BBVA Research

Country Risk Report

A Quarterly Guide to Country Risks – June 2016

(Data as of the end of May 2016)

Cross-Country Emerging Markets Unit

Summary

Sovereign markets and ratings agencies update

- **Argentina** was upgraded by the three agencies after its return to the bond markets. **Ireland** was upgraded by Moody's. Fitch downgraded **Brazil** and upgraded **Hungary**.
- **The market pressure (downgrades/upgrades) has stabilized after a calmed quarter**. Turkey, Chile, Colombia, China and Malaysia still on the spotlight.
    - **In the last 3 months we have relived in the markets the same cycle of turmoil-calm experienced in the second half of last year and during the "Taper tantrum" in 2013.** Once again, reassuring policy signals from China, lessened concerns on US recession and CB wording and actions have helped to reduced volatility in financial markets.
    - However, **financial markets remain cautious** and mild capital outflows from EMs have come back again during May in front of FED's lift off perspectives. More recently, uncertainty events (i.e. Brexit referendum) are weighing on the come back of the risk off mood.

Country risk assessment

- **Leverage level is still worrisome throughout developed economies** in spite of sustained private deleveraging process across the board.
- **In EM, differentiation matters:** Private leverage is the main vulnerability in EM Europe; low GDP growth in LatAm and fiscal vulnerability in EM Asia.
- **All in all, the most relevant risks for the global scenario are:**
    - **China's unbounded private indebtedness**
    - **The unintended consequences of the Fed's incoming tightening** against the background of damaged balance sheets in EM corporates.
    - **In addition, various political and geopolitical risks could emerge**, including Brexit and political elections in Spain and the US.

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Country Risk Report

Sovereign markets and rating agencies update

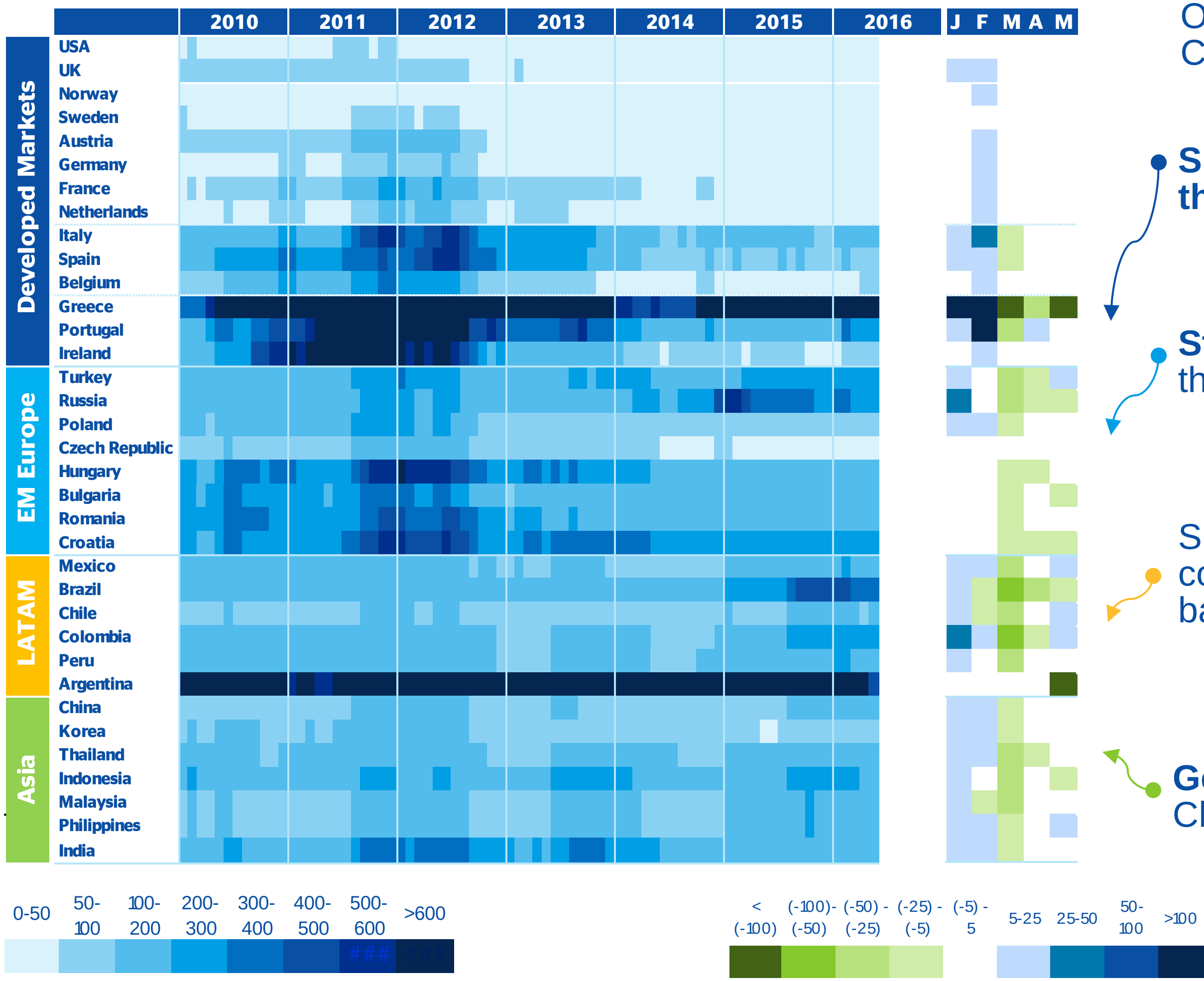
Overall decrease in sovereign CDS, although CDS levels in EMs still remain close to post-Lehman crisis highs

Sovereign CDS spreads

Source: Datastream and BBVA Research

Changes

(last six months MoM)



Outright stability in advanced economies CDS.

- **Sharp decrease in Greek CDS. Portugal is the less benefited in the periphery**.
- **Stability continues in EM Europe** among the global reduction in spreads.
- Sharp decrease in Argentinian CDS after its comeback to debt markets. Most countries back to August-15 levels.
- **General lessening in EM Asia's spreads**. China continues as the worst performer

Country Risk Report

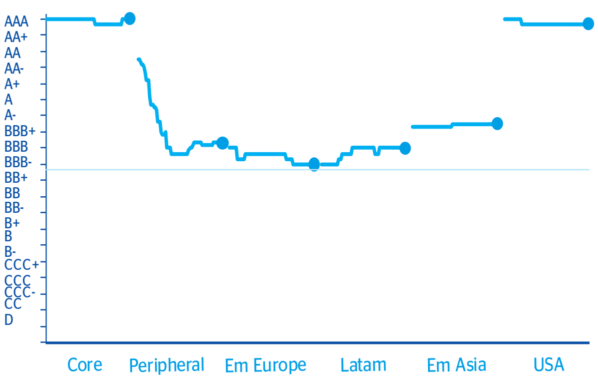
Sovereign markets and agency ratings update

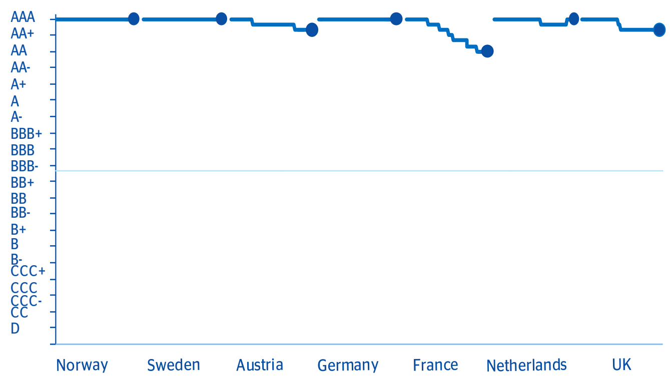
Argentina was upgraded by the three agencies. Ireland upgraded by Moody's. Fitch downgrades Brazil and upgrades Hungary

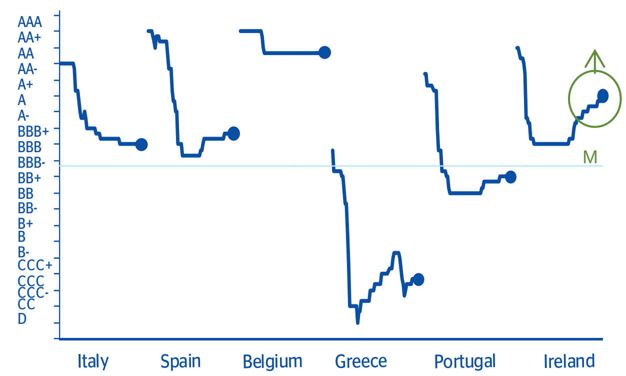
Sovereign Rating Index 2010-16

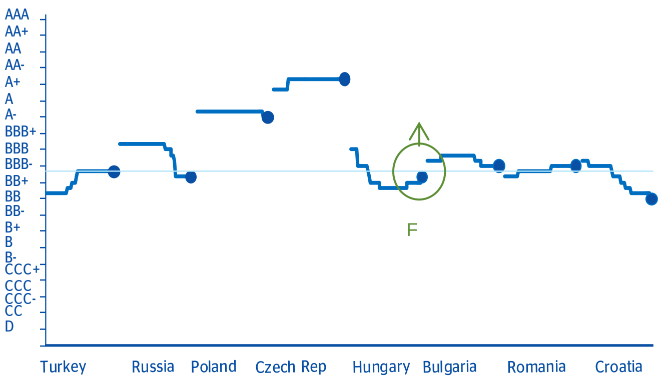
Source: BBVA Research by using S&P, Moody's and Fitch data

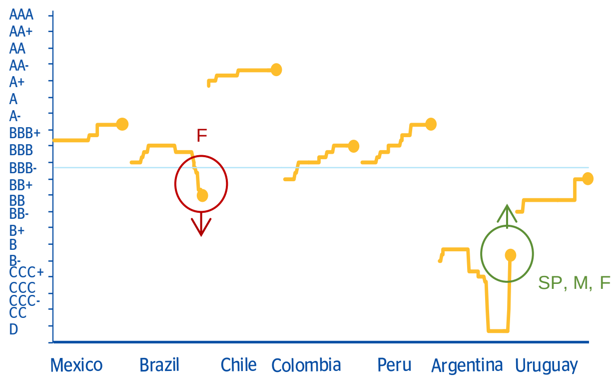
Upgrade Downgrade **SP:** Standard & Poors **M:** Moody's **F:** Fitch

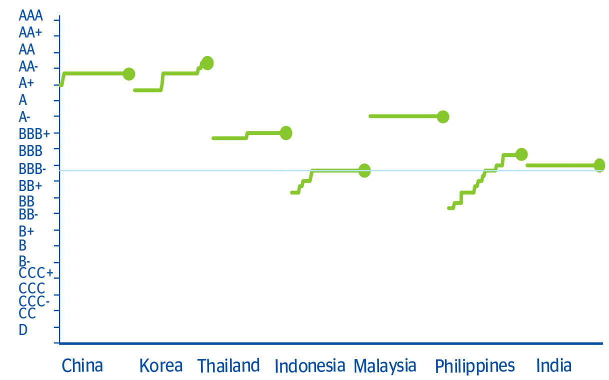












Sovereign Rating Index: An index that translates the three important rating agencies ratings letters codes (Moody's, Standard & Poors and Fitch) to numerical positions from 20 (AAA) to default (0). The index shows the average of the three rescaled numerical ratings.

Country Risk Report

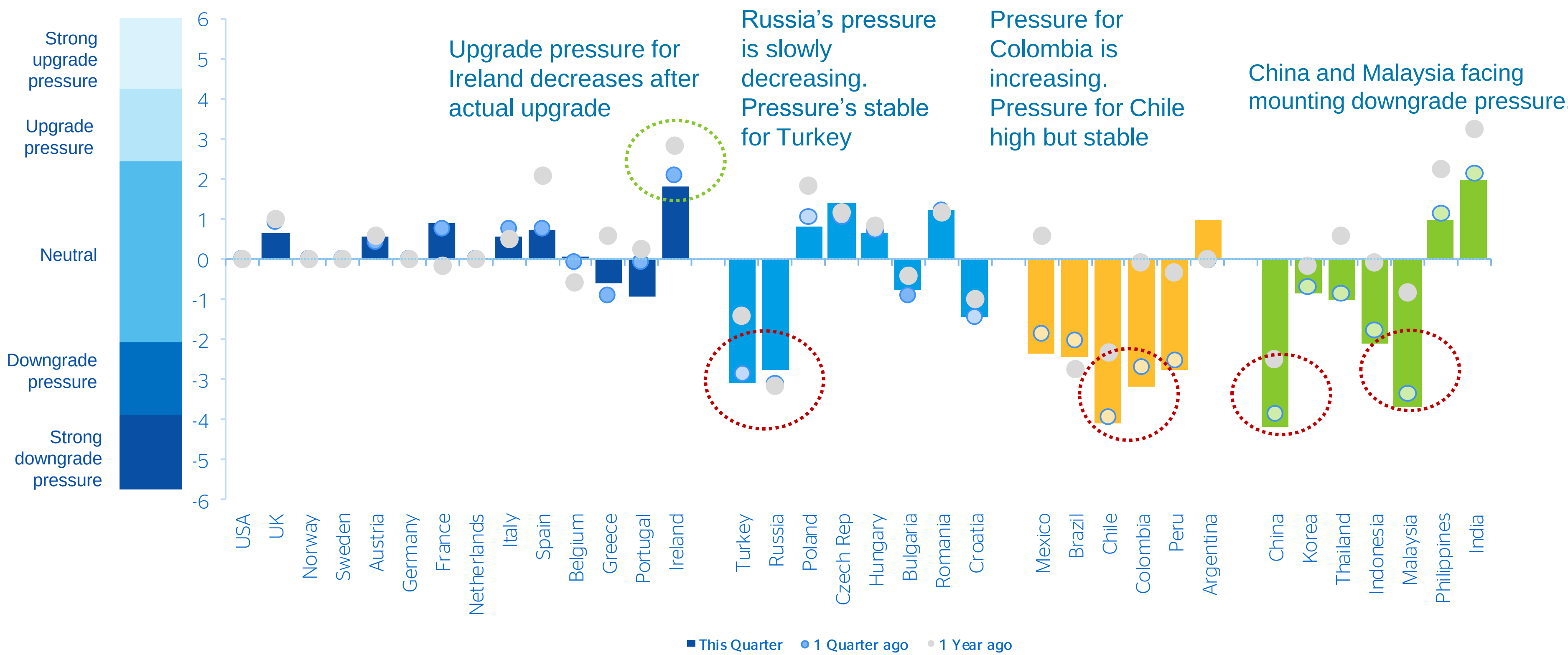
Sovereign markets and agency ratings update

Market pressure has stabilized after a calmed quarter. Turkey, Chile, Colombia, China and Malaysia still on the spotlight

Agencies' rating downgrade pressure gap (May 2016)

(difference between CDS-implied rating and actual sovereign rating, in notches)

Source: BBVA Research

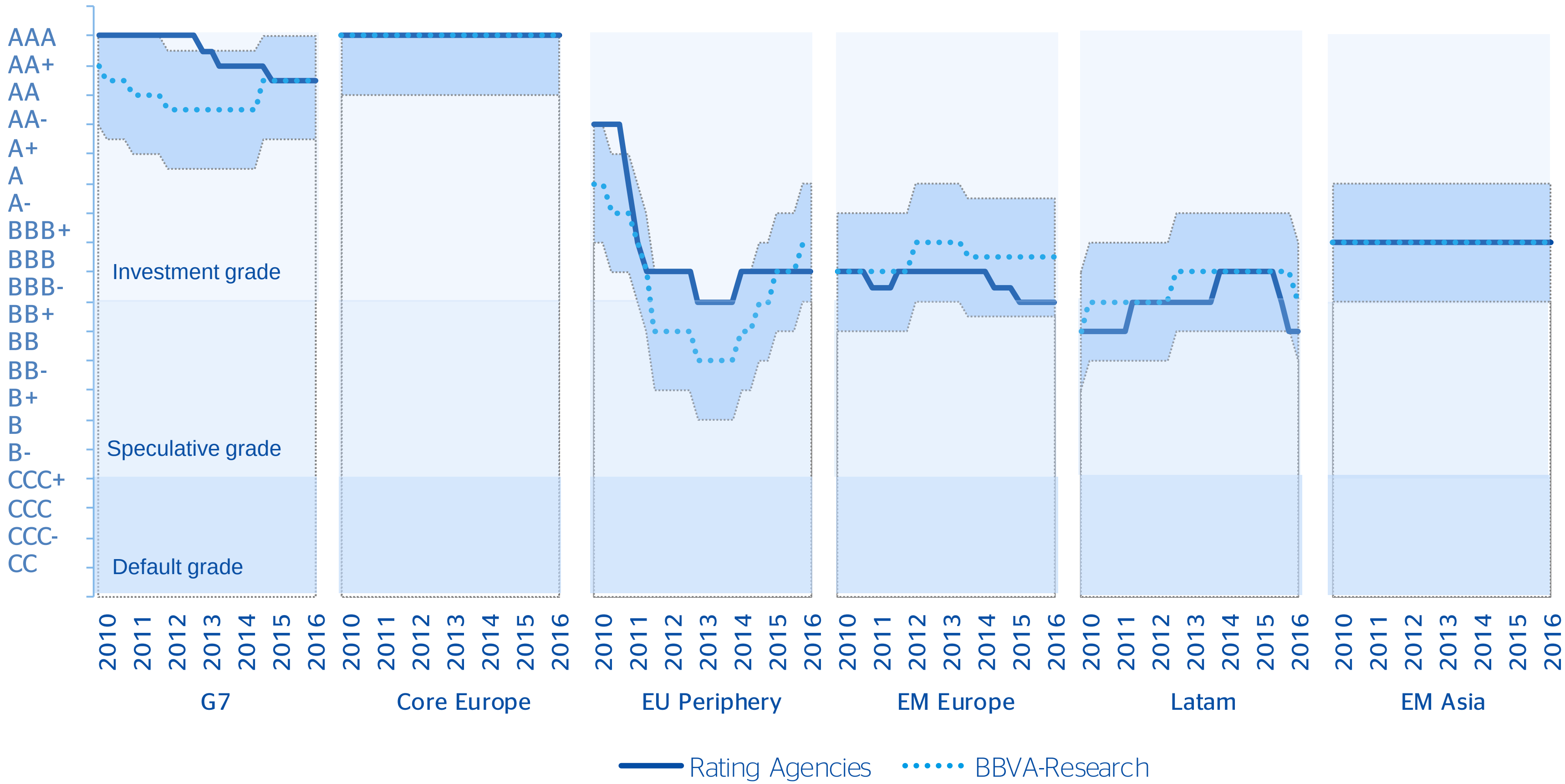


LatAm average rating below investment grade threshold. EU Periphery Europe and EM Europe ratings still below fundamentals

Agencies' Sovereign rating vs. BBVA Research

(Agencies' Rating and BBVA scores +/-1 std dev)

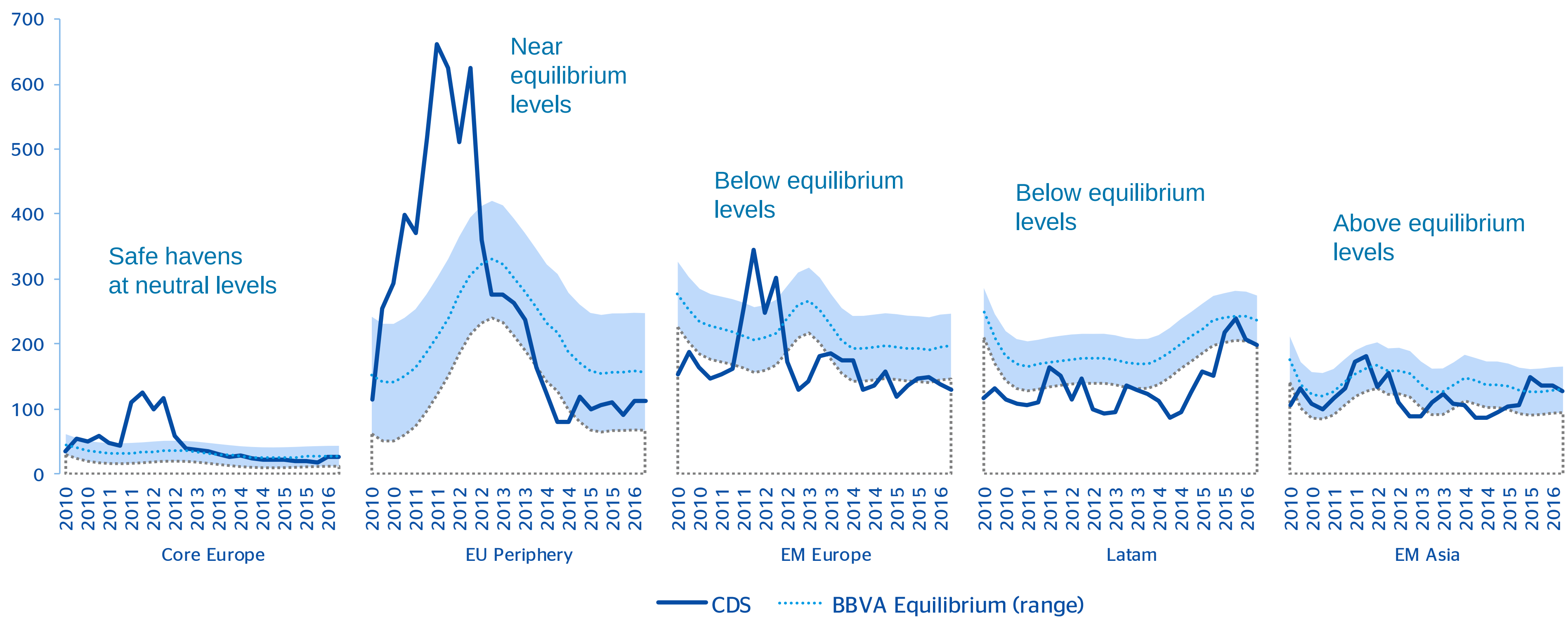
Source: Standard & Poors, Moody's, Fitch and BBVA Research



LatAm average CDS has narrowed below its equilibrium spread. EM Asia now in line with its equilibrium.

CDS and equilibrium risk premium May 2016

(equilibrium: average of four alternative models + 0.5 standard deviation)
*EU Periphery excludes Greece
Source: BBVA Research and Datastream



Country Risk Report

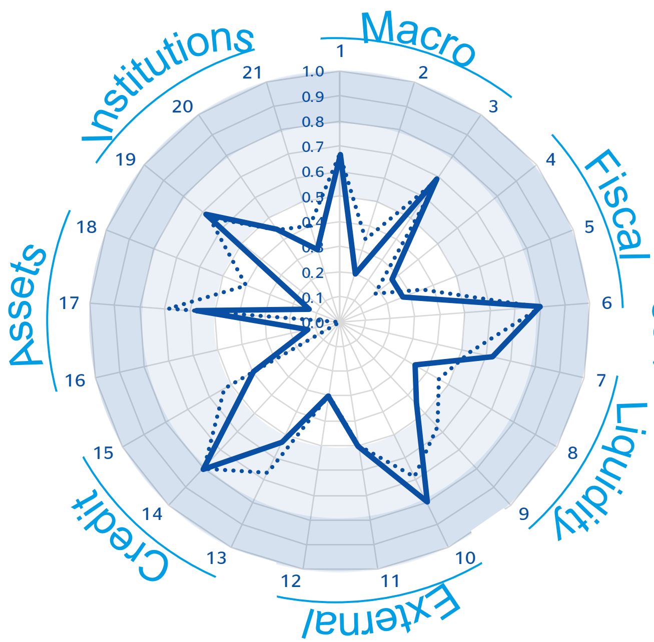
Macroeconomic vulnerability and risk assessment

Private leverage significantly decreasing in Periphery Europe. External debt still worrisome throughout developed economies

Developed countries: vulnerability radar 2016

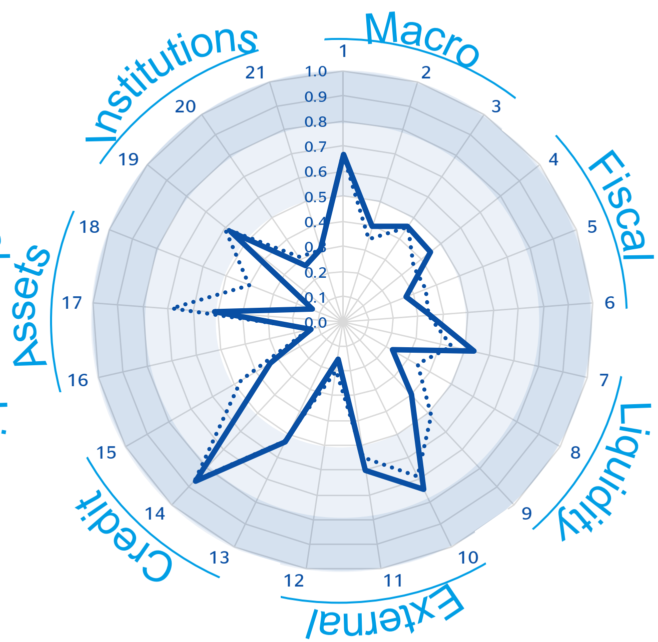
Relative position for the emerging developed countries. Max risk=1, Min risk=0. Previous year data is shown as a dotted line.
Source: BBVA Research

G7



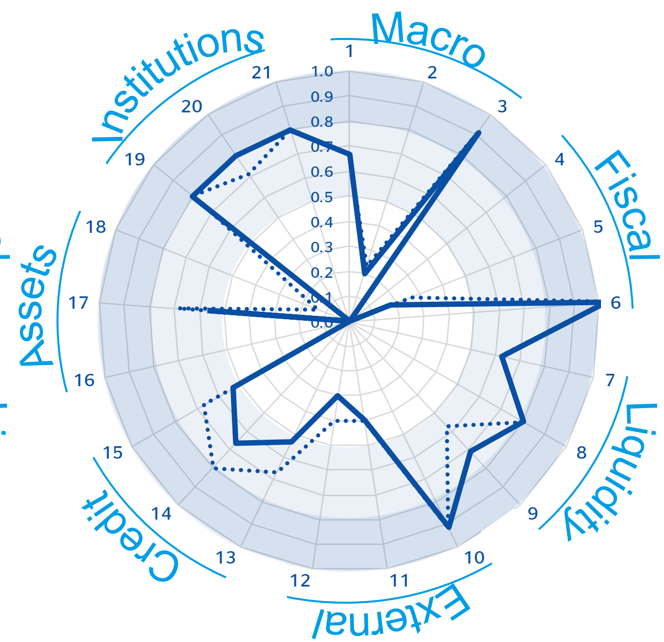
Corporate leverage and External debt, the main vulnerabilities

Core Europe



Corporate debt clearly the main vulnerability

Periphery Europe



Increasing public debt levels increases fiscal vulnerability.

High risk
Risk to monitor
Safe

Macro: (1) GDP (% YoY) (2) Prices (% YoY) (3) Unemployment (% LF)
Fiscal: (4) Structural balance (%) (5) Interest rate – GDP %YoY (6) Public debt (% GDP)
Liquidity: (7) Debt by non-residents (%total) (8) Financial needs (%GDP) (9) Financial pressure (% GDP)
External: (10) External debt (%GDP) (11) RER appreciation (%YoY) (12) CAC balance (%GDP)

Credit: (13) Household (%GDP) (14) Corporate (%GDP) (15) Credit-to-deposit (%)
Assets: (16) Private credit to GDP (%YoY) (17) Housing Prices (%YoY) (18) Equity (%)
Institutional: (19) Political stability (20) Corruption (21) Rule of law

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Country Risk Report

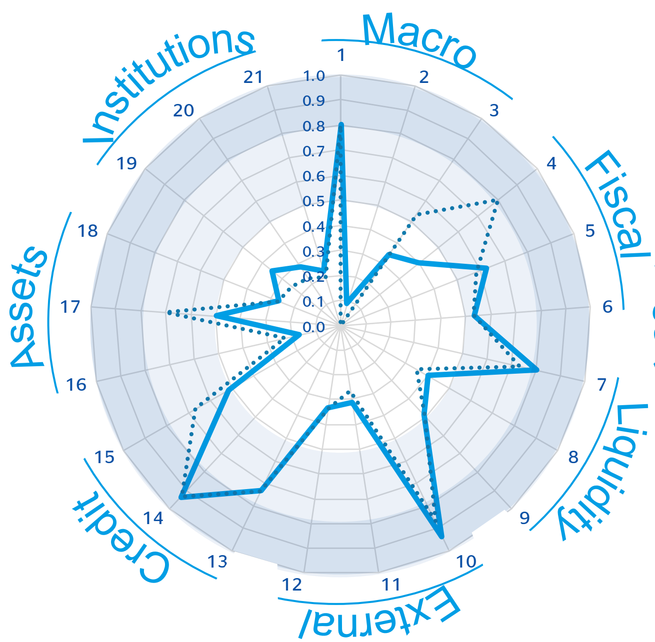
Macroeconomic vulnerability and risk assessment

External debt the main vulnerability in EM Europe, low GDP growth in LatAm, and fiscal vulnerability in EM Asia

Emerging countries: vulnerability radar 2016

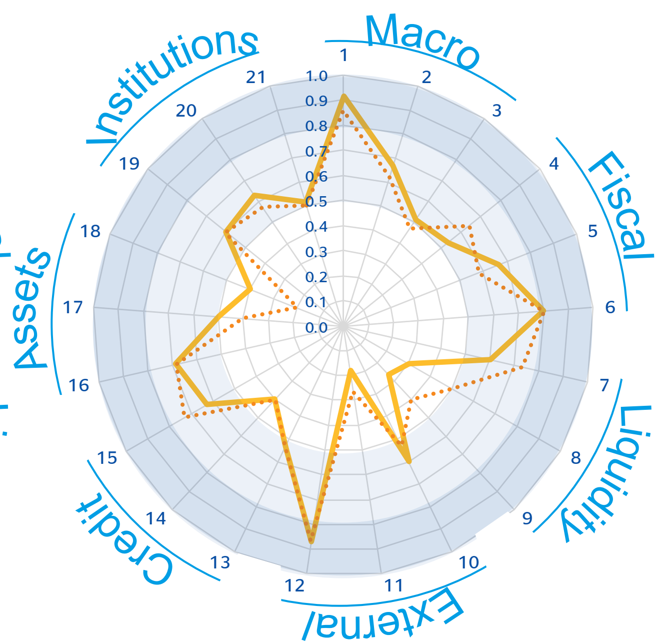
Relative position for the emerging developed countries. Max risk=1, Min risk=0. Previous year data is shown as a dotted line.
Source: BBVA Research

Emerging Europe



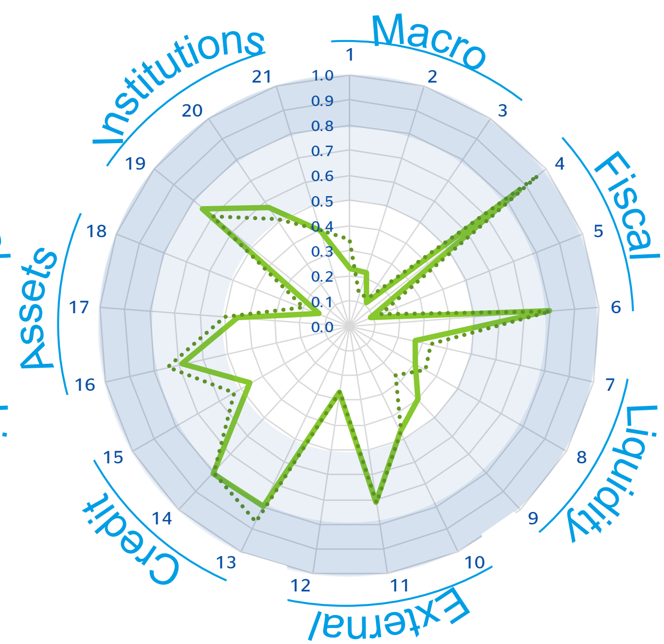
Significant improvement in public primary balances. High levels of corporate and external debt

LatAm



GDP growth and external vulnerabilities worsening with respect to 2015. Improvement in liquidity vulnerabilities

Emerging Asia



Public balances still the main vulnerability. Private leverage (households & corporates) also at risky levels

High risk
Risk to monitor
Safe

Macro: (1) GDP (%YoY) (2) Prices (% YoY) (3) Unemployment (% LF)
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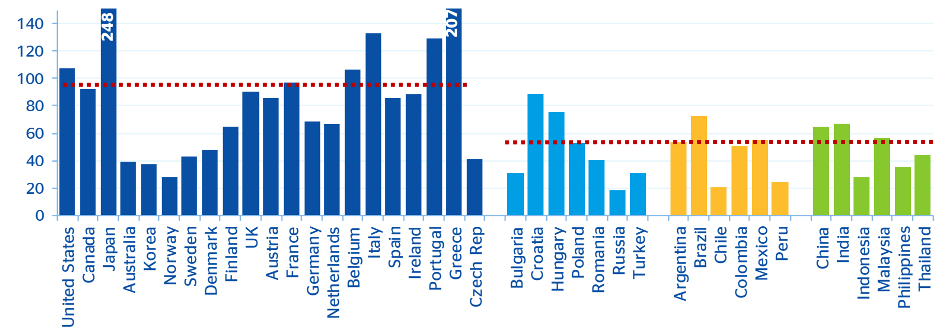
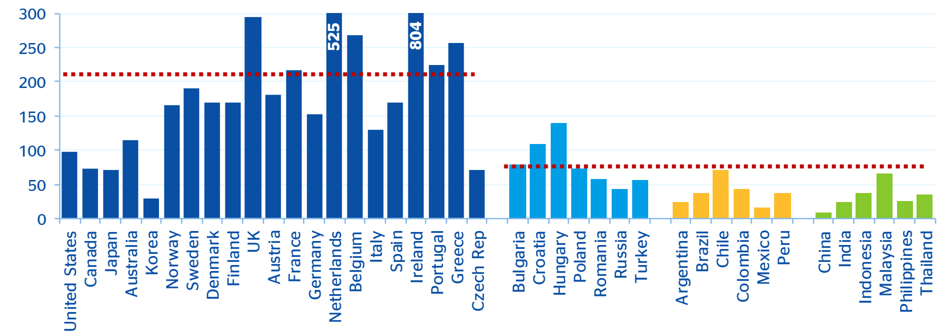
Public and private debt chart gallery

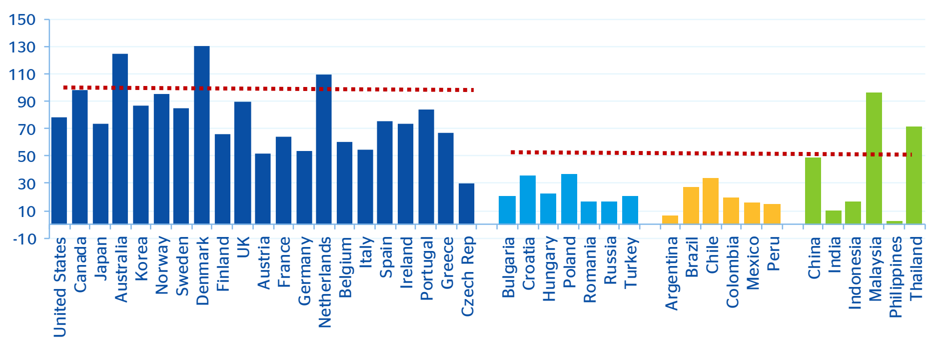
Gross Public Debt 2016
(% GDP)
Source: BBVA Research and IMF



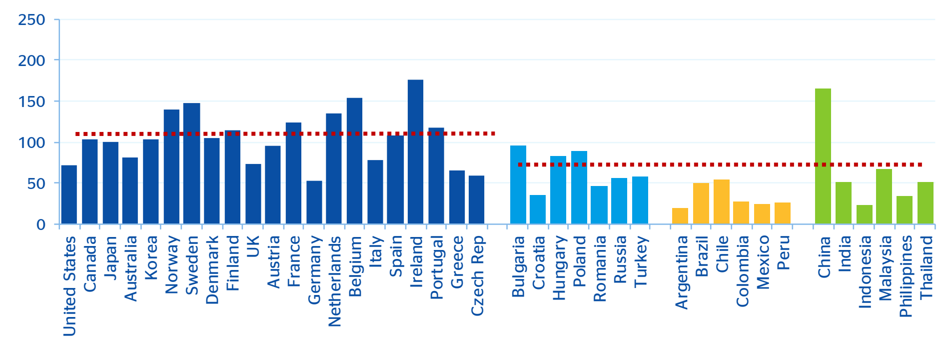
External Debt 2016
(% GDP)
Source: BBVA Research and IMF



Household Debt 2016
(% GDP)
Source: BBVA Research and BIS



Corporate Sector Debt 2016
(% GDP, excluding bond issuances)
Source: BBVA Research and BIS



Risk thresholds

Country Risk Report

International financial markets, global risk aversion and capital flows

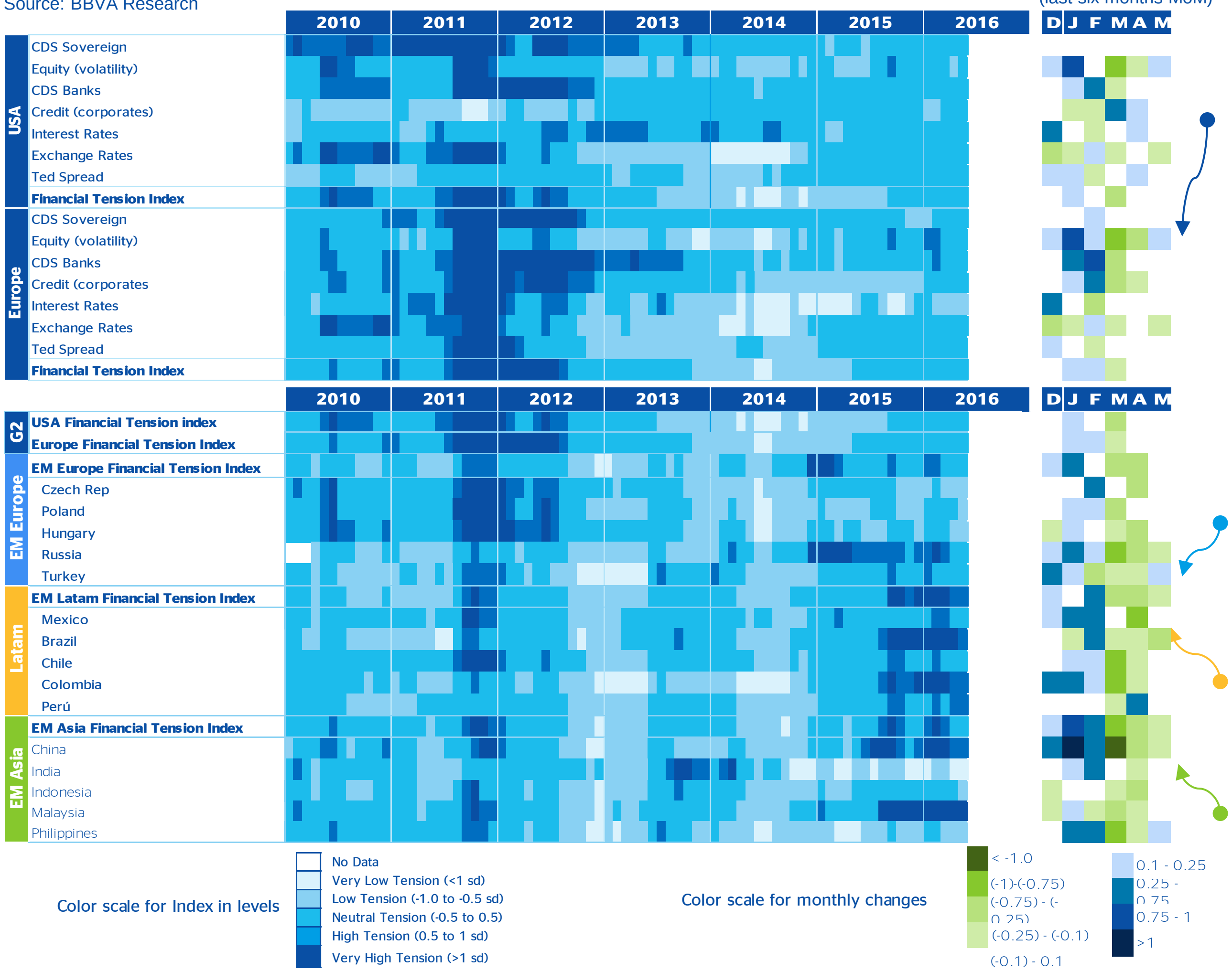
Financial tensions fell sharply across the board in March and have stabilized afterwards

BBVA Research Financial Stress Map

Source: BBVA Research

Changes

(last six months MoM)



The decrease in volatility in equity markets was the main driver of the reduction of Financial Tensions in US and Europe.

Most factors have relaxed since March, with some tension in credit (corporate) spreads.

FTI in EMs returned once again to the levels prevailing before the recent turmoil in January and September.

EM Europe continues to be the most stable emerging region.

FT in Latam continue to be at high levels despite some relaxation. Colombia, Brazil and Peru remain in the high tension area.

Malaysia and China are also in the high tension area.

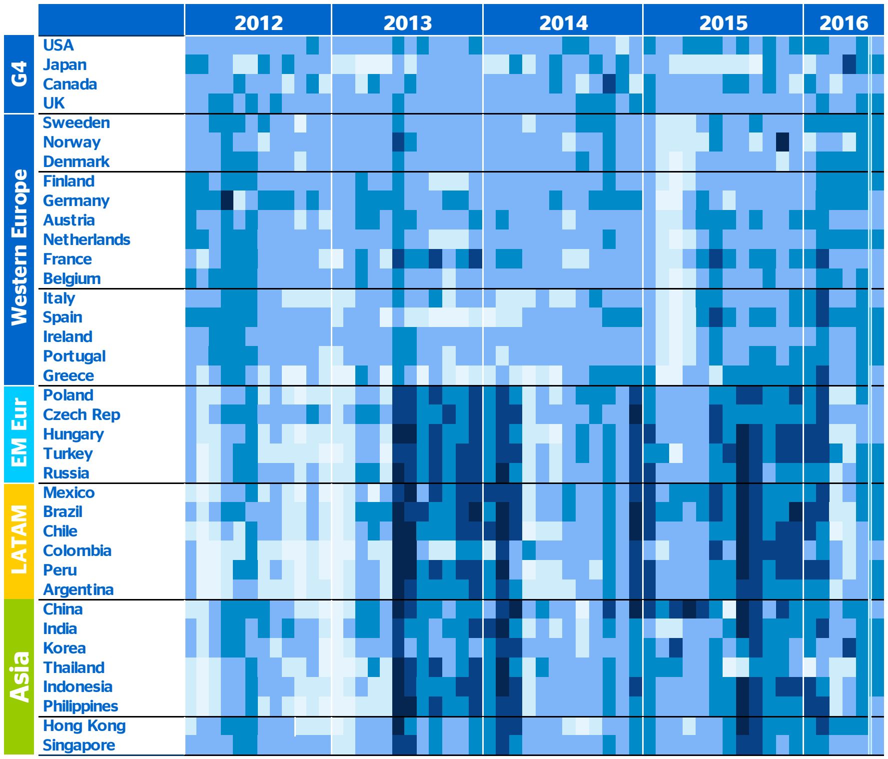
Country Risk Report

International financial markets, global risk aversion and capital flows

Too early Fed hike expectations took a toll. Latest data unwind the damage. EM flows towards neutrality in Q2

BBVA High Frequency Portfolio Flows Map

(% monthly change in net liabilities measured as net flows to total assets under management) Source: BBVA Research

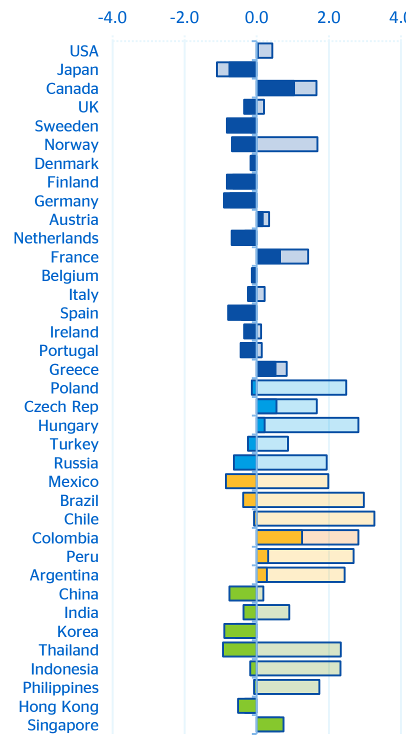


BBVA Research Portfolio Flows Map*

The Flows Map show the monthly evolution of net inflows with Darker blue colors representing sharp net outflows and lighter colors standing for net Inflows

Cum. Flows May-June(est.) vs. March-April graph and comment

(% quarterly change in flows, shades are previous values)



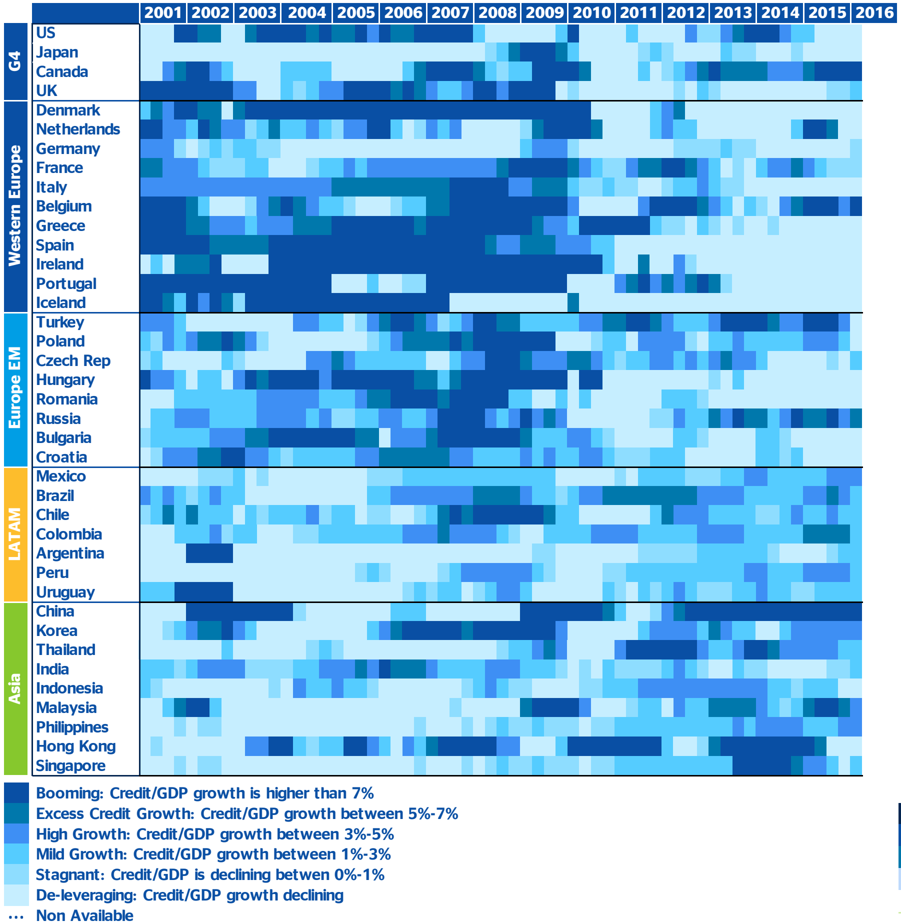
- The risk-on mood experienced since mid Q1 2015 subsided in May. EM portfolio flows receded again bringing the monthly flow variations into negative territory.
- Decreasing EM net flows linked to initial expectations on a nearing Fed hike and not due to risk aversion. A context of volatility prevails though.
- June US data and Yellen's comments watered down the expectation of further rate hikes though flows revived at the start of the month akin the recovery will not last.
- All in all the rest of the quarter might close to flat for EM and DM tough in quarterly terms Q2 will register positive inflows across the board.

Turkey is currently deleveraging. Credit growth in Colombia is cooling off. Leverage growth in China seems unbounded

Private credit color map (2001-2016 Q1)

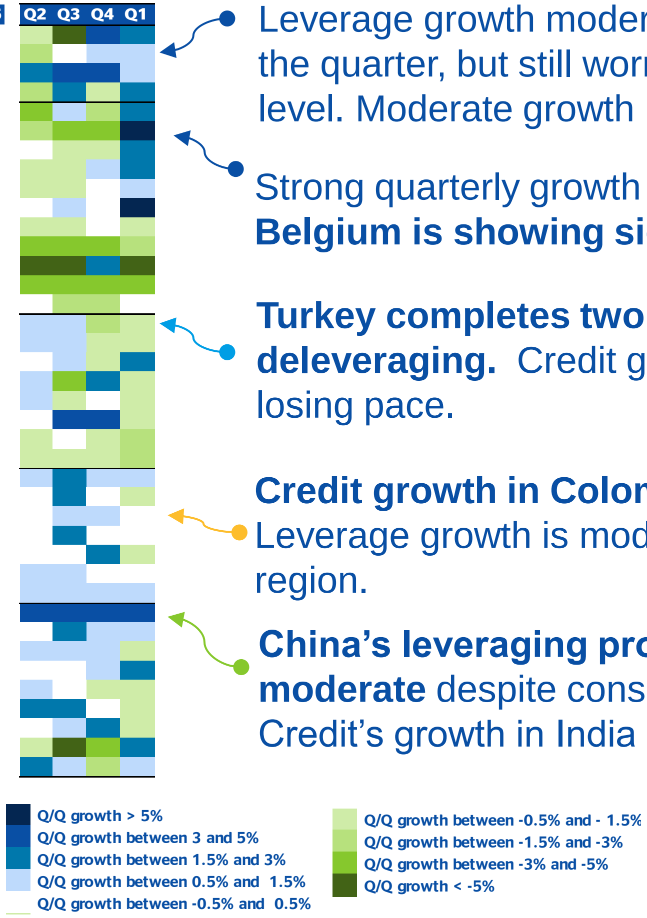
(yearly change of private credit-to-GDP ratio (YoY)

Source: BBVA Research, IFS and BIS



QoQ growth

Last four quarters up until Q1-2016



Leverage growth moderated in Canada during the quarter, but still worrisome at an annual level. Moderate growth in USA, Japan and UK.

Strong quarterly growth in northern Europe. **Belgium is showing signs of excess.**

Turkey completes two quarters of deleveraging. Credit growth in Russia is also losing pace.

Credit growth in Colombia is cooling off. Leverage growth is moderate throughout the region.

China's leveraging process does not moderate despite consensus about its excess. Credit's growth in India is gaining pace.

Country Risk Report

Assessment of financial and external disequilibria

Housing prices seem to be picking up in both developed and Emerging Europe. Prices in UK & Ireland growing rapidly.

Real housing prices color map (2001-2016 Q1)

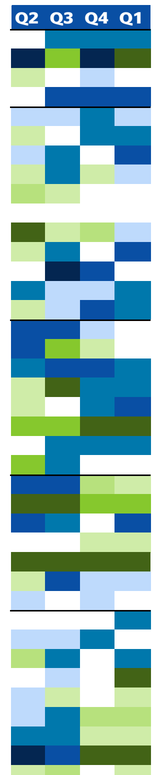
(yearly change of real housing prices YoY)

Source: BBVA Research, BIS and Oxford Economics

Booming: Real House prices growth higher than 8%
Excess Growth: Real House Prices Growth between 5% and 8%
High Growth: Real House Prices growth between 3%-5%
Mild Growth: Real House prices growth between 1%-3%
Stagnant: Real House Prices growth between 0% and 1%
De-Leveraging: House prices are declining
Non Available Data

QoQ Growth

Last four quarters up until Q1-2016



Q/Q growth > 3.5%
Q/Q growth between 2% and 3.5%
Q/Q growth between 1% and 2%
Q/Q growth between 0.5% and 1%
Q/Q growth between -0.5% and 0.5%
Q/Q growth between -0.5% and - 1%
Q/Q growth between -1% and -2%
Q/Q growth between -2% and -3.5%
Q/Q growth < -3.5%

Long-lasting housing prices growth in US. **Excess growth continues in UK.** High volatility in prices growth in Japan.

Signs of overheating in Ireland, although slowing down. Prices in Spain and Portugal continue their recovery

Mixed quarterly data across EM Europe. Moderation of growth in Turkey, acceleration in Czech Rep. Contraction in Russia.

Prices decreasing or growing moderately in most LatAm countries**, with Chile being the clear exception.**

Mixed situation in EM Asia. Prices in China are picking up again. Strong decline in HK prices.

Country Risk Report

Assessment of financial and external disequilibria

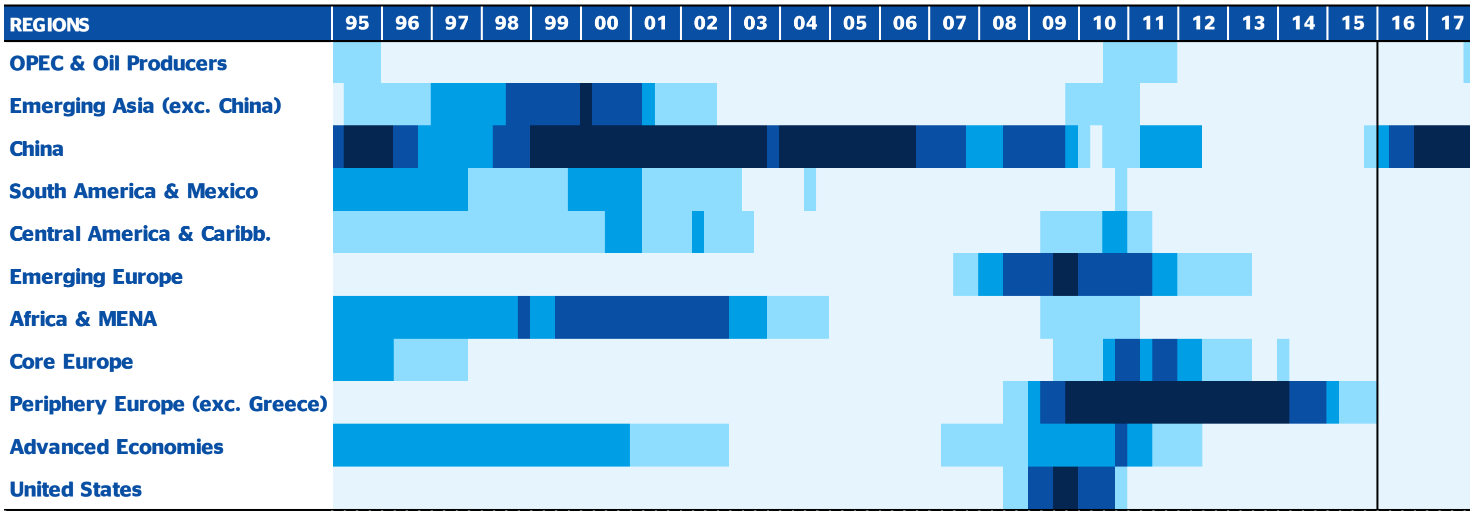
Some Oil Exporters and China, the ones most likely to face a banking crisis in the next two years

Early warning system (EWS) of Banking Crises (1992Q1-2017Q4)

Probability of Systemic Banking Crisis (based on 8-quarters lagged data*):

***The probability of a crisis in Q4-2016 is based on Q4-2014 data.**

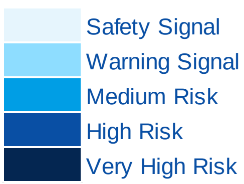
Source: BBVA Research



Opec & Oil producers can suffer banking problems on new oil price paradigm

China's Banking woes will accelerate unless corrected

Europe's periphery (ex Greece) problems are relaxing



- In this Quarterly Report we introduce our Early Warning System (EWS) of Banking Crises at a regional level. A banking crisis in a given country follows the definition by Laeven and Valencia (2012), which is shown in the Appendix.
- The complete description of the methodology can be found at https://goo.gl/r0BLbl and at https://goo.gl/VA8xXv.
- The probabilities shown are the simple average of the estimated individual countries probabilities for each region. The definition of each region is shown in the Appendix.

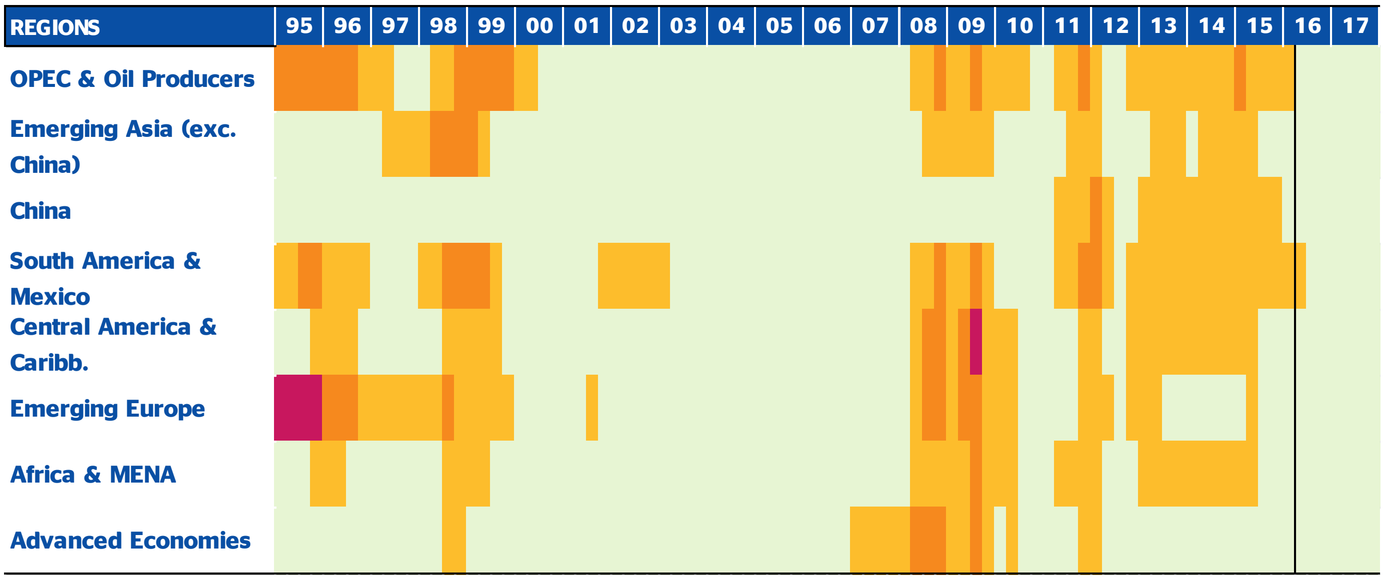
Country Risk Report

Assessment of financial and external disequilibria

Oil Exporters and some Latam countries still the most vulnerable to currency shocks. The probability of currency crises decreases after the sharp correction

Early warning system (EWS) of Currency Crisis Risk: probability of currency tensions

The probability of a crisis is based on 4-quarters lagged data, e.g. Probability in Q4-2016 is based on Q4-2015 data.
Source: BBVA Research



The tension for oil exporters is diminishing

The foreign exchange pressure still remains for some LatAm countries

- Safe
- Warning
- High Risk
- Very High Risk

- We have developed a similar Currency-Crises Early Warning System EWS that allow us to estimate the probability of a currency crisis, which is defined as a "large" fall in the exchange rate and in foreign reserves in a given country, according to certain predefined measures.
- The probabilities shown in the table are the simple average of the individual countries probabilities for each region. The list of the leading indicators used in the estimation of the probability and the definition of each region are shown in the Appendix.

Vulnerability indicators: developed economies

Vulnerability indicators* 2016: developed countries

Source: BBVA Research, Haver, BIS, IMF and World Bank

	Fiscal sustainability			External sustainability			Liquidity management			Macroeconomic performance			Credit and housing			Private debt			Institutional		
	Structural primary balance **(1)**	Interest rate GDP growth differential 2014-19	Gross public debt **(1)**	Current account balance **(1)**	External debt **(1)**	RER appreciation **(2)**	Gross financial needs **(1)**	Short-term public debt **(3)**	Debt held by non-residents **(3)**	GDP growth **(4)**	Consumer prices **(4)**	Unemployment rate **(5)**	Private credit to GDP growth **(4)**	Real housing prices growth **(4)**	Equity markets growth **(4)**	Household debt **(1)**	NF corporate debt **(1)**	Financial liquidity **(6)**	WB political stability **(7)**	WB control corruption **(7)**	WB rule of law **(7)**
United States	-1.4	-1.2	107	-2.8	98	13.2	20	15	34	2.5	1.3	4.8	-3.5	4.4	-0.5	78	71	63	-0.6	-1.3	-1.6
Canada	-1.4	-0.8	92	-3.5	72	-11.5	12	13	22	1.5	1.4	7.3	10.0	10.8	-9.4	98	104	136	-1.2	-1.8	-1.9
Japan	-4.4	-0.6	249	3.8	71	-3.4	41	19	8	0.5	-0.2	3.3	-3.4	0.6	-12.7	74	101	50	-1.0	-1.7	-1.6
Australia	-0.7	-0.5	39	-3.6	114	-5.8	4	8	66	2.5	2.5	5.9	7.7	7.2	-12.1	125	80	137	-1.1	-1.9	-1.9
Korea	0.4	0.7	37	8.2	30	0.0	2	10	13	2.7	1.7	3.5	3.6	3.1	-2.2	87	104	97	-0.2	-0.5	-1.0
Norway	-10.6	-0.6	28	6.5	166	-9.9	0	30	34	1.0	2.5	4.6	15.3	1.5	-7.9	95	140	124	-1.1	-2.2	-2.0
Sweden	-1.1	-2.4	43	5.8	189	-5.2	6	12	46	3.7	1.4	6.8	-6.1	12.2	-18.1	85	147	199	-1.1	-2.1	-2.0
Denmark	-1.6	-1.1	47	6.6	170	-0.9	7	24	43	1.6	0.8	6.0	-5.8	3.2	-0.6	130	105	323	-0.9	-2.3	-2.1
Finland	-0.7	-1.1	64	0.0	170	-1.7	8	8	79	0.9	0.8	9.3	-1.3	4.4	-11.3	66	115	136	-1.3	-2.2	-2.1
UK	-1.4	-1.0	90	-5.4	295	0.1	10	6	28	1.8	0.7	5.0	-5.1	7.1	-8.8	90	73	59	-0.4	-1.7	-1.9
Austria	0.5	-0.4	86	3.6	180	0.4	6	6	76	1.2	1.8	6.2	1.4	3.1	-9.5	52	95	98	-1.3	-1.4	-2.0
France	-0.5	-0.9	97	-0.3	217	-2.5	14	11	61	1.3	0.1	10.1	-3.0	1.0	-12.9	64	124	109	-0.4	-1.3	-1.5
Germany	1.8	-1.3	69	8.0	153	-2.4	4	4	61	1.7	0.0	4.6	-1.8	5.6	-16.7	54	53	93	-0.9	-1.8	-1.9
Netherlands	0.6	-1.3	67	10.6	551	-1.2	8	12	52	1.8	0.5	6.4	-8.1	1.3	-10.1	109	134	98	-1.0	-2.0	-2.0
Belgium	-0.2	-0.5	107	0.5	268	-1.3	18	16	59	1.2	0.6	8.3	-3.3	0.5	-7.0	61	154	54	-0.7	-1.6	-1.5
Italy	2.9	0.9	133	2.6	130	-2.6	18	16	36	1.0	0.1	11.4	-3.5	-1.7	-21.8	54	78	108	-0.5	0.1	-0.3
Spain	0.4	-1.7	85	2.1	169	-2.8	18	16	43	2.7	-0.3	19.8	-14.2	2.8	-24.3	75	108	112	-0.3	-0.5	-0.9
Ireland	1.9	-1.6	89	4.0	781	-4.1	7	6	62	5.0	0.5	8.3	-46.2	7.5	4.8	73	176	58	-1.1	-1.6	-1.8
Portugal	2.9	0.8	130	1.3	225	-0.7	18	16	72	1.4	0.5	11.6	-14.8	4.9	-6.3	84	117	137	-0.8	-0.9	-1.1
Greece	3.2	-1.8	207	-0.2	257	-4.3	15	6	82	-0.6	0.2	25.0	-2.2	-5.1	-25.6	67	65	154	0.0	0.2	-0.3

*Vulnerability indicators: (1) % GDP (2) Deviation from four-year average (3) % of total debt (4) % year on year (5) % of Total labour force (6) Financial system credit to deposit (7) Index by World Bank governance indicators

Vulnerability indicators: emerging economies

Vulnerability indicators* 2016: emerging countries

Source: BBVA Research, Haver, BIS, IMF and World Bank

	Fiscal sustainability			External sustainability			Liquidity management			Macroeconomic performance			Credit and housing			Private debt			Institutional		
	Structural primary balance (1)	Interest rate GDP growth differential 2014-19	Gross public debt (1)	Current account balance (1)	External debt (1)	RER appreciation (2)	Gross financial needs (1)	Reserves to short-term external debt (3)	Debt held by non-residents (3)	GDP growth (4)	Consumer prices (4)	Unemployment rate (5)	Private credit to GDP growth (4)	Real housing prices growth (4)	Equity markets growth (4)	Household debt (1)	NF corporate debt (1)	Financial liquidity (6)	WB political stability (7)	WB control corruption (7)	WB rule of law (7)
Bulgaria	-0.9	0.4	30	1.7	79	-2.1	4	2.4	44	2.3	1.1	8.6	-3.0	4.2	-13.2	21	95	82	-0.1	0.3	0.1
Czech Rep	-0.8	-1.4	41	0.6	71	-2.7	8	14	32	2.5	1.5	4.7	-3.2	9.7	-12.9	30	59	86	-1.0	-0.3	-1.1
Croatia	0.6	0.9	89	2.7	108	-1.6	19	3.7	37	1.9	0.8	16.4	-3.8	-1.3	-2.5	35	35	100	-0.6	-0.2	-0.3
Hungary	1.0	-0.3	75	5.4	140	-4.4	19	2.7	61	2.3	1.2	6.7	-10.8	-5.2	26.1	23	83	93	-0.7	-0.1	-0.5
Poland	-1.2	-1.8	52	-1.8	73	-5.0	10	2.5	57	3.6	0.5	6.9	1.5	0.7	-9.4	36	90	111	-0.9	-0.6	-0.8
Romania	-1.5	-1.8	40	-1.7	57	-2.4	9	3.4	49	4.2	1.5	6.4	-1.9	3.9	-4.8	17	47	91	-0.1	0.1	-0.1
Russia	-3.6	1.6	18	4.2	42	-23.2	5	4.3	15	-1.8	7.9	6.5	2.6	-17.6	15.1	16	55	105	0.8	0.9	0.7
Turkey	0.3	-2.2	31	-3.6	55	0.6	5	16.1	34	3.8	9.8	10.8	3.4	6.7	3.0	21	57	124	1.1	0.1	0.0
Argentina	-4.4	-1.2	53	-3.5	24	-32.6	9	1.8	59	-0.4	32.0	7.7	1.4	-31.5	19.9	6	19	66	-0.1	0.6	0.9
Brazil	-0.5	3.4	73	-2.1	37	-9.8	18	7.3	17	-3.0	6.8	8.8	3.3	-13.1	-2.1	27	49	112	0.0	0.4	0.1
Chile	-2.3	-1.2	21	-1.8	70	-2.3	3	5.8	16	1.7	3.2	6.8	2.1	6.8	0.5	34	54	148	-0.5	-1.5	-1.4
Colombia	-0.2	1.9	51	-6.3	42	-25.8	5	3.6	25	2.0	6.2	10.7	5.4	0.5	-1.3	19	27	109	1.1	0.4	0.3
Mexico	-0.4	0.2	55	-3.1	17	-14.8	10	6.7	34	2.2	2.9	4.2	3.8	3.1	4.4	16	25	82	0.8	0.7	0.5
Peru	-0.8	-1.8	24	-3.4	37	-3.5	4	3.1	34	3.6	2.9	6.3	3.4	6.1	-1.4	15	26	96	0.5	0.6	0.6
China	-2.2	-5.0	65	2.6	9	5.8	4	5.7	..	6.5	1.8	4.1	17.3	1.4	-18.3	49	165	86	0.5	0.3	0.3
India	-2.4	-4.0	66	-1.5	23	8.6	11	4.5	7	7.6	5.1	5.5	-0.1	-4.0	-9.4	10	51	83	1.0	0.5	0.1
Indonesia	-1.2	-3.3	28	-2.6	37	5.0	5	2.5	56	5.3	4.5	5.9	0.5	-0.7	-12.2	16	22	97	0.4	0.6	0.3
Malaysia	-1.9	-2.7	56	2.3	65	-7.2	10	1.9	28	4.4	3.1	3.2	6.5	3.2	-6.2	96	--	106	-0.3	-0.5	-0.6
Philippines	1.4	-3.6	36	2.6	26	3.3	7	5.6	31	6.5	2.9	6.0	3.2	3.6	-8.5	3	34	62	0.7	0.4	0.3
Thailand	0.5	-2.4	44	8.0	35	-1.4	6	3.1	12	3.5	1.6	0.8	2.9	2.0	-6.5	71	50	98	0.9	0.4	0.2

*Vulnerability indicators: (1) % GDP (2) Deviation from four-year average (3) % of total debt (4) % year on year (5) % of total Llbour force (6) Financial system credit to deposit (7) Index by World Bank governance indicators

Methodology: indicators and maps

- Financial Stress Map: It stresses levels of stress according to the normalised time series movements. Higher positive standard units (1.5 or higher) stand for high levels of stress (dark blue) and lower standard deviations (-1.5 or below) stand for lower level of market stress (lighter colours)
- Sovereign Rating Index: An index that translates the letter codes of the three important rating agencies' rating (Moody's, Standard & Poors and Fitch) to numerical positions from 20 (AAA) to default (0). The index shows the average of the three rescaled numerical ratings
- Sovereign CD Swaps Map: It shows a colour map with six different ranges of CD Swaps quotes (darker >500, 300 to 500, 200 to 300, 100 to 200, 50 to 100 and the lighter below 50 bp)
- Downgrade Pressure Gap: The gap shows the difference between the implicit ratings according to the Credit Default Swaps and the current ratings index (numerically scaled from default (0) to AAA (20)). We calculate implicit probabilities of default (PD) from the observed CDS and the estimated equilibrium spread. For the computation of these PDs we follow a standard methodology as described in Chan-Lau (2006), and we assume a constant Loss Given Default of 0.6 (Recovery Rate equal to 0.4) for all the countries in the sample. We use the resulting PDs in a cluster analysis to classify each country at every point in time in one of 20 different categories (ratings) to emulate the same 20 categories used by the rating agencies. The graph plots the difference between CDS-implied sovereign rating and the actual sovereign rating index, in notches. Higher positive differences account for potential Upgrade pressures and negative differences account for Downgrade potential. We consider the +/- 2 notches area as being Neutral
- Vulnerability Radars:
  - A Vulnerability Radar shows a static and comparative vulnerability for different countries. For this we assigned several dimensions of vulnerabilities, each of them represented by three vulnerability indicators. The dimensions included are: Macroeconomics, Fiscal, Liquidity, External, Excess Credit and Assets, Private Balance Sheets and Institutional. Once the indicators are compiled, we reorder the countries in percentiles from 0 (lower ratio among the countries) to 1 (maximum vulnerabilities) relative to their group (Developed Economies or Emerging Markets). Furthermore, Inner positions (near 0) in the radar shows lower vulnerability, while outer positions (near 1) stand for higher vulnerability. Furthermore, we normalize each value with respect to given risk thresholds, whose values have been computed according to our own analysis or empirical literature. If the value of a variable is equal to the threshold, it would take a value of 0.8 in the radar.

Methodology: indicators and maps

Risk thresholds table

Vulnerability Dimensions	Risk thresholds Developed Economies	Risk thresholds emerging economies	Risk direction	Research
Macroeconomics				
GDP	1.5	3.0	Lower	BBVA Research
Inflation	4.0	10.0	Higher	BBVA Research
Unemployment	10.0	10.0	Higher	BBVA Research
Fiscal vulnerability				
Cyclically adjusted deficit ("Strutural Deficit")	-4.2	-0.5	Lower	Baldacci et Al (2011). Assesing fiscal stress. IMF WP 11/100
Expected interest rate GDP growth diferential 5 years ahead	3.6	1.1	Higher	Baldacci et Al (2011). Assesing fiscal stress. IMF WP 11/100
Gross public bebt	73.0	43.0	Higher	Baldacci et Al (2011). Assesing fiscal stress. IMF WP 11/100
Liquidity problems				
Gross financial needs	17.0	21.0	Higher	Baldacci et Al (2011). Assesing fiscal stress. IMF WP 11/100
Debt held by non residents	84.0	40.0	Higher	Baldacci et Al (2011). Assesing fiscal stress. IMF WP 11/101
Short term debt pressure				
Public short-term debt as % of total public debt (Developed)	9.1		Higher	Baldacci et Al (2011). Assesing fiscal stress. IMF WP 11/100
Reserves to short-term debt (Emerging)		0.6	Lower	Baldacci et Al (2011). Assesing fiscal stress. IMF WP 11/100
External Vulnerability				
Current account balance (% GDP)	4.0	6.0	Lower	BBVA Research
External debt (% GDP)	200.0	60.0	Higher	BBVA Research
Real exchange rate (Deviation from 4 yr average)	5.0	10.0	Higher	EU Commission (2012) and BBVA Research
Private Balance Sheets				
Household debt (% GDP)	84.0	84.0	Higher	Chechetti et al (2011). "The real effects of debt". BIS Working Paper 352 & EU Comission (2012)
Non-financial corporate debt (% GDP)	90.0	90.0	Higher	Chechetti et al (2011). "The real effects of debt". BIS Working Paper 352 & EU Comission (2013)
Financial liquidity (Credit/Deposits)	130.0	130.0	Higher	EU Commission (2012) and BBVA Research
Excess Credit and Assets				
Private credit to GDP (annual change)	8.0	8.0	Higher	IMF global financial stability report
Real housing prices growth (% YoY)	8.0	8.0	Higher	IMF global financial stability report
Equity growth (% YoY)	20.0	20.0	Higher	IMF global financial stability report
Institutions				
Political stability	0.2 (9th percentile)	-1.0 (8th percentile)	Lower	World Bank governance Indicators
Control of corruption	0.6 (9th percentile)	-0.7 (8th percentile)	Lower	World Bank governance Indicators
Rule of caw	0.6 (8th percentile)	-0.6 (8 th percentile)	Lower	World Bank governance Indicators

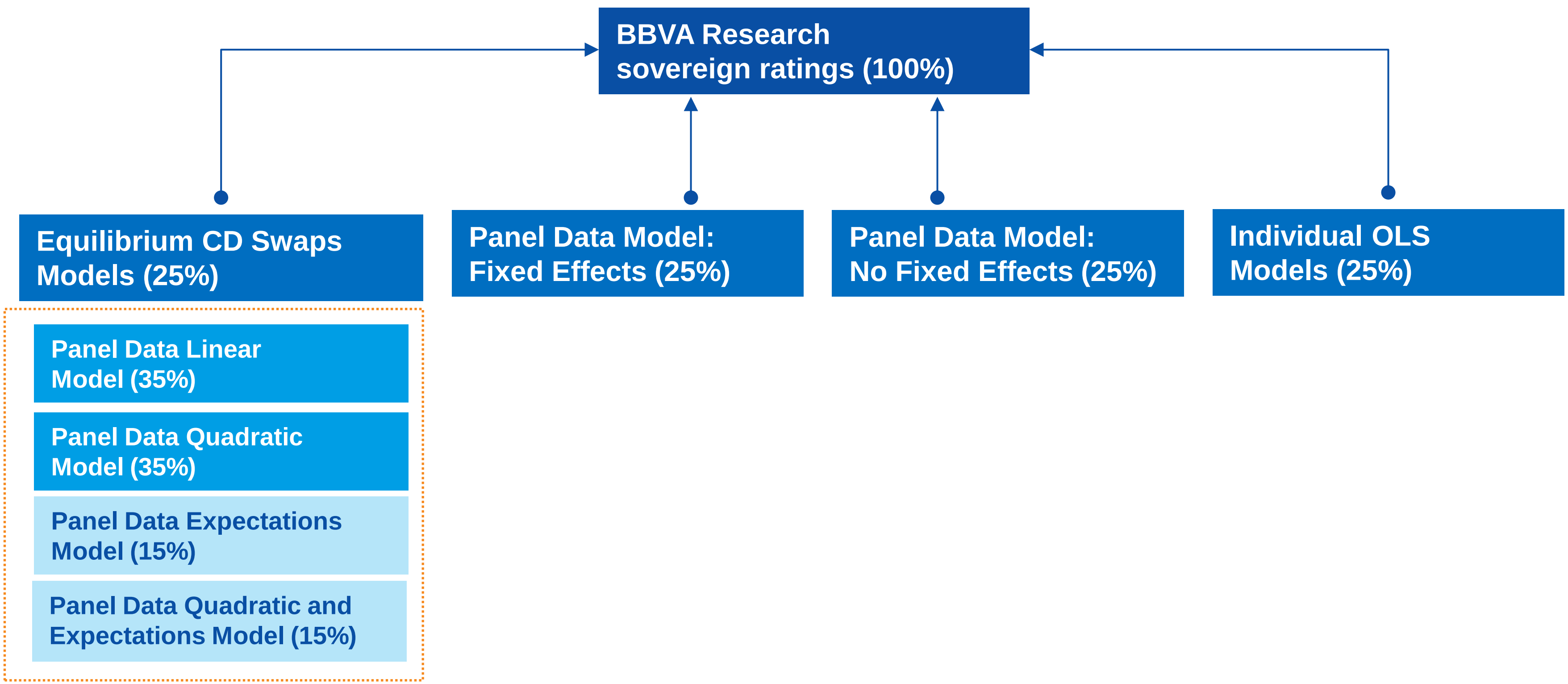
Methodology: models and BBVA country risk

- BBVA Research sovereign ratings methodology: We compute our sovereign ratings by averaging four alternative sovereign rating models developed at BBVA Research:
  - Credit Default Swaps Equilibrium Panel Data Models: This model estimates actual and forecast equilibrium levels of CD Swaps for 40 developed and emerging markets. The long-run equilibrium CD Swaps are the result of four alternative panel data models. The averages of these equilibrium values are finally converted to a 20 scale sovereign rating scale. The CDS equilibrium is calculated by a weighting average of the four CDS equilibrium model estimates (30% for the linear and quadratic models and 15% for each expectation model to correct for expectation uncertainty). The weighted average is rounded by 0.5 standard deviation confidence bands. The models are the following
    - Linear Model (35% weight): Panel Data Model with fixed effects including global risk aversion, GDP growth, inflation, public debt and institutional index for developed economies, and adding external debt and reserves to imports for emerging markets
    - Quadratic Model (35% weight): This is similar to the Linear Panel Data Model but including a quadratic term for public (developed and emerging) and external debt (emerging)
    - Expectations Model (15% weight): This is similar to the linear model, but public and external debt account for one year’s expected values
    - Quadratic Expectations Model (15% weight): Similar to the expectations model, but including quadratic terms of public debt and external debt expectations
  - Sovereign Rating Panel Data Ordered Probit with Fixed Effects Model: The model estimates a sovereign rating index (a 20 numerical scale index of the three sovereign rating agencies) through ordered probit panel data techniques. This model takes into account idiosyncratic fundamental stock and flows sustainability ratios allowing for fixed effects , thus including idiosyncratic country-specific effects
  - Sovereign Rating Panel Data Ordered Probit without Fixed Effects Model: The model estimates a sovereign rating index (a 20 numerical scale index of the three sovereign rating agencies) through ordered probit panel data techniques. This model takes into account idiosyncratic fundamental stock and flows sustainability but fixed effects are not included, thus all countries are treated symmetrically without including the country-specific long-run fixed effects
  - Sovereign Rating Individual OLS models: These models estimate the sovereign rating index (a 20 numerical scale index of the three sovereign rating agencies) individually. Furthermore, parameters for the different vulnerability indicators are estimated taken into account the history of the country, independent of others. The estimation comes from Oxford Economics Forecasting (OEF) for the majority of countries. For those countries that are not analysed by OEF, we estimate a similar OLS individual model.

Methodology: models and BBVA country risk

BBVA Research sovereign ratings methodology diagram

Source: BBVA Research



Methodology: Early Warning Systems

EWS Banking Crises:

The complete description of the methodology can be found at https://goo.gl/r0BLbI and at https://goo.gl/VA8xXv. A banking crisis is defined as systemic if two conditions are met: 1) Significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations), 2) Significant banking policy intervention measures in response to significant losses in the banking system. The probability of a crisis is estimated using a panel-logit model with annual data from 68 countries and from 1990 to 2012. The estimated model is then applied to quarterly data. The probability of a crisis is estimated as a function of the following leading indicators (with a 2-years lag):

- Credit-to-GDP Gap (Deviation from an estimated long-term level)
- Current account balance to GDP
- Short-term interest rate (deviation against US interest rate)
- Libor interest rate
- Credit-to-Deposits
- Regulatory Capital to Risk Weighted Assets ratio.

EWS Currency Crises:

We estimate the probability of a currency crisis (a large fall in exchange rate and foreign reserves event) is estimated using a panel-logit model with 78 countries from 1980Q1 to 2015Q4, as a function of the following variables (with an 4-quarters lag):

- Credit-to-GDP ratio Gap (based on HP filter)
- Inflation
- BAA Spread
- Cyclical Current Account (based on HP filter)
- Short-term interest rate (deviation against US interest rate)
- Libor interest rate (different lags)
- Real effective exchange rate
- Investment to GDP
- GDP real growth rate (HP-trend and cyclical deviation from trend)
- Total trade to GDP

Methodology: Early Warning Systems

EWS Banking Crises Definition of Regions:

- **OPEC and Other Oil Exporters**: Algeria, Angola, Azerbaijan, Bahrain, Canada, Ecuador, Nigeria, Norway, Qatar, Russia and Venezuela
- **Emerging Asia**: Bangladesh, China, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand and Vietnam.
- **South America & Mexico**: Argentina, Brazil, Chile, Colombia, Mexico, Paraguay, Peru and Uruguay
- **Other LatAm & Caribbean**: Bolivia, Costa Rica, Dominican Rep., El Salvador, Guatemala, Honduras, Nicaragua and Panama
- **Africa & MENA**: Botswana, Egypt, Israel, Morocco, Namibia and South Africa.
- **Emerging Europe:** Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Rep, Slovenia, Turkey, Ukraine
- **Core Europe**: Austria, Belgium, Denmark, Finland, France, Germany, Netherlands, Sweden and United Kingdom.
- **Periphery Europe**: Greece, Ireland, Italy, Portugal and Spain
- **Advanced Economies**: Australia, Japan, Korea, Singapore, Iceland, New Zealand and Switzerland.

EWS Currency Crises Definition of Regions:

- **OPEC and Other Oil Exporters**: Algeria, Angola, Azerbaijan, Bahrain, Nigeria, Norway, Oman, Qatar, Russia, Trinidad and Tobago, United Arab Emirates and Venezuela
- **Emerging Asia**: Bangladesh, China, Hong Kong, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand and Vietnam.
- **South America & Mexico**: Argentina, Brazil, Chile, Colombia, Mexico, Paraguay, Peru and Uruguay
- **Other LatAm & Caribbean**: Bolivia, Costa Rica, Dominican Rep., El Salvador, Guatemala, Honduras, Jamaica and Nicaragua
- **Emerging Europe:** Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Rep, Slovenia, Turkey, Ukraine
- **Africa & MENA**: Botswana, Egypt, Israel, Morocco, Namibia, South Africa and Tunisia
- **Advanced Economies**: Australia, Japan, Korea, Singapore, Canada, Iceland, New Zealand and Switzerland.

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