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Bilateral Data on Capital Flows: Role in Financial Stability Monitoring

Kevin Cowan
Central Bank of Chile

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Kevin Cowan(*)

(*) this presentation does not represent the official view of the Central Bank of Chile or its Governors.



Introduction

- There is substantial evidence that the demand by non residents for EME assets is volatile, and depends on “push” factors that are unrelated to the marginal productivity of the host economy.
- The concern is that increased demand for these assets leads to:
 - higher prices of EMEs assets...
 - ... and increased issuance of these assets, which can be associated with a current account (CA) deficit, since assets finance consumption, investment and government spending.
- When demand falls this can have significant costs in EMEs:
 - Price adjustments can generate financial distress when accompanied by leverage,
 - costly macro adjustment (as in Calvo et al 2004) and a long literature on the costs of CA adjustments (Edwards 2004).



The role of bilateral data sources

- Understanding the determinants of “surges” and “stops” in different types of capital flows, and then monitoring their evolution, are both important components for financial stability analysis in financially integrated EMEs.
- In this context, the purpose of this presentation is:
 - To evaluate the extent to which global **bilateral** databases are useful for financial stability analysis.
 - Assess directions of new data initiatives and availability to improve this analysis.
- Focus on portfolio and debt inflows, given the relative stability of FDI flows (Levchenko and Mauro 2006, Milesi-Ferretti and Tille 2011).



Outline

- Some stylized facts on gross capital flows
- Cross border bank lending
- Portfolio flows
- Concluding remarks

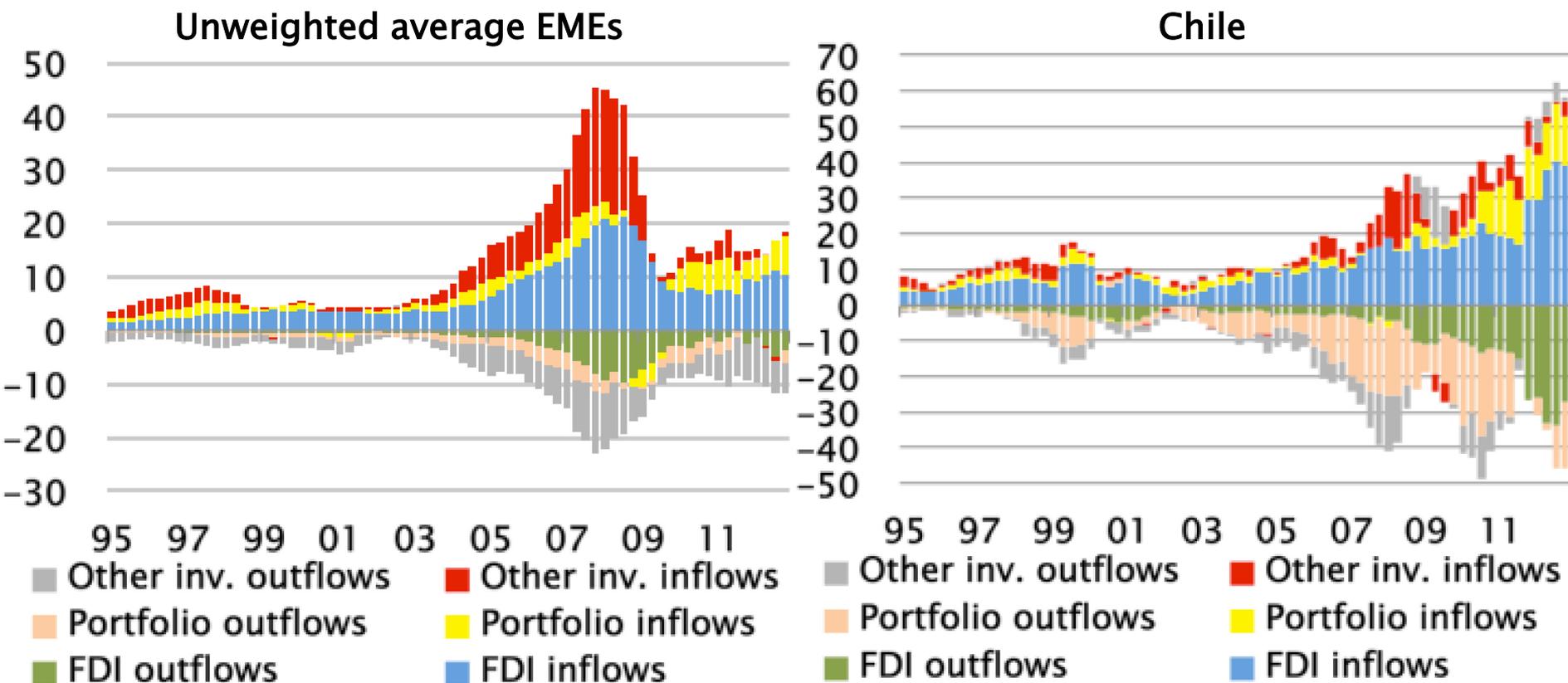


Stylized Facts on Gross Capital Flows



Global Patterns in Capital Flows to EMEs

Gross capital inflows and outflows
(percent of 2000 GDP)

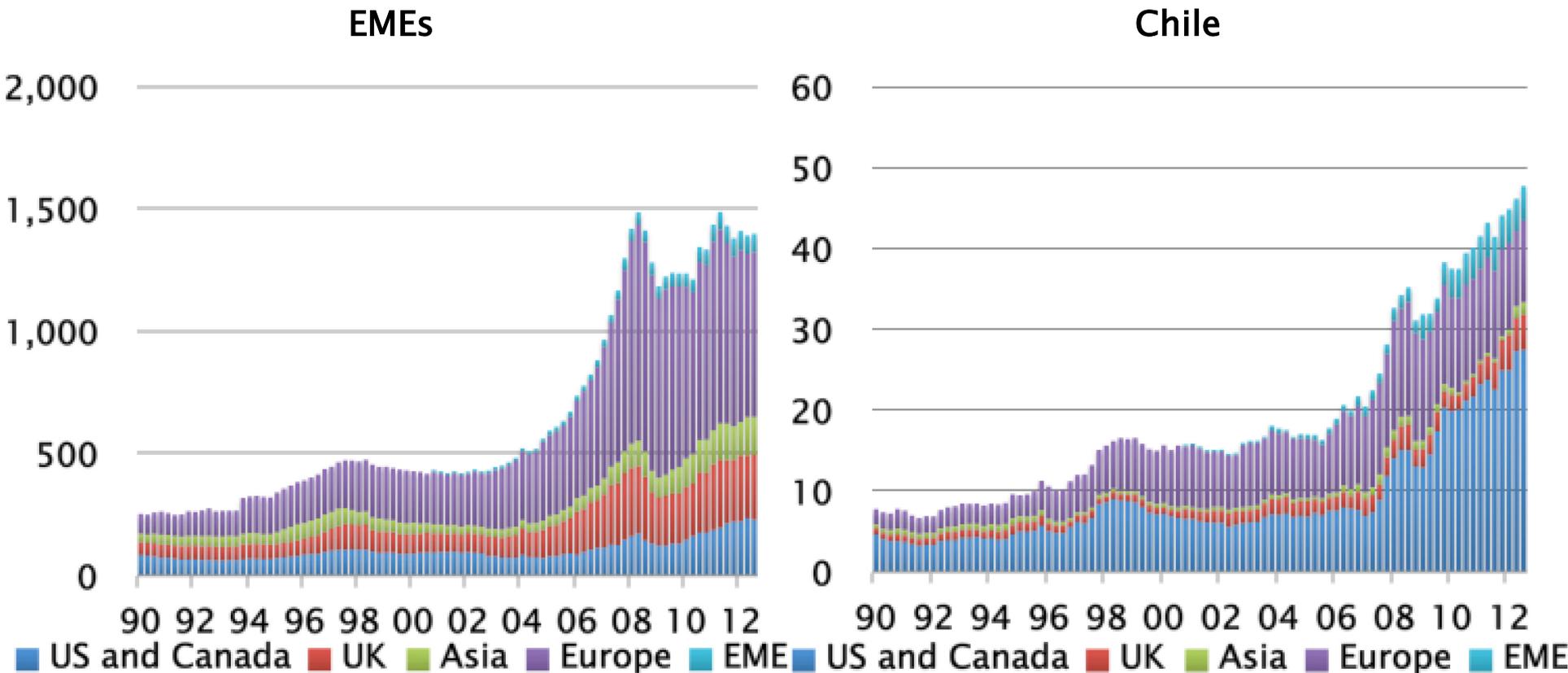


Source: authors calculations based on IMF data.



The growth in Cross Border Bank Lending to EMEs

Foreign claims by reporting areas
(billions of US dollars)



Source: BIS locational statistics



Cross Border Bank Lending



A selective survey of the literature

- Earlier literature looked at push pull factors for different types of capital flows, including cross border debt. Used BoP data and aggregate measures of global conditions. (Fernandez-Arias, 1996; Hernández et al, 2001)
- Later literature explored bilateral flows (using BIS data) – which allowed more detailed information on home country macro conditions or the average conditions of banks in the home country.
- Key assumption: imperfect substitution between banks...makes home/bank variables relevant.
- Does this disaggregated information add value to the traditional balance of payment and stock flows? **The evidence is a clear yes.**



What do we know? Determinants of Bilateral Cross Border Bank Flows

- World Bank (2008) with BIS data on foreign bank claims for 124 emerging economies finds that **deterioration in interbank liquidity** reduces lending to emerging markets.
- Cetorelli and Goldberg (2011) find a similar result using BIS data and exposure to **dollar funding liquidity risk**.
- McGuire and Tarashev (2008) find a significant long term relationship between the dynamics of cross border banking claims, and **funding conditions + bank solvency**.
- Herrmann and Mihaljek (2010) find that greater geographical distance reduces cross border loans to emerging economies.
- Muller and Uhde (2013) confirm this result, and find that in addition **bank solvency, home market concentration and regulatory environment**, are significant drivers of cross border bank flows.



Determinants of Bilateral Cross Border Bank Flows (cont.)

- Note that most previous papers introduce controls for **macro economic conditions** in home host countries (see also Buck et al 2010).
- This data has also allowed for estimates of **contagion via bank lending**. (Van Rijckeghem and Weder (2000 and 2001); Martinez et al 2005, Opazo Silva 2007).
- Note that because of data availability for cross border lending, these these papers include country level summary stats of **bank level data**: solvency, provisions, common exposures.
- One exception (De Haas and Van Horen (2012)) **confirms the importance of bank specific variables**. Use micro-data of syndicated loans from 75 banks to 59 countries: bank-specific shocks ended up being transmitted across borders. Banks that were particularly shocked in the crisis restricted their lending, especially to small borrowers



Additional evidence on the role of bank variables: Chilean micro data

- Aggregate funding conditions in home market affect cross border lending (McGuire et al 2008)
- Use individual loan data to analyze at bank level.
- Dependent variable: spread over libor on bank to bank loans.
- RHS variables:
 - Chilean country risk (chilean sovereign CDS)
 - Overall financial conditions in home market (proxy country CDS)
 - Bank funding conditions (proxy home bank CDS)
- Data also allows to analyze capacity of substitution.
- Work in progress...



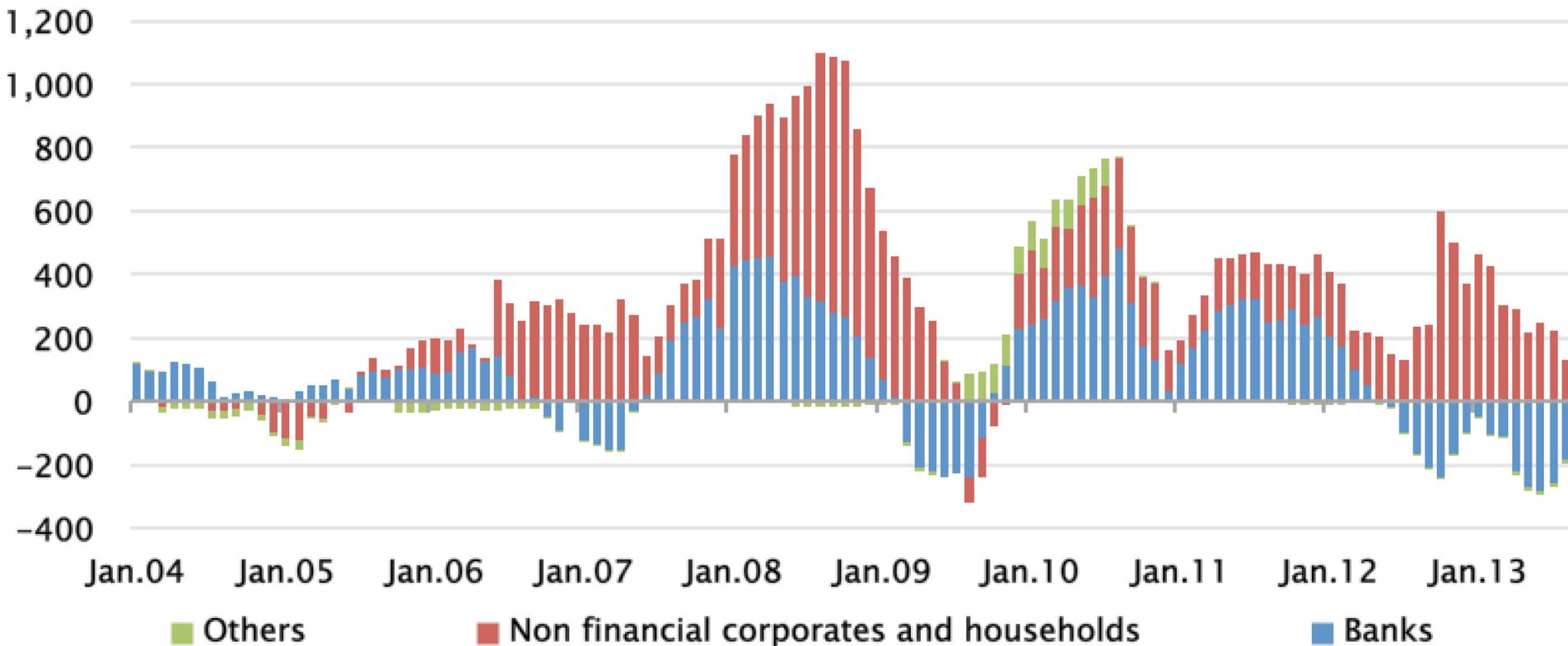
The database...

- Bank pair transactions:
 - e.g. Banco Estado with Citibank
 - Approx . 3000 transactions
- Key fields:
 - Rate (expressed in spreads over LIBOR)
 - Amount
 - Currency
 - Maturity
 - Trade related
- Look at some stylized facts first...



The data are new bank–bank loans

Financial Account Liabilities in Chile: Other investments (12m moving average, millions of US dollars)

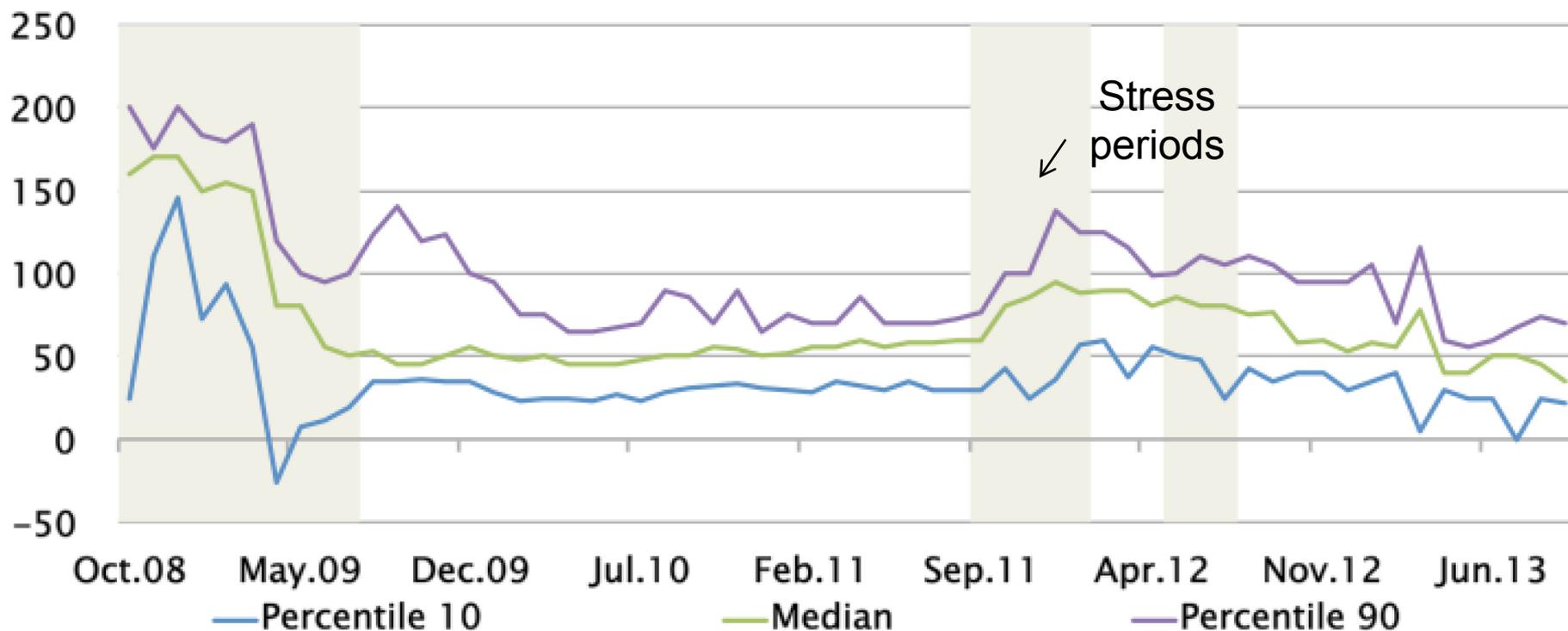


Others includes General Government, Central Bank and other financial institutions, like mutual funds, insurance companies, etc. Source: Central Bank of Chile.



Spreads vary over time and in the cross section, in particular in periods of global stress

Cross-border chilean banks spreads (basis points)

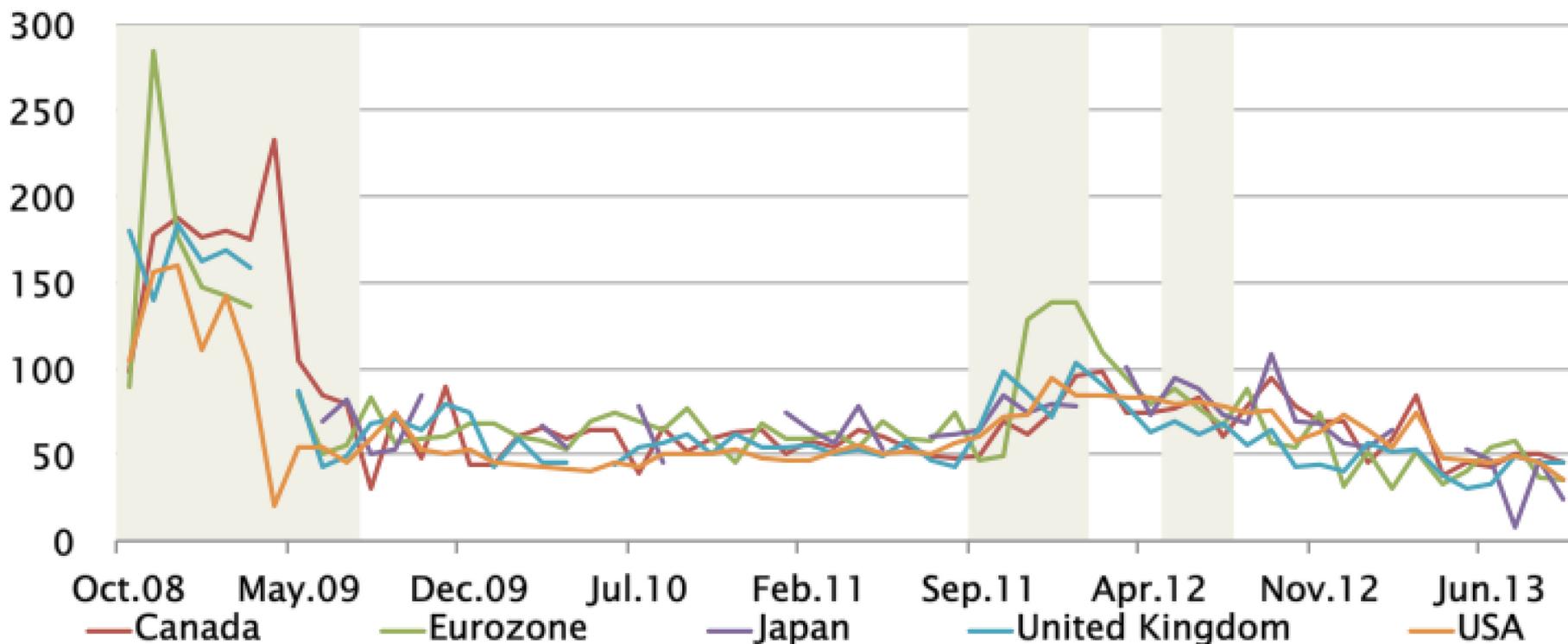


Source: Central Bank of Chile



In stress periods, there is significant country variance...validates need for bilateral data

Cross-border chilean banks spreads, by zone
(basis points)

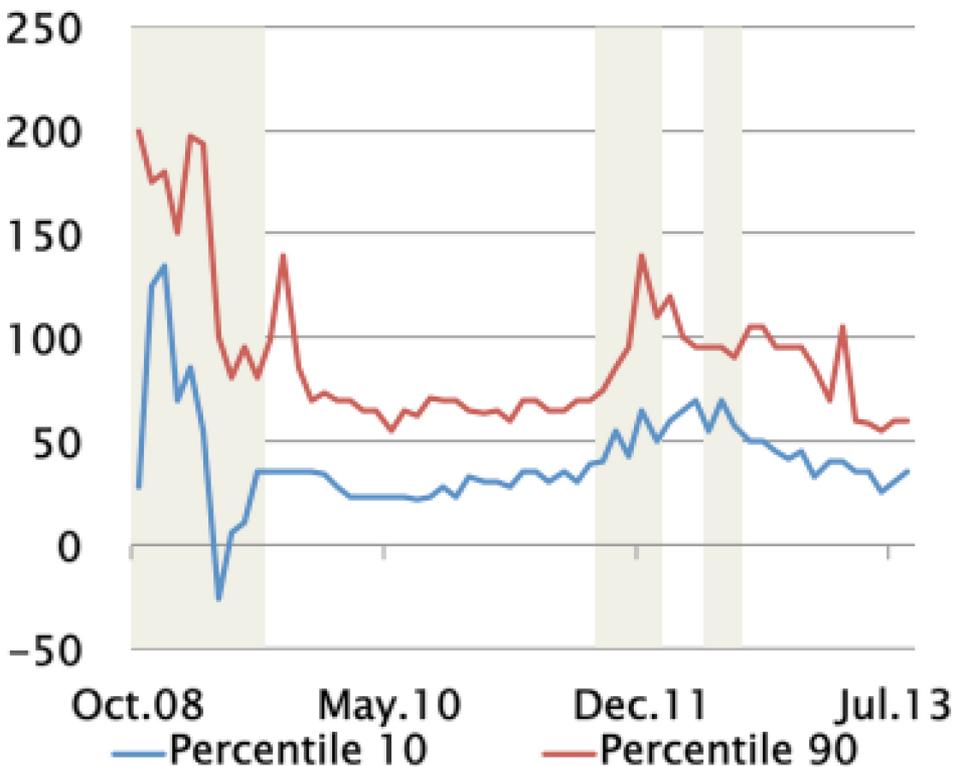


Source: Central Bank of Chile

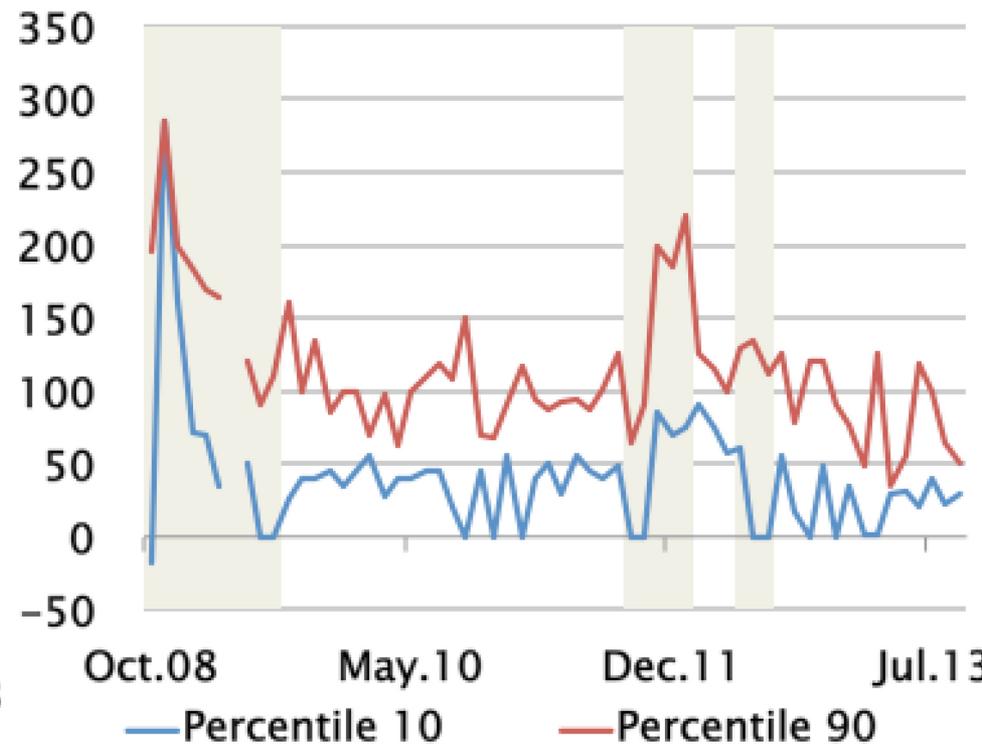


In turn...there are variations within countries and zones. For example USA and EZ

US (basis points)



Eurozone (basis points)



Source: Central Bank of Chile.



A simple empirical evaluation using operations level data

Cross-border bank spread regressions

	Full Sample		Crisis		Non Crisis	
In term	17.6	***	21.9	***	16.6	***
log(trade)	-12.4	***	-16.5	***	-11.0	***
log(fix rate)	5.2	***	14.0	***	1.5	***
cds chile	0.5	***	0.6	***	0.2	***
cds country	0.1	***	0.2	***	0.0	
cds bank	0.0		0.0		0.1	***
R ²	0.55		0.67		0.42	
N	2692		635		2057	
Dummies Chilean Bank	Yes		Yes		Yes	
Dummies Lender Bank	Yes		Yes		Yes	

Source: Central Bank of Chile



Why don't Chilean banks switch to the cheapest lender...data show high persistence

Cross-border bank volume regressions: Persistence (RHS: flow of credit, MMUSD)

		Full		Full		Crisis		Non crisis	
Lags									
	1	0.26	***	0.26	***	0.22	***	0.26	***
	2	0.16	***	0.16	***	0.12	***	0.17	***
	3	0.1	***	0.1	***	0.17	***	0.09	***
	4	0.05	***	0.05	***	0.17	***	0.03	***
	5	0.04	***	0.06	***	0	***	0.06	***
cds chile		yes		no		no		no	
cds country		yes		no		no		no	
cds bank		yes		no		no		no	

Source: Central Bank of Chile



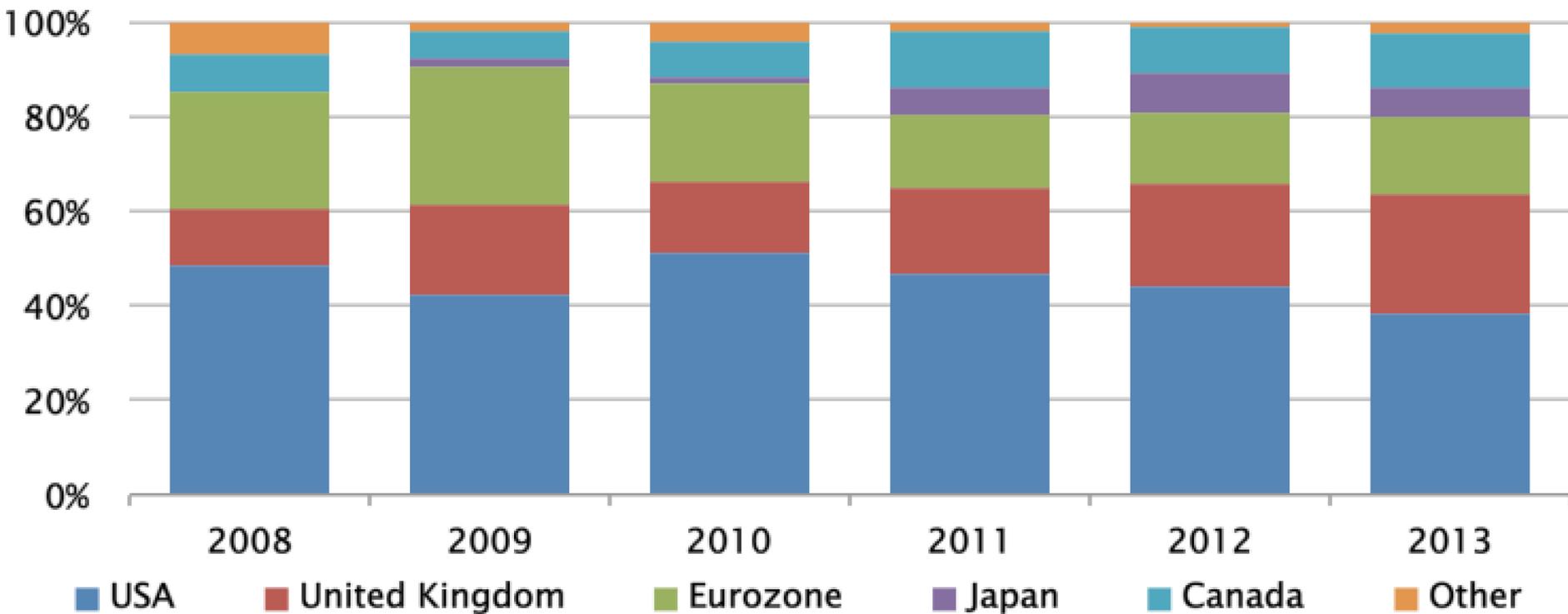
Implications of cross border bank lending literature for financial stability monitoring...

- Monitor home country (and home bank) diversification,
- Monitor overall (and home bank) funding conditions in relevant home countries,
- Monitor bank “health” in relevant home countries, including common exposures, ideally at bank level.
- An example...



Country composition of loans to Chilean Banks

Cross border bank loans to chilean banks
(% of stock)

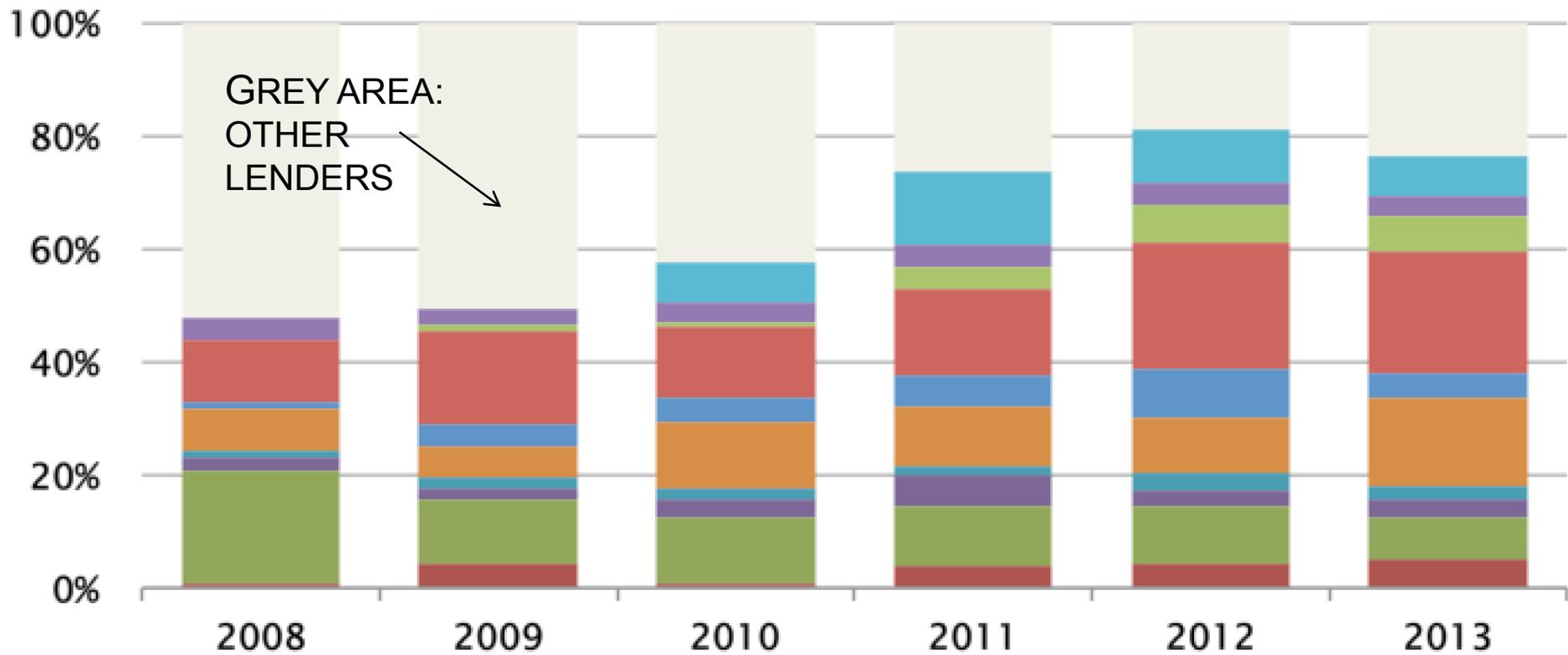


Source: Central Bank of Chile



Concentration of lending banks is high, but lenders have evolved.

10 largest Lender Banks of 2012 – share of total lending (percent)

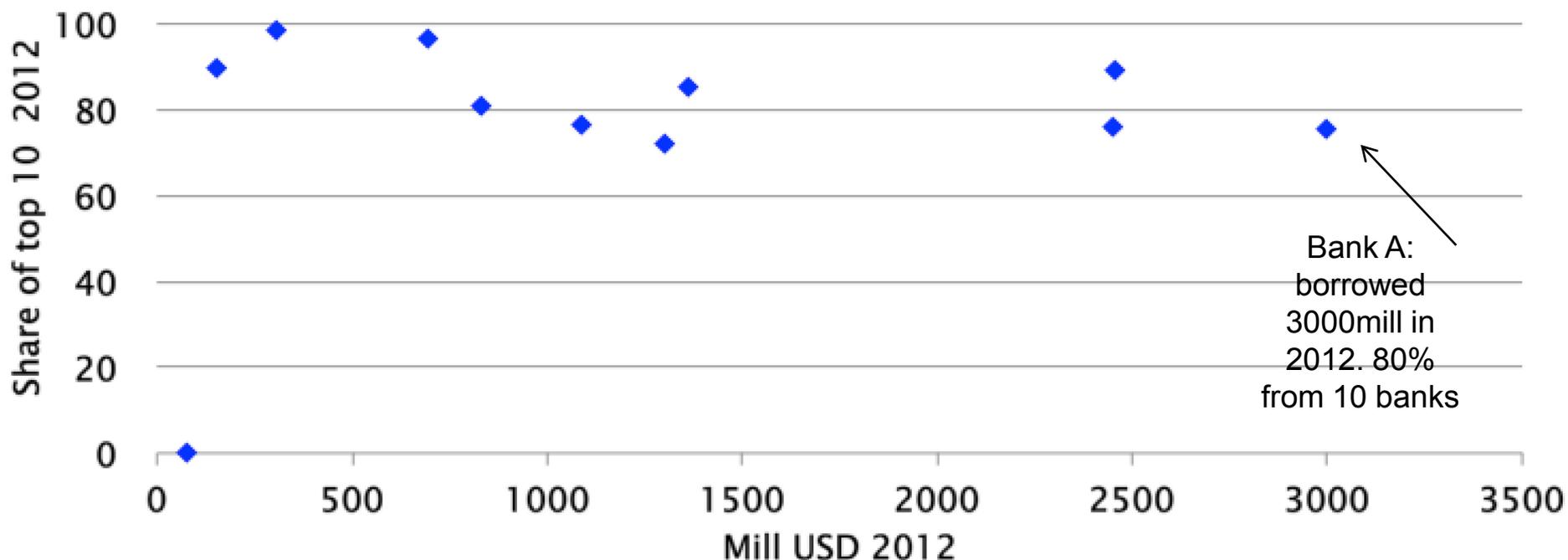


Source: Central Bank of Chile



Concentration of lenders across Chilean banks is high independent of size

Concentration of top 10 foreign creditor banks by each Chilean bank
(y axis: % of loans from largest 10 lenders. X axis total loans 2012)

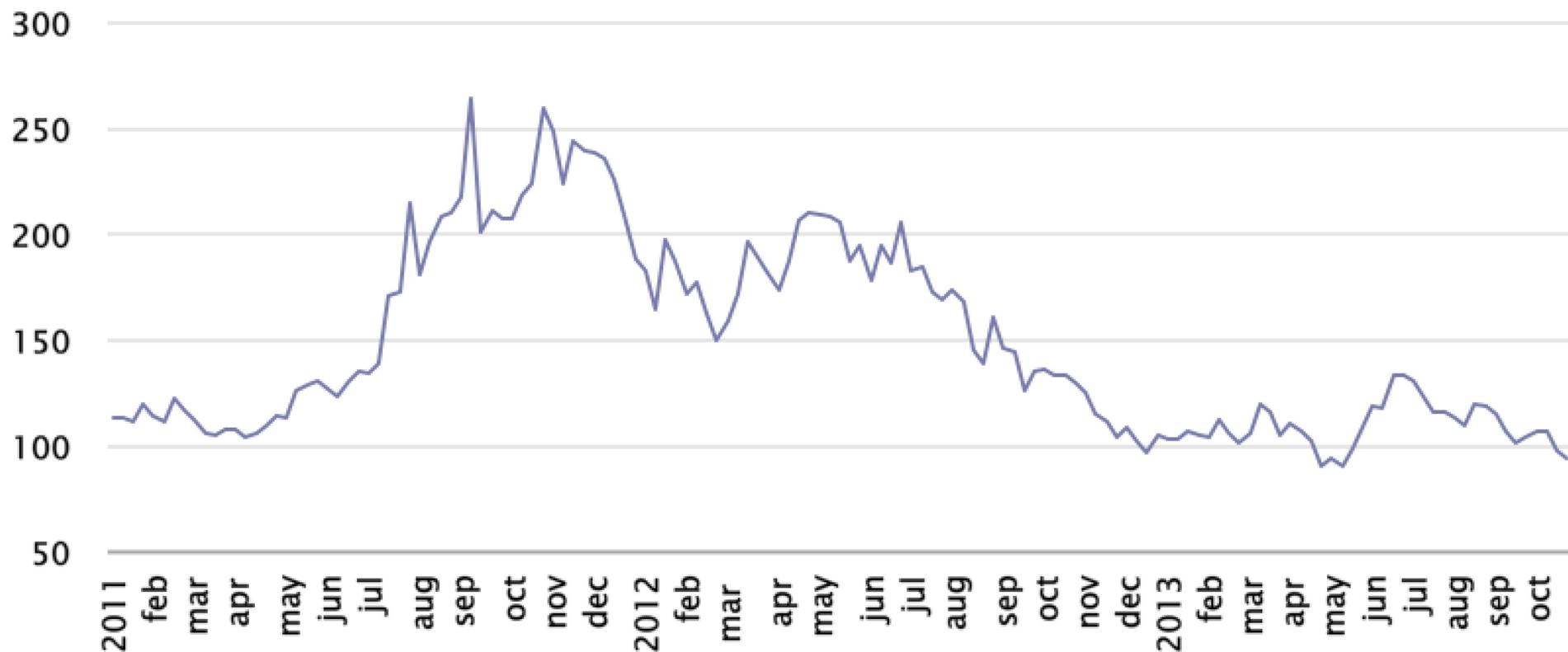


Source: Central Bank of Chile.



A concrete use of bank level data for high frequency monitoring

Average CDS of Main Banks Lending to Chilean Banks
(basis points)



Source: Central Bank of Chile.



Takeaways...

- Empirical evidence suggests that the availability of more detailed bank-level data, allowing to gauge in a more granular way cross-border bank relationships, can go a long way towards improving our assessment of financial fragilities.
- This because of imperfect substitution across banks, and the role of bank conditions in determining lending supply (specially in times of financial stress).
- Although countries can draw on their own data for monitoring fragilities, cross country data set are critical for carrying out the empirical analysis needed to quantify these mechanisms.



Portfolio Flows



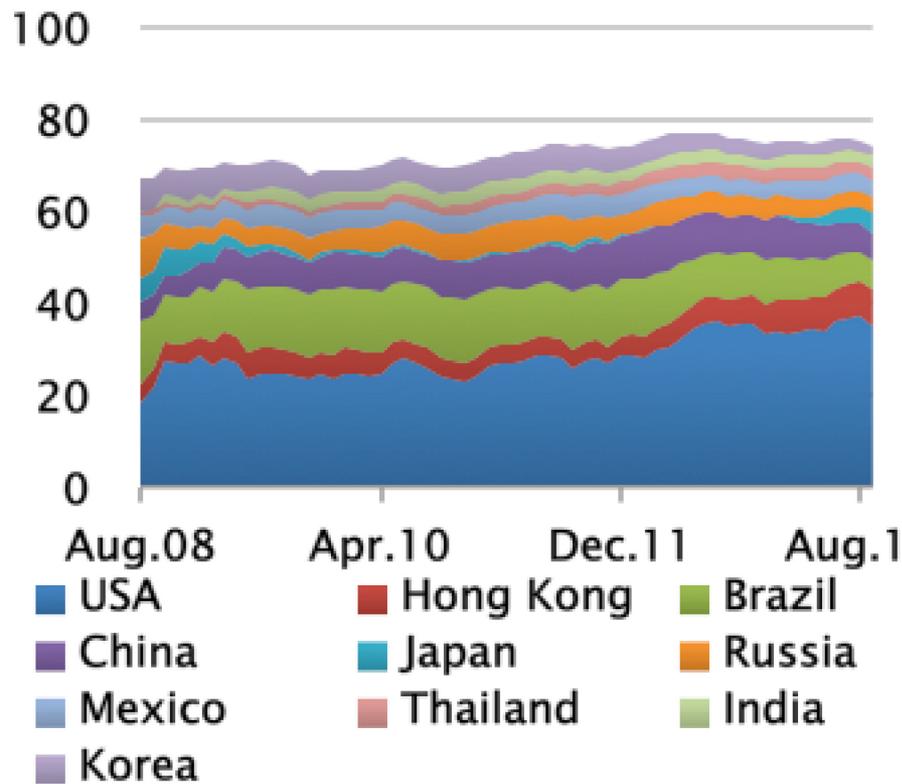
Is bilateral data on portfolio flows useful?

- There is limited empirical analysis that looks at home – host determinants of portfolio flows. Data limitations.
- Existing cross country data suffers from a limitation: immediate vs final investment destination. A large share of data comes through (or goes to) international financial centers.
- A quick look at Chilean data illustrates the relevance of this point...

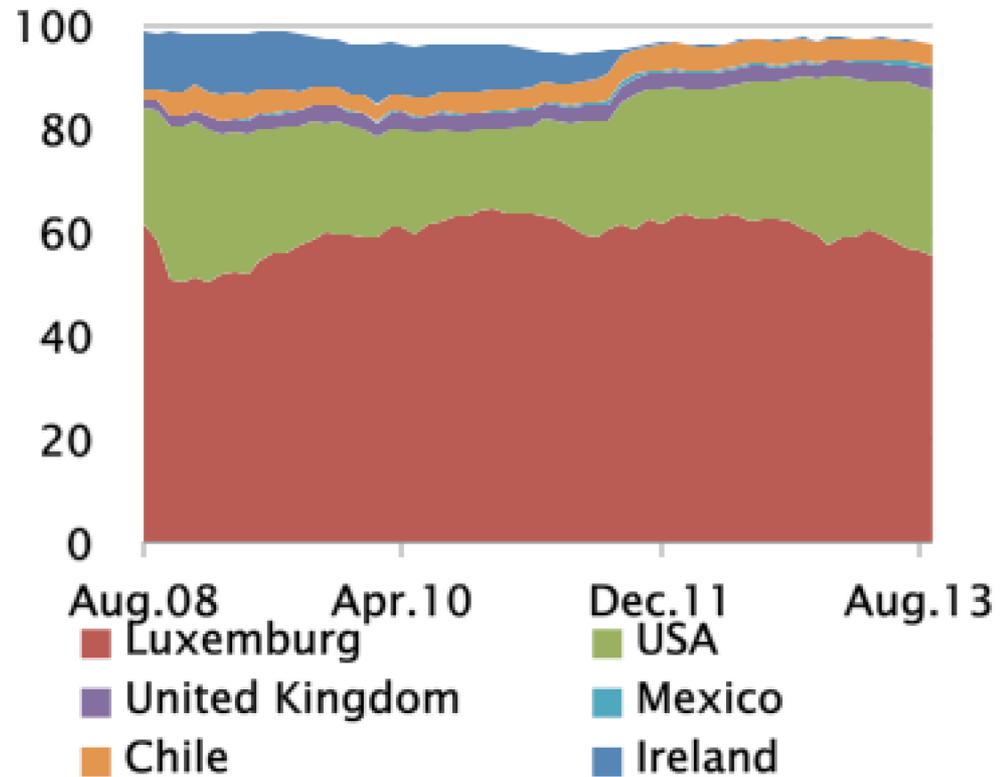


Chilean Pension Fund Investments: Ultimate vs. immediate Destination

Ultimate destination – Top 10
(percent of investment abroad)



Immediate destination – Top 6
(percent of investment abroad)



Source: Superintendency of Pensions.



An investor based approach may be more relevant

- Recent work by the IMF (GFSR 2011) emphasizes the importance of looking at the type of investor behind portfolio flows.
- Distinguish the following categories...

	Real Money	Leveraged
Private	Mutual Funds ETFs Pension Funds Life Insurance	Hedge Funds Carry trades Banks and broker dealers
Public	SWF Reserves	

...each of which has potentially different investment criteria (and balance sheet limitations).



Aggregate data shows the relevance of different types of investors...and the growing role of public funds

Table 2.1. Assets under Management by Institutional Investors

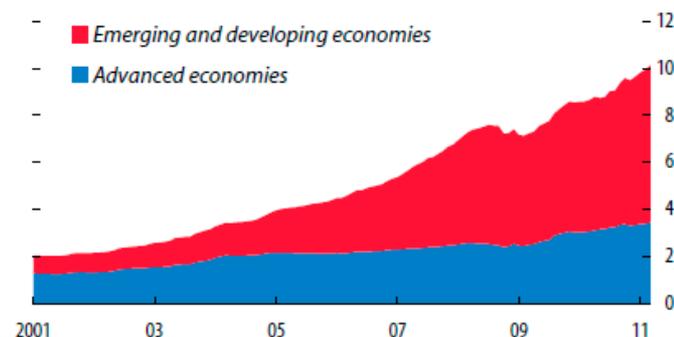
	1995	2000	2005	2006	2007	2008	2009
	<i>(In trillions of U.S. dollars)</i>						
Institutional Investors	21.9	33.5	49.0	56.6	62.8	52.5	60.3
Investment funds ¹	6.3	12.1	18.2	21.5	24.9	20.6	24.0
Insurance companies	8.0	10.4	16.3	18.1	19.9	18.3	20.0
Autonomous pension funds	7.2	10.8	14.3	16.5	17.7	13.3	15.9
Other institutional investors	0.5	0.5	0.5	0.6	0.7	0.6	0.7
	<i>(In percent of GDP)</i>						
Institutional Investors	103.0	147.6	162.0	178.1	181.7	143.3	173.7
Investment funds ¹	29.8	53.4	60.3	67.8	72.1	56.3	69.2
Insurance companies	37.7	45.6	53.9	57.1	57.5	50.0	57.7
Autonomous pension funds	33.8	47.4	47.3	51.8	51.2	36.3	45.9
Other institutional investors	2.5	2.2	1.6	1.9	1.9	1.6	2.0

Sources: OECD; and IMF Staff estimates.

Note: Data based on the following 17 OECD countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Japan, Luxembourg, the Netherlands, Norway, Spain, Turkey, the United Kingdom, and the United States. The data may reflect some double-counting of assets, such as those owned by defined contribution pension funds and managed by investment companies.

¹Investment funds include closed-end and managed investment companies, mutual funds, and unit investment trusts.

Figure 2.6. Foreign Exchange Reserves, Excluding Gold
(In trillions of U.S. dollars)



Source: IMF, International Financial Statistics.

Table 2.2. Assets of Selected Sovereign Wealth Funds
(In billions of U.S. dollars)

Country	Sovereign Wealth Fund	End-2007	End-2010
Australia	The Future Fund	44.9	70.3
Canada	Alberta Heritage Savings Trust Fund	16.7	15.5
Chile	Economic and Social Stabilization Fund	14.0	12.7
Chile	Pension Reserve Fund	1.5	3.8
China	China Investment Corporation	200.0	409.6
Ireland	National Pensions Reserve Fund	31.1	30.3
Korea	Korea Investment Corporation	15.5	37.6
New Zealand	New Zealand Superannuation Fund	10.7	14.0
Norway	Government Pension Fund-Global	373.1	525.1
Singapore	Temasek	134.1	153.0
Timor-Leste	Petroleum Fund of Timor-Leste	2.1	6.9
Trinidad and Tobago	Heritage and Stabilization Fund	1.8	4.0
United States	Alaska Permanent Fund	39.4	38.8

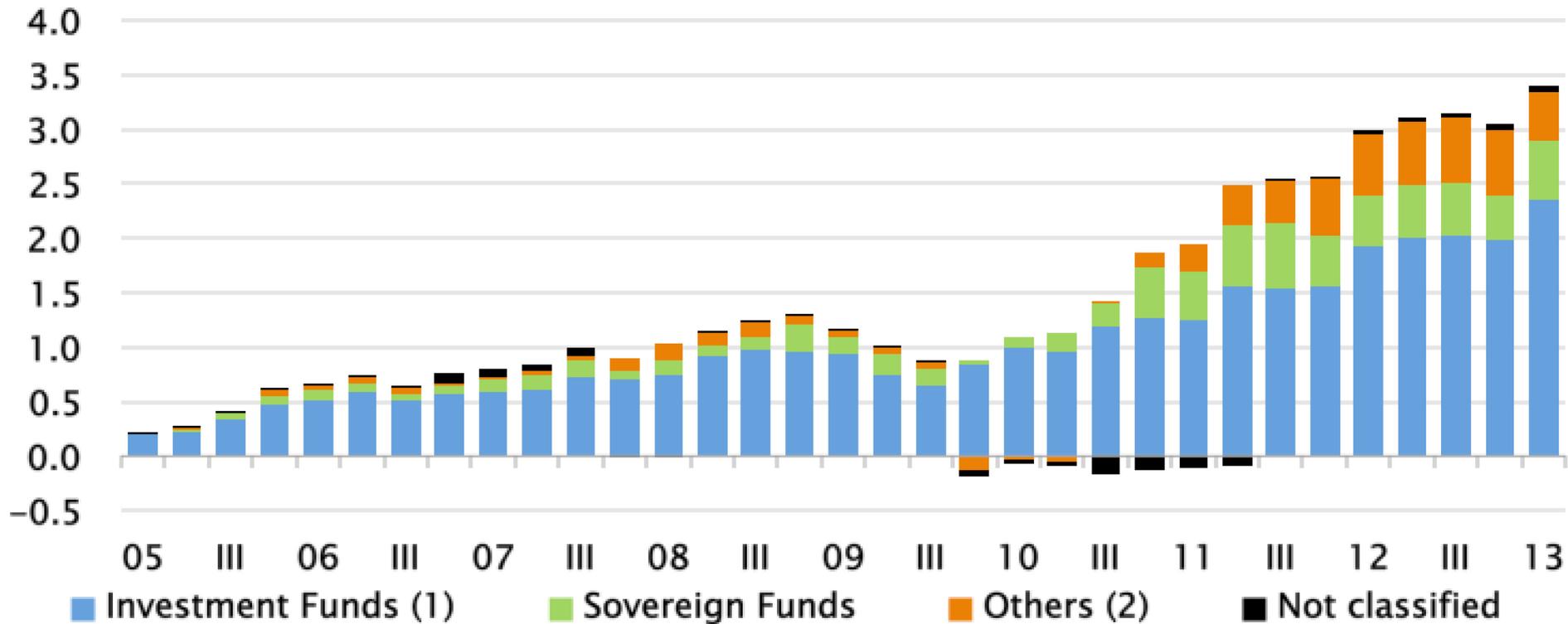
Sources: Sovereign wealth fund websites; and IMF staff calculations.

Note: Australia (January 31, 2008, excluding Telstra); China (September 29, 2007); Singapore (March 31, 2008 and March 31, 2011); and Trinidad and Tobago (September 30, 2007 and September 30, 2010).



Data for Chile, suggest a similar pattern

Net gross equity inflows, by investor
(percent of GDP)



Source: Central Bank of Chile



A large (and growing) literature has looked at the portfolio decisions of institutional investors

- Mostly limited to mutual fund investments (see survey in Gelos 2011)
- Some recent papers focus on push and pull factors...
 - Fratzscher (2012) exploits a 50 economy weekly panel, and finds that changes in global liquidity and risk conditions have played an important role on global capital flows.
 - Puy (2013) splits portfolio flows in equity and bonds, and finds that unobservable global and regional factors explain most of the variation of flows, for advanced and emerging economies.



A large (and growing) literature has looked at portfolio decisions of institutional investors (cont)

- Others focus on portfolio allocation mechanisms:
 - Kaminsky et al (2004) study the existence of **contagion and momentum strategies**.
 - Griffin et al (2004) use a model with home bias and response of foreign investors to unexpected high returns, and find that equity flows toward a country increase with the return of that country's stock market...**which also suggests momentum trading**.
 - Broner et al (2006) develop a model in which equity fund managers shift their allocation towards the average portfolio, providing evidence of a **portfolio rebalancing channel of contagion**.
 - Raddatz and Schmuckler (2012) also find evidence of a **portfolio channel**, and that mutual funds helped to spread "crisis" across countries.



A large (and growing) literature has looked at portfolio decisions of institutional investors (cont)

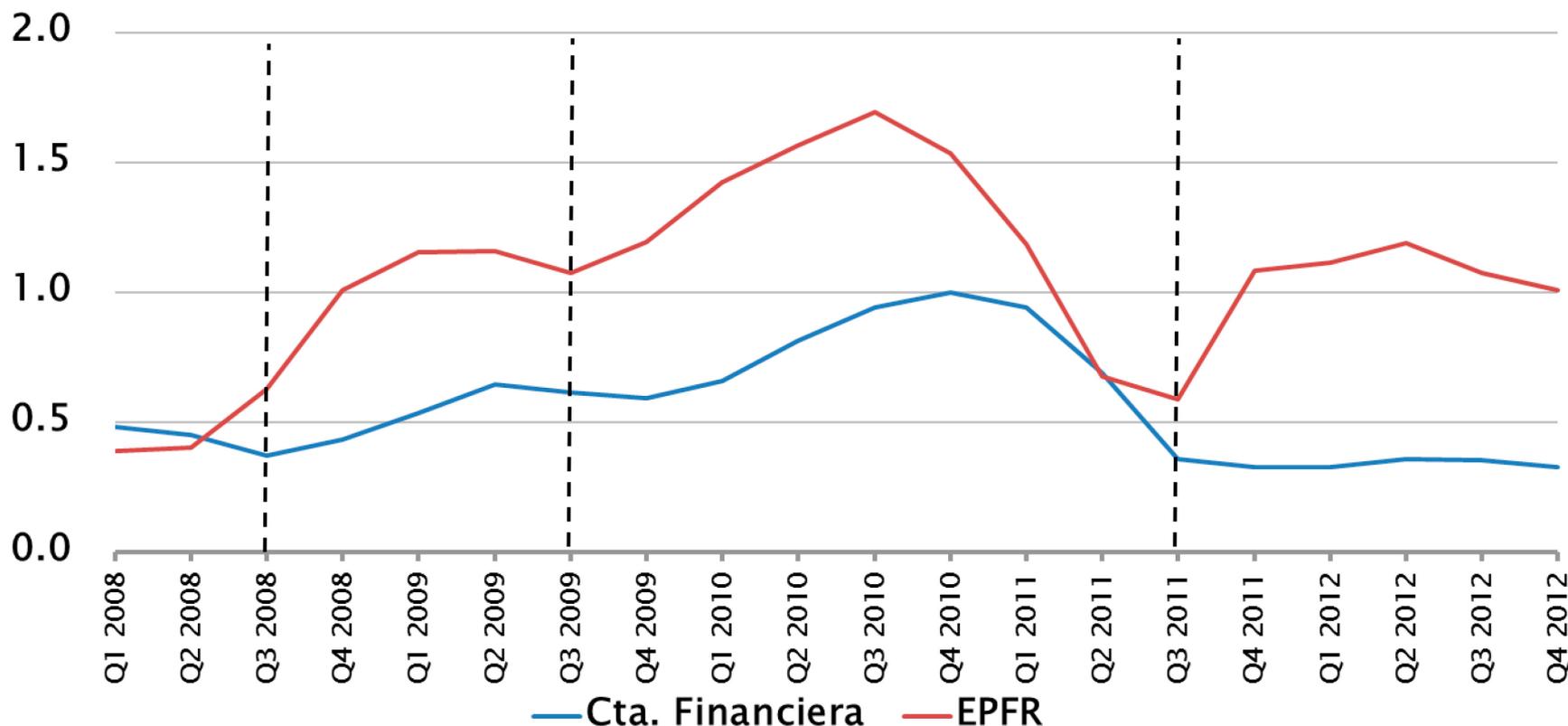
- This makes this kind of investor volatile, and potentially a source of contagion...even beyond EME.
- For example Hau and Luai (2013), Manconi, Massa and Yasuda (2012) both highlighted the role of equity and bond funds in propagating the great financial crisis.
- Other sources of investment more stable (GFSR 2011)



Flows measured by EPFR (MFs and ETFs) are more volatile than those in the Financial Account of the BoP.

Volatility of Portfolio flows toward Latam (*)

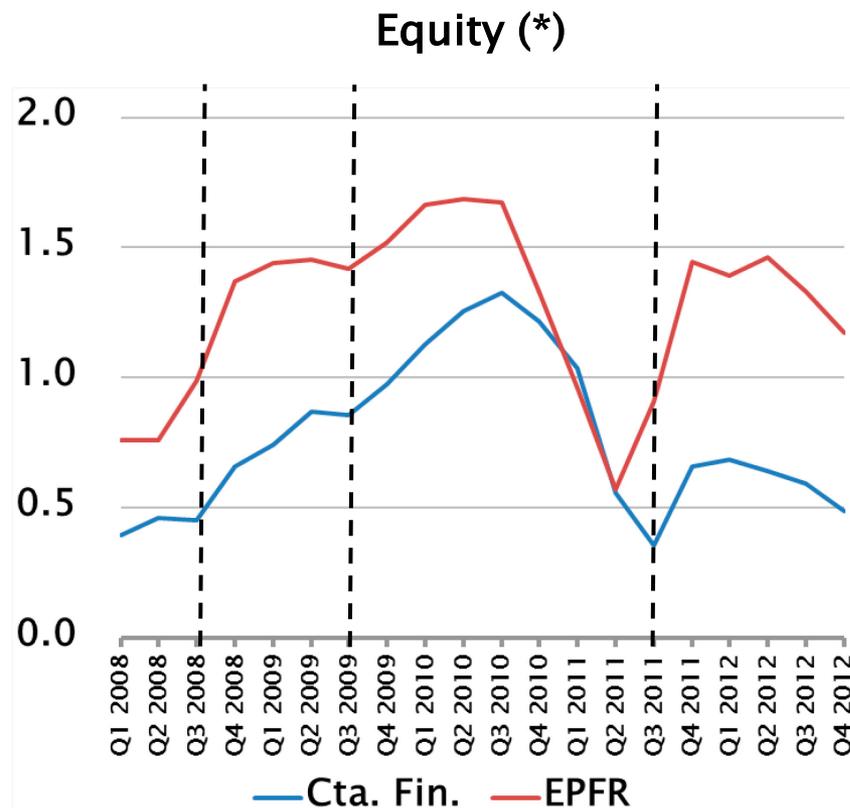
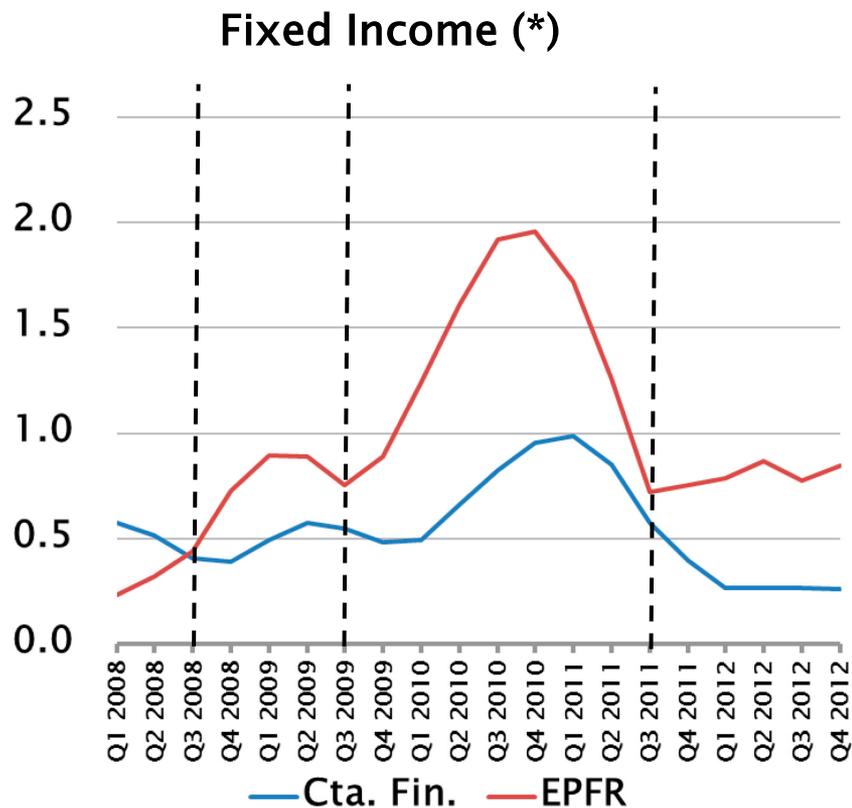
(Var. Coeff. Of annual flows; 2-years moving std dev., over average 2006-13)



(*) EPFR-Latam includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Rep., Ecuador, El Salvador, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela. Financial account data includes only Argentina, Brazil, Chile, Colombia, Mexico and Venezuela, however, these economies account for the 99% of the total flows in the overall EPFR. Source: EPFR and IFS.



Fixed income and Equity portfolio volatility (coefficient of variation)



(*) EPFR–Latam includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Rep., Ecuador, El Salvador, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela. Financial account data includes only Argentina, Brazil, Chile, Colombia, Mexico and Venezuela, however, these economies account for the 99% of the total flows in the overall EPFR. Source: EPFR and IFS.



Takeaways

- Expanding available data on cross country portfolio flows may not be the most profitable avenue...
- ...whereas investor type seems very relevant.
- Two potential approaches:
 - Expand BoP statistics and national level data
 - Replicate BIS approach: IOPS and IAIS
- Ideally...common investor data (Gelos 2011)



Takeaways

- More research needed in portfolio decisions of investors (in particular sovereign and hedge), and how they interact with each other.
- There are other sources of heterogeneity that appear relevant:
 - Currency
 - Place of issuance



Regarding currency and place of issuance...

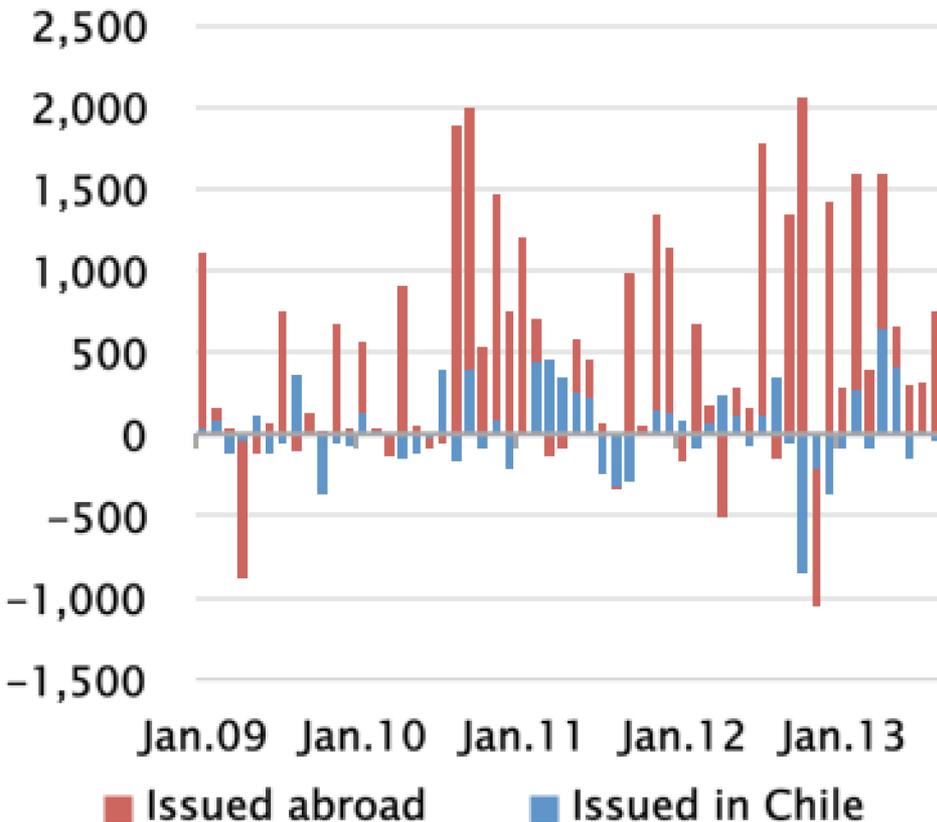
- Available BoP is resident based...and does not account for place or currency of issuance.
- This appears particularly relevant for debt: local currency local issuance vs. foreign currency foreign issuance.
- This can be partly offset by using private data (Dealogic).
- In the case of Chile...the distinction is extremely relevant..



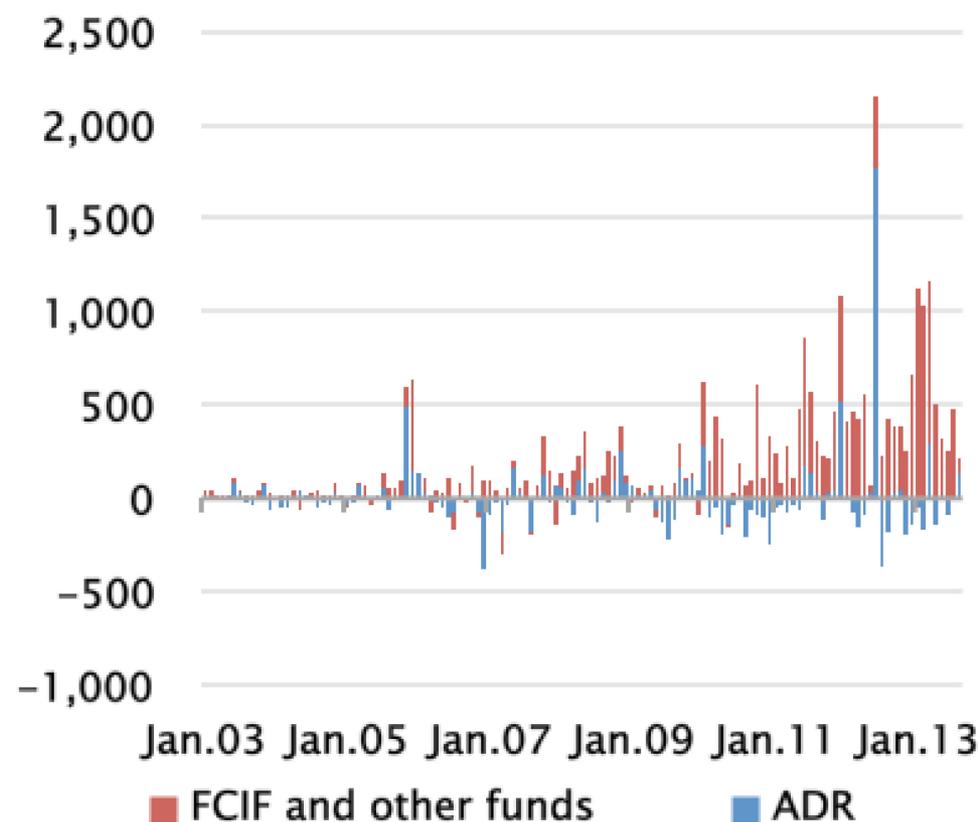
Portfolio debt inflows are high...but almost 100% is foreign debt issuance

Portfolio inflows in Chile
(millions of US dollars)

Fixed income portfolio liabilities



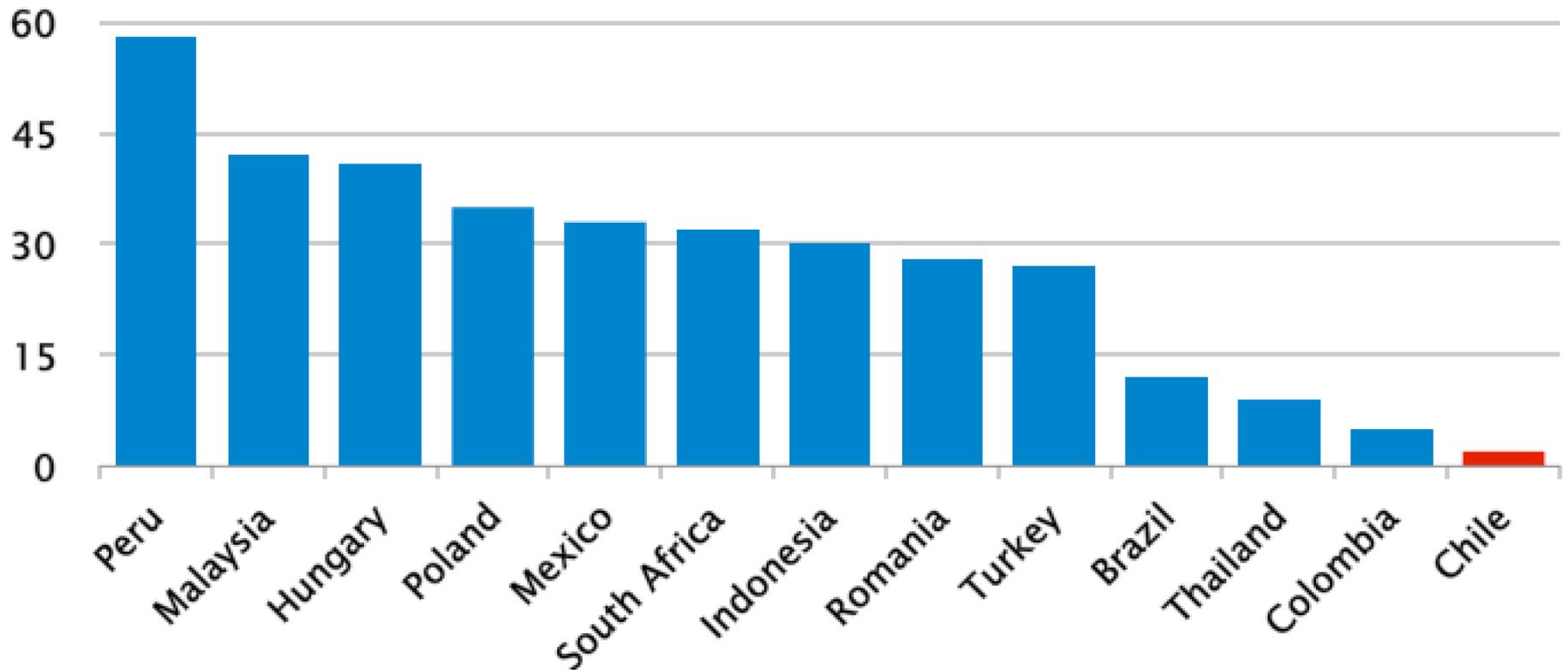
Equity portfolio liabilities





This is consistent with data that shows low non-resident participation in local currency bond markets

Share of non resident investors in local currency sovereign bond markets
(percent, Q3 2012)



Source: IMF y JP Morgan



Conclusions



Conclusions

- Although BIS data is an extremely useful tool for monitoring the risk of reversal in cross border bank credit, there is value in obtaining bank level data on cross border lending – at least for the largest global banks.
- Recent disclosure of data by the BEA in its stress tests is a valuable example.
- These datasets would allow research and monitoring (in particular of cross exposures).
- The use of existing surveys on portfolio investments for financial stability analysis, is limited by the “veil” introduced by International Financial Centers.



Conclusions

- Disaggregating portfolio flows by type of investors is an important avenue to explore, as suggested by data from Chile and recent research...knowing who is driving the investment is at least as important as knowing their nationality.
- Expanding (and systematizing) data on place of issuance is another relevant dimension for risk monitoring.
- Finally – the overall importance of granular data on cross border flows and positions makes global initiatives like the LEI, that allow to collect this data in a consistent manner, a priority.



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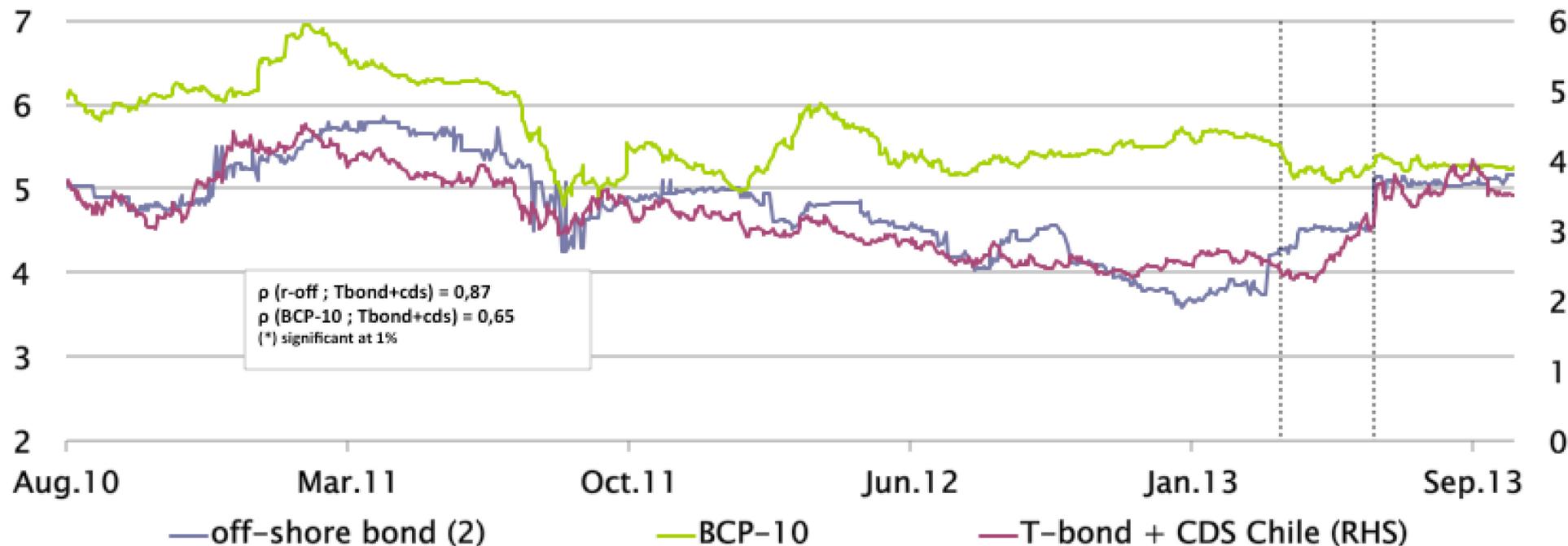
Kevin Cowan(*)

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While the sensitivity to global shocks is related to place of issuance

Sovereign on and off-shore 10 year yields vs Tbond+CDS Chile (1)
(percent, basis points, as of 10-08-2013)



(1) Vertical dashed lines correspond to the start of GDN transactions, 04-05-13, the first, and the FOMC meeting of 06-18-13. (2) Off shore yields correspond to the 2010 issuance of 10 year bonds in external markets in 2010. Source: Central Bank of Chile and Bloomberg.