

The Financial Crisis and The Geography of Wealth Transfers*

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Abstract

This paper studies the geography of wealth transfers during the latest financial crisis. We construct valuation changes on bilateral external positions in equity, direct investment and portfolio debt at the height of the crisis to map who benefited and who lost from the massive movements in relative asset prices. We find a very diverse set of fortunes governed by the structure of countries' external portfolios. In particular, we are able to relate the gains and losses on the debt portfolio to the widespread exposure to ABCP conduits and the degree of dollar shortage. We also uncover a wider set of countries who played the role of "global insurers" in this last crisis.

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1 Introduction

Two stylized facts dominate the global economy since 1970: the explosion in cross-border financial flows and positions, and the -more recent- emergence of unusually large current account surpluses and deficits (the so-called ‘global imbalances’). In the span of a little less than two generations, the size and structure of international balance sheets has been altered dramatically. Consider the case of the United States (Table 1). Forty years ago, in 1971, as the Bretton Woods system of fixed but adjustable exchange rates teetered on the brink of collapse, the United States was a creditor country, with a positive Net International Investment Position (NIIP) of about 6 percent of U.S. output. More importantly, U.S. gross external claims and liabilities were quite small, at 17 and 11 percent of output respectively reflecting the large direct and indirect costs of cross-border financial transactions. About a third of these cross-border positions took the form of bank loans. Most (80 percent) of the remaining claims were direct investment, while a sizeable share (45 percent) of remaining liabilities were in the form of foreign holdings of US government securities. Fast forward to 2007, on the eve of the worst financial crisis since the Great Depression. By then, the U.S. has become a sizeable debtor country, with a negative NIIP of about 12 percent of output. More dramatically, gross external claims and liabilities soared, respectively, to 119 and 131 percent of output. While cross-border loans still represent roughly a third of cross-border positions, the structure of the rest of the U.S. external balance sheet has become substantially more complex. Debt instruments still account for about half of the remaining external liabilities. However, holdings of US government securities now accounts for only half of that amount. The other half includes corporate debt and, more importantly, structured credit instruments such as US mortgage-backed securities. The composition of gross external claims has changed too, with equity holdings and direct investment each accounting for 40 percent of remaining external claims. The case of the United States is hardly unique. As the seminal work of [Lane and Milesi-Ferretti \(2001\)](#) and [Lane and Milesi-Ferretti \(2007\)](#) has demonstrated, cross-border participations increased tremendously for many countries,

including all advanced economies.

Beyond this common trend, however, many differences arise and countries differ markedly in the structure of their external balance sheet. As [Gourinchas and Rey \(2007\)](#) and others have pointed out, the U.S. external balance sheet displays a very specific pattern: short in ‘safe’ or liquid securities and long in ‘risky’ or illiquid ones. Interestingly, these patterns can persist through time, despite the profound structural transformations described above. For instance, the share of ‘safe’ and liquid securities –defined as bank loans and debt instruments– in overall US external liabilities was 67 percent in 1971 and 63 percent in 2007. Similarly, the share of ‘risky’ and illiquid securities in gross external claims –defined as direct investment and equity claims– was 54 percent in 1971 and 60 percent in 2007 (Table 1). What constitutes ‘safe’ or ‘risky’ securities may have changed over time, but the overall pattern of *liquidity and maturity transformation* revealed by the analysis of the U.S. external balance sheet did not.

If the U.S. invests abroad in risky assets and funds itself with safe liabilities, two implications follow. First, we expect the US to earn a risk premium. A large body of evidence on this question strongly suggests that it does (see [Gourinchas et al. \(2010\)](#) for recent estimates)¹. Second, and this is the focus of this paper, the US should suffer disproportionate losses in times of crisis, when the value of its risky external financial portfolio collapses relative to the value of its safe external liabilities. As [Gourinchas et al. \(2010\)](#) document, this too appears to be the case. Between 2007:4 and 2009:1, the US net foreign asset position deteriorated by 21% of GDP, of which about 16% represents the net valuation loss suffered by the US on its external portfolio (Table 2). This valuation loss amounts to roughly \$2,200 billion. Losses were especially acute for US equity and direct investments abroad which shrunk in half over that period while U.S. government debt liabilities increased by almost \$1,000 bn, or about 7 percent of output.² As [Gourinchas et al. \(2010\)](#) argued, to the ‘exorbitant privilege’

¹See [Curcuru et al. \(2008\)](#) for a contrarian view.

²Some of the decline in equity and direct investment represents net sales of foreign assets by US investors over that period since both US and foreign investors ‘retrenched’ during the crisis ([Forbes and Warnock \(2010\)](#)). Some of the increase in US government securities liabilities to foreigners also represent net purchases

of positive excess returns, one must add the ‘exorbitant duty’ of disproportionate losses in times of crisis.

By construction, if the US is persistently short ‘safe’ and liquid assets and long ‘risky’ and illiquid ones, the rest of the world must display -in the aggregate– the exact opposite pattern: long in ‘safe’ or liquid assets and short in ‘risky’ or illiquid ones. In normal times, it earns a lower return on its safe external claims than it pays on its risky external liabilities. In times of crisis, however, the large valuation *loss* of the US represents a large valuation *gain* for the rest of the world. Since this wealth transfer occurs in times of crisis, i.e. precisely at time when the marginal utility of consumption is high, it has a natural interpretation as an *insurance payment*, the corresponding *insurance premium* of which is nothing but the excess return or ‘exorbitant privilege’ of normal times. That the US plays the role of a global insurer (for a fee!) is not a coincidence: it is after all, the country at the center of the International Monetary System, and the issuer of the global reserve asset. Unlike earlier explanations emphasizing the role of trade or economic size and network externalities for the determination of the international currency, [Gourinchas et al. \(2010\)](#) and [Farhi et al. \(2011\)](#) emphasize that it is a combination of domestic financial development, economic size, and the fiscal capacity of the sovereign, that determine whose currency and government security endogenously emerge as reserve currency and reserve asset.³ Because of their deep, liquid and historically safe market for government securities, the U.S. exhibit a comparative advantage in liquidity and maturity transformation. Since these attributes have remained largely intact through the modern period, they also help us understand why the US retains its role at the center of the International Monetary System, despite the lack of formal arrangement since the collapse of the Bretton Woods system and why the structure of its external balance sheet,

of these instruments over the period.

³Currency internationalisation has been discussed in various contexts in the literature - see for example Cohen [1971], McKinnon [1979], Krugman [1984], Alogoskoufis and Portes [1993], Matsuyama, Kiyotaki, Matsui [1993], Zhou [1997], Hartmann [1998], Portes and Rey (1998), Rey (2001). The role of the centre country in the international monetary system has mostly been construed as the one of international liquidity provider. Because the medium of exchange function is characterized by network externalities, large economies and economies dominating world trade such as nineteenth century Britain issue the international currency . The importance of network externalities in foreign exchange markets is reflected in their organization around vehicle currencies through which most of the transactions are done.

while experiencing profound transformations, still performs essentially the same aggregate liquidity and insurance role.

It does *not* follow from the preceding discussion that all countries benefit equally from their exposure to the US. It is well-known, for instance, that the financial crisis, having originated in the subprime segment of the U.S. housing market, propagated to rest of the world partly through the heavy losses some European financial institutions suffered on their holdings of US mortgage-backed securities ([Acharya and Schnabl \(2010\)](#)). Recent work also documents that many emerging market economies concentrated their -growing- holdings of external financial claims in the form of US government securities, which provided a safe haven in the midst of the crisis ([Bernanke et al. \(2011\)](#) and [Bertaut et al. \(2011\)](#)). These two examples illustrate the fact that different countries or regions may choose different locus on the risk-return frontier offered by the menu of US financial assets. However, the overall impact on countries balance sheet is much more complex. Beyond these direct linkages, different countries may also have substantially different *indirect* exposure, through their holdings of third-country assets, themselves differentially exposed to the financial crisis. For instance, some countries may hold equity and debt claims on the European financial sector, and thus be indirectly exposed to US housing risk. Others, as discussed extensively by [McGuire and von Peter \(2009\)](#) in the context of the European dollar shortage, may rely on short-term foreign currency borrowing, exposing them to rollover and funding risk and to potentially severe deleveraging.

Understanding the overall structure of global financial linkages during the financial crisis and the associated wealth transfers requires that we go beyond measuring changes in gross and net foreign positions as recorded in the Net International Investment Position. Instead, one needs estimates of *bilateral* external claims and liabilities and of their change during the crisis. Such data would allow us to answer the following critical question: where did the \$2,200 billion US wealth transfer go?⁴ This paper represents an attempt at answering this

⁴For an early discussion of this issue see the interesting column of [Milesi-Ferretti \(2009\)](#) in *voxeu*

question. It produces the first ‘*heat-map*’ of the geographic distribution of gains and losses, by country and asset class between 2007:4 and 2008:4 for portfolio and direct investment. It identifies relative winners and losers from the financial crisis, once direct and indirect wealth transfers are taken into account. To do so, we build on the careful and timely work of [Milesi-Ferretti et al. \(2010\)](#) who construct a dataset of bilateral gross and net external positions on the eve of the financial crisis for countries and groups of countries accounting for more than 97 percent of global external assets and liabilities.⁵ We extend their work along several dimensions. First, we construct quarterly estimates of net and gross bilateral positions from 2007:4 to 2008:4. Second, we present separate estimates of bilateral positions for Brazil, Russia, India, and most importantly, China, by relying on hand collected data of the balance sheet of large state banks. This enables us in particular to have a more precise measure of Chinese portfolio debt holdings. Third, we do a detailed study of the bilateral determinants of gains and losses during the height of the crisis.

Our analysis is in some ways similar to [He et al \(2010\)](#) who studied balance sheet adjustments during the financial crisis. Their analysis focused on the balance sheet of various US financial institutions and changes in holdings of securitized assets. Ours concentrates on the external wealth of nations and changes in bilateral holdings of various broad classes of assets. Both shed light on the evolution of leverage during the crisis.

It is important to emphasize from the outset that data limitations induce substantial uncertainty in an exercise of this nature. High quality data on bilateral positions and flows are not systematically available. Instead, we are forced to rely on a number of empirical assumptions and educated guesses in putting together our database. Important data limitations arise from the limited coverage of bilateral banking transactions at market value; the residence principle that underlies most balance of payment data and results in excessively large holdings attributed to custodial and offshore financial centers; and the general lack of data availability for some groups of countries, including offshore financial centers,

⁵Earlier work by [Kubelec and Sa \(2010\)](#) also constructs bilateral holdings between 1980 and 2005 for a larger group of countries using gravity equations to fill-in some of the positions.

many middle east oil producing countries as well as some emerging economies. Nevertheless, we believe that despite the necessary inaccuracies implied by our empirical assumptions, some consistent patterns emerge from the data, which will survive the additional empirical scrutiny that we hope will be possible in the near future. We also endeavour to provide several versions of the estimates of gains and losses of countries, some multilateral, some bilateral, some based on FDI estimated at market value, some where FDI is at current cost, etc... in order to do robustness checks.

Our exercise reveals a number of important findings. First, we see very important valuation changes during the crisis period and these valuation changes are very unevenly distributed, as external portfolio structures are very heterogeneous. Most countries make capital gains on their portfolio equity positions in the crisis as they are either short on equity overall (like the UK, who made a gain of about \$284 bn⁶) or hold equity assets whose value tanked less than theirs during the crisis. On the other side, taking the capital loss, is of course the US, who is long equity and made massive losses on its portfolio equity position (about \$1,153bn loss). The structure of the external debt portfolio, and in particular whether debt assets are mostly government bonds or corporate bonds or asset backed mortgage securities is a crucial determinant of the valuation gains and losses. We find that countries who self insure by holding mostly government bonds tend to limit losses or even post gains on their net debt portfolios, while countries who levered heavily to invest mostly in asset backed mortgage securities or other toxic assets tend to post losses on their net debt. We see a clear positive correlation in the data between countries which make losses on their debt portfolios and those who set up ABCP conduits. Though the sample coverage is relatively small, we also find a positive correlation between countries who set up ABCP conduits and the [McGuire and von Peter \(2009\)](#) measure of Dollar shortage, suggesting that the lack of Dollar liquidity in the banking system was associated with important losses on external debt portfolios.

⁶Number based on our aggregate estimates presented in Table 3.

The next section reviews the evolution of the external balance sheets of the countries in our sample. Section 3 discusses our empirical methodology to construct a bilateral gross and net positions for portfolio and direct asset holdings, for which we have the most detailed data and presents the ‘heat map’ of bilateral gains and losses by asset class. Section 4 relates the distribution of wealth transfers to observable determinants, such as the exposure to asset backed commercial paper (ABCP), the overall dollar shortage as well as to measures of the regulatory environment. Section 5 concludes.

2 External Balance Sheet Adjustments

We begin our analysis by reviewing the evolution of the external balance sheet for a large sample of countries from the end of 2007 to the end of 2008. This period covers the most acute phase of the crisis during the fourth quarter of 2008 following the collapse of Lehman Brothers, and is therefore the most relevant from the perspective of wealth transfers.

The recovery in many asset markets around the world in 2009 did reverse some of the wealth transfers documented in this paper, perhaps as a result of the coordinated and aggressive macroeconomic policies that may have helped stabilize the world economy. What interests us here is a measure of the wealth transfers resulting directly from the crisis itself, i.e. measured at a time when the possibility and the effectiveness of coordinated counter-cyclical policies remained remote and the risk of a second Great Depression was on everyone’s mind.

Our sample of countries include most industrial countries –Canada, the Euro area, Japan, Switzerland, the UK, the US, and a group of other advanced economies composed of Australia, Denmark, New Zealand, Norway and Sweden– as well as major emerging economies – Brazil, China, India, Russia, Singapore, Hong-Kong and a group of emerging Asian economies composed of Indonesia, South Korea, Malaysia, the Philippines and Thailand. Missing from this sample are oil exporters and offshore financial centers, both with potentially large gross

and net cross-border positions.⁷

For each country in the sample, we construct an estimate of the aggregate valuation gain/loss as:

$$VA_t^i = NA_t^i - NA_{t-1}^i - CA_t^i,$$

where NA_t^i denotes the net foreign asset position at time t for country i and CA_t^i the current account balance during period t . We further break down the net foreign asset position into net direct investment, equity, portfolio debt and other assets (mostly bank loans), according to $NA_t^i = \sum_c NA_t^{i,c}$ where $NA_t^{i,c}$ represents the net position of country i in asset class c at time t . Using the balance of payment identify, we can then write the valuation term as the sum of the changes in the net asset position by asset classes, $\Delta NA_t^{i,c}$, corrected for the net financial flows in asset category c over the period, denoted $NF_t^{i,c}$.⁸

$$VA_t^i = \sum_c \Delta NA_t^{i,c} - NF_t^{i,c}. \quad (1)$$

Table 3 reports our estimates and figure 1 presents the corresponding breakdown of the valuation term. For each country, or group of countries, the figure reports VA_t^i (the solid line) as well as the various components $\Delta NA_t^{i,c} - NF_t^{i,c}$ according to equation (1). Figure 1 also includes the valuation gain/loss for the ‘rest of the world’ (RoW), defined as the counterpart of the aggregate valuation term in our data:

$$VA_t^{\text{row}} = - \sum_i VA_t^i.$$

This valuation term accounts both for incomplete geographical coverage as well as any measurement error. Accordingly, its interpretation should be subject to extra caution. Nevertheless, we will use it to assess the plausibility of our empirical exercise. We collect quarterly and annual data on foreign assets and liabilities, with corresponding financial flows, for

⁷See Lane and Milesi-Ferretti (2009) for some estimates of offshore financial centers net asset positions.

⁸The sum of net financial flows equals the current account balance, up to errors and omissions and unilateral transfers and remittances, which we ignore in this decomposition.

11 individual countries and 3 country groups between 2007 and 2009. Assets and liabilities positions are broken down by assets class: portfolio debt, portfolio equity, direct investment, other investment and reserves (with matching flows, but excluding financial derivatives). For debt, equity, direct investment and other investment positions we rely on national sources for Canada, China, the Euro Area, Japan, Switzerland, United Kingdom and the United States whereas for all other countries data are from the IMF Balance of Payments Statistics. For reserves we use “Total reserves minus gold” obtained from the IMF International Financial Statistics. All flow data were obtained from the IMF Balance of Payments Statistics.

For the purpose of comparability across countries, we constructed figure 1 and Table 3 with US direct investment positions measured at *current cost*. This brings down the overall US valuation loss between 2007:4 and 2008:4 from -\$2,069bn when using direct investment at market value as in Table 1 and 2, to -\$863bn.⁹

A number of important features emerge from the data. First, as conjectured, the simple proposition that the US suffered a valuation loss while other countries gained uniformly is not supported by the data. The Euro area, mainland China and Switzerland also experienced sizeable losses, of \$185bn, \$158bn and \$53bn respectively whereas the U.K (\$542bn), Russia (\$317bn), Brazil (\$292bn) and emerging Asia (\$245bn) were the main net beneficiaries. Taken together, the countries of our sample –outside the US– experienced a positive wealth transfer of \$1,145bn exceeding the \$863bn losses of the U.S, the difference being attributed to the rest of the world.

Second, most of the US losses arise from the \$1,153bn decline in its net equity portfolio. By construction, the cross section distribution of valuations within each asset class sums to zero, that is for each asset class c :

$$\sum_i V A_t^{i,c} = 0,$$

⁹The valuation component on US net direct investment at market value is -\$1,150bn and \$56bn at current cost. By construction, the difference, equal to \$1,206bn, must be accounted for by valuation gains on net direct investment (at market value) in other countries. The next section will provide rough estimates of bilateral direct investment positions at market value.

where $VA_t^{i,c} = \Delta NA_t^{i,c} - NF_t^{i,c}$. Inspection of table 3 and figure 1 reveals that the counterpart of the US net equity losses were widely distributed, most countries realizing gains on their equity portfolio, especially the Euro area (\$506bn), the UK (\$284bn), Russia (\$208bn), Brazil (\$205bn), emerging Asia (\$192bn) and Japan (\$176bn). In all these countries, the gains arise from a drastic reduction in the value of equity liabilities, relative to equity holdings. All these countries had short cross border equity positions as of 2007.

Third, the gains/losses attributable to US cross-border portfolio debt holdings are relatively small, all of the increase in debt liabilities (\$505bn) being more than accounted for by gross capital inflows (\$591bn) especially into US government securities. The small associated valuation loss on US portfolio debt liabilities (-\$86bn) underlies the stability of U.S. government securities during the crisis. By contrast, the U.K., experienced a valuation gain of \$339bn on its net debt position, largely due to the decline in the value of its debt liabilities (-\$515bn), some of which can be attributed to the decline in the value of the Sterling relative to the US dollar during that period. Conversely, the Euro area suffered large valuation losses on its external debt claims (-\$461bn) most likely related to the collapse in the value of its portfolio of US structured credit products. Overall, the contrast between these three countries is consistent with the US issuing safe public debt and risky private-label debt (see [Bernanke et al. \(2011\)](#)); the Euro area holding a portfolio of risky private-label debt assets; the U.K issuing Sterling denominated debt and risky private-label debt both of which declined in value during the crisis.

Fourth, despite large holdings of U.S. public securities China suffered an overall negative wealth transfer during the crisis (\$158bn), representing about 3.5 percent of its output. Inspecting the composition of this wealth transfer, reveals that it results from the overall good performance of the Chinese economy over that period. The valuation losses on equity, direct investment and bank loans arose from the increase in the value of the corresponding Chinese assets over that period, which represents an increase in the external liabilities of China. In addition, China suffered a \$61bn loss on its foreign exchange reserve holdings,

most likely as a result of the markdown on its non-dollar reserves when most currencies lost ground against the US dollar. These findings also highlight that the decline in China’s net external wealth would have been much more pronounced, were it not for its large holdings of US government securities.

Taken together, the results from figure 1 reveal a remarkable pattern. If we define *ex-post global insurers* as the set of countries that provided significant positive transfers to the rest of the world during the financial crisis, this set includes the following countries: the United States (\$863bn, 6 percent of GDP), the Euro area (\$185bn, 1.36 percent), Switzerland (\$53bn, 10.6 percent) and China (3.5 percent).¹⁰ . The channels through which each of these countries experienced valuation losses vary. For the US, it is the collapse in its long net equity position, relative to its short debt position. For Switzerland and the Euro area, it is the decline in the value of their debt holdings of their long direct investment position. For China, as discussed above, it is the increase in value of its domestic assets (equity and direct investment) and the losses on its foreign exchange reserves.

This finding indicates that the *heat-map* of gains and losses is substantially more complex than expected. In particular, it suggests that it is incorrect to think of the United States as the single provider of global liquidity and insurance. The allocation of losses is still extremely asymmetric –with the US accounting for about 68 percent of the cross border wealth losses, the Euro area for 15 percent, China for 13 percent and Switzerland for 4 percent.¹¹ Nevertheless it provides perhaps an early indication that the global economy may have already moved towards a *multilateral system*, where the provision of global liquidity is not concentrated in the hands of the United States any longer. One the whole, our results are also consistent with the recent work emphasizing the resilience of emerging economies during the recent crisis (see [Kose and Prasad \(2010\)](#) and [Gourinchas and Obstfeld \(2011\)](#)).

¹⁰Technically, the list should also include Singapore (\$56bn valuation loss representing 29 percent of its output). However, Singapore is a regional financial center and discrepancies between claims and liabilities lead to us to interpret these numbers with caution.

¹¹The share of the US losses in total losses would be even larger if we measure direct investment at market value since the US valuation loss would be roughly three times as large.

3 Bilateral valuation gains and losses

3.1 Data and Methodology

We estimate the distributions of bilateral valuations gains and losses during 2007-2008. Balance of payment data and international investment positions are based on the concept of residency. This concept is not fully adequate to analyze risk sharing in the international economy. Ideally, we would like to have data on final ownership of assets. While it is possible to obtain such data for cross border bank positions, these data do not exist yet for portfolio investment or FDI. All our results are therefore subjected to these limitations. A second important difficulty is the estimation of bilateral investment positions and bilateral flows in different asset classes. [Kubelec and Sa \(2010\)](#) and [Milesi-Ferretti et al. \(2010\)](#) have done pioneering work in trying to estimate bilateral investment positions. Nevertheless, data limitations remain severe in terms of country coverage in particular and availability of data at market value (see the appendix for a more detailed discussion of data issues).

For each asset class, we estimate the bilateral distribution of valuation gains and losses VX_{t+1}^{ij} at time $t + 1$ between country i and j during the height of the crisis between 2007 Q4 and 2008 Q4. We derive VX_{t+1}^{ij} using the following accounting identity:

$$VX_{t+1}^{ij} = PX_{t+1}^{ij} - PX_t^{ij} - FX_{t+1}^{ij}, \quad (2)$$

where PX_t^{ij} denotes the holdings of country i in country j at time t , and FX_t^{ij} represents the net financial purchases by residents of country i in country j in the asset class considered.

Yearly data on some components of bilateral international portfolios holdings by asset classes are available through the CPIS survey and other sources in recent years for a number of countries. Bilateral flow data coverage is, however, generally far from complete or not available. We use the following methodology to estimate them on quarterly data.¹²

¹²We provide all our data sources for specific countries in the appendix.

Portfolio debt and portfolio equity

We compute bilateral portfolio weights w_t^{ij} of country i vis-a-vis country j for a given asset class at date t using bilateral CPIS data as: $w_t^{ij} = PX_t^{ij} / \sum_{j \in CPIS} PX_t^{ij}$. The coverage of the CPIS data is not exhaustive, hence the sum of all the bilateral positions of country i for portfolio debt or equity covered by the CPIS does not correspond to the reported aggregated IIP for these assets. Accordingly, we construct a *coverage rate* for country i at date t as $\alpha_t^i = \sum_{j \in CPIS} PX_t^{ij} / PX_t^i$, where PX_t^i is the reported aggregate (multilateral) international investment position for country i . We denote the aggregate flow in a given asset class by FX_{t+1}^i , and estimated variables with a ‘hat’. Our goal is to construct an estimate of the quarterly bilateral flows $F\hat{X}_t^{ij}$. Our working assumption is that the geographical distribution of flows over each quarter corresponds to the portfolio weights at the beginning of the quarter. Scaling total flows in proportion to the data coverage on the positions, it results that our estimated bilateral flows are constructed as:

$$F\hat{X}_{t+1}^{ij} = w_t^{ij} FX_{t+1}^i \alpha_t^i.$$

An estimate of next quarter’s positions (ex-valuation gains) can then be constructed as:

$$P\hat{X}_{t+1}^{ij} = PX_t^{ij} + F\hat{X}_{t+1}^{ij}$$

The procedure is then iterated by defining the next quarter portfolio weights as $\hat{w}_{t+1}^{ij} = P\hat{X}_{t+1}^{ij} / \sum_{j \in CPIS} P\hat{X}_{t+1}^{ij}$ and using these to construct the following quarter bilateral flows etc...

We recover the yearly valuation term in the fourth quarter, VX_{t+4}^{ij} , as the difference between end of year bilateral positions as recorded in the available surveys, adjusted for our

constructed cumulated bilateral flows:

$$\begin{aligned}
 VX_{t+4}^{ij} &= PX_{t+4}^{ij} - \sum_{s=1}^4 F\hat{X}_{t+s}^{ij} - PX_t^{ij} \\
 VX_{t+4}^{ij} &= PX_{t+4}^{ij} - \alpha_t^i \sum_{s=1}^4 \hat{w}_{t+s-1}^{ij} FX_{t+s}^i - PX_t^{ij},
 \end{aligned}$$

where the second line substitutes $F\hat{X}_{t+s}^{ij}$ for its empirical counterpart. We emphasize again that this approach is quite crude, given the data limitation and is likely to suffer from a number of shortcomings. However, in the absence of more detailed data, it strikes us as reasonable to assume that flows are allocated proportionally to observed positions.¹³

Bilateral FDI

For our sample, up-to-date official data on FDI at market value is only available for the following countries: the US, Hong Kong, Japan, Australia and Sweden.¹⁴ . In order to obtain bilateral FDI positions at market value we rely wherever possible on official estimates of the aggregate FDI positions at market value (or equivalently the market-to-book value). For countries that do not report such estimates, we update an initial market value estimates by using equity price indices and aggregate FDI flows. Once we have the derived - or provided - estimate of the aggregate market value FDI stock for 2007 and 2008 we use the ratio of market value to book value of the aggregate stock to infer the bilateral FDI stocks at market value.

For the US, the BEA provides market value of the aggregate FDI stock which we use to convert the bilateral BEA FDI positions at historical cost to market value. The same method is used for Japan (where market value estimates are provided by the Bank of Japan) and Sweden (the Swedish Riksbank).

¹³One simple case where our assumption would be violated is one where investors would want to maintain fixed portfolios shares. In that case, investors would rebalance their portfolio every period, which would require underweighting assets that outperform, so that the financial flows would not be proportional to beginning of period holdings. Our simple rule assumes that investors do not follow such a simple rebalancing rule.

¹⁴Of those, only Australia and Hong-Kong use market value as the primary FDI valuation method in their official IIP release.

For the UK, Switzerland, Denmark and Canada we rely on an initial estimate of the aggregate FDI positions at market value which we update by using destination country equity indices and aggregate direct investment flows. we rely on the [Kubelec et al. \(2007\)](#) for UK direct investment positions as of 2005; [Kumah et al. \(2009\)](#) for Denmark in 2006, [Stoffes and Tille \(2009\)](#) for Switzerland in 2005 and Statistics Canada for Canada in 2005. For the remaining countries in our sample we rely on bilateral DI positions at market value derived from partner countries sources. With these estimates of yearly annual positions in hand, we construct bilateral FDI flows and valuations using the same approach as for portfolio debt and equity.

Bilateral Foreign exchange data

For the currency composition of foreign exchange reserves we use national sources (Canada, Russia, Switzerland and the UK) or else adopt the 2007 currency share of official reserves provided in Milesi-Feretti et.al. (2010) for 2008. While this strategy is by no means optimal, in view of the relative stability of fx reserve currency shares over time, we believe any resulting errors to be comparatively small. Bilateral FX reserves flows and valuations are computed as for portfolio debt, equity and FDI.

Bilateral loan data

The locational banking statistics of the BIS, based on the concept of residency, give data on bilateral banking positions. These data however are bound to be of little use for our purposes as loan books and large parts of the banking books are not marked to market. The speed of write downs and the provisioning for bad loans have proceeded at different speeds across countries and it is unclear how much of this is reflected in the BIS numbers of 2007-2008. Furthermore, there are large differences between consolidated statistics and locational statistics, suggesting that the concept of residency, compatible with balance of payment accounting is bound not to reflect the ultimate geographical distribution of gains and losses. Rather than attempt a heroic effort at reconciling loan data on a bilateral basis, we preferred to treat bilateral loan data as a residual in our analysis.

3.2 Heatmaps

Traditionally, the propensity of countries to experience a financial crisis has been linked to large current account deficits and net imbalances. As financial globalization proceeds, cross border asset positions are growing at a rapid rate, and balance sheet effects are becoming increasingly important so that even countries with net balanced positions and no current account deficit can become financially illiquid. Nowadays, financial fragility has to be assessed through information on gross external asset positions, disaggregated by asset classes. Tracking the process of international transmission of financial shocks involves knowing the network of bilateral gross exposures of countries. Hence, we believe that the construction of bilateral heatmaps such as the ones we are presenting in this paper for the 2007-2008 crisis, can be of great interest to understand better systemic risk and the propagation of shocks at the international level. In what follows we present bilateral heatmaps on gains and losses by asset categories (portfolio debt, equity and FDI).

There are several ways of constructing heatmaps. We can use data on bilateral assets and liabilities of reporting countries or alternatively use data based only on the asset side of reporting countries. Because data on the asset side is usually more reliable (see [Milesi-Ferretti et al. \(2010\)](#) for a discussion), this is what we present in this section.

Heatmap on bilateral valuation gains and losses on the net equity portfolio

Each heatmap presents in columns the source country and in rows the countries in which the source countries invest. Hence if we look at the heatmap of portfolio equity assets, in the first column and second row (Brazil- Canada), the number 4.1 means that Brazil is making a valuation gain of \$4.1 billions on its net equity asset portfolio vis-a -vis Canada (and conversely that Canada is making a valuation loss of the same amount). The numbers across the diagonal are symmetric as we used exclusively assets data. Several facts are noteworthy. First, despite the difference in coverage and the assumptions we had to make when constructing the data, the sum of our bilateral valuations (equal to \$163.5 billions for Brazil) is usually reasonably close to the total valuations computed directly from aggregated

net positions in Table 3 and reported for convenience in the last row labeled “all countries.” In principle, the two numbers should not necessarily be equal since the latter includes all countries while the bilateral coverage in Table 4 is more limited. Nevertheless, the numbers should be close if the omitted countries don’t account for a significant share of cross-border equity positions. For the United States, for instance, the two numbers are strikingly close (-\$1,179 billions versus -\$1,153 billions).¹⁵ Second, we uncover a remarkable geographical pattern of gains and losses. As risky assets valuation plummeted during the crisis, the United States, with long equity positions vis-a-vis each of the other geographical entities in our sample, suffered across the board losses. Furthermore, after controlling for their bilateral equity portfolio gain against the US, all other advanced economies except Japan also made losses on their net equity position, reflecting their overall short equity position vis-a-vis the US and long position against the rest of the world. The case of the UK is particularly interesting. It registers one of the biggest gain on its portfolio equity (\$188 billions) and is characterized by a massive short position vis a vis the US and a somewhat smaller short position vis a vis the Euro Area and Canada. Emerging markets, on the other hand, tend to be short equity vis a vis most of their partners, and as a result, benefited from the worldwide fall in equity markets. This is particularly clear for the BRIC countries (Brazil, Russia, India and China) who make gains on most of their bilateral net equity positions.

Heatmap on bilateral valuation gains and losses on the net debt portfolio.

The data on portfolio debt show bigger gaps in coverage than the equity data. In particular, the data coverage for the Euro area and the UK seems particularly limited, as revealed by the comparison between the sum of bilateral gains and losses and the aggregate figure obtained directly from the IIP and reported in the last line.¹⁶ At the present time, the table also excludes China since comparable data on flows and positions was not available.¹⁷ Ventilated

¹⁵For other countries, the sum of our bilateral valuation effects can differ substantially. The discrepancy is largest for China where aggregate equity data indicate a small valuation loss of \$12 billions, while our cumulated bilateral valuations report a gain of \$186 billions. Besides measurement issues, the difference could be due in part to valuation losses that China experienced against countries not included in our sample.

¹⁶The last line ‘all countries’ of Table 5 differs from the net portfolio debt column of table 3 since the latter also includes valuation gains on official reserve positions (mostly held in government securities).

¹⁷Since China does not report to the CPIS, we can construct portfolio debt holdings from counterpart data

data on China debt holding positions will soon be available and incorporated in the next version of this paper. Data coverage for the United States seems adequate since we report a valuation loss of \$27 billions while the aggregate position indicates \$46 billions. It would be ideal to be able to distinguish between government debt and corporate debt, which includes all toxic assets to do our valuation exercise. Unfortunately this breakdown is not available. Hence the net valuation on the debt portfolio will depend on the relative weights of US treasuries, say, versus asset-backed mortgage securities in countries portfolios. As indicated, our heatmap also does not include official reserve holdings with the data on debt (unlike Table 3 above which aggregated the two). According to [Bernanke et al. \(2011\)](#), saving glut economies such as China and Emerging Asia have concentrated their portfolio holdings into government bonds, pushing downwards their yields and inducing more advanced economies, in particular the euro area to invest in higher yielding securities, such as ABCP. Our data seem consistent with this narrative, as the Euro Area has a large long position in US debt in 2007, which translated in large losses during the crisis. Similarly, other advanced economies, Canada, Switzerland, who were also long in US debt and had presumably a similar portfolio structure as the Euro area made losses on their net debt liabilities. A noticeable exception is the UK, who, despite a long position in US debt realized a massive gain, due mainly to the collapse of the value of US debt assets in the UK. The US makes gains on its net debt portfolio vis a vis most advanced economies (except the UK) and conversely makes losses vis a vis Russia and Hong Kong, which are likely to have accumulated more US government bonds than corporate debt.

Heatmap on bilateral valuation gains and losses on the net FDI portfolio

Comparing the sum of our bilateral net valuations for FDI at market value with the aggregate data on valuation estimated from reported IIP, our data coverage is clearly limited for some areas.¹⁸ The Euro area coverage in particular seems problematic, since the sum

and from Treasury Surveys in the case of the U.S.. However, the surveys include official holdings together with private debt holdings of US debt.

¹⁸Note that for this heatmap, we constructed market value FDI estimates wherever possible (see Appendix). Thus, the data presented here differs from the data presented in Table 3, where for the US we used FDI at current cost to allow for better comparability across countries on aggregate data..

of bilateral valuations indicates a gain of \$681 billions, while the corresponding aggregate figure is a loss of \$334 billions (Table 6). It seems unlikely that the discrepancy, a valuation loss in excess of \$1,000 billions, could be accounted purely by the gaps in our geographic coverage, especially vis-a-vis other emerging markets. With this caveat in mind, the results on bilateral direct investment still present some interesting features. Japan has net DI assets vis a vis all the countries in our sample, except Switzerland. Consequently, suffered bilateral losses against each country (except Switzerland). Similarly the US made massive losses vis-a-vis the euro area against which it holds a large long position. UK FDI in the US seems to have particularly underperformed and is responsible for the gain that the US makes on its net FDI portfolio vis a vis the UK.

4 Determinants of gains and losses

It is now well understood that before the crisis, a number of AAA-rated securities (mostly asset-backed mortgage securities) were perceived as perfect substitutes for US government securities. Following [Bernanke et al. \(2011\)](#), let us call them ‘private-label’ safe assets. Eventually, the safety of the private label assets proved illusory, and their price spiralled downwards during the crisis. By contrast, US Treasuries held-up remarkably well and even saw their price rise due to inflows of capital seeking safe haven protection (see [McCauley and McGuire \(2009\)](#)). [Acharya and Schnabl \(2010\)](#) estimate that the banks around the world manufactured over \$1,200 billion of these ‘private-label’ safe assets by selling short-term Asset-Backed Commercial Paper (ABCP) via conduits to risk-averse investors and investing the proceeds primarily in long-term U.S. securities. As liquidity in the dollar money markets dried-up in 2007, many banks found themselves unable to roll over these ABCP and forced to reinstate the mortgages from the conduits on their balance sheet, with significant losses. Our data on bilateral exposures are ideal to investigate the macroeconomic impact of those investments by commercial banks, i.e. whether countries whose banks set up large asset-backed commercial paper conduits also experienced large losses on their external debt

portfolios. Figure 2 illustrates the positive correlation between the share of ABCP conduits in total external debt positions as of 2007 and the rate of losses made on external debt portfolios between 2007 Q4 and 2008 Q4.¹⁹ Though the sample is small, the correlation is strikingly positive, suggesting that setting up ABCP conduits is a major determinant of aggregate losses on external debt. Furthermore, there is a strong mapping between the geographical distributions of losses and the share of the various areas in total ABCP holdings. As pointed out in [Bernanke et al. \(2011\)](#), the Euro area leveraged massively to invest in those private-label safe assets ending up holding 40% of total outstanding ABCP and as a result saw massive decline in the value of its external debt to the tune of 54% of total losses (Figure 3). The UK, who held 16% of the total stock of ABCP bore 21% of total losses.

Reinforcing the plausibility of the mechanism described above linking prevalence of ABCP conduits and liquidity dry ups entailing losses on assets, we find a strong positive correlation between the measures of dollar shortage in some banking systems developed by [McGuire and von Peter \(2009\)](#) and the propensity of those systems to set up ABCP conduits. Figure 4 uses the upper limits of the dollar shortage measures developed by [McGuire and von Peter \(2009\)](#) both at the office and at the group level. Those measures are constructed by assuming that net interbank borrowing in dollar, net borrowing on the FX swap markets in dollars (which the authors back out from the balance sheet identity assuming no open positions on the forex), dollar borrowing from official monetary authorities, as well as liabilities to non banks are all short term. The difference between those short term dollar liabilities and the longer term dollar assets gives the dollar funding gap or dollar shortage of a country banking system.²⁰ With the exception of Switzerland, which did not have any significant exposure to ABCPs in 2007, there is a very clear link between measures of dollar shortage and ABCP

¹⁹We are very grateful to Viral Acharya and Philip Schnabl for sharing their data with us. Their dataset consists in the following countries: Australia, Austria, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, Switzerland, UK, USA.

²⁰We are grateful to the authors for providing us with their data, whose construction is described in [McGuire and von Peter \(2009\)](#). The group-level estimates are constructed by aggregating banks' global balance sheets into a consolidated whole, and then calculating funding risk on this aggregated balance sheet. The office-level estimates are constructed by calculating funding risk at the office location level, and then aggregating the series up across office locations for each banking system. By construction, the office level estimates should at least be as large as the corresponding group level.

conduits.

Finally, we report in Figure 5 the total valuation losses together with the [Kaufmann et al. \(2010\)](#) indicator of the quality of the regulatory environment. Recent research by [Giannone et al. \(2011\)](#) finds that the severity of the crisis was strongest related to degree of liberalization in credit markets, as measured by indicators or ‘regulatory quality’ such as [Kaufmann et al. \(2010\)](#).²¹ The correlation between the two variables is positive (0.45) and visual inspection confirms that countries with more liberalized credit markets tended to suffer larger valuation losses on their external portfolio.

5 Conclusion

The global crisis of 2007-2009 led to massive changes in relative asset prices. We construct a dataset that allows us to analyze the geography of wealth transfers during the crisis. The ‘heatmap’ we produce highlight a very diverse set of outcomes depending on the structure of the structure of countries’ external portfolios. Some saw the value of their net assets plunging, others benefited from large capital gains. The countries whose net international asset positions deteriorated provided wealth transfers to the others at a time where marginal utility of consumption was very high. For that reason they can be regarded as “global insurers”, as suggested in [Gourinchas et al. \(2010\)](#). Interestingly, we find that the United States, the country at the centre of the international monetary system and issuer of the main reserve assets, the US Treasuries, provided most of the insurance during the crisis, as its international investment position deteriorated massively. But other countries, which may be regarded more like regional insurers joined in, such as Switzerland, or even the Euro area. A general pattern in our data is that most countries long equity or direct investment faced losses on their net positions, as risky assets took some of the sharpest valuation falls in the crisis. For portfolio debt, the exact structure of portfolio matters, and in particular

²¹For group of countries, we assign the regulatory quality index as follows: Germany for euro area, St Kitts for offshore centers, Saudi Arabia for oil exporters, Thailand for emerging Asia, Norway for other advanced countries, and Peru for other latin-american countries.

the relative weights of government bonds versus toxic corporate debt made an important difference for the outcomes. We find that some correlation of exposure to ABCP conduits -mostly in US dollars, existing dollar shortage measures, and losses on the debt portfolio. Finally our exercise, just like [Milesi-Ferretti et al. \(2010\)](#) underlines important data issues regarding cross country coverage of international investment positions and flows.

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Appendix

FDI

We denote market value by MV, book value by BV, current cost by CC and historical cost by HV. The list of countries providing both aggregate and bilateral FDI positions data at MV includes:

- Australia (IIP & bilateral positions = MV)
- Hong Kong (IIP & bilateral positions = MV)
- New Zealand (IIP & bilateral positions = MV except for some firms who provide positions at BV)
- Norway (IIP & bilateral positions = MV)

For the following countries, we estimate both the aggregate FDI positions and the bilateral positions at MV:

- Canada (IIP & bilateral positions = BV, we estimate MV, initial 2005 market value estimate provided by Statistics Canada)
- Denmark (IIP & bilateral positions = BV, we estimate MV, initial 2006 market value estimate provided by [Kumah et al. \(2009\)](#))
- Switzerland (IIP & bilateral positions = BV, we estimate MV, initial 2005 market value estimate provided by [Stoffes and Tille \(2009\)](#))
- United Kingdom (IIP & bilateral positions = BV, we estimate MV, initial 2005 market value estimate provided by [Kubelec and Sa \(2010\)](#))

Countries providing aggregate FDI data at market value along with official valuation series:

- Japan (IIP & bilateral positions = BV, Bank of Japan provides estimate of aggregate FDI abroad & inward market-to-book value ratio, we use this to obtain bilateral positions at MV)
- Sweden (IIP & bilateral positions = BV, also provides estimate of aggregate FDI at MV, we use those to obtain bilateral positions at MV)
- United States (IIP = CC, BEA bilateral positions = HC, market-to-HC ratio provided by BEA, use this to obtain bilateral positions at MV)

The following countries do not report aggregate FDI at MV and we are unable to compute our own estimates. Reported bilateral positions are at BV.

- Brazil (IIP = BV, bilateral positions at MV imputed from partner countries)
- China (IIP = BV, bilateral positions at MV imputed from partner countries)
- Emerging Asia (IIP = BV, bilateral positions at MV imputed from partner countries)
- Euro Area (IIP & bilateral = BV, bilateral positions at MV imputed from partner countries)
- India (IIP = BV, bilateral positions at MV imputed from partner countries)

- Russia (IIP = BV, bilateral positions at MV imputed from partner countries)

Methodology for market value estimation:

1. Start from an initial estimate of the aggregate FDI abroad/inward position at MV (usually for 2005, provided by statistical agency or other, see above).
2. multiply the date t position in USD with the weighted average of the destination countries' USD ex-dividend equity index returns, with weights corresponding to the date t FDI portfolio weights (FDI abroad); or home country USD equity index return (inward FDI)
3. add USD financial outflow/inflow to obtain date t+1 position at MV
4. calculate market-to-book value ratio for each date
5. calculate bilateral positions at MV using 4)

Our valuation methodology exposes the estimated bilateral valuations to a number of potential biases:

1. skewed coverage rate for countries with aggregate IIP data at BV – e.g. Euro area, China etc. – leading us to over or underestimate bilateral FDI flows
2. incomplete bilateral FDI balance sheets for countries where MV positions were imputed from partner country FDI assets and liabilities.

Valuations calculation: For FDI valuations we employ the same method as for portfolio debt and equity.

Additional notes:

Our benchmarking on equity index returns is done under the assumption that the USD equity returns of our sample of countries/regions span the entire FDI abroad geography of each source country. Further, FDI positions in offshore centres are not ventilated by residence of ultimate recipient; hence no capital gain and exchange rate return can be computed thereupon (particularly important for Switzerland, which reports a 20% portfolio weight on its FDI abroad position vis-a-vis offshore centres).

China

China does not report the geographical allocation of its portfolio investment holdings. We therefore investigated in great details national sources and hand collected data to remedy this shortcoming. Only large state owned banks(4 of them) hold portfolio debt and bank loans. For example, the Bank of China San Paolo branch lends to local clients and reports the transactions to its headquarter. At the end of term, Bank of China reports the data of portfolio debt and bank loans to the CBRC (Banking commission). The CBRC send the aggregated data to SAFE. In a final step, SAFE reports the official BOP to BIS-OECD-IMF-World Bank and publishes half year aggregated BOP data in dollar term. Hence we have to go back to the banks reports to have details on the geographical breakdown.

Portfolio equity asset:

QDII, is a scheme to allow financial institutions to invest in offshore markets. QDII is a quota system for domestic investors to investment abroad . Similarly, QFII is designed for foreign investors to invest in China. Most of QDII and QFII are investing in equity market. We collected data on QDII and QFII from SAFE. Portfolio equity assets is relatively small due to teh QDII having been launched only in 2006. Besides, China does not have many wealth management services to

help Chinese invest in overseas equity markets. We obtained a record of all authorized overseas investments in equity for the years 2006-2010. The amount involved are small. For 2006, the total flows amount to \$9,675 million, for 2007, \$30,544.7 million and for 2008, \$3,255. We have the breakdown by domestic investor name but unfortunately not disaggregated by geographical area of investment.

Portfolio debt

Bank loan

Only state owned banks hold foreign portfolio debt. We searched through the banks reports to find the information. Bank of China used to be the only state owned bank investing overseas and is still the No.1 bank for international business. The total assets of the bank amounted in 2010 at 10,459,865 million RMB. We have the following decomposition of cross border claims.

Bank of China	2007	2008
	Portfolio debt	loans
dollar		
euro		
HK dollar		
yen		
CHF		

Other state owned banks have only very limited overseas assets.

Banks	Industrial and Commercial	China	Agricultural
(bil. of RMB)	Bank of China	Construction Bank	Bank of China
Total assets	12,780	10,810	10,337
Share of overseas revenues			

FDI The only market value estimates of Chinese FDI have been done in 2004. After 2004, government agencies added up flow data to estimate the official IIP. Therefore, the official IIP of 2005-2009 are not market value.

	1971:3	2007:2
Gross Liabilities	11.2	130.8
Bank Loans	3.1	38.8
Debt	4.4	44.2
of which:		
Government	3.7	21.2
Corporate	0.8	23.1
Equity	2.6	22.2
Direct Investment	1.2	25.6
Gross Asset	16.9	119.1
Gold	1.1	1.2
Bank Loans	5.3	36.1
Debt	1.4	10.0
Equity	0.7	35.0
Direct Investment	8.4	36.5
Net	5.7	-11.7
Safe & Liquid/Liabilities	66.6	63.5
Risky & Illiquid/Assets	53.9	60.0

Table 1: US External Balance Sheet. percent of US GDP. Source: [Gourinchas et al. \(2010\)](#)

Positions as of:	2007:4	2009:1	Change	
	% of GDP	% of GDP	% of GDP	bn (US dollars)
Net	-10.2	-31.4	-21.1	-2,966
of which				
cumulated current account			-5.5	-767
valuation change			-15.7	-2,199
Gross Liabilities	132.6	113.3	-21.6	-3,040
Bank Loans	38.9	34.8	-4.8	-669
Debt	46.0	48.8	2.1	288
of which:				
Government	22.3	29.7	7.0	987
Corporate	23.7	19.2	-5.0	-699
Equity	22.6	13.5	-9.5	-1,333
Direct Investment	25.2	16.2	-9.4	-1,326
Gross Asset	122.5	81.8	-42.7	-6,006
Gold	1.5	1.7	0.2	22
Bank Loans	36.2	35.4	-1.4	-200
Debt	11.1	8.8	-2.5	-353
Equity	36.7	17.0	-20.4	-2,866
Direct Investment	36.9	19.0	-18.6	-2,609

Table 2: Change in US External Balance Sheet. percent of US GDP. 2007:4 to 2009:1.
Source: [Gourinchas et al. \(2010\)](#)

Country	Valuation		Equity		Direct Investment		Debt		Loans				
			Claims	Liab.	Net	Claims	Liability	Net	Claims	Liab.	Net		
U.S.	-863	-2,398	-1,245	-1,153	-161	-218	56	-120	-86	-34	149	-119	268
Euro area	-185	-1,171	-1,677	506	-607	-273	-334	-461	-135	-326	-394	-363	-31
U.K.	542	-567	-851	284	-423	-337	-86	-176	-515	339	-332	-337	5
Japan	65	-244	-420	176	7	46	-39	-66	126	-193	419	298	121
Switzerland	-53	-197	-220	23	28	77	-49	-45	-6	-39	13	2	11
Canada	17	-261	-189	-71	-78	-131	53	-24	-41	18	-7	-25	18
Other advanced	-3	-434	-401	-33	-221	-234	14	-135	-142	8	-101	-111	10
Brazil	292	-2	-207	205	7	-67	74	8	-15	23	-3	7	-9
India	20	0	-18	18	0	-24	24	-25	0	-24	-1	-3	3
Russia	317	-1	-209	208	-220	-350	130	-18	-18	0	-50	-29	-21
Emerging Asia	245	-54	-246	192	-10	-67	57	-24	-8	-16	-35	-48	13
China	-158	1	13	-12	16	64	-48	-61	-2	-59	-22	17	-39
Hong Kong	101	-258	-237	-21	-300	-421	122	7	2	5	-8	-4	-4
Singapore	-56	-80	-74	-5	-27	-22	-6	-31	0	-31	-15	0	-15
Rest of the World	-282			-314			32						-329

Table 3: The Geography of Wealth Transfers, 2007:4-2008:4. Decomposition of the valuation change into a net equity, net direct investment, net debt and net bank loans components.

Net Valuation on Equity

Source Partner	Brazil	Canada	China	Emerging Asia	Euro Area	Hong Kong	India	Japan	Other Advanced	Russia	Singapore	Switzerland	United Kingdom	United States
Brazil	0	-4.1	0	-2.7	-36.8	0	0	-3.9	-4.1	0	-0.3	-1.1	-9.7	-100.9
Canada	4.1	0	1.2	7.9	41.3	2.8	1.7	7.2	3.0	1.9	1.2	0.7	36.0	-89.6
China	0	-1.2	0	-13.4	-27.7	-68.5	0	-9.7	-1.3	0.0	-1.4	-0.6	-23.6	-38.6
Emerging Asia	2.7	-7.9	13.4	0	-46.7	6.1	3.6	0.4	-7.1	-0.1	-9.2	-1.4	-22.5	-113.9
Euro Area	36.8	-41.3	27.7	46.7	0	22.6	46.9	53.0	-48.4	37.1	2.9	-40.4	49.9	-302.4
Hong Kong	0	-2.8	68.5	-6.1	-22.6	0	1.2	-7.5	-5.4	0	-5.4	-0.8	7.7	-53.5
India	0	-1.7	0	-3.6	-46.9	-1.2	0	-4.5	-4.2	0	-8.1	-0.3	-26.2	-52.8
Japan	3.9	-7.2	9.7	-0.4	-53.0	7.5	4.5	0	-0.5	3.4	4.1	-0.3	-30.5	-93.7
Other Advanced	4.1	-3.0	1.3	7.1	48.4	5.4	4.2	0.5	0	6.1	-0.7	10.3	12.3	-23.6
Russia	0	-1.9	0	0.1	-37.1	0	0	-3.4	-6.1	0	-0.5	-3.4	-11.6	-54.8
Singapore	0.3	-1.2	1.4	9.2	-2.9	5.4	8.1	-4.1	0.7	0.5	0	-0.4	-0.9	-25.9
Switzerland	1.1	-0.7	0.6	1.4	40.4	0.8	0.3	0.3	-10.3	3.4	0.4	0	-14.9	-45.7
United Kingdom	9.7	-36.0	23.6	22.5	-49.9	-7.7	26.2	30.5	-12.3	11.6	0.9	14.9	0	-222.4
United States	100.9	89.6	38.6	113.9	302.4	53.5	52.8	93.7	23.6	54.8	25.9	45.7	222.4	0
Sum of the above	163.5	-19.5	186.1	182.4	108.8	26.7	149.4	152.4	-72.2	118.9	9.9	22.9	188.3	-1217.7
All countries	205.3	29.9	-12.1	191.7	506.1	-21.1	17.5	175.6	-33.3	208.0	-5.5	23.0	283.8	-1153.4

Table 4: Bilateral Equity Heatmap

The table reports the bilateral valuation gain(+) / loss(-) between 2007:4 and 2008:4, for each source/partner pair. Sources: Author's Calculations.

Net Valuation on Debt

Source Partner	Brazil	Canada	Emerging Asia	Euro Area	Hong Kong	Japan	Other Advanced	Russia	Singapore	Switzerland	United Kingdom	United States
Brazil	0	-0.3	2.3	-8.0	0	3.5	-1.1	0	0	0.2	-2.8	3.5
Canada	0.3	0	0.2	2.4	-0.1	-4.0	2.5	0	-0.1	1.1	0.9	3.5
Emerging Asia	-2.3	-0.2	0	-23.6	-3.1	2.6	2.7	0	-18.4	0.3	-5.2	6.9
Euro Area	8.0	-2.4	23.6	0	-9.3	-78.1	1.8	5.8	-7.0	-7.5	18.3	61.2
Hong Kong	0	0.1	3.1	9.3	0.0	-13.1	7.7	-0.1	0.7	0.4	-16.7	-3.0
Japan	-3.5	4.0	-2.6	78.1	13.1	0	-14.9	0.3	0.8	-1.8	-9.0	16.2
Other Advanced	1.1	-2.5	-2.7	-1.8	-7.7	14.9	0.0	0.7	-5.8	-1.9	-18.7	3.3
Russia	0	0.0	0	-5.8	0.1	-0.3	-0.7	0	-0.1	-0.1	-7.6	-2.3
Singapore	0	0.1	18.4	7.0	-0.7	-0.8	5.8	0.1	0	0	2.0	2.6
Switzerland	-0.2	-1.1	-0.3	7.5	-0.4	1.8	1.9	0.1	0	0	9.5	3.6
United Kingdom	2.8	-0.9	5.2	-18.3	16.7	9.0	18.7	7.6	-2.0	-9.5	0	-122.9
United States	-3.5	-3.5	-6.9	-61.2	3.0	-16.2	-3.3	2.3	-2.6	-3.6	122.9	0
Sum of the above	2.8	-6.6	40.2	-14.4	11.7	-80.7	20.9	16.8	-34.5	-22.4	93.5	-27.4
All countries	12.1	16.9	-1.9	-324.4	9.2	-218.4	23.4	15.9	-28.7	-35.5	340.8	-45.8

Table 5: Bilateral Portfolio Debt *Heatmap* ex-China

The table reports the bilateral valuation gain(+)/loss(-) between 2007:4 and 2008:4, for each source/partner pair on cross-border equity positions. Sources: Author's Calculations.

Net Valuation on Direct Investment

Partner \ Source	Brazil	Canada	China	Emerging Asia	Euro Area	Hong Kong	India	Japan	Other Advanced	Russia	Singapore	Switzerland	United Kingdom	United States
Brazil	0	12.8	0	0	0	0	0	-5.9	-4.3	0	0	-6.4	-3.7	-44.1
Canada	-12.8	0	8.8	2.3	-12.6	2.5	8.1	-10.4	5.7	0.5	2.0	-7.5	-14.4	-70.2
China	0	-8.8	0	0	0	279.5	0	-28.5	-3.6	0	8.3	-1.4	-2.7	-4.2
Emerging Asia	0	-2.3	0	0	0	-0.3	0	-56.4	-6.5	0	9.3	-6.5	-18.5	-46.7
Euro Area	0	12.6	0	0	0	0	0	-143.9	-68.2	0	0	-62.3	-102.4	-316.6
Hong Kong	0	-2.5	-279.5	0.3	0	0	0	-7.0	-2.3	0	1.5	-1.9	-52.9	-37.3
India	0	-8.1	0	0	0	0	0	1.2	-0.4	0	5.4	-1.1	-5.1	-9.1
Japan	5.9	10.4	28.5	56.4	143.9	7.0	-1.2	0	22.3	0.1	18.5	-3.9	34.7	69.1
Other Advanced	4.3	-5.7	3.6	6.5	68.2	2.3	0.4	-22.3	0	2.4	0	-3.2	-30.6	2.8
Russia	0	-0.5	0	0	0	0	0	-0.1	-2.4	0	0	-2.1	-13.1	-7.2
Singapore	0	-2.0	-8.3	-9.3	0	-1.5	-5.4	-18.5	-0.4	0	0	-7.6	-5.5	-90.2
Switzerland	6.4	7.5	1.4	6.5	62.3	1.9	1.1	3.9	3.2	2.1	7.6	0	-3.0	-9.0
United Kingdom	3.7	14.4	2.7	18.5	102.4	52.9	5.1	-34.7	30.6	13.1	5.5	3.0	0	27.7
United States	44.1	70.2	4.2	46.7	316.6	37.3	9.1	-69.1	-2.8	7.2	90.2	9.0	-27.7	0
Sum of the above	51.6	97.9	-238.6	127.9	680.7	381.6	17.2	-391.6	-28.9	25.5	148.6	-91.8	-245.0	-535.0
All countries	73.8	148.8	-47.8	56.5	-333.8	121.5	23.8	-588.3	36.1	130.2	-5.6	-276.3	-645.1	-1143.2

Table 6: Bilateral Direct Investment *Heatmap*

The table reports the bilateral valuation gain(+)/loss(-) between 2007:4 and 2008:4, for each source/partner pair on cross-border direct investment positions. Source: Author's calculations.

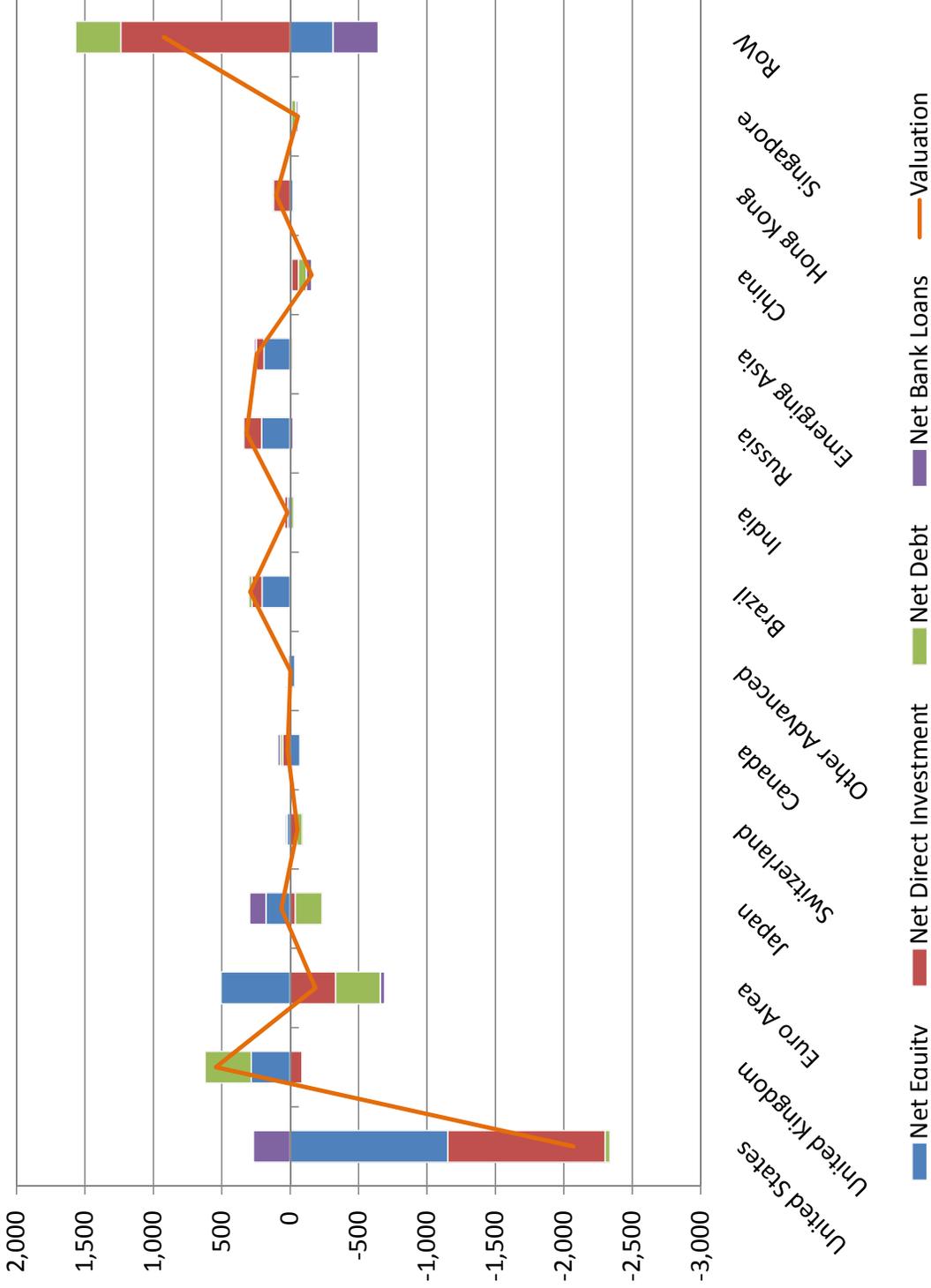
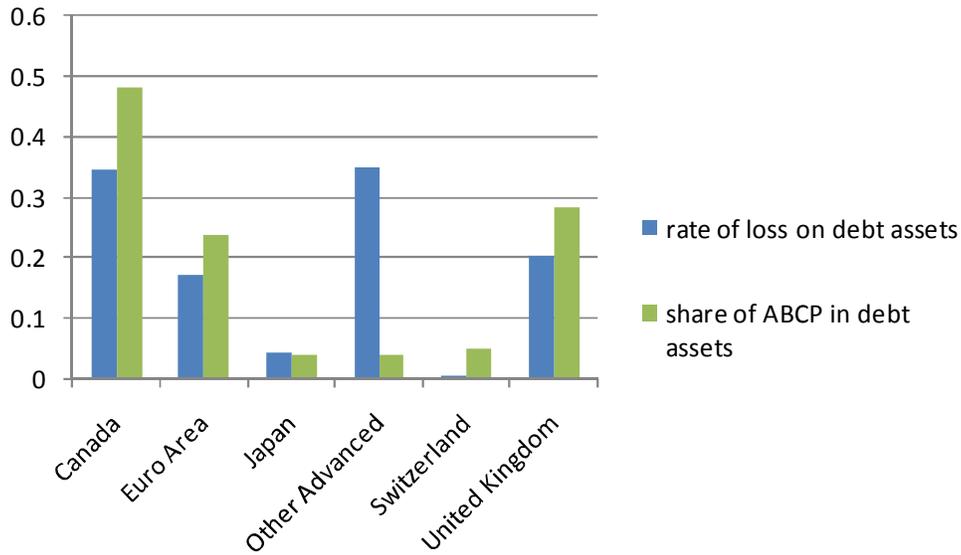


Figure 1: The Geography of Wealth Transfers

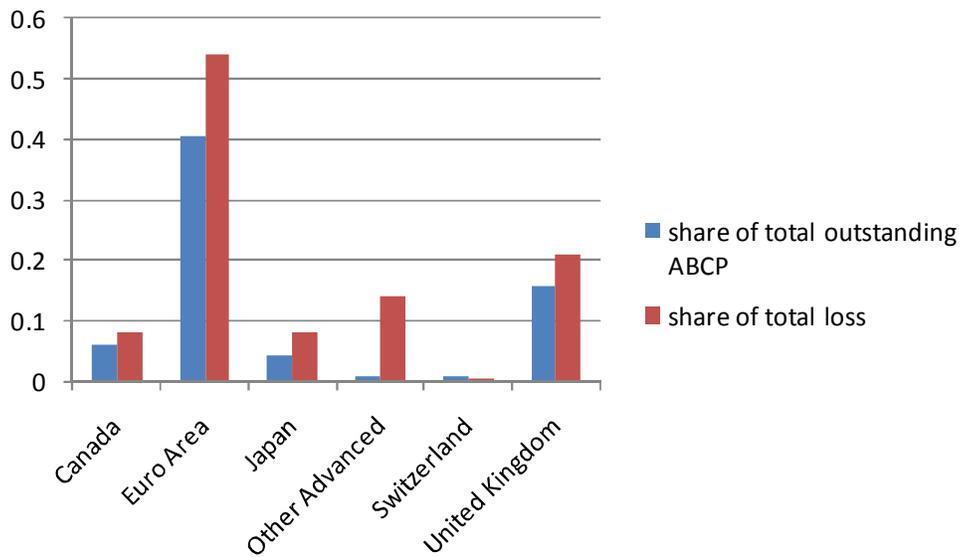
Author's Calculations. The figure reports the external valuation gain(+)/loss(-) between 2007:4 and 2008:4, broken down by asset class (equity, direct investment, debt and bank loans) and corrected for current account flows over the same period. See appendix for data sources.

Figure 2: Exposure to ABCP and Portfolio Debt Losses, by country



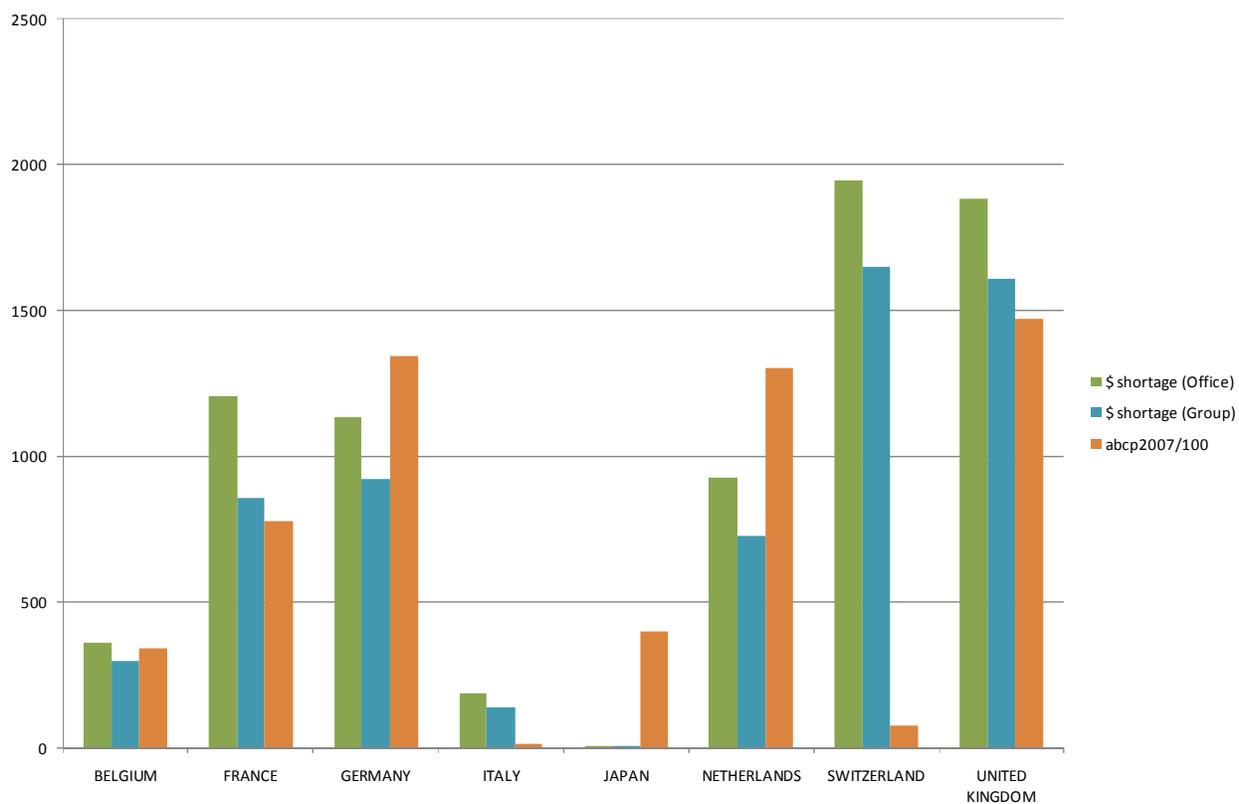
The figure reports for each country or group the share of ABCP in that country debt claims position in 2007, as well as the rate of loss on debt assets between 2007:4 and 2008:4. Source: Authors' calculations and [Acharya and Schnabl \(2010\)](#)

Figure 3: Exposure to ABCP and Portfolio Debt Losses, fraction of total



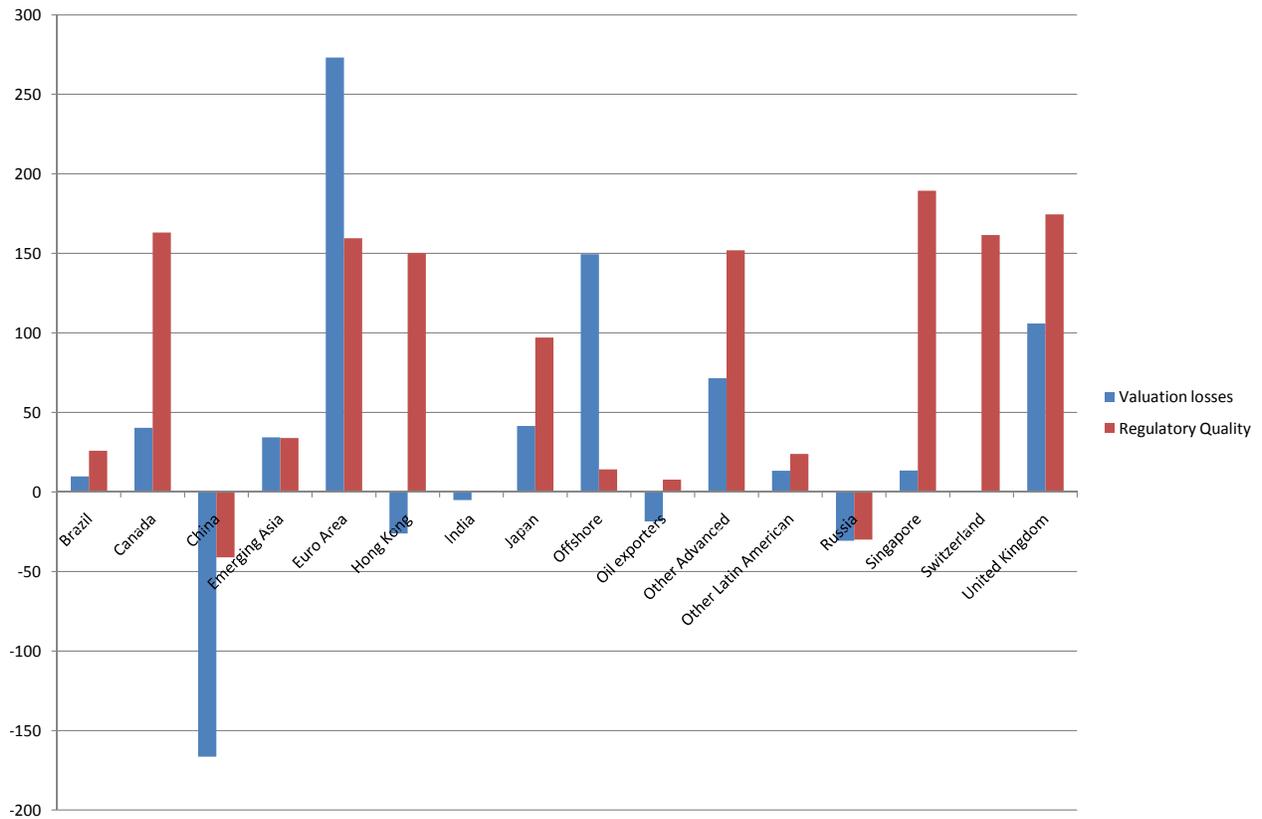
The figure reports for each country or group the share of ABCP in total ABCP holdings in 2007, as well as the share of overall loss on debt assets between 2007:4 and 2008:4. Source: Authors' calculations and [Acharya and Schnabl \(2010\)](#)

Figure 4: Dollar Shortage and ABCP exposure



The figure reports the upper limit of the dollar shortage measures constructed at the office and group level together with ABCP exposure data at the country level. Source: [McGuire and von Peter \(2009\)](#) and [Acharya and Schnabl \(2010\)](#)

Figure 5: Regulatory Environment and Valuation Losses



The figure reports the index of regulatory quality from [Kaufmann et al. \(2010\)](#), together with total valuation losses (+) or gains (-)