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International Capital Mobility  
and Financial Fragility - Part  
4. Which Structural Policies  
Stabilise Capital Flows  
When Investors Suddenly  
Change Their Mind?  
Evidence from Bilateral  
Bank Data

**Rudiger Ahrend,  
Cyrille Schwellnus**

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**INTERNATIONAL CAPITAL MOBILITY AND FINANCIAL FRAGILITY: PART 4. WHICH  
STRUCTURAL POLICIES STABILISE CAPITAL FLOWS WHEN INVESTORS SUDDENLY  
CHANGE THEIR MIND? EVIDENCE FROM BILATERAL BANK DATA**

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by **Rudiger Ahrend and Cyrille Schwellnus**

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## ABSTRACT/RÉSUMÉ

### **International capital mobility and financial fragility: Part 4. Which structural policies stabilise capital flows when investors suddenly change their mind? Evidence from bilateral bank data**

The global financial crisis of 2007-09 and the ensuing sovereign debt crisis in Europe provide evidence that portfolio rebalancing of financial investors can contribute to spread financial turmoil across countries. Rebalancing of portfolios, in turn, may be driven by the need to meet liquidity or capital requirements, or by sudden changes in investor sentiment. This paper tests explicitly for the change-in-sentiment channel of financial contagion. Using bilateral bank data and an instrumental variables technique that allows focusing on changes in investors' country assessments that are unrelated to fundamentals, changes in investor sentiment are indeed found to drive capital flows. Sentiment-driven capital flows are found to be smaller in countries with a tougher regulatory stance, such as stricter banking supervision or enhanced financial transparency.

*JEL classification codes:* F21; G11; G18

*Keywords:* Capital flows; crisis; contagion; investor sentiment; financial regulation

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### **Flux de capitaux internationaux et fragilité financière : Partie 4. Quelles politiques structurelles stabilisent les flux de capitaux quand les investisseurs changent de perceptions ? Une analyse empirique sur données bancaires bilatérales**

La crise financière de 2007-09 et la crise de la dette souveraine en Europe qui s'ensuit démontrent que les rééquilibrages de portefeuilles des investisseurs peuvent contribuer à propager l'instabilité financière entre pays. Ces rééquilibrages peuvent être motivés par le besoin de satisfaire des seuils de liquidité ou de capital, ou par de soudains changements de perceptions. Cet article teste si les changements de perceptions des investisseurs internationaux constituent un vecteur de contagion financière. En utilisant des données bancaires bilatérales et une technique de variables instrumentales qui permet d'isoler des changements de perceptions des investisseurs indépendants des fondamentaux des pays de destination, l'analyse empirique montre que les changements de perceptions ont un effet sur les flux de capitaux. Les flux de capitaux causés par les changements de perceptions sont moindres dans les pays ayant une régulation financière plus exigeante, par exemple une supervision bancaire plus stricte ou une plus grande transparence financière.

*Classification JEL :* F21; G11; G18

*Mots-Clés :* Flux de capitaux ; crise ; contagion ; perceptions des investisseurs ; régulation financière

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By Rudiger Ahrend, Cyrille Schwellnus<sup>1</sup>

**Introduction and main results**

1. The global financial crisis of 2007-09 and the ensuing sovereign debt crisis in Europe are yet another proof that financial crises frequently occur in clusters. While the synchronicity of financial crises could purely result from common shocks to economic fundamentals or transmission through trade linkages, one common view is that their fast spreading across countries in part also reflects financial contagion (Kaminsky and Reinhart, 2000; Kaminsky *et al.*, 2003; Ahrend and Goujard, 2011). According to the financial contagion view, international investors respond to a financial crisis in one country by rebalancing their portfolios, thereby spreading financial instability. This portfolio rebalancing can result from liquidity or capital constraints as balance sheets of leveraged financial institutions deteriorate or, alternatively, from sudden swings in investor sentiment. In the first case financial contagion is driven by those investors who actually have endured losses from negative shocks elsewhere, whereas in the second case investors contribute to financial contagion independently of whether or how much they may have suffered from the original negative shocks. Studies (Kaminsky and Reinhart, 2000; Van Rijckeghem and Weder, 2001; Ahrend and Goujard, 2011) that have found evidence supporting the financial contagion channel are generally consistent with financial contagion being spread through asset disposals that reflect balance sheet constraints of banks.

2. This paper explores whether – beyond balance sheet constraints – financial contagion has also been caused by sudden reversals in investor sentiment. More specifically, the paper examines the impact of sudden reversals in investor sentiment on bank capital flows. The data on investor sentiment toward a given country is taken from a survey of institutional investors assessing the creditworthiness of a large number of countries, with the measure used in this paper constructed in such a way that it is independent of a country’s domestic fundamentals. Sudden swings in sentiment can occur when investors overestimate economic interdependence between a country in crisis and others, or extrapolate new information on the former to the latter (Moser, 2003). For example, the emergence of financial stress in one country may serve as a “wake-up call” to re-evaluate the risk of countries in the same region. Such sudden swings in

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sentiment and the ensuing portfolio rebalancing may lead to sudden reversals of capital flows and thereby contribute to the transmission of financial stress across countries.<sup>2</sup> In addition, the paper addresses the question which structural policies may shield countries against sudden swings in sentiment. By enhancing the stability of capital flows, structural policies such as strict banking supervision, a high degree of financial transparency or capital account restrictions on financial flows could conceivably contribute to shielding countries against sentiment-driven financial contagion.

3. This paper adds to the literature by explicitly estimating the effects of swings in sentiment on capital flows, as well as by assessing the extent to which structural policies may mitigate such sentiment-driven reversals. The basic estimation setup can be thought of as a refined regression of gross capital inflows as a share of total liabilities against changes in investor sentiment. While domestic economic developments may partly drive investor sentiment, only swings unrelated to domestic economic fundamentals are relevant in the context of financial contagion. One major contribution of this paper is to apply an instrumental variables technique that extracts the variation in investor perceptions that is attributable to external developments. This is achieved by using investors' perceptions of neighbouring countries and of the global situation as instrumental variables for investors' perceptions of the country of interest. Controlling for unobserved country heterogeneity by creditor-year and debtor-year fixed effects, the paper identifies the effect of exogenous shocks to investor perceptions on capital flows by applying a differences-in-differences methodology. For instance, a causal effect of a negative shock to investor perceptions is inferred if gross capital outflows to a creditor country holding a higher share of the considered debtor country's liabilities increase by more as a share of total liabilities of the debtor than outflows to a country holding a lower share of its liabilities.<sup>3</sup> Finally, this paper uses cross-country differences in the effect of exogenous swings in investor perceptions to assess which structural policies may shield countries against this "swings-in-sentiment" channel of financial contagion.

4. The empirical analysis finds evidence that investor sentiment is an important driver of capital flows: Fluctuations in investor sentiment resulting from external economic developments rather than from changes in countries' fundamentals are found to have resulted in sudden reversals of capital flows. The effect of negative and positive swings in investor sentiment appears to be quantitatively similar, suggesting that financial market sentiment is a driver of capital flows in times of both bonanza and crisis. Finally, certain structural policies appear to be associated with reduced sentiment-driven capital flows, including stricter banking supervision, more transparent financial markets, low entry barriers in banking, and advanced securities market regulation. By contrast, the empirical analysis in this paper does not find evidence that sentiment-driven capital flows are systematically related to measures of capital account openness.

5. The remainder of this paper is structured as follows. Section 1 describes in detail the construction of the exogenous investor sentiment variable and the differences-in-differences identification strategy. It further includes a brief description of the data used for the empirical implementation. Section 2 presents descriptive evidence on sudden changes in investor sentiment and associated capital flows. The main econometric results are reported in Section 3 while Section 4 presents a range of robustness checks.

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2. Sudden swings in sentiment do not necessarily indicate irrational behaviour of investors. When accurate information is costly to acquire, it may be rational to lump *a priori* similar countries together or to consider the emergence of financial stress in a specific country group as a signal to re-assess financial risk more generally (Moser, 2003).

3. This paper focuses on gross capital inflows, which following standard terminology, are defined as the net purchases of domestic assets by foreign residents (Broner *et al.*, 2012). In standard terminology, net capital inflows are defined as the difference of net purchases of domestic assets by foreign residents minus net purchases of foreign assets by domestic residents.

## 1. Methodology and Data

6. The econometric analysis assesses the effect of changes in investor sentiment on gross bilateral bank capital flows in a differences-in-differences setup. More specifically, gross bilateral bank capital inflows as a share of total bank liabilities are regressed on the interaction between sentiment shocks and bilateral bank integration, accounting for unobserved country-pair heterogeneity and for aggregate shocks to recipient- and sending-countries through fixed effects. The estimated coefficient on the interaction term measures by how much more investing countries which are financially more integrated with the recipient country react to sentiment shocks toward the recipient country than investing countries that are financially less integrated with the latter. Under the identification assumption that investing countries which are financially more integrated with the recipient country withdraw or invest larger shares of the recipient country's total liabilities in response to sentiment shocks than those that are financially less integrated, a positive estimated coefficient of the interaction term can then be interpreted as a causal effect of sentiment shocks on gross bank capital flows. Sentiment shocks are constructed from a survey of investor perceptions, using an instrumental variables technique to isolate shocks that are unrelated to changes in domestic fundamentals (see below).

7. The baseline estimated equation relates gross bilateral bank capital inflows as share of the recipient country's total bank liabilities to the interaction between bilateral financial integration and sentiment shocks in the recipient country:

$$\frac{Inflow_{ijt}}{TotLiab_{i,t-1}} = \beta(\omega_{ij} \times \Delta Sentiment_{it}) + \gamma_{ij} + \gamma_{it} + \gamma_{jt} + \varepsilon_{ijt}. \quad (1)$$

$Inflow_{ijt}/TotLiab_{i,t-1}$  is the gross bank capital inflow to country  $i$  from country  $j$  normalised by the total external bank liabilities of country  $i$  in year  $t$ ;  $\omega_{ij}$  is the share of country  $i$ 's total external bank liabilities held by country  $j$ ;  $\Delta Sentiment_{it}$  is the change in investor sentiment toward country  $i$  in period  $t$ , and  $\gamma_{ij}$ ,  $\gamma_{it}$  and  $\gamma_{jt}$  are country-pair, recipient-country-period and sending-country-period fixed effects, respectively.<sup>4</sup> The model is estimated at semi-annual frequency.<sup>5</sup>

8. Potential endogeneity issues resulting from the inclusion of  $\omega_{ij}$  in Equation (1) are addressed by computing external liability shares as three-year averages prior to the beginning of the estimation period. Using pre-sample averages for interaction variables is standard practice in differences-in-differences estimation setups (Rajan and Zingales, 1998). Endogeneity of the share of country  $i$ 's total external liabilities held by country  $j$  ( $\omega_{ij}$ ) arises mechanically because, in any given period  $t$ ,  $\omega_{ij}$  is a function of the inflows from country  $j$  to country  $i$ . To guard against this mechanical endogeneity of  $\omega_{ij}$ , the paper uses bilateral liability shares computed prior to the estimation sample. The further in the past  $\omega_{ij}$  is computed, the less precise it becomes as a measure of bilateral financial integration toward the end of the sample

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4. Extreme capital flow outliers in terms of previous periods' capital stocks are removed from the estimation sample. More specifically, a capital flow is considered an extreme outlier when a country's total foreign liabilities are withdrawn by a single creditor country in a single period, or when capital inflows from a single creditor country more than double a country's total foreign liabilities in a single period. Such extreme outliers account for less than 0.3% of the observations in the sample.

5. The capital flow data are available at a quarterly frequency, but the investor sentiment data are only available at a semi-annual frequency. Given the large volatility of investor sentiment, interpolating the investor sentiment data and estimating the model at a quarterly frequency would introduce substantial measurement error.



period. The paper therefore restricts the sample period to 1990-2009 and uses the average of the bilateral liability shares between 1985 and 1988 as measures of bilateral financial integration.<sup>6</sup>

9. Endogeneity may further arise from the simultaneous determination of capital flows and sentiment shocks or from reverse causality. Capital flows and sentiment shocks may be determined simultaneously as a result of changes in country fundamentals, such as unobserved productivity shocks. Reverse causality would arise if capital flows drive investor sentiment rather than the opposite. To deal with these issues and focus on shocks to investor sentiment unrelated to domestic economic developments, Equation (1) is estimated applying an instrumental variables (IV) technique.

10. The change in sentiment toward country  $i$  is instrumented by the average change in sentiment toward its five geographically most proximate neighbours and the average change in perceptions of the global situation.<sup>7</sup> In general, changes in fundamentals in a given country should not be a major driver of average investor sentiment toward its five geographically most proximate neighbours. Yet, the average change in sentiment toward the five geographically most proximate neighbours should be highly correlated with changes in country-specific investor sentiment as suggested by the literature documenting a strong regional component in financial contagion (Kaminsky and Reinhart, 2000). Indeed, the descriptive analysis in Section 2, especially Figure 3, shows that investors' perceptions of neighbouring countries and country-specific investor sentiment strongly co-move. Overidentification tests reported in Section 3 do not reject the null hypothesis of instrument exogeneity. Moreover, Section 4 shows that even when excluding large countries that may to some extent drive average investor sentiment toward their five geographically most proximate neighbours the estimated coefficients do not change significantly, suggesting that there is no issue of reverse causality. Therefore, the two key requirements for the instrumental variables strategy to be applicable – instrument strength and instrument validity – appear to be satisfied.

11. The basic estimation setup in Equation (1) can be adapted to test whether there is a different impact of negative and positive sentiment shocks on capital flows. This requires splitting the coefficient of interest into two parts. While threshold selection procedures for models with exogenous and endogenous explanatory variables are by now fairly common in the literature (Hansen, 2000; Hansen and Caner, 2004), methods to deal with endogenous thresholds have thus far not been developed. Therefore, the definition of a negative shock is based on a discretionary but intuitive threshold of the instrumental variables, relative to the sample median of changes in investor sentiment toward neighbours or at the global level. Unless otherwise stated, in the remainder of the paper a negative shock is defined as a decline in investor sentiment toward neighbours or at the global level. The estimating equation can then be written as:

$$\frac{Inflow_{ijt}}{TotLiab_{i,t-1}} = \sum_{k=0}^1 \beta^k (D_{it}^k \times \omega_{ij} \times \Delta Sentiment_{it}) + \gamma_{ij} + \gamma_{it} + \gamma_{jt} + \varepsilon_{ijt}, \quad (2)$$

where  $D^k$  are dummy variables indexing positive and negative shocks.

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6. Apart from introducing measurement error, using earlier periods for the computation of  $\omega_{ij}$  would result in the loss of bilateral country pairs, as information on bilateral capital stocks for a substantial number of countries only becomes available later in the sample period. In any case, Section 4 checks the robustness of the presented results to extending the sample period.

7. The average sentiment change toward neighbours is computed as the average change toward the five geographically most proximate countries among those that share a common border with the country of interest. If a country shares a common border with less than five countries – which is for instance the case of islands – geographical distance is retained as the only criterion. The average change in perceptions of the global situation is computed as the average change of sentiment toward all countries, excluding the country itself.

12. The basic estimation setup in Equation (2) can further be adapted to test whether the impact of sentiment shocks differs across countries with different structural policy setups. A particular focus of this paper is on the financial regulatory setup. For this purpose, a distinction is made between countries with above- and below-median scores on structural policy indicators. The estimating equation becomes:<sup>8</sup>

$$\frac{Inflow_{ijt}}{TotLiab_{i,t-1}} = \sum_{m=0}^1 \beta^m (S_{it}^m \times \omega_{ij} \times \Delta Sentiment_{it}) + \gamma_{ij} + \gamma_{it} + \gamma_{jt} + \varepsilon_{ijt}, \quad (3)$$

where  $S^m$  are dummy variables for above- and below-median scores. By creating dummy variables that split the sample four-ways into both the positive-negative shock and above-below median structural policy score dimensions, *i.e.* creating the interactions of the dummy variables in Equations (2) and (3), it is further possible to test whether differences in the impact of a sentiment shock across countries with different structural policy indicators depend on the shock being positive or negative. For instance, *a priori* it would be expected that a negative sentiment shock would have a smaller effect on capital flows in countries with capital outflow controls. However, no such association would be expected for positive sentiment shocks.

## 1.1 Data

- **Quarterly bilateral bank capital flow and stock data** come from the proprietary BIS Locational Banking Statistics, which include data on liabilities and exchange-rate adjusted changes in liabilities of banks located in BIS member countries *vis-à-vis* non-residents in more than 150 partner countries at a quarterly frequency since the end of 1977.<sup>9</sup> The paper focuses on exchange-rate adjusted changes in liabilities of these 150 partner countries toward banks in BIS reporting countries. Changes in liabilities measure the net purchases of domestic assets by foreign banks, *i.e.* gross capital inflows.<sup>10</sup> While the data mainly reflect inter-bank loans and deposits, they cover all types of assets and liabilities on banks' balance sheets, including portfolio equity and debt and FDI. Banks' international assets and liabilities cover a substantial part of aggregate international investment positions. Kalemlı-Ozcan *et al.* (2009), for instance, find that over the 1977-2006 period, banks accounted for around 60% of total international capital flows and positions.
- **Investor sentiment.** Since 1979, *Institutional Investor* magazine semi-annually asks economists and sovereign-risk analysts at leading global banks, money market funds and securities firms to rate the creditworthiness of a large number of countries on a scale from 0 to 100, with 100 representing no risk of default. As these ratings are survey-based and thus reflect the subjective assessment of analysts rather than directly observable country characteristics, they can be viewed as measures of investor sentiment. The main focus of this paper is on fluctuations in sentiment unrelated to observable country-specific developments. As the surveyed analysts also account for observable country characteristics in their subjective assessments, this paper isolates

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8. In practice, Equation (3) is estimated separately for the samples of countries with above-median and for those with below-median scores on structural policy indicators while constraining the country-year and bilateral fixed effects to be equal across samples. This allows the correlation between endogenous and instrumental variables to differ across the two samples.

9. On the reporter side, the Locational Banking Statistics obtained from the BIS includes information on bank assets and liabilities of the following countries: Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Indonesia, Ireland, Isle of Man, Italy, Japan, Luxembourg, Macao, the Netherlands, Panama, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

10. To some extent, changes in exchange-rate adjusted liabilities may measure domestic valuation changes. However, given that the BIS data mainly reflect inter-bank loans and deposits this is likely to be a minor issue.

the part of investor sentiment that is unrelated to observable country characteristics through the instrumental variables procedure described in Section 2.

- **Structural policy variables**

- **Financial reform.** Abiad *et al.* (2008) construct indicators of financial reform in seven areas over the period 1973-2005: credit controls and reserve requirements, interest rate controls, entry barriers, state ownership, policies on securities markets, banking regulations, and restrictions on the capital account. They further combine these indicators into an overall indicator of financial reform.
- **Financial transparency.** The survey-based level of financial disclosure requirements is based on various issues of the Global Competitiveness Report issued by the World Economic Forum.
- **Capital controls and exchange-rate regime.** The analysis relies primarily on the capital control measures of Brune (2006), who constructs disaggregated measures for inflows and outflows and for the different types of flows (portfolio, loans, FDI). The measures of Schindler (2009) and Quinn and Toyoda (2009) are used to check for robustness. The exchange-rate flexibility measure is based on the IMF official classification.
- **Other.** Income per capita and leverage in the financial sector – proxied by the ratio of bank assets to capital – are taken from the World Bank World Development Indicators. The bilateral distances used for the construction of the instrumental variable are taken from CEPII's distance database. Overall institutional development, which is used as a control variable in one of the robustness checks, is computed as the first standardised principal component of the following World Bank Governance Indicators (Kaufman *et al.*, 2010): government effectiveness, rule of law, control of corruption and regulatory quality. A measure of the overall business climate is constructed as the first standardised principal component of the following World Bank Doing Business Indicators: extent of disclosure, strength of investor protection, strength of legal rights, depth of credit information, contract enforcement, and recovery rate under bankruptcy. The government budget balance as a share of GDP is taken from the IMF World Economic Outlook database.

## 2. Descriptive Analysis

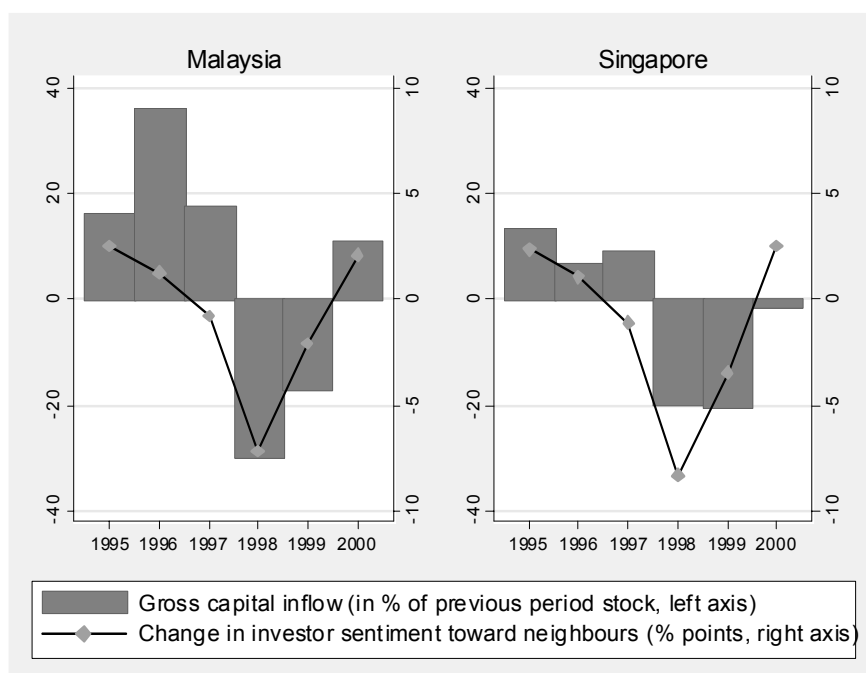
13. This section analyses the relationship of the main instrumental variable – investor sentiment toward neighbours – with capital flows as well as with country-specific investor sentiment. Investor sentiment toward neighbours is arguably independent of domestic fundamentals but may nonetheless be positively correlated with country-specific investor sentiment as suggested by empirical studies documenting a strong regional component of financial contagion (Kaminsky and Reinhart, 2000). Plausibility of the econometric approach requires investor sentiment toward neighbours to be positively correlated with country-specific capital outflows as well as with country-specific investor sentiment. For expositional purposes, it is focused on large negative changes in investor sentiment toward neighbours, either by looking at well-known episodes of financial contagion or by restricting the sample to the first fifth of the distribution of such changes.

### 2.1 Capital flows around sentiment shocks toward neighbours

14. During the Asian financial crisis of 1997-99, an episode of a large swing in investor sentiment, capital flows toward a given country were associated with changes in investor sentiment toward

neighbouring countries. This was illustrated by Malaysia and Singapore, which both experienced large capital outflows in 1998 and 1999 even though they were generally perceived as domestically and externally less imbalanced than other countries in the region (Kaminsky *et al.*, 2000) (Figure 1). At least partly, these outflows were related to a generalised deterioration in investors' perceptions of the region. Even Singapore, a country toward which investor sentiment hardly declined during the crisis, experienced significant capital withdrawals.

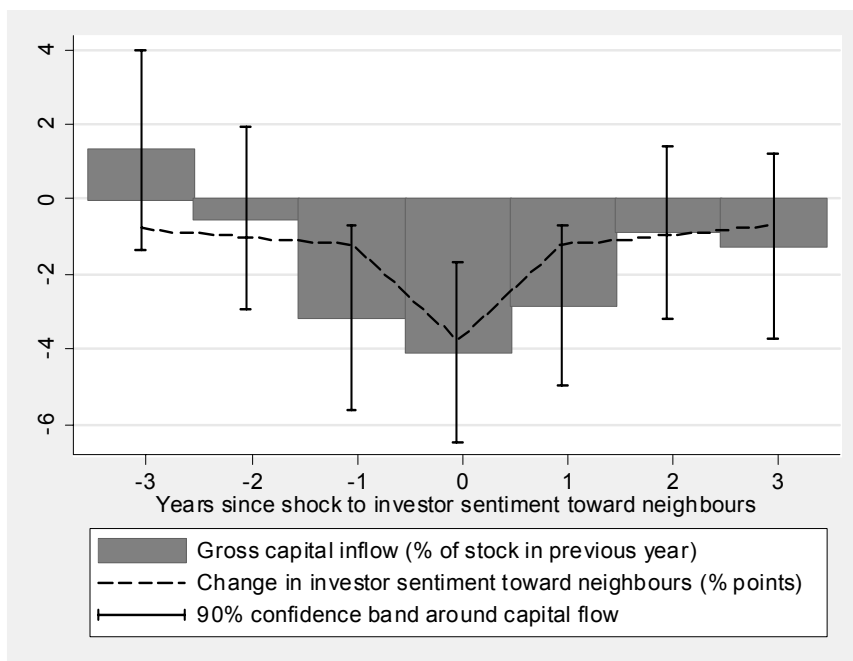
**Figure 1. Capital outflows were strongly related to developments in neighbouring countries during the Asian financial crisis of 1997-99**



Source: OECD calculations based on BIS and *Institutional Investor*.

15. More generally, episodes of large declines in investor sentiment toward a country's neighbours are associated with large capital outflows. Looking at the evolution of investor sentiment toward countries exposed to neighbours experiencing large sentiment declines (relative to those countries not exposed to such declines in sentiment toward their neighbours) is particularly illustrative in this respect. Figure 2 shows that large declines in investor sentiment toward neighbours are associated with large capital outflows for the country under consideration in the year of the shock. The bars in Figure 2 correspond to the estimated  $\alpha$  coefficients in the equation  $y_{itct} = \sum_{k=-3}^3 \alpha_k 1_{t=c+k} + \gamma_i + \delta_t + \varepsilon_{itct}$ , where  $y$  are capital flows to country  $i$  in year  $t$ ;  $c$  is the year of the adverse shock to investor sentiment toward neighbours;  $\gamma$  and  $\delta$  are, respectively, country- and year-fixed effects; and  $\varepsilon$  is the error term. The dashed line is obtained by a similar procedure.<sup>11</sup> As the negative shock to investor sentiment is preceded by a gradual decline, capital also starts to flow out in the years preceding the shock.

11. For presentational purposes, capital flows (as a share of previous periods' stocks) below the 5 percentile and above the 95 percentile are excluded in the construction of Figure 2.

**Figure 2. Large declines in investor sentiment toward neighbours are associated with capital outflows**

Note: The bars show capital flows for countries exposed to large declines in investor sentiment toward their five closest neighbours, relative to the evolution of capital flows in all other countries in the sample. The dashed line shows the evolution of investor sentiment toward neighbours experiencing such shocks relative to the neighbours of all other countries in the sample. Shocks are defined as below-first-quintile changes in investor sentiment toward neighbours, *i.e.* the first fifth of the distribution of changes in investor sentiment toward neighbours.

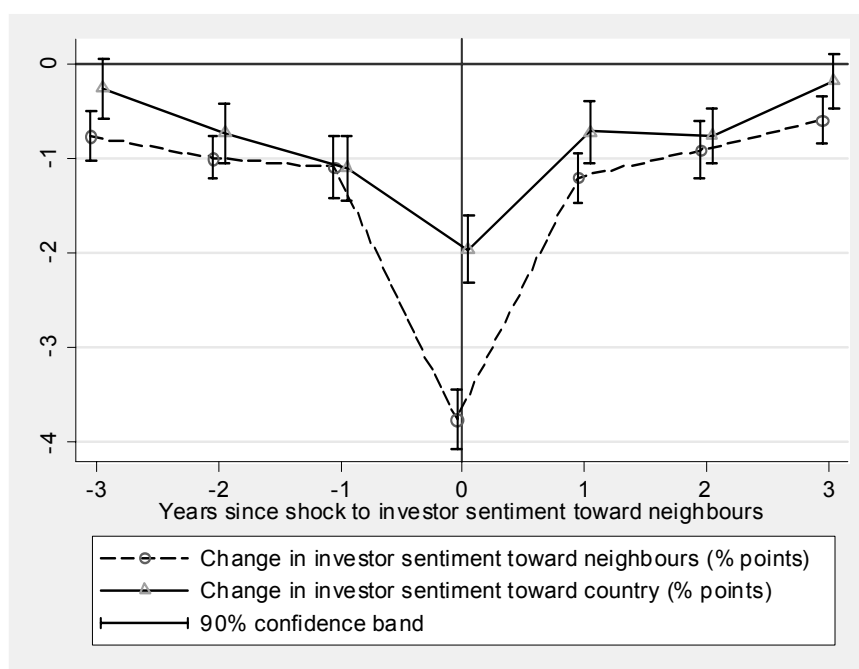
Source: OECD calculations based on BIS and *Institutional Investor*.

## 2.2 Co-movement between country-specific investor sentiment and investors' perceptions of neighbouring countries

16. Investor sentiment toward a given country and sentiment toward its neighbours co-move, which is a key requirement for the instrumental variables estimation strategy in Section 3. In particular, around large negative shocks to investors' perceptions of neighbouring countries, country-specific investor sentiment typically also declines (Figure 3).<sup>12</sup> The average decrease in country-specific investor sentiment of around two percentage points is coincident with a decline in investor sentiment toward neighbouring countries of around four percentage points on average. To put this into perspective, during the Asian financial crisis the countries neighbouring Singapore and Malaysia experienced a decline in investor sentiment of around seven percentage points (see Figure 1). While the decline in country-specific investor sentiment is particularly large in the year in which neighbouring countries experience the largest decline in investor perceptions, both neighbouring countries' and country-specific investor sentiment start to decline several years ahead.

12. The estimates of capital outflows around episodes of large declines in investor sentiment toward neighbours are based on a similar differences-in-differences procedure as described in the previous subsection.

**Figure 3. Investor sentiment toward a given country around shocks to investors' perceptions of neighbouring countries**



Note: The solid line shows the evolution of country-specific investor sentiment for countries exposed to large declines in investor sentiment toward their five closest neighbours relative to the evolution of investor sentiment toward all other countries in the sample. The dashed line shows the evolution of investor sentiment toward neighbours experiencing such shocks relative to the neighbours of all other countries in the sample. Shocks are defined as below-first-quintile changes in investor sentiment toward neighbours, *i.e.* the first fifth of the distribution of changes in investor sentiment toward neighbours.

Source: OECD calculations based on *Institutional Investor*.

17. The co-movement between country-specific investor sentiment and investors' perception of neighbouring countries in Figure 3 does not necessarily indicate that investor sentiment toward neighbours causes country-specific investor sentiment, so that more sophisticated econometric analysis is needed to assess causality. There could be co-movement without causality if common regional shocks drive both country-specific investor sentiment and sentiment toward neighbours. Systematic correlation of changes in economic fundamentals could also result in co-movement without causality.<sup>13</sup> Reverse causation would arise if the specific country under consideration drives investor sentiment toward its neighbours.<sup>14</sup>

18. The precise constellation of country-specific investor sentiment and sentiment toward neighbours in Figure 3 is, however, difficult to reconcile with the view that co-movement between the two variables merely reflects common shocks or reverse causation. If common shocks were indeed the main drivers of investor sentiment toward a given country and sentiment toward its neighbours, changes in the two variables in Figure 3 would be expected to be quantitatively similar, which is clearly not the case. In any

13. Yet, there generally remains sufficient variation in the precise timing of changes in economic fundamentals even across neighbouring countries to suggest that this is econometrically a minor issue. Housing market developments in the run-up and during the global financial crisis of 2008-09 are a case in point. While some countries experienced a housing boom and subsequent bust, there was considerable variation in housing market developments, even among neighbouring countries. Similarly, there is generally considerable cross-country variation in the precise timing of productivity shocks.

14. Section 4 will look into this issue and show that the econometric results are robust to dropping countries that are large relative to their neighbours.

case, the econometric analysis presented in Section 3 accounts for common regional or global shocks by including creditor- and debtor-year fixed effects. Alternatively, if country-specific developments were driving investor perceptions of neighbours, changes in country-specific investor sentiment would be expected to be quantitatively larger than changes in neighbours' perceptions, as only a fraction of the former should be passed onto the latter. By contrast, Figure 3 shows that changes in perceptions of neighbours are quantitatively larger and only partly passed through to domestic perceptions.<sup>15</sup> In any case, the econometric analysis presented in Sections 3 and 4 shows that overidentification tests do not reject the hypothesis of instrument exogeneity, and that excluding large countries – which should drive perceptions towards neighbours more than small countries – does not significantly change the estimated coefficients.

19. Overall, the descriptive evidence suggests that the mechanisms emphasised in the econometric analysis are indeed at work. Shocks to investors' perceptions of a country's neighbours spill over to investor perceptions of the country and – even when such spillovers are weak – investors appear to base their capital allocation decisions in part on perceptions of neighbouring countries.

### 3. Econometric Analysis

20. This section estimates the baseline econometric model described above, both for the full sample and restricting the sample to negative investor sentiment shocks. The model is then modified to assess whether the effect of investor sentiment shocks varies across countries with different structural policy settings.

#### 3.1 Baseline estimation

21. The econometric analysis shows that capital flows strongly respond to sentiment shocks. The estimated positive coefficient on the sentiment-shock variable reported in Column (1) of Table 1 implies that improvements in sentiment lead to capital inflows while deteriorations lead to outflows. As outlined in Sections 1 and 2, sentiment shocks are constructed such that they are exogenous to the economic fundamentals of the country under consideration and – at least partly – reflect sentiment spillovers from neighbours. The reported P-value of the Hansen J-statistic – a simple test of instrument validity using over-identifying restrictions – confirms that the null hypothesis of instrument exogeneity cannot be rejected. In this sense, Column 1 of Table 1 may be interpreted as evidence for sentiment-driven financial contagion. The estimated coefficient of around one implies that in response to a decline in sentiment of 10 points (on *Institutional Investor's* 0-100 scale) investors would withdraw 10% of their holdings. The size of this effect is roughly in line with the descriptive evidence on the response of capital flows to sudden and large reversals in investor sentiment presented in Section 2 (see Figure 2).

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15. A regression of country-specific changes in investor sentiment on changes in sentiment toward neighbours shows that a one-percentage-point decline in investor sentiment toward neighbours is generally passed through to a 0.3 percentage point decline in country-specific investor sentiment.

**Table 1. Sentiment shocks and capital flows**  
1990-2009

Dependent variable	(1)	(2)	(3)	(3)
	Capital flow			
Estimation method	Instrumental variables			
Sample	Full	Negative shock (Neighbours or global)	Negative shock (Neighbours)	Negative shock (Global)
Shock	<b>1.08***</b> (0.362)	<b>1.03**</b> (0.466)	<b>0.929**</b> (0.451)	<b>1.1**</b> (0.510)
Observations	75299	48079	37605	37411
Hansen J-statistic	0.00	0.34	0.82	0.84
P-value	0.96	0.56	0.36	0.36
Fixed effects	Recipient-country-year Sending-country-year Pair	Recipient-country-year Sending-country-year Pair	Recipient-country-year Sending-country-year Pair	Recipient-country-year Sending-country-year Pair

Note: Shock denotes the interaction between bilateral financial exposure and change in investor sentiment (coefficient  $\beta$  in equation 1 above). The reported coefficients are estimated by instrumental variables. Standard errors clustered at recipient-country level, with \*\*\* indicating significance at 1%, \*\* at 5% and \* at 10%.

Source: OECD calculations.

22. Columns (2)-(4) report the estimated coefficients when the sample is restricted to negative sentiment shocks.<sup>16</sup> In Column (2) a negative shock is defined as a decline in investor sentiment toward neighbours or at the global level.<sup>17</sup> The estimated coefficient is statistically indistinguishable from the overall coefficient. In Column (3) a negative shock is defined as a decline in investor sentiment toward neighbours irrespective of the evolution of global investor sentiment, while in Column (4) it is defined as a negative shock to global investor sentiment irrespective of the evolution in neighbouring countries. In both cases, the estimated coefficients are statistically indistinguishable from the coefficient estimated for the full sample. As the coefficient for the full sample is estimated more precisely, the remainder of the paper mainly focuses on results for the full sample. When the focus is on negative shocks the definition in Column (2) of Table 1 is used.

### 3.2 The role of institutions

23. This section analyses whether the effect of sudden reversals in sentiment on capital flows depends on structural policy settings in the recipient country. Specifically, it is examined how the effect varies with banking supervision, entry barriers in banking, security market regulation, financial market transparency, capital controls and the exchange rate regime. The econometric framework described in Section 1 allows the estimation of separate coefficients for sentiment shocks at high and low levels of the structural policy indicators.<sup>18</sup> As the structural policy indicators are introduced one at a time and the included indicators may be correlated with those that are omitted, the coefficients can, strictly speaking, not be interpreted as causal effects. However, it should be noted that the association between sentiment-driven capital flows and the detailed country characteristics analysed below are independent of the overall

16. The estimated fixed effects are restricted to be the same across samples. In this sense, the coefficients in Columns (2)-(4) in Table 1 correspond to the estimation of Equation (2), with the dummy variable for negative sentiment shocks taking a value of one.

17. All changes in investor sentiment in this paper are defined relative to the sample median.

18. Except for the exchange-rate regime, countries with a structural policy indicator above the median are assigned to the high-indicator group while the remainder is assigned to the low-indicator group. In the case of the exchange-rate regime, countries with no separate legal tender or a pre-announced peg or currency board arrangement are assigned to the low-indicator group while the remainder is assigned to the high-indicator group.



level of economic or institutional development.<sup>19</sup> Moreover, the sample correlations between the financial sector related structural policies are not excessively large (around 0.5), suggesting that the different variables indeed measure different dimensions of financial sector related policies. Although the empirical setup does not allow attributing differences in the effect of sentiment shocks to one specific structural policy, it is nevertheless likely that improving several structural policy settings that are found to be significant would reduce the effect of sentiment shocks on capital flows, all else equal.

24. There is evidence that the financial regulatory setup can mitigate the impact of sentiment-driven shocks on capital flows. Column (1) of Table 2 shows that the impact of sentiment-driven shocks is lower in countries with strict banking supervision and prudential regulations. Given the construction of the banking supervision indicator in Abiad *et al.* (2008), this may be due to banking supervisors being less tolerant of risky assets on banks' balance sheets, a higher degree of independence of the supervisory agency or broad coverage of institutions under supervisory oversight. This may reduce the riskiness of banks' balance sheets, thereby reducing the sensitivity of capital flows to external shocks. Moreover, Column (2) of Table 2 suggests that sentiment-driven shocks have larger effects in countries with strict bank entry regulation. In countries not restricting the entry of foreign banks, cross-border capital flows are likely to be intermediated to a large degree through branches or subsidiaries of foreign banks, which due to their superior local information-gathering capabilities may be less subject to sudden reversals of sentiment compared to foreign investors without a local presence. By contrast, in countries with strict entry regulation, international capital flows may reflect direct cross-border loans by banks located abroad to local firms and financial institutions. Finally, advanced securities market regulation, including measures to develop a domestic bond market and the authorisation of foreign equity market investments, are associated with a weaker impact of sentiment-driven shocks on capital flows (Column 3). This may be explained by the substitution of relatively less volatile bond and equity flows for more volatile bank flows in countries taking regulatory measures to develop their securities markets.

25. Enhanced financial market transparency is also associated with reduced sentiment-driven reversals in capital flows. Column (4) of Table 2 shows that countries ranking above the median on the World Economic Forum measure of financial market transparency generally do not suffer sentiment-driven reversals of capital flows. As investors in such countries dispose of all relevant financial information at a low cost, they are less liable to base their country assessments on external developments. By contrast, the effect of reversals in sentiment on capital flows appears to be unrelated to the level of capital account openness and the exchange rate regime.<sup>20</sup> One explanation for the former result could be that investors may be able to circumvent capital account restrictions. The role of the exchange-rate regime may be different for positive and negative investor-sentiment shocks (see below).

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19. The effect of sentiment shocks does not vary across countries with different income per capita levels or with different institutional quality as measured by the first principal component of World Bank Governance Indicators (see Table 4).

20. Similar results as in Column (5) are obtained when the capital account openness measures of Schindler (2009) or Quinn and Toyoda (2009) are used instead of Brune's (2006). Using the exchange-rate flexibility measure of Levy-Yeyati and Sturzenegger (2005) instead of Ilzetzki *et al.* (2011) does not change the results in Column (6). These results are available from the authors upon request.

**Table 2. Structural policies and investor sentiment shocks**  
1990-2009

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Gross capital inflow					
Estimation method	Instrumental variables					
Structural policy indicator	Strength of bank supervision	Restrictiveness of entry barriers in banking	Development of security market regulation	Degree of financial market transparency	Capital account openness <sup>1</sup>	Flexibility of exchange-rate regime <sup>2</sup>
Difference in coefficients (High - Low)	<b>-1.34*</b>	<b>-2.06***</b>	<b>-1.02*</b>	<b>-1.62**</b>	-0.01	-0.17
Shock x High value of indicator	0.43 (0.393)	0.378 (0.449)	0.309 (0.275)	0.352 (0.490)	<b>1.36***</b> (0.450)	<b>1.06**</b> (0.523)
Shock x Low value of indicator	<b>1.77***</b> (0.640)	<b>2.44***</b> (0.588)	<b>1.33**</b> (0.554)	<b>1.97***</b> (0.501)	<b>1.37**</b> (0.652)	<b>1.23**</b> (0.579)
Observations	49758	49758	49758	35802	65797	65891

*Note:* Shock denotes the interaction between bilateral financial exposure and change in investor sentiment (coefficient  $\beta^2$  in equation 3 above). The reported coefficients are estimated by instrumental variables including recipient- and sending-country-year-fixed effects and country-pair-fixed effects. Standard errors clustered at recipient-country level, with \*\*\* indicating significance at 1%, \*\* at 5% and \* at 10%.

1. Capital account openness measure based on Brune (2006).
2. Exchange-rate flexibility measure based on IMF official classification.

*Source:* OECD calculations.

26. The role of structural policies does not appear to differ depending on whether investor sentiment improves or deteriorates.<sup>21</sup> In principle, it would be conceivable that some structural policy settings have different effects on capital outflows than on capital inflows. For instance, capital inflow restrictions may dampen capital inflows in response to a positive sentiment shock, but have little bearing on capital outflows when investor sentiment suddenly turns against the recipient country. However, with the partial exception of the exchange rate regime indicator, for the structural policy indicators analysed in this section, this does not appear to be the case. The estimated difference in coefficients between countries with high and low values of the structural policy indicators is generally the same for negative shocks as for the overall sentiment shocks (Table 3, Columns 1-5). The coefficient on the sentiment shock for countries with a rigid exchange rate regime increases when only negative shocks are considered (Table 3, Column 6). The reason why a rigid exchange rate regime only seems to have a magnifying effect on capital flows in case of a negative sentiment shock is that investors may consider a central bank less able to defend an exchange rate peg in the event of capital outflows than when faced with strong capital inflows (reflecting the asymmetric role of currency reserves).

21. In Table 3, a negative shock is defined as decline in investor sentiment toward neighbours or a decline in global sentiment. This corresponds to the definition of a negative shock in Column (2) of Table 1.

**Table 3. Structural policies and negative investor sentiment shocks**  
1990-2009

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Gross capital inflow					
Estimation method	Instrumental variables					
Structural policy indicator	Strength of bank supervision	Restrictiveness of entry barriers	Development of security market regulation	Degree of financial market transparency	Capital account openness	Flexibility of exchange-rate regime
Difference in coefficients (High - Low)	<b>-1.58*</b>	<b>-2.14**</b>	<b>-1.12*</b>	<b>-1.26*</b>	-0.92	<b>-1.62*</b>
Shock x High structural policy indicator	0.15 (0.487)	0.13 (0.463)	0.05 (0.269)	0.35 (0.472)	<b>0.97**</b> (0.465)	0.33 (0.598)
Shock x Low structural policy indicator	<b>1.73**</b> (0.756)	<b>2.27***</b> (0.796)	<b>1.17*</b> (0.626)	<b>1.62***</b> (0.486)	<b>1.89**</b> (0.819)	<b>1.95**</b> (0.784)
Observations	31796	31796	31796	22885	42045	41968

Note: Shock denotes the interaction between bilateral financial exposure and change in investor sentiment (coefficient  $\beta^2$  in equation 3 above). The reported coefficients are estimated by instrumental variables including recipient- and sending-country-year-fixed effects and country-pair-fixed effects. Standard errors clustered at recipient-country level, with \*\*\* indicating significance at 1%, \*\* at 5% and \* at 10%.

1. Capital account openness measure based on Brune (2006).
2. Exchange-rate flexibility measure based on IMF official classification.

Source: OECD calculations.

### 3.3 Other country characteristics

27. Broad country characteristics unrelated to financial sector policies but which measure the stage of economic development or overall institutional quality do not appear to mitigate the effect of investor-sentiment shocks on capital flows. This suggests that sentiment-driven capital flows are specifically related to the financial-sector structural policies analysed in Table 2 rather than the broad country characteristics analysed in Column (1) of Table 4 shows that the effect of sentiment shocks is not different across high- and lower-income countries. Similarly, there is no statistically significant difference between countries with high institutional quality, as measured by the first standardised principal component of World Bank Governance Indicators, and those with lower-quality institutions (Column 2). Likewise, the overall degree of financial reform, as measured by the aggregate financial reform indicator of Abiad *et al.* (2008), is not systematically related to the effect of sentiment reversals on capital flows (Column 3). This suggests that the weaker effect of sentiment shocks in countries with stricter bank and securities market regulation and with looser entry restrictions indeed captures these disaggregated dimensions of financial reform rather than broad financial market “liberalisation”. Column (4) shows that the overall business climate, as measured by the first standardised principal component of World Bank Doing Business Indicators including measures of transparency and creditor protection, is not associated with capital flows driven by sentiment reversals. Finally, Columns (5) and (6) show that the overall government budget balance or financial sector leverage do not appear to matter for sentiment-driven capital flows.

**Table 4. The role of other country characteristics in mitigating investor sentiment shocks**

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Gross capital inflow					
Estimation method	Instrumental variables					
Structural policy indicator	Income per capita	Overall institutional quality	Overall financial reform	Overall business climate	Government balance	Leverage financial sector
Difference in coefficients (High - Low)	0.91	0.47	-0.54	0.79	-0.62	-0.51
Shock x High structural policy indicator	<b>1.3***</b> (0.423)	<b>1.26***</b> (0.487)	<b>0.69**</b> (0.274)	<b>1.33***</b> (0.494)	0.66 (0.836)	<b>0.843**</b> (0.397)
Shock x Low structural policy indicator	0.39 (0.602)	0.79 (0.531)	<b>1.23*</b> (0.666)	0.54 (0.551)	<b>1.28*</b> (0.658)	<b>1.35**</b> (0.598)
Observations	71363	75299	49758	71727	27595	50535

Note: Shock denotes the interaction between bilateral financial exposure and change in investor sentiment (coefficient  $\beta^2$  in equation 3 above). The reported coefficients are estimated by instrumental variables including recipient- and sending-country-year-fixed effects and country-pair-fixed effects. Standard errors clustered at recipient-country level, with \*\*\* indicating significance at 1%, \*\* at 5% and \* at 10%.

1. Capital account openness measure based on Brune (2006).
2. Exchange-rate flexibility measure based on IMF official classification.

Source: OECD calculations.

## 4. Robustness Checks

### 4.1 Exclusion of large countries

28. The results are similar to those in the baseline specification when countries that are large relative to their neighbours are excluded from the sample. As discussed in Sections 2 and 3, economic developments in large countries may drive investor sentiment toward their neighbours. For instance, a negative shock to economic fundamentals in a large country may induce investors to revise their assessments of neighbouring countries. This would preclude the use of investor sentiment toward neighbours as an exogenous instrumental variable. Even though the instrument validity tests reported in Table 1 suggest that this is econometrically a minor issue, Table 5 reports the results of estimations excluding the ten largest countries (relative to their neighbours) in the sample.<sup>22</sup> The estimated coefficients are similar to those for the full sample (see Table 2). The only noticeable difference is that the P-value for the difference in the estimated coefficient for countries with above- and below-median development of securities market regulation becomes now borderline insignificant at the 10% level. However, as the difference in the estimated coefficient for countries with above- and below-median development of securities market regulation is almost the same as in Table 2, this is likely to reflect the loss in estimation efficiency due to the reduction in sample size rather than an endogeneity problem.

22. The ten countries with the largest GDP relative to their neighbours are (in decreasing order): South Africa, United States, Russia, Nigeria, Japan, India, Germany, China, Brazil and Australia.

**Table 5. The results are robust to excluding countries that are large relative to their neighbours**

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Gross capital inflow					
Estimation method	Instrumental variables					
Structural policy indicator	Strength of bank supervision	Restrictiveness of entry barriers in banking	Development of security market regulation	Degree of financial market transparency	Capital account openness <sup>1</sup>	Flexibility of exchange-rate regime <sup>2</sup>
Difference in coefficients (High - Low)	<b>-1.47**</b>	<b>-2.52***</b>	-1.03	<b>-1.37*</b>	-0.06	-0.23
Shock x High value of indicator	0.431 (0.449)	0.381 (0.473)	0.382 (0.284)	0.731 (0.528)	<b>1.4***</b> (0.467)	<b>1.09**</b> (0.510)
Shock x Low value of indicator	<b>1.9***</b> (0.641)	<b>2.9***</b> (0.635)	<b>1.41**</b> (0.599)	<b>2.1***</b> (0.570)	<b>1.46**</b> (0.688)	<b>1.32**</b> (0.654)
Observations	43828	43828	43828	30507	60463	59961

Note: Shock denotes the interaction between bilateral financial exposure and change in investor sentiment (coefficient  $\beta^2$  in equation 3 above). The reported coefficients are estimated by instrumental variables including recipient- and sending-country-year-fixed effects and country-pair-fixed effects. Standard errors clustered at recipient-country level, with \*\*\* indicating significance at 1%, \*\* at 5% and \* at 10%.

1. Capital account openness measure based on Brune (2006).
2. Exchange-rate flexibility measure based on IMF official classification.

Source: OECD calculations.

#### 4.2 Different sample period

29. The key results on structural policies do not change when the sample is extended to include observations from the 1980s. The 1990-2009 sample period for the baseline estimations was chosen to limit measurement error in bilateral financial integration, which needs to be computed prior to the estimation sample to avoid endogeneity bias stemming from the simultaneous determination of bilateral capital stocks and flows. Bilateral capital stocks computed very far in the past are imprecise measures of bilateral financial integration toward the end of the sample, which may bias the estimated coefficients toward zero and result in a loss of estimation efficiency. Table 6 nonetheless reports the results from estimating the model over the period 1985-2009, with bilateral financial integration computed using bilateral capital stocks from the period 1980-83. The estimated coefficients are similar to those in Table 2, except that the difference in the estimated coefficients for countries with above- and below-median strength of banking supervision is no longer significant at the 10% level. However, given that the estimated coefficients decrease in both the strong- and weak-supervision samples and the standard deviation increases, this is likely to reflect higher measurement error in the bilateral financial integration variable rather than a smaller “true” coefficient.

**Table 6. The results are robust to changing the sample period**

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Capital flow					
Estimation method	Instrumental variables					
Structural policy indicator	Strength of bank supervision	Restrictiveness of entry barriers in banking	Development of security market regulation	Degree of financial market transparency	Capital account openness <sup>1</sup>	Flexibility of exchange-rate regime <sup>2</sup>
Difference in coefficients (High - Low)	-1.17	<b>-2.18***</b>	<b>-1.67**</b>	<b>-2.15**</b>	-0.81	-0.02
Shock x High value of indicator	0.42 (0.424)	0.37 (0.495)	-0.06 (0.375)	-0.12 (0.715)	<b>1.27**</b> (0.520)	<b>1.24**</b> (0.489)
Shock x Low value of indicator	<b>1.59**</b> (0.686)	<b>2.56***</b> (0.661)	<b>1.61***</b> (0.615)	<b>2.03***</b> (0.572)	<b>2.08**</b> (0.887)	<b>1.26*</b> (0.674)
Observations	51452	51452	51452	37473	67577	65525

Note: Shock denotes the interaction between bilateral financial exposure and change in investor sentiment (coefficient  $\beta^2$  in equation 3 above). The reported coefficients are estimated by instrumental variables including recipient- and sending-country-year-fixed effects and country-pair-fixed effects. Standard errors clustered at recipient-country level, with \*\*\* indicating significance at 1%, \*\* at 5% and \* at 10%.

1. Capital account openness measure based on Brune (2006).
2. Exchange-rate flexibility measure based on IMF official classification.

Source: OECD calculations.

## Conclusion

30. This paper constructs a measure of investor sentiment that is independent of countries' domestic to assess the impact of swings in investor sentiment on bank capital flows. In a differences-in-differences setup which uses the bilateral dimension of proprietary BIS data for the identification of the effect of interest, strong support is found for the view that sudden reversals in sentiment partly drive capital flows.

31. Financial market policies, such as strict bank supervision or a high degree of financial transparency, can shield countries against sudden swings in sentiment. This is consistent with the view that strengthening regulations that enhance the stability of capital flows may be particularly useful when the propagation of financial crises is in good part driven by international investors' portfolio rebalancing. In fact, policies that may be useful to limit financial fragility deriving from common shocks to fundamentals or transmission through trade linkages, such as strengthening economic resilience by improving macroeconomic policy frameworks, as well as product and labour market regulation, are found to be of limited use when the economy is hit by investor sentiment shocks.

## REFERENCES

- Abiad, A., E. Detragiache and T. Tressel (2008), “A New Database of Financial Reforms”, *IMF Working Paper* 08/266.
- Ahrend, R. and A. Goujard (2011), “Drivers of Systemic Banking Crises: The Role of Bank-Balance-Sheet Contagion and Financial Account Structure”, *OECD Economics Department Working Papers*, No. 902, OECD Publishing.
- Broner, F., T. Didier, A. Erce, S. Schmukler (2011), “Gross Capital Flows: Dynamics and Crises”, *Journal of Monetary Economics* 60(1), forthcoming.
- Brune, N. (2006), “Financial Liberalization and Governance in the Developing World”, unpublished Ph.D. dissertation, Yale University.
- Duval, R. and L. Vogel (2008), “Economic Resilience to Shocks: The Role of Structural Policies”, *OECD Journal: Economic Studies* 44(1): 1-38.
- Eichengreen, B., A. Rose and C. Wyplosz (1996), “Contagious Currency Crises”, *Scandinavian Economic Review* 98: 463-84.
- Glick, R. and A. Rose (1999), “Contagion and Trade: Why are Currency Crises Regional?”, *Journal of International Money and Finance* 18 (4): 603–617.
- Hansen, B. (2000), “Sample Splitting and Threshold Estimation” *Econometrica* 68: 575-603.
- Hansen, B. and M. Caner (2004), “Instrumental Variable Estimation of a Threshold Model”, *Econometric Theory* 20, 813-843
- Kalemli-Ozcan, S., E. Papaioannou and J. L. Peydro (2009), “Financial Regulation, Financial Globalization and the Synchronization of Economic Activity”, *NBER Working Paper* No. 14887.
- Kaminsky, G. and C. Reinhart (2000), “On Crises, Contagion, and Confusion”, *Journal of International Economics* 51: 145-68.
- Kaminsky, G., C. Reinhart and C. Vegh (2003), “The Unholy Trinity of Financial Contagion”, *Journal of Economic Perspectives* 17(4): 51-74.
- Kaminsky, G., R. Lyons, S. Schmukler (2000) “Economic Fragility, Liquidity, and Risk: The Behavior of Mutual Funds during Crises”, mimeograph
- Kaufmann, D., A. Kraay and M. Mastruzzi (2010), “The Worldwide Governance Indicators : A Summary of Methodology, Data and Analytical Issues”, World Bank Policy Research.
- Moser, T. (2003), “What is International Financial Contagion?” *International Finance* 6(2): 157-178.
- Rajan, R. and L. Zingales (1998), “Financial Dependence and Growth”, *American Economic Review* 88: 559-586.
- Quinn, D. and A. Toyoda (2008) “Does Capital Account Liberalization Lead to Economic Growth?” *Review of Financial Studies* 21(3): 1403-1449.
- Schindler, M. (2009), “Measuring Financial Integration: A New Dataset”, *IMF Staff Papers* 56(1): 222-238.
- Van Rijckeghem, C. And B. Weder (2001), “Sources of Contagion: Is it Finance or Trade?” *Journal of International Economics* 54: 293-308.

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