also as much more diverse. Although with enlargement, Europe has ceased being the club of predominantly rich countries it once was, and North America is heterogeneous as Mexico is not in the same income league as the US and Canada, diversity within these two regions remains considerably less pronounced than in East Asia which includes low, middle and high-income countries[9].

b. Trade

As already mentioned, all three regions exhibit a high degree of intraregional trade integration. This is especially true of Europe where internal trade has developed first in the wake of the single market and the euro and more recently through the offshoring of production from western Europe to central and eastern Europe, and represents a high and stable proportion of total trade (close to 70%). It should also be noted that Europe now comprises many small countries that trade a lot, but primarily with neighbours (Ottaviano and Mayer, 2007).

The share of intraregional trade is significantly less in the two other regions, especially in North America where the internal integration dynamics have apparently stalled (Figure 1).[10] Account should however

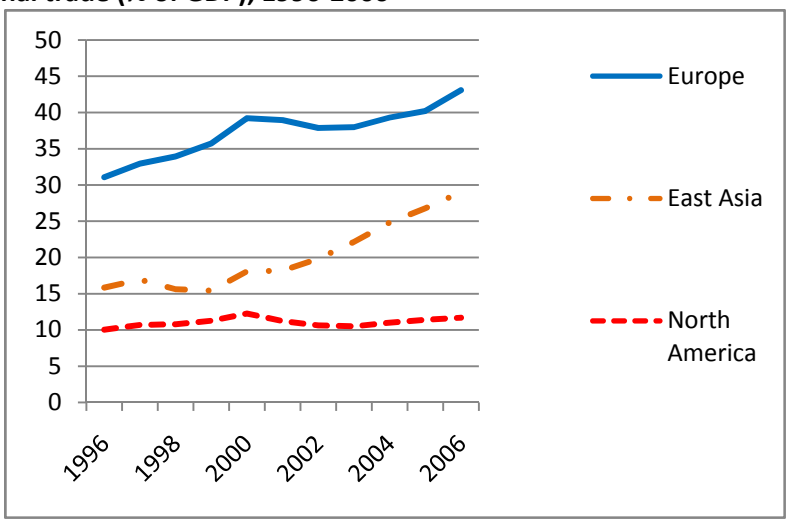
[8] Europe is often considered as a smaller financial player than North America (Coeuré and Pisani-Ferry, 2007). It is actually as large if Switzerland is included and bank deposits are taken into account in addition to private securities.

[9] Economies are divided among income groups by the World Bank based on the countries' gross national income per capita levels in 2006. The threshold for each subgroup is $905 or less, $906 to $11,115 and $11,116 or more.

[10] Two trends are actually at work in North America: a greater regional integration for exports on the one hand; and a drastic increase in the share of imports coming from the rest of the world on the other hand.

be taken of the fact that the weight of the US in the North American region exceeds by far the weight of the largest country in each of the other two regions. To the extent that the US mainly 'trades with itself', the limited scope for trade within North America is natural.[11]

Figure 1: Intraregional trade (% of GDP), 1996-2006



Souce: IMF, *Direction of Trade Statistics*, April 2008; authors' calculations.

Remarkably, intraregional trade has risen sharply over the last decade in East Asia, thanks to the development of strong foreign investment and offshoring links between Japan, China and the other countries in the region and to the dynamism of trade in intermediate products (IMF, 2007a). It has now reached a level similar to that of Europe in the mid-1990s and three times higher than that of the North-American region. This is an especially noticeable evolution for a region that includes two very large, naturally less open economies and it is an indication of the strength of the economic integration process at work within it.

Trade integration in East Asia, Europe and North America also differs in terms of product composition. The level of internal trade in intermediate products remains especially high in East Asia where it represents almost 65 percent of total internal trade (the corresponding share for Europe and North America is one fourth lower). North America stands out as primary products represent 15% of its internal trade, three times more than within East Asia or Europe.[12]

[11] Mayer and Zignago (2006) compute an indicator of trade intensity within region, taking into account size effects. They find that if the size factor is discounted, the intensity of integration between the US and Canada actually exceeds that of integration among the four largest European countries.

[12] The composition of internal trade by the main end-use of products is based on authors' calculations for the year 2006. Original data come from the database *Comtrade* (UN) and are grouped in three categories (primary goods, intermediate goods, final goods) following the BEC (Broad Economic Categories) three-digit classification.

Turning to external trade, East Asia clearly stands out as more open to (extra-regional) trade than the other two regions (Table 2). The trade-to-GDP ratio (excluding internal trade) has increased almost twice as much as those of Europe and North America over the last decade to reach one-third of GDP. The figure echoes the recent observation made by IMF (2008b) that 'if anything, Asian economies are more reliant on trade developments outside the region than ever before'.

Noticeably, East Asia is the only surplus region. North America's trade imbalance is particularly striking as almost 70 percent of its external trade is made of imports (Table 2). In terms of trade composition, the three regions share the same reliance on the provision of primary goods by the rest of the world and East Asia remains highly dependent on final consumers in other countries for buying its final goods (something we will investigate more closely when discussing the transmission of shocks).

Table 2: Trade openness, 1996 and 2006

	East Asia		**Europe**		**North America**	
External trade (exports plus imports as a percentage of GDP)						
1996	18		15		13	
2006	32		20		16	
of which (% of 2006 external trade):	*Exports*	*Imports*	*Exports*	*Imports*	*Exports*	*Imports*
	54	46	46	54	31	69
Composed of (% of exports or imports)						
Primary goods	2	32	4	25	10	13
Intermediate goods	40	46	47	35	51	37
Final goods	58	22	49	40	39	50
Trade balance	*3*		*-2*		*-6*	

Source: IMF, *Direction of Trade Statistics*, April 2008; Comtrade (UN); authors' calculations.

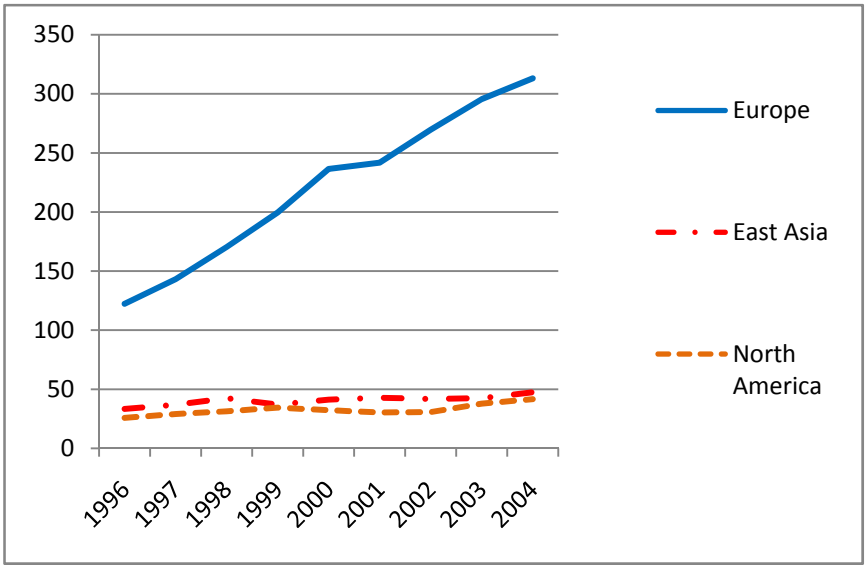
c. Finance

Thanks to the data assembled by Philip R. Lane and his team, a closer look at the process of regional financial integration is now possible, overcoming some of the limitations of past analyses (Belaisch and Zanello, 2006; IMF, 2005; and Cowen and al., 2006)[13]. Figure 2 presents this process in the three regions.

[13] Unless specified, the data used in this paper to study bilateral financial integration are from Lane and Shambaugh (2007). Although imperfect (see Appendix 4 for a list of the main sources used and assumptions made), they are to our knowledge the best available source on bilateral cross-border holdings as the data from the McKinsey Global Institute (2008) has remained unavailable for the public. Box 2.4 in IMF (2007b) reviews the ongoing initiatives taken by international organisations to improve the quality and comprehensiveness of bilateral data on cross-border holdings of assets and liabilities.

Europe is by far the part of the world where regional financial integration is the most advanced. Since the mid-1990s, intra-European cross-border portfolio holdings have increased dramatically as a consequence of the creation of an integrated market for securities, the elimination of costs on cross-border transactions and the introduction of the euro. This was the result of a very deliberate policy of financial integration undertaken in the 1980s and carried out step by step over the years. Although financial liberalisation was conducted *erga omnes*, without giving preferential treatment to capital flows within the EU, regulatory harmonisation was essentially internal. Differences in taxation still represent an obstacle to the emergence and development of truly pan-European financial products (especially at retail level as households are subject to country-specific provisions as regards the taxation of savings and capital income) but from tax as well as from a regulatory standpoint, all European securities benefit from national treatment.[14]

Figure 2: Intraregional holdings of assets and liabilities (% of GDP), 1996-2004



Source: authors' calculations based on Lane and Shambaugh (2007) data

Regional financial integration is markedly less important in the other two regions where it has stagnated at a low level for most of the period before picking up somewhat recently. One natural explanation is that Europe is composed of half a dozen medium-sized economies and a large number of small countries, which implies that, as for trade, the potential for cross-border holdings is larger. But regulatory obstacles to cross-border financial integration and monetary factors certainly play a role too in explaining why financial integration trails trade integration within East Asia to such an extent.

Turning to the composition of intraregional holdings, it is interesting to note that the equity share for East Asia and North America is about the same (around 45%), higher than in Europe where it accounts

[14] For a deeper discussion of in the recent progress in financial integration in Europe, see European Commission (2007), European Central Bank (2007) and Lane (2006).

for only one third of intraregional holdings. North America is however far less integrated as regards the interbank market as cross-border deposits account only for about 10% of total intraregional holdings against respectively 30% and 40% in East Asia and Europe.

Also, the low degree of regional financial integration in Asia can be regarded as consistent with the asset supply constraints models of Caballero, Farhi and Gourinchas (2007) and of Mendoza, Quadrini and Rios-Rull (2008). In these models, a key comparative advantage of the US is its ability to supply high-quality financial assets that the rest of the world is not able to produce. Although this characterisation of the US may command more irony than support in the wake of the financial crisis, the contrast between the rapid pace of trade integration and the slow pace of financial integration within East Asia can be read as an illustration of the intuition behind the asset supply constraint models. By the same token, the high and rapidly rising degree of financial integration within Europe is an indication that it has become able to produce internationally attractive financial assets.

Financial openness (as measured by the ratio of portfolio assets and liabilities to GDP) is making great progress everywhere but especially in East Asia (Table 3). While in the mid-1990's this region was clearly less open financially than Europe and North America, a large part of the difference has vanished since the mid-1990s.

Table 3: Financial openness, 1996 and 2004

	East Asia		**Europe**		**North America**	
Foreign asset holdings and liabilities (% of GDP)						
1996	53		85		98	
2004	104		136		147	
of which (% of 2004 foreign holdings):	*Assets*	*Liabilities*	*Assets*	*Liabilities*	*Assets*	*Liabilities*
	68	36	70	66	64	83
Composed of (% of assets or liabilities)						
Equity	16	60	43	45	64	38
Debt	27	3	18	12	4	33
Loans	22	38	35	44	32	29
FX reserves	34	-	3	-	1	-
Net equity position	-10		1		9	
Net debt/loans/FX reserves position	43		3		-28	

Source: authors' calculations based on Lane and Shambaugh (2007) data

Quite clear also from Table 3 is the distinction between regions in terms of the net foreign assets (NFA) position. Europe stands out as the sole region close to balance as East Asia exhibits a large positive NFA

position equivalent to almost one third of its GDP while North America exhibits a significant negative NFA position equivalent to a fifth of its GDP in 2004.

The composition of both assets and liabilities differs strongly across regions. East Asia stands out for the high share of FX reserves on the assets side and the overwhelming share of equity on the liability side, whereas the US is characterised by the overwhelming share of equity on the asset side. The net equity position of North America is therefore strongly positive (and the debt position strongly negative) while the opposite is true for East Asia. Beyond the well-known polarisation of the net foreign asset positions, the table therefore corroborates the observation by Gourinchas and Rey (2007) that the US now plays the role of 'the world's venture capitalist' and highlights that it is East Asia that plays the mirror role.

d. Summing up

Summing up, the three regions have quite similar economic weight but East Asia stands out as more heterogeneous and more open, both in trade and financial terms. Europe is by far more integrated regionally, followed by East Asia where, however, financial integration significantly trails trade integration. Regional integration in North America visibly lacks momentum, especially on the trade front. Finally, all regions hold significant gross external asset positions but there are strong differences in the composition of assets and liabilities, with North America playing the role of a venture capitalist and East Asia the mirror role.

3. A map of interdependence

We now turn to the bilateral linkages between East Asia, Europe and North America, looking separately at trade and financial linkages to investigate how the three regions interact with each other and draw consequences for the transmission of shocks between them.

a. Trade linkages

To investigate trade linkages, we proceed in two steps. We start with bilateral flows between regions and their recent evolution. We then look more closely at indicators or export exposure to demand from the partner regions.

Table 5 breaks down by partner region the trade openness indicator of Table 3. The most significant observation from it is that the other two partners are of roughly similar weight for each of the three regions. Europe and North America are of almost equal importance to East Asia and for each of them (especially for North America); interdependence with East Asia has become more important than interdependence with the other western partner. Europe-Asia trade flows have been especially vibrant in recent years, with trade integration increasing by more than 50%, almost twice the pace observed between East Asia and North America, and flows between Asia and Europe now distinctively exceed those between North America and Europe.

Table 4: Bilateral trade integration (% of GDP), 1996 and 2006

Trading partner → / Region ↓	East Asia	Europe	North America
		1996	
East Asia	X	5.1	6.9
Europe	3.8	X	3.7
North America	5.5	3.9	X
		2006	
East Asia	X	8.1	9.4
Europe	5.2	X	4.6
North America	6.6	4.6	X

Source: IMF, *Direction of Trade Statistics*, April 2008; authors' calculations.
Note: Sum of imports and exports of goods with trading partner as a share of region's GDP. Intra-regional trade is excluded.

b. Financial linkages

Financial linkages are the second key element of the regions' interdependence that we study. Drawing on the pioneering work of Lane and Milesi-Ferretti (2006) and Lane and Shambaugh (2007), we build bilateral interdependence matrices analogous to that of Table 5[15]. We focus on the volume of bilateral cross-border holdings of assets and liabilities[16].

Table 5 shows the sum of each region's foreign assets and liabilities vis-à-vis partners as a share of the region's GDP. Data are for 1996 and 2004 (the last year for which comprehensive data is available). What strikes one here is, first, the strength of financial linkages between Europe and North America and, second, the relative weakness of Europe's links with Asia. Here the rather US-centric view of the world we mentioned in the introduction seems justified, as the 'third link' between Europe and East Asia appears significantly less developed. If anything, the evolution since 1996 has reinforced those two features that were already apparent in 1996.

[15] The data presented thereafter are preliminary and are based on declarations made by creditors. We have not attempted at this stage to reconcile the sometimes significant discrepancies between declarations by creditors and debtors. Estimates therefore need to be taken with caution.

[16] An alternative approach is to focus on prices rather than flows and study co-movements in asset prices. These are relevant over a shorter time horizon and are already well documented in the literature. For Asia, see chapter IMF (2008a). For Europe, see IMF (2008c).

Table 5: Bilateral financial integration (% of GDP), 1996 and 2004

Financial Partner	East Asia	Europe	North-America
Region			
		1996	
East-Asia	X	22.2	29.0
Europe	21.0	X	51.1
North-America	23.1	63.7	X
		2004	
East-Asia	X	42.9	57.5
Europe	26.5	X	89.0
North-America	30.0	102.1	X

Source: Authors' calculations based on Lane and Shambaugh (2007) data

Note: Figures represent the sum of bilateral assets and liabilities as a percentage of the region's GDP. For example, the sum of North-American assets and liabilities vis-à-vis Europe represented, in 2004, 92.4% of Europe's GDP and 93.6% of North America's GDP

Table 6 decomposes bilateral holdings by asset classes. Figures are tentative as they are not corrected for inconsistencies in reporting but they nevertheless provide important orders of magnitude. Most noticeable are the significantly higher share of reserves in East Asia's North American assets (at the expense of equity), the predominant share of equity (largely FDI) in Europe's and North America's Asian assets, and also the asymmetry between Europe's North American assets, which consists in both debt and equity, and America's European assets, which consist predominantly in equity. This asymmetry has diminished in recent years, however.

The image here is one of strong asymmetries both in terms of partners and of assets. In a nutshell, East Asian residents primarily hold North American debt (in part as reserves) and secondarily European debt, European residents hold North American debt and equity, and North American residents primarily hold European equity, secondarily European debt and East Asian equity.

Table 6: Breakdown of bilateral asset holdings by asset classes, 2004

	East Asia	Europe	North America
	2004	2004	2004
East Asia			
Total assets (% of GDP)	X	25	41
Share of:			
Equity		19%	14%
Debt		22%	30%
Loans		35%	14%
FX reserves		23%	42%
Europe			
Total assets (% of GDP)	12	X	48
Share of:			
Equity	45%		41%
Debt	1%		26%
Loans	53%		29%
FX reserves	1%		4%
North America			
Total assets (% of GDP)	12	45	X
Share of:			
Equity	71%	60%	
Debt	3%	4%	
Loans	23%	35%	
FX reserves	2%	1%	

Source: Authors' calculations based on Lane and Shambaugh (2007) data
Note: Equity=Portfolio Equity + FDI; Debt=Portfolio Debt + Bank Debt

c. Summing up

Summing up, what emerges from this survey of the bilateral linkages between the three regions is a strong contrast between trade and financial links. In trade, East Asia is the two other regions' main partner and it is itself highly dependent on exports to the European and the North American markets. In finance, Europe and North America are each other's main partner and East Asia, while holding sizeable external financial assets, is a significantly less important player. Furthermore, East Asia's financial links with Europe are significantly less developed than with North America.

We can now use our simple findings to shed light on two much-debated issues: the transmission of economic shocks originating in any of the three regions (and the corresponding discussion on economic 'decoupling' between North America, Europe and East Asia); and the role of the three regions in the global current account adjustment.

4. Implications for the transmission of shocks

Two types of shocks are often considered in current discussions about the repercussions of the US slowdown and the subprime-induced financial turmoil: pure domestic demand shocks originating for example in an exogenous softening of household consumption; and financial shocks resulting from either strains to market liquidity or a stock market correction. While simple ratios cannot substitute for fully worked out models, they can nevertheless help in appreciating to what extent such shocks can be expected to affect the partner regions.

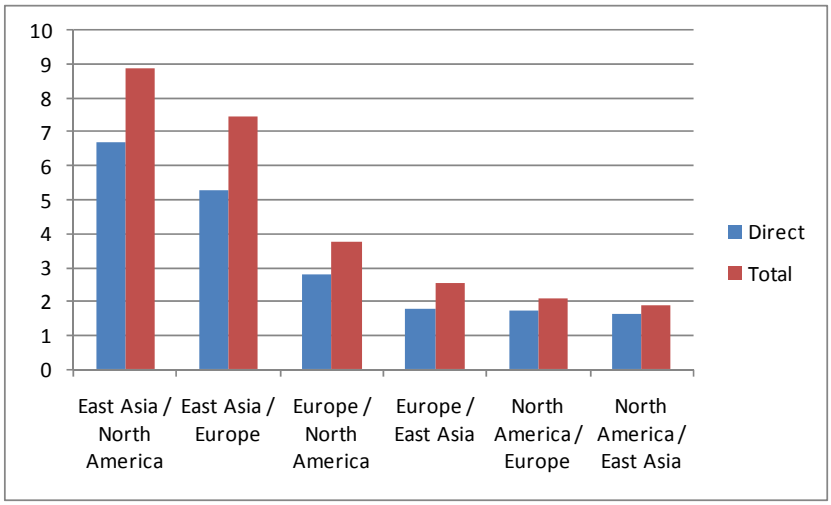
a. Trade linkages

A first observation is that East Asia is much more exposed to demand shocks originating in either North America or Europe than the other two partners. In spite of growing regional integration, the share of exports to the other two regions in East Asian GDP is astonishingly high and it implies that any slowdown in the North American or European domestic demand is bound to have significant repercussions. In spite of the very strong trade ties within East Asia, this casts doubts on any notion of 'decoupling'. In fact, ties within East Asia may well serve as channels of transmission of shocks originating outside the region rather than as channels of isolation.

Figure 3 illustrates this point by taking into account interdependence through third markets (see Appendix 1 for methodology). Indeed, a Japanese firm exporting intermediate goods for assembly in China and re-export to the US is in fact more dependent on the US market (and less on the Chinese one) than indicated by direct trade integration indicators.

Figure 3: Export dependency vis-à-vis the other two regions, 2006

Percentage of the exporting region's GDP



Source: authors' calculations based on IMF, *Direction of Trade Statistics*, April 2008

The focus on exports and the taking into account of indirect export exposure further highlights the dependency of the Asian countries vis-à-vis both North American and European markets and intensifies the contrast between, on the one hand, East Asia, and on the other hand Europe and North America, for which total exposure to any of the other two regions is at least twice as low. Especially – thanks, in fact, to the very low level of US exports – the export dependency of the North American region is strikingly low (Figure 3). While the indicator is rough, it highlights that countries that appeared to have become less exposed to external trade such as Thailand and Singapore have, in fact, become more exposed when indirect linkages are accounted for.[17]

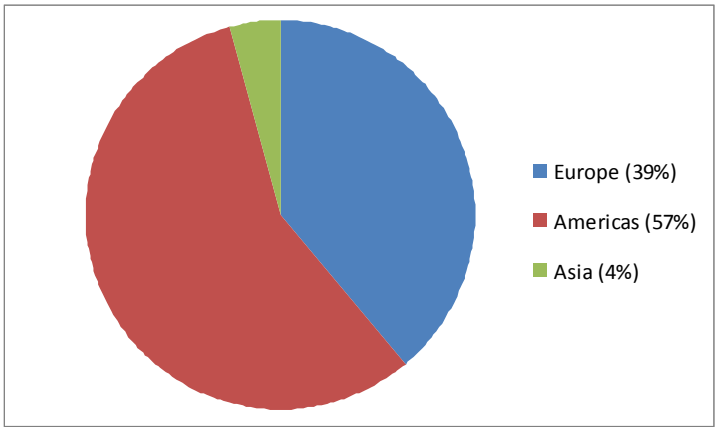
[17] Country results are given in Appendix 2.

Second, Europe's exposure to demand shocks originating in North America is more than twice as low as for East Asia and North America's exposure to shocks originating in either of the other two regions is about four times lower. As far as trade channels are concerned, demand shocks affecting Europe or East Asia are basically unimportant for the North American economy. If one can speak of decoupling, it is paradoxically there.

b. Financial linkages

In view of the close financial integration between Europe and North America, the potential for the transmission of financial shocks is high. What about Asia? Aggregate numbers suggest that there is a somewhat lower, but still high, potential for such transmission also, but this ignores the fact that the distribution of East Asia's North American financial assets is very different from the one of Europe. The predominance of government bonds in Asian assets explains why the fallout from the subprime crisis has been almost unnoticeable in East Asia despite the size of the region's portfolio. In effect, by October 2008 losses incurred by European banks exceeded those reported by US banks, while Asian banks reported only minor losses. This is a vivid illustration of the extent of asymmetries between transatlantic financial integration and the integration between East Asia and either of the two other regions (Figure 4). By the same token, a North American stock market correction is bound to have significantly stronger effects on Europe than on East Asia.

Figure 4: Breakdown of potential bank losses, 1-2007 to 10-2008



Source: IMF, *Global Financial Stability Review*, Oct. 2008

5. Implications for global adjustment

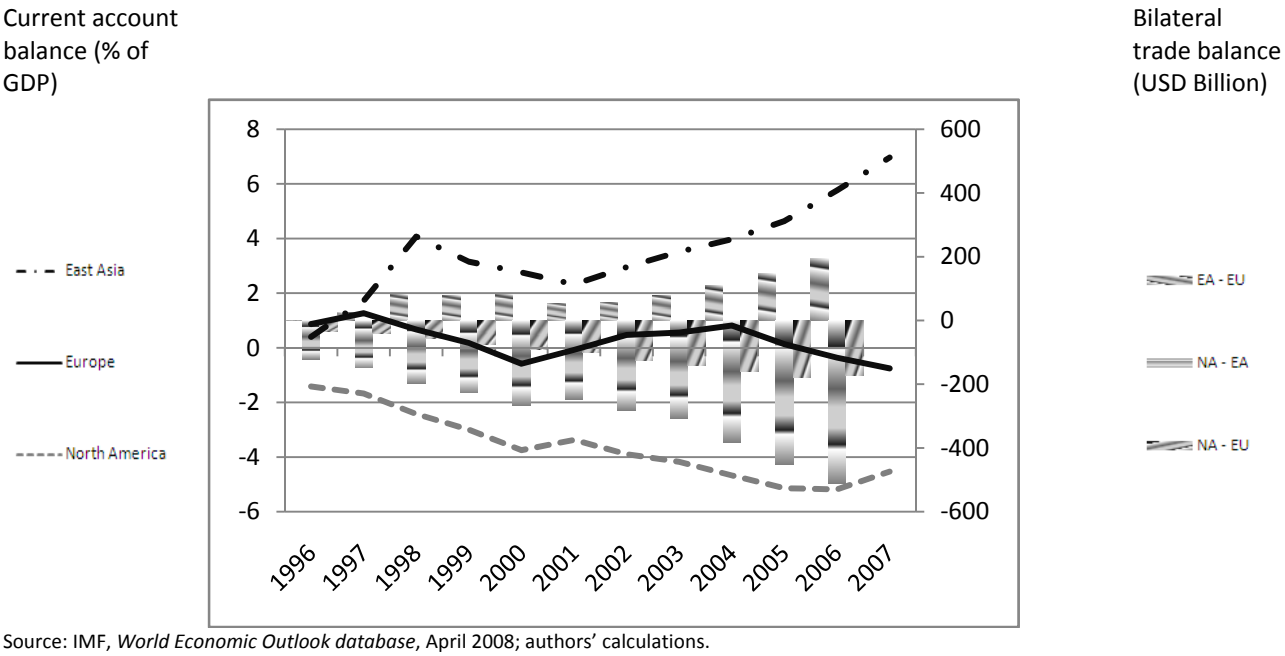
a. Current accounts

As regards the global current account adjustment the three regions are clearly polarised, as indicated by the familiar Figure 5 which depicts the evolution of current account balances: East Asia is at one end and North America at the other end, with Europe in between. The aggregation even exacerbates the difference between Asia and North America as all countries in the East Asian region but Cambodia, Laos

and Vietnam recorded surpluses in 2006. The region's two largest economies, Japan and China, have both recorded sizable surpluses in recent years.

Europe's intermediate situation can be further highlighted by the observation of bilateral trade deficits: its surplus vis-à-vis North America roughly matches its deficit with East Asia. However, in spite of the hope that it would not need to be part of the solution of a problem it was not part of, Europe has by no means remained a bystander in the global adjustment so far, as illustrated by the evolution of the exchange rate of the euro vis-à-vis the dollar.

Figure 5: Current account balances and bilateral trade balances, 1996-2007



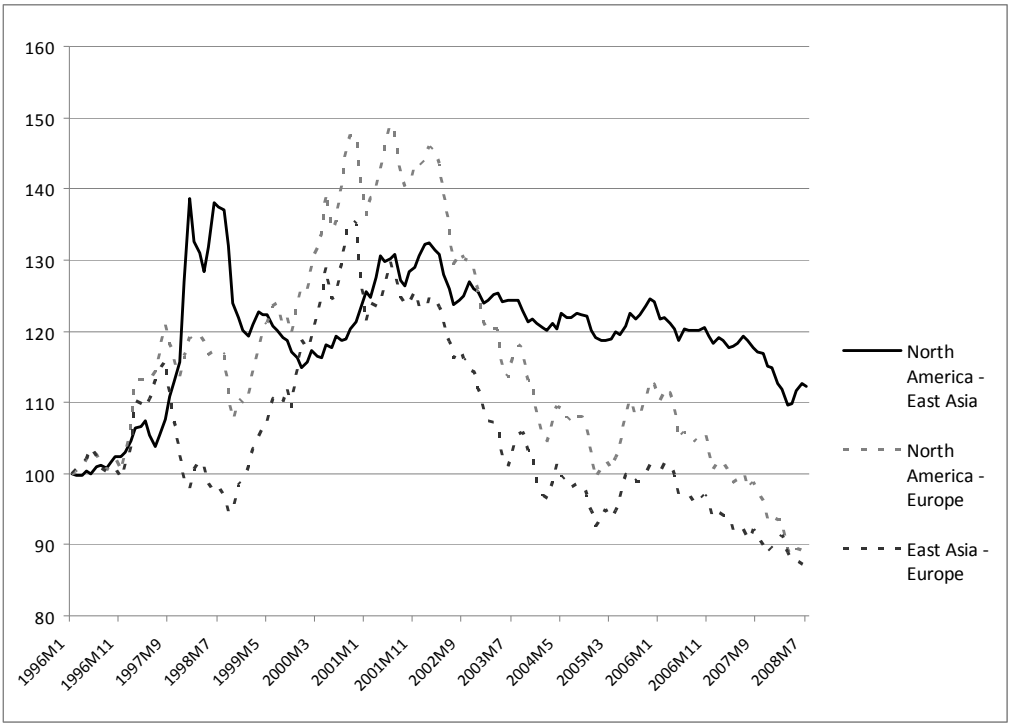
Source: IMF, *World Economic Outlook database*, April 2008; authors' calculations.

b. Exchange rates

To assess the degree to which exchange rates have been responsive to current accounts, we have computed bilateral effective exchange rates between regions (Appendix 3). Figure 6 gives their evolution since 1996. The graph highlights the particular situation of Europe, whose bilateral exchange rates with both East Asia and North America exhibit much more variability than between East Asia and North America. Europe depreciated until the end of 2001 and then experienced a continuous appreciation. On the contrary, from the aftermath of the Asian crisis of 1997-98 until mid-2007, East Asia's bilateral exchange rate with North America has remained remarkably stable. It is only over the last year that a faster and more pronounced appreciation of the Asian currencies vis-à-vis the North-American ones can be observed. However, it has not been sufficient to reverse significantly the appreciation of Europe vis-à-vis East Asia. By mid-2008, Europe had appreciated by 60% vis-à-vis North America and by more than 40% vis-à-vis East Asia since the dollar peaked in 2001, while East Asia's

appreciation vis-à-vis North America had been only about 15%. This was, however, before the subsequent reversal of the euro-dollar exchange rate.

Figure 6: Bilateral nominal effective exchange rates between regions, 1/1996 to 7/2008



Note: an increase means an appreciation of the NEER of the left-hand side region vis-à-vis the right hand-side region.
Source: IMF, *Direction of Trade Statistics,* April 2008; IMF, *International Financial Statistics, August* 2008; authors' computations.

There are several reasons why exchange rates have not been responsive to the evolution of current account and trade balances. To start with, a number of East Asian currencies are either pegged to the US dollar or in a managed floating regime that leaves little flexibility for the exchange rate to appreciate, and the role of the US dollar as an external anchor of several East Asian currencies creates a collective action problem in the region (Williamson, 1999). Especially, China's exchange rate policy exerts strong influence over those of the other emerging countries in the region (Ito, 2008). Second, the prolonged weakness of the yen as a result of the policy adopted by the Bank of Japan to counter deflationary trends in the 2000s has contributed to preventing an upward adjustment and has also exerted influence over the policies of the other countries in the region. As a result, exchange rate volatility has been significantly lower between East Asia and North America than for the other two pairs, except during the Asian crisis period (Table 8).

Table 7: Monthly volatility of bilateral exchange rates between regions, 1996-2007

	North America - East Asia	North America - Europe	East Asia - Europe
1996-1999	12.3	7.9	6.0
2000-2003	4.5	11.6	9.8
2004-2007	2.1	5.0	3.5

Source: IMF, *Direction of Trade Statistics*; IMF, *International Financial Statistics*; authors' computations.

c. Europe and the Asian dollar exchange rates

As the euro continued its appreciation against the US dollar, Europeans have since the beginning of 2007 expressed greater concern about this situation and have complained about both the weakness of the Japanese yen and the slow pace of appreciation of the Chinese renminbi. However it has not always been clear what a change in the East Asian (especially Chinese) exchange rate policy or regime would imply for Europe.

One approach is to start from the equilibrium exchange rate of North America (or, if one prefers, the US dollar) and to compute what is the relationship between the European and the East Asian exchange rates vis-à-vis North America that is consistent with North America reaching its equilibrium exchange rate. From this perspective, European and East Asian appreciations are clearly substitutes and East Asian exchange rate stickiness implies a higher level for the euro and the other European currencies. This is for example the approach followed by Ahearne et al. (2007).

The problems with this approach are two. First, it fails to explain why North America needs to reach its equilibrium exchange rate. At the extreme, this notion is irrelevant if other countries maintain a completely fixed exchange rate with the dollar and are willing to accumulate whatever amount of dollar reserves this requires, as argued by Dooley et al. (2003). This is best understood by imagining the United States and China as partners in a de facto currency union. Accordingly, it should not be the US or Chinese current account balance that matters, but rather the aggregate US-China current account balance or that of a wider dollar zone, in the same way that what matters for the exchange rate of the euro is neither the Spanish deficit nor the German surplus, but the aggregate balance, which is close to equilibrium[18].

Second, the equilibrium exchange rate approach overlooks the fact that a Chinese move toward a more flexible exchange rate regime would result in a European appreciation as China diversifies its reserves away from US dollar assets and, at least partially, into European currencies. The reasoning here starts from the financial account rather than the current account, resulting in the opposite conclusion.

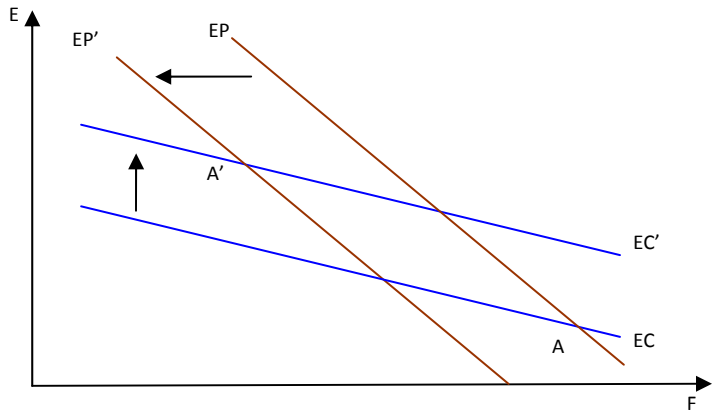
Thus, there seems to be an inconsistency between the so-called trade view and the so-called financial account view of Europe's relationship to East Asian exchange rate policies.

[18] The aggregate US-China balance, while still far from equilibrium, has improved in recent times and the bilateral balance with Europe is close to equilibrium.

The model of Blanchard, Giavazzi, and Sa (2005) helps clarify the reason for the inconsistency, as it encompasses both views[19]. It can be summarised in two long-term relations between the exchange rate (E)[20] and the external debt (F) of the United States (in the original model), represented by current account balance (EC) and a portfolio balance (EP) schedules (Figure 7). Both slope downward: in the steady state a higher debt implies a more devalued exchange rate, resulting in a larger trade surplus, which allows for servicing of the debt. Higher debt also implies that non-residents hold more dollar assets, which they are inclined to do if a lower dollar makes those assets cheaper.[21]

Suppose now that E represents the exchange rate of North America vis-à-vis Europe and that F represents the holdings of North-American assets by European residents. A Chinese move to a floating exchange rate regime means two things: first, an East-Asian appreciation resulting in an outward shift of the EC curve, as for a given level of debt, the same North-American current account balance can be achieved with an appreciated bilateral exchange rate of North America vis-à-vis Europe (this corresponds to the so-called trade view); and second, the removal of a marginal buyer of North-American assets, which moves the EP curve inward, as for a given level of debt, North-America needs to depreciate as Europeans have to hold more of its currencies in their portfolios (this corresponds to the so-called financial account view). In the long run, the result of the two moves is unambiguously a North-American appreciation vis-à-vis Europe (a move from A to A' in Figure 7).

Figure 7: Effects of a RMB float on the euro-dollar exchange rate



In the short term, however, the shift of EP to EP' implies a North American depreciation vis-à-vis Europe (see Blanchard, Giavazzi, and Sa 2005), as for a given level of debt and North-American current account deficit, an end to Chinese intervention implies a lower demand for dollar-denominated assets, which implies a further depreciation of the US currency.

[19] This section is adapted from Pisani-Ferry (2008)

[20] A rise in E represents a North-American appreciation.

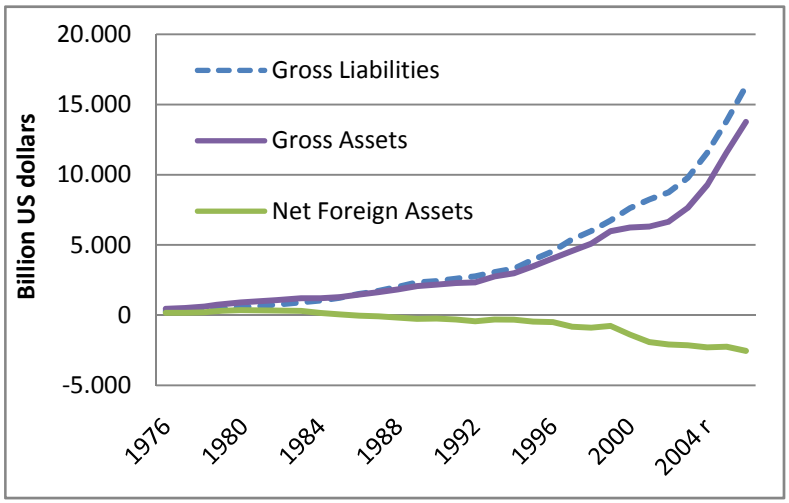
[21] Returns on dollar and non-dollar assets are supposed to be identical. Remember also that these are long-run equilibrium relations; therefore a lower exchange rate has no implications for expectations.

The issue for the Europeans is therefore one of time preference. The renminbi peg on the dollar has the advantage of avoiding too sharp a depreciation of the dollar in the short run, but it also contributes to the build-up of US external debt, and thus to an eventually lower dollar in the long run. This is one of the reasons why the Europeans have long been hesitant and have refrained from expressing strong views about the Chinese exchange rate policy.

d. Valuation effects

An important consequence of the rise in cross-border capital flows is that valuation effects have become a significant transmission channel of exchange rate changes. In the pre-financial liberalisation world of the 1980s or even in its early phase in the 1990s cross-border holdings were too small for this channel to matter, but they cannot be neglected anymore in the liberalised world of the 2000s. In the case of the US, whose assets are overwhelmingly denominated in foreign currencies while its liabilities are denominated in dollars, valuation effects have been strong enough to imply that the country could run current account deficits of the order of magnitude of 6-7% of GDP without incurring an increase in its net debt position. The counterpart of such deficit without debt is obviously a wealth transfer, meaning a reduction of wealth for the rest of the world as holders of US dollar-denominated assets incur a loss on their portfolio.

Figure 8: US foreign assets and liabilities, 1976-2006



Source: Bureau of Economic Analysis

A series of recent papers have revisited the US adjustment problem in this perspective. While valuation effects are by definition one-off (an exchange rate change immediately affects the domestic currency value of net foreign assets), they are important in a period of continuous exchange rate change. Gourinchas (2007) provides a survey of research in this field and comes up with an estimate of the direct wealth transfer effect of a 10% depreciation of the US dollar, which he assesses to be of the order of magnitude of 5% of GDP. This is consistent with detailed estimates by Cédric Tille and co-authors (see

for example Higgins et al., 2006). However, they do not provide a decomposition of the wealth transfer by partner country.

In what follows, we use the breakdown of assets and liabilities by partner region and information on the aggregate currency composition of assets and liabilities to evaluate the geographical distribution of the wealth effects of currency movements (see Appendix 5 for methodology and sources). This is a highly tentative exercise that is affected by considerable uncertainty for three reasons. First, the geographical breakdown of the three regions' assets and liabilities is imprecise, as already indicated. Second, the currency composition of assets and liabilities is known only partially and in this case only vis-à-vis all partners, not on a bilateral basis. Decomposing valuation effects thus requires making sometimes heroic assumptions. Third, it should be noted that estimates of wealth transfers through valuation effects assume that exchange rate changes were unanticipated and did not affect the market valuation of the assets and liabilities in their currency of denomination. In other words, they are intrinsically naive[22]. For all these reasons, estimates need to be made with considerable caution. For this tentative estimate, we rely as much as possible on no-nonsense assumptions and then compute the direct effects of an unexpected variation in the value of the exchange rate.

We start by evaluating the effects of a North-American depreciation (Table 8-a). To do that, we depart from the standard one-country approach that measures the wealth transfer effect by the variation of the Net Foreign Asset position (NFA) as a proportion of GDP. The problem with this measure is that it fails to account for the size of wealth effects in a multi-country setting. A country whose NFA remains constant in proportion to GDP may gain or lose international purchasing power as a consequence of exchange rate changes. This especially applies to creditor countries which are likely to use their wealth to buy foreign goods and services. We therefore measure wealth effects for country *i* by the change in the ratio of its NFA position to the combined GDP of the three regions (all variables being expressed in the same currency):

$$\Delta W_i = \Delta\left(\frac{NFA_i}{\sum_1^3 Y_k}\right) \quad \text{which implies } \sum \Delta W_i = 0$$

As well known from numerous studies, a drop in the value of the dollar leads to significant capital gains for the US as a substantial proportion of its assets are denominated in foreign currencies while its liabilities are denominated in US dollars. We find that a 10% North American depreciation leads to a transfer from East Asia and Europe to North America equivalent to 1.6% of the aggregate GDP of the three regions. This is somewhat less than the previously mentioned figure for the US vis-à-vis the rest of the world, because we cancel out changes in NFA within North America and ignore changes in NFA vis-à-

[22] Co-movements of exchange rates and assets prices would need to be taken into account in a more realistic estimate of the wealth transfer effects.

vis the rest of the world[23]. Corresponding losses are incurred by Europe and also, to a lesser extent, by East Asia.

What has taken place since the beginning of the decade is however mainly an appreciation of the European currencies vis-à-vis both North American and East Asian currencies, as documented on Figure 6. It is therefore interesting to assess the effects of a European appreciation vis-à-vis the other two regions (Table 8-b). North American gains are reduced by five decimal points, while the loss for Europe is increased by 0.3 percentage points and East Asia becomes a net beneficiary.

We use these calculations to measure the wealth effects of exchange rate changes since 2001 (Table 8-c). To this end, we compute the 2001-2008 trends of the three bilateral exchange rates and combine them with the simulations of Table 8-a and 8-b. There are again a number of methodological caveats to bear in mind. First, we apply trend exchange rate changes for 2001-2008 to the 2004 breakdown of assets and liabilities. This would be correct, had the evolution of exchange rates and gross foreign assets and liabilities been linear, but this is clearly not the case. So our result is an approximation which may especially underestimate the wealth effects of exchange rate changes on East Asia. Second, we use trade-based weight to aggregate countries within regions, whereas we should in principle use assets-based weight. We suspect this is not a severe limitation but we admit that we have not evaluated the corresponding bias.

Turning to results, we find significant wealth gains and losses. Even taking into account that part of the loss only wiped out temporary gains made during the previous appreciation period, the corresponding effects are considerable: basically, North America has benefitted from a wealth gain amounting to about 5% of the three region's combined GDP (or 4% of world GDP) and Europe has incurred the corresponding loss. East Asia, by contrast, has so far remained immune from the wealth effects of exchange rate changes.

[23] These evaluations, however, may err on the conservative side as external assets and liabilities have expanded significantly since 2004.

Table 8: Variation in NFA/aggregate 3-regions GDP ratios following exchange rates variation

a) 10% North American depreciation

	East Asia	Europe	North America	Total
East Asia	0.0%	0.2%	-0.7%	-0.5%
Europe	-0.2%	0.0%	-1.0%	-1.1%
North America	0.7%	1.0%	0.0%	1.6%

b) 10% European appreciation

	East Asia	Europe	North America	Total
East Asia	0.0%	0.4%	-0.2%	0.3%
Europe	-0.4%	0.0%	-1.0%	-1.4%
North America	0.2%	1.0%	0.0%	1.1%

c) Cumulative wealth effects since dollar peak in 2001*

	East Asia	Europe	North America	Total
East Asia	0.0%	1.5%	-1.2%	0.3%
Europe	-1.5%	0.0%	-4.1%	-5.6%
North America	1.2%	4.1%	0.0%	5.3%

Source: Author's calculations based on assets and liabilities for 2004

Note: [*] The cumulative movements of bilateral NEER between the three regions over the period 2001M6-2008M7 are based on trends. Trends for this period of time are as follows: East Asian currencies have appreciated by 1.7% per year vis-à-vis North American currencies; European currencies have appreciated by 6.1% per year vis-à-vis North American currencies and by 4.7% per year vis-à-vis East Asian currencies.

These are effects significant enough to warrant being taken into account in the evaluation of the effects of the strengthening of European currencies. Surprisingly, however, they are usually not mentioned in the frequent EU-US controversies about exchange rates.

East Asia seems to be immune from wealth losses in spite of its high dollar exposure. This is because its currencies have largely followed the depreciation of the dollar. Losses vis-à-vis North America have been offset by gains vis-à-vis Europe.

6. Conclusions

The scope of the overview presented in this paper is broad and for this very reason our approach has been highly stylised. Conclusions therefore are of the same nature, and they can only pretend to be an input into more specific and precise discussions.

A few facts however emerge.

First, East Asia not only appears to be the region most involved in, and dependent on, world trade, but it appears also as increasingly outward-looking financially. This is a striking characteristic for a region that includes two very large economies and (at least for trade) is integrating rapidly at the regional level. A clear implication is that the rapid pace of intraregional integration cannot be regarded as limiting

integration on a global scale and should not be taken as implying that growth in the region can decouple from the rest of the world.

Second, integration within the three regions we have focused on – East Asia, Europe and North America - is very uneven. Trade and financial integration is by far more advanced in Europe and it continues to deepen, whereas there is no visible momentum in North America. In East Asia, there is a strong contrast between, on the one hand, fast-strengthening trade integration and, on the other hand, the stagnation of financial integration at a low level. These observations need to be qualified because they rely on simple statistics rather than a normative model that takes into account the size of countries and the distance between them. Nevertheless the contrast between Europe, where trade and financial integration have been progressing in tandem, and East Asia, where they have not, is robust. There are two possible explanations for it. One, consistent with the asset supply constraint hypothesis, is that East Asian assets are intrinsically less attractive, including for the East Asians themselves. The other one is that regulatory obstacles have prevented financial integration within the region and that initiatives taken to remove them and promote the emergence of a regional financial market have been insufficient or misguided. It would be important to sort out which hypothesis accounts for the largest part of the observed asymmetry.

Third, there is a clear contrast between trade and finance as regards the relative importance of the three bilateral linkages between East Asia, Europe and North America. For trade, the historically major transatlantic link has become the least important one – East Asia is now for both North America and Europe a more important partner than the other western partner and, for East Asia, Europe and North America are of broadly similar significance. So in this respect, the polarised view of the world economy does not correspond to reality. For finance, however, the transatlantic link remains by far the most important one and the 'third link' between Europe and Asia is of notably lesser importance: for Europe, financial links with Asia are about three times less that with North America. This asymmetry highlights the significance of the potential for Asian wealth diversification into European assets – an issue much discussed recently in the context of the weakening of the dollar and on which research has not come to a consensus view (see Chinn and Frankel, 2008 and Posen, 2008).

Fourth, the North American adjustment issue puts Europe and East Asia in polar situations. In view of its balanced current account, Europe could pretend (and has long pretended) not to have taken part in the emergence of the 'global imbalances' problem, but it has to a considerable extent been part of the adjustment to it through the appreciation of its currencies. East Asia has to a very large extent taken part in global imbalances, but it has to a limited extent only been part of the adjustment. For Europe, it has not always been clear where its interest lies, especially as a move towards greater flexibility of East Asian exchange rate policies could trigger in the short term a further appreciation of European currencies, and this has in the past led to irresolution. However from a long-term perspective Europe's interest is that East Asia should play a larger part in the adjustment as this would limit the appreciation of its currencies and would also reduce the negative wealth effects it incurs as a consequence of North America's depreciation.

Fifth, since gross stocks of external assets and liabilities have grown dramatically, the asset valuation effects of exchange rate changes matter for all three regions. An admittedly rough calculation indicates that from 2001 until mid-2008 corresponding wealth transfers, mainly from Europe to North America, have amounted to about 4% of world GDP – an astonishingly high figure. North America has been the main beneficiary of them, mostly at the expense of Europe, and East Asia has essentially been unaffected.

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Appendix 1: Measuring Indirect Export Exposure

The nature of regional trade integration differs greatly between regions with East Asia, on the one hand, and Europe and North America on the other. While the rise in intraregional trade in East Asia has, as in other regions, been driven by intra-industry trade, it mainly reflects the international organisation of the production chain and therefore involves intermediate products rather than final goods (IMF, 2007a). In more developed trading blocs, more of the intra-industry trade stems from final demand for product variety. Failure to quantify this phenomenon leads to underestimating dependence on foreign markets.

Rigorous analysis of interdependence through such trade requires disaggregation of trade flows. The IMF (2008b) has however shown that an indicator based on aggregate trade flows provides a good proxy for a more precise measure. The indicator is defined as:

$$TotalExposure(i,K) = \sum_{j=all} \frac{X(i,j) \times (X(j,K)/GDP(j))}{GDP(i)} + \frac{X(i,K)}{GDP(i)}$$

where $X(i,j)$ denotes country i's exports to country j. The indicator is a proxy measure of the total exposure of country i to region K that aims to take into account all possible indirect routes to K.

Appendix 2: Export dependency of individual countries

East Asia

	Europe				North America			
	Direct		Total		Direct		Total	
	1996	2006	1996	2006	1996	2006	1996	2006
Brunei Darussalam	0.8	1.2	3.5	2.6	1.5	4.5	5.3	6.6
Cambodia	3.3	9.0	3.7	12.0	0.1	27.8	0.7	30.9
China, P.R.: Mainland	2.5	7.3	3.9	9.9	3.3	8.6	4.7	11.3
Indonesia	3.2	3.8	4.0	5.9	2.9	4.0	4.0	6.1
Japan	1.4	2.2	1.8	3.0	2.6	3.8	3.1	4.6
Korea, Republic of	3.3	5.2	4.4	7.4	4.4	5.5	5.7	7.6
Lao People's Democratic Republic	1.3	3.5	1.9	5.5	0.1	0.4	0.6	2.8
Malaysia	10.8	13.4	15.5	21.5	14.6	20.6	21.0	28.2
Myanmar	2.1	2.5	3.4	4.9	2.3	0.1	4.1	2.6
Philippines	3.9	7.4	5.0	10.5	8.5	7.7	9.6	10.7
Singapore	18.7	23.1	25.4	37.7	25.8	21.6	34.3	38.8
Thailand	5.4	9.2	6.9	13.7	5.9	10.4	7.9	15.0
Vietnam	4.4	13.1	6.0	15.7	1.0	14.8	3.2	17.6
Average	5.6	8.9	8.0	13.1	7.1	11.3	10.2	15.7
Standard deviation	5.9	7.3	8.4	10.8	8.8	9.6	12.1	12.9
Weighted Average	2.7	5.3	3.6	7.4	4.0	6.7	5.2	8.9

Source: authors' computation based on *Direction of Trade Statistics*, April 2008, IMF.

North America

	Europe				East Asia			
	Direct		Total		Direct		Total	
	1996	2006	1996	2006	1996	2006	1996	2006
Canada	1.9	2.1	2.6	2.8	2.3	1.7	3.0	2.3
Mexico	1.2	1.3	1.7	1.9	0.7	0.5	1.3	1.0
United States	1.8	1.7	2.0	2.0	2.1	1.7	2.3	1.9
Average	1.6	1.7	2.1	2.2	1.7	1.3	2.2	1.7
Standard deviation	0.4	0.4	0.4	0.5	0.9	0.7	0.8	0.6
Weighted average	1.8	1.7	2.0	2.1	2.1	1.6	2.3	1.9

Source: authors' computation based on *Direction of Trade Statistics*, April 2008, IMF.

Europe

	North America				East Asia			
	Direct		Total		Direct		Total	
	1996	2006	1996	2006	1996	2006	1996	2006
Austria	1.0	2.9	1.5	4.2	1.1	1.7	1.6	2.7
Belgium-Luxembourg	2.6	6.1	3.8	8.7	2.3	3.1	3.3	5.0
Bulgaria	1.5	1.6	2.2	2.8	1.4	1.7	2.1	2.5
Cyprus	0.1	0.1	0.4	0.2	7.7	8.4	8.1	8.7
Czech Republic	0.9	1.8	1.5	3.8	1.2	1.1	1.7	2.5
Denmark	1.2	2.5	1.9	3.6	2.1	2.0	2.6	2.8
Estonia	1.1	4.2	1.9	5.7	0.4	2.3	1.3	3.4
Finland	2.6	2.8	3.4	4.0	3.2	2.8	3.9	3.8
France	1.3	1.7	1.7	2.5	1.3	1.5	1.7	2.0
Germany	1.9	3.8	2.3	5.0	1.9	2.9	2.3	3.7
Greece	0.4	0.4	0.5	0.6	0.3	0.2	0.5	0.4
Hungary	1.1	2.1	1.5	4.0	0.4	1.6	0.9	3.1
Ireland	6.8	9.8	8.3	11.6	4.3	3.6	5.5	4.6
Italy	1.7	2.0	2.1	2.6	1.7	1.3	2.1	1.9
Latvia	0.2	0.7	0.6	1.6	0.0	0.4	0.5	1.0
Lithuania	0.4	3.0	1.0	4.3	0.5	1.3	1.2	2.2
Malta	7.2	5.7	9.2	8.3	7.1	11.0	7.8	11.6
Netherlands	1.7	3.6	2.7	6.0	1.9	2.5	2.7	4.1
Poland	0.4	0.8	0.7	1.5	0.4	0.5	0.7	1.2
Portugal	1.0	1.5	1.6	2.3	0.4	0.8	0.8	1.4
Romania	0.6	0.8	1.0	1.4	0.9	0.4	1.3	1.0
Slovak Republic	0.6	2.7	1.2	4.6	0.3	0.4	1.0	1.8
Slovenia	1.0	1.5	1.4	3.0	0.6	0.4	1.0	1.6
Spain	0.8	1.1	1.2	1.6	0.7	0.5	1.0	0.9
Sweden	2.9	4.0	3.7	5.2	3.0	2.3	3.6	3.1
Switzerland	2.8	5.0	3.5	6.2	3.3	3.4	3.8	4.3
United Kingdom	2.9	2.8	3.5	3.5	2.0	1.3	2.5	1.8
Average	1.7	2.8	2.4	4.0	1.9	2.2	2.4	3.1
Standard deviation	1.7	2.1	2.1	2.6	1.9	2.4	2.0	2.4
Weighted average	1.8	2.8	2.4	3.8	1.7	1.8	2.2	2.5

Source: authors' computation based on *Direction of Trade Statistics*, April 2008, IMF.

Appendix 3: Bilateral effective exchange rates between regions

To build a measure of bilateral effective exchange rates between our three main regions we rely on data on nominal bilateral exchange rates and weight them by bilateral trade flows (both from the IMF). The methodology is straightforward and similar to that employed for constructing multilateral effective exchange rates; see for example Buldorini and al. (2002).

As a first step, we construct bilateral effective exchange rates between each country and region. Let I, J, K be three different regions. If $X_{i,j}$ is country i's trade with partner country j in $J.$,

$$X_{i,\bullet} = \sum_{j \in J} X_{i,j}$$

is country i's total trade with region $J.$

Let $e_{i,j}$ be the bilateral nominal exchange rate between the currencies of country i and country j. Country i's bilateral effective exchange rate with region J can be written as:

$$E_{i,\bullet} = \sum_{j \in J} \frac{X_{i,j}}{X_{i,\bullet}} \times e_{i,j}$$

The effective exchange rate between region I and region J is then obtained by aggregation over the countries of region I.

$$E_{I,J} = \sum_{i \in I} \frac{X_{i,J}}{X_{I,J}} \times E_{i,\bullet}$$

Note that this definition implies that $E_{IJ} \neq E_{JI}$. So we speak for example of the exchange rate of Europe vis-à-vis Asia, which is not the same as the exchange rate of Asia vis-à-vis Europe. In practice, however, differences are small.

Appendix 4: Financial linkages

The bilateral data assembled by Lane and Shambaugh (2007) are used to estimate the strength of financial linkages between East Asia, Europe and North America. This appendix summarises the information available in Appendix A in Lane and Shambaugh (2007).

Asset class	*Sources*	*Assumptions*
Portfolio Equity Portfolio Debt	IMF's Coordinated Portfolio Investment Survey (CPIS)	• Missing points are estimated using a gravity-based model of bilateral equity/debt holdings • Holdings listed in offshore financial centres are eliminated
Direct Investment	UN's United Nations Conference on Trade And Development (UNCTAD)	• FDI valued at historical cost • Liabilities of the reporters used to estimate assets of the non reporters
Bank Loans	Bank of International Settlements (BIS)	• Liabilities of the reporters used to estimate assets of the non reporters
Reserves	IMF's Currency Composition of Official Foreign Exchange Reserves (COFER) Data from Central Banks Data from Literature	• For World total • For country holdings • For country holdings

Appendix 5: Currency composition of bilateral holdings of financial assets and liabilities

To estimate the currency composition of bilateral holdings of financial assets and liabilities, we proceed in two steps.

As a first step, we gather information on the currency composition of the main important countries or currency areas composing the three regions we study. The table below shows the sources used for that matter. At this stage, we make a series of simplifying assumptions applying the US currency composition to North America, that of the euro area to Europe and a linear combination of those of Japan and China to East Asia. While we are conscious that these simplifying assumptions do not come at zero cost, we believe the weight of these areas in each region (and namely in the region's NFA position) is big enough to remain somewhat representative.

Country	Source
US	Tille (2005) Treasury International Capital (TIC) System data
Euro Area	Lane and Milesi-Ferretti (2007) ECB data
Japan	Lane and Milesi-Ferretti (2007) Bank of Japan data
China	Lane (2006)

As a second step, we combine the data on bilateral holdings of foreign assets and liabilities gathered by Lane and Shambaugh (2007) with the data on the aggregate currency composition of financial holdings in order to estimate the currency composition of bilateral holdings by partner region. For equity, we make the standard assumption that they are denominated in the currency of the issuer. For foreign exchange reserves, we make the equally natural assumption that the currency and country distributions are identical and check our estimates against those of Lane and Milesi-Ferretti (2007). For debts and loans, we use the aggregate information available on several countries on the asset and liability sides and correspondingly adjust assumptions as regards the currency composition of bilateral holdings. At this stage, we can therefore provide an estimate of the currency composition of, say, Europe's financial

assets in East Asia (the table indicates that all European equity assets and FX reserves in East Asia are denominated in Asian currencies; that half of European loans to East Asians are denominated in European currencies, the other half being denominated in North American currencies; and so on). The table below reports the currency composition of bilateral holdings of financial assets by partner region[24].

	In currency	A	E	D	A	E	D	A	E	D
	In region	EA	EA	EA	EU	EU	EU	NA	NA	NA
East Asia (EA)	Equity	-	-	-	0	1	0	0	0	1
	Portfolio debt	-	-	-	0	1	0	0	0.1	0.9
	Loans	-	-	-	0	0.9	0.1	0	0.1	0.9
	FX reserves	-	-	-	0	1	0	0	0	1
Europe (EU)	Equity	1	0	0	-	-	-	0	0	1
	Portfolio debt	0.1	0.5	0.4	-	-	-	0	0.5	0.5
	Loans	0	0.5	0.5	-	-	-	0	0	1
	FX reserves	1	0	0	-	-	-	0	0	1
North America (NA)	Equity	1	0	0	0	1	0	-	-	-
	Portfolio debt	0.23	0	0.77	0	0.23	0.77	-	-	-
	Loans	0.07	0	0.93	0	0.07	0.93	-	-	-
	FX reserves	1	0	0	0	1	0	-	-	-

[24] The currency composition of bilateral holdings of financial liabilities by partner regions is also available from the authors on request.