BBVA | RESEARCH

A QUARTERLY GUIDE TO COUNTRY RISKS
November
2016
(Data as of the end of October 2016)

Country Risk Report

Summary

Country Risk	Ratings agencies	• **Turkey** was downgraded by S&P and Moody's. **Hungary** and **Korea** upgraded by S&P. **Slovenia** and **Iceland** were also upgraded.
	Financial Markets	• **Financial tensions**, Global Risk Aversion and sovereign CDS have all been trending downwards since the turmoil at the beginning of the year. • **China** still faces the largest downgrade pressure, that has significantly risen for **Portugal.** Markets signal a possible upgrade for **Czech Rep**. and **India.**
	BBVA Research	• In the **periphery of EU** there is room to **improve rating agencies' rating** as regard its economic fundamentals. • **High levels of public debt in Advanced Economies** and **fiscal unbalances in Emerging** Asia and LatAm remain as an important vulnerability.
Special Issues		• **Global leverage evolution is shaped by China**. We estimate that the global leverage excess (credit-gap) reached in 2015 the same levels than in 2009 due to **mounting leverage in China** and its growing share in the World's economy. • **Sovereign default-like events matter**: we estimate that everything else constant, a recent sovereign default-like event implies having a CDS spread more than twice the one a country would have otherwise. Similarly, the effect of a change in different determinants is more than double if a country had a default-like event recently.

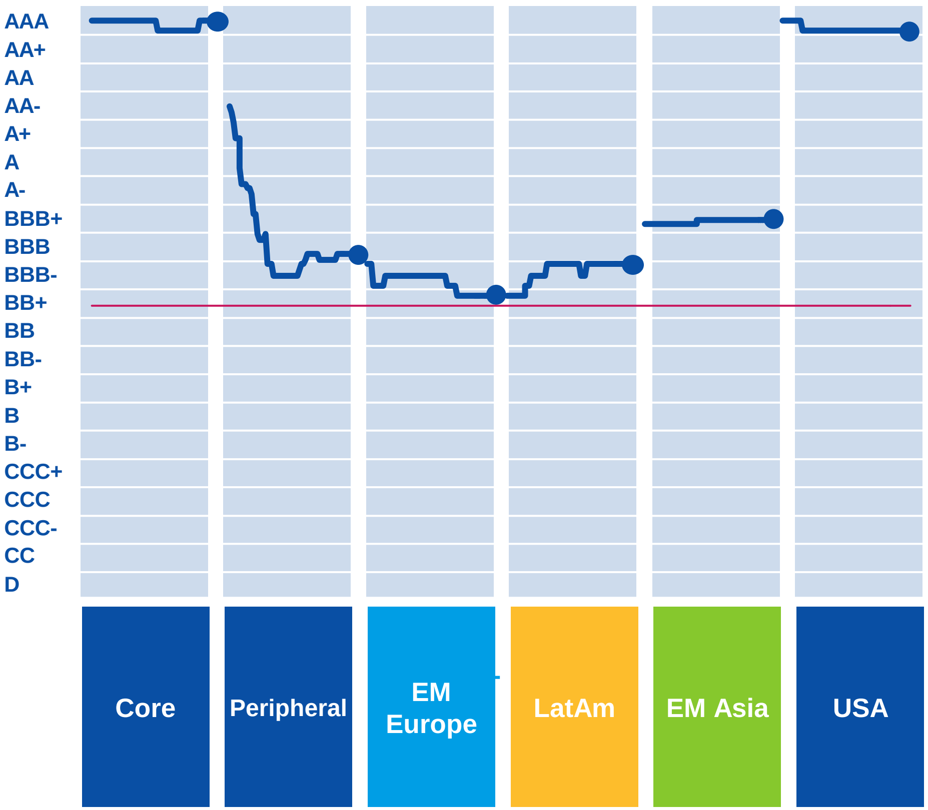
Index

1 Sovereign markets and ratings update

Evolution of sovereign CDS by country
Evolution of sovereign ratings
Market downgrade/upgrade pressure

Sovereign markets and rating agencies update

Sovereign Rating Index 2010-16



- **Turkey** was downgraded by S&P and Moody's. **Hungary** and **Korea** upgraded by S&P. **Slovenia** and **Iceland** also upgraded

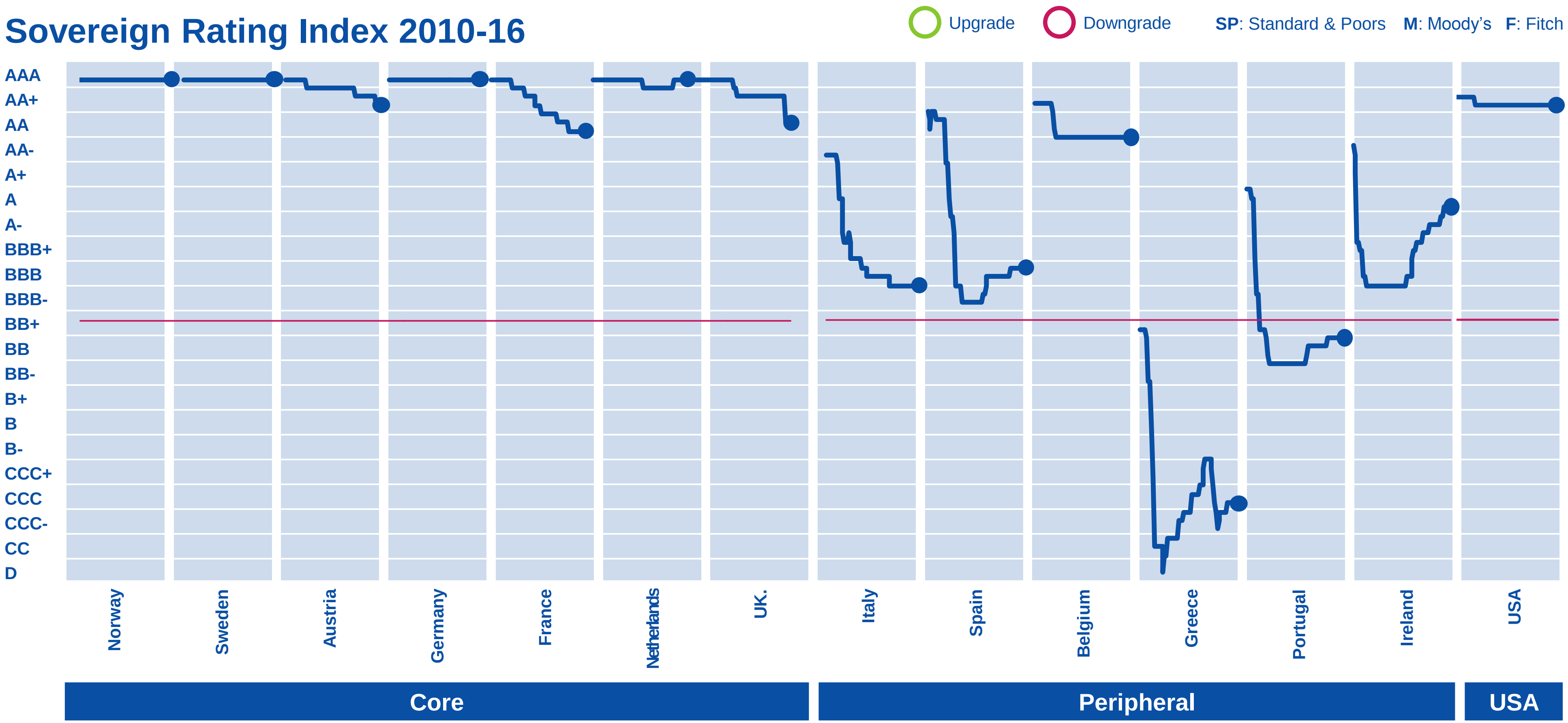
Source: BBVA Research by using S&P, Moody's and Fitch data

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.

DEVELOPED COUNTRIES

Sovereign markets and rating agencies update

Sovereign Rating Index 2010-16

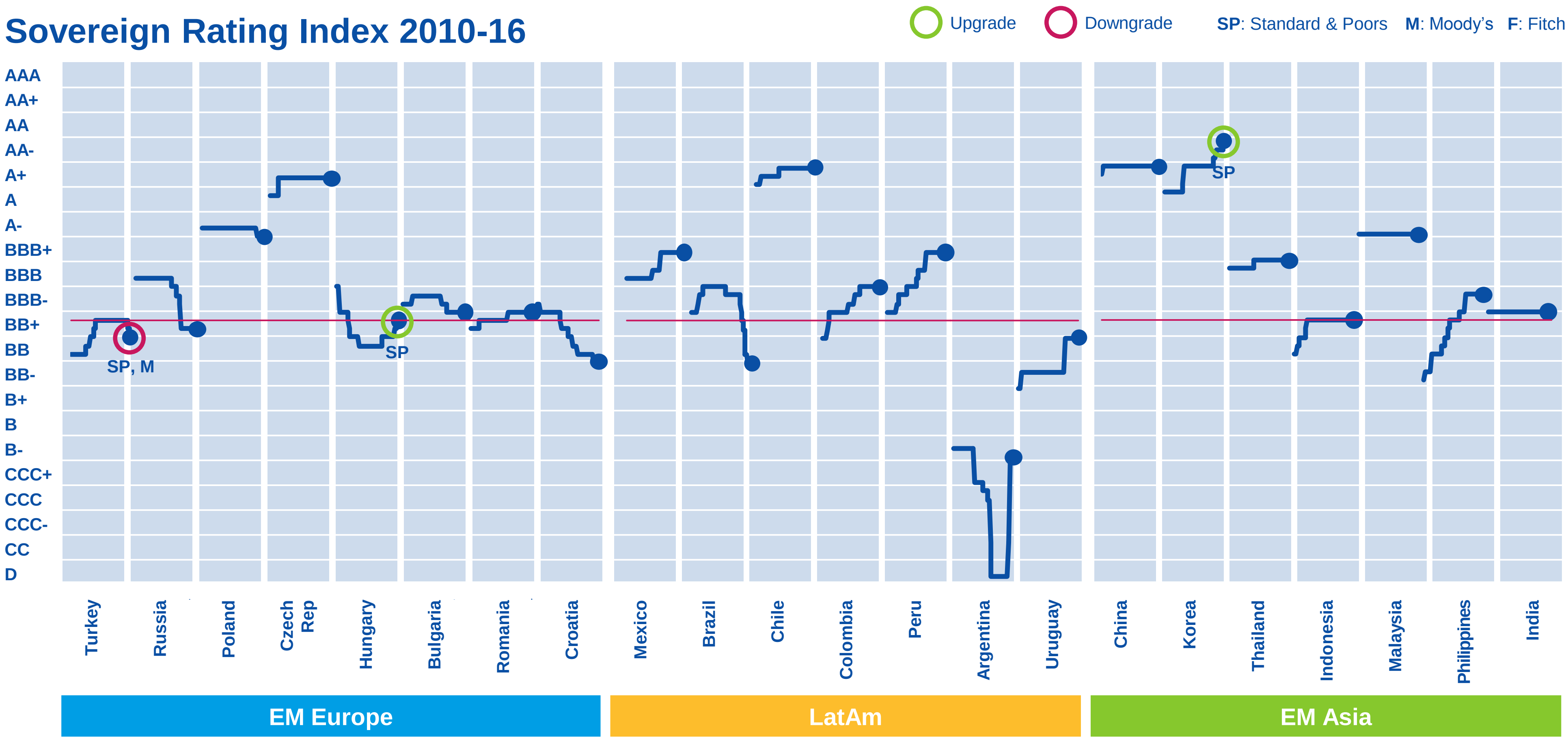


Source: BBVA Research

EMERGING COUNTRIES

Sovereign markets and rating agencies update

Sovereign Rating Index 2010-16

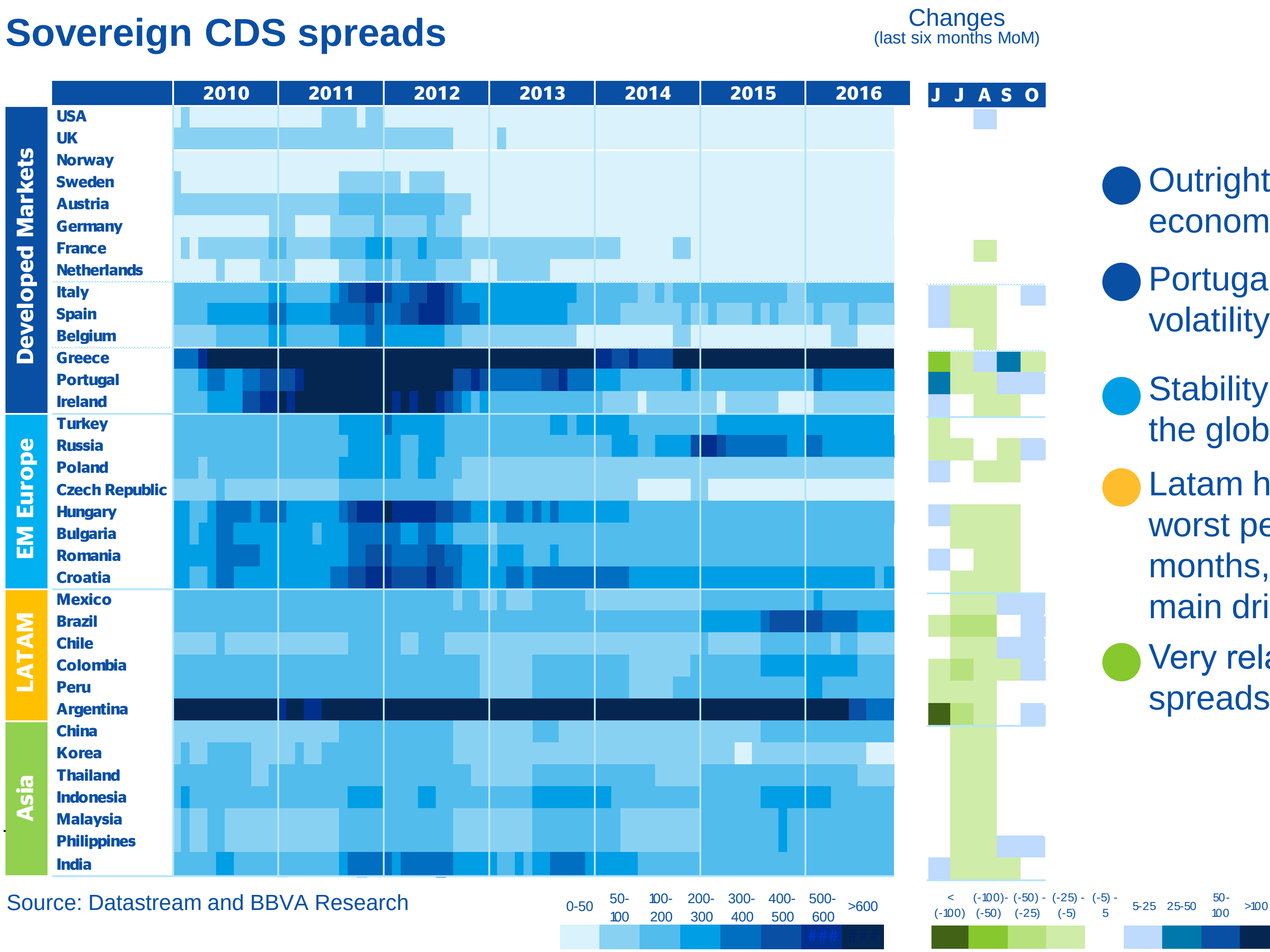


Source: BBVA Research

Sovereign markets and rating agencies update

Sovereign CDS relaxed further during July and August and has remained stable since then. Portugal CDS is on the rise

Sovereign CDS spreads



Source: Datastream and BBVA Research

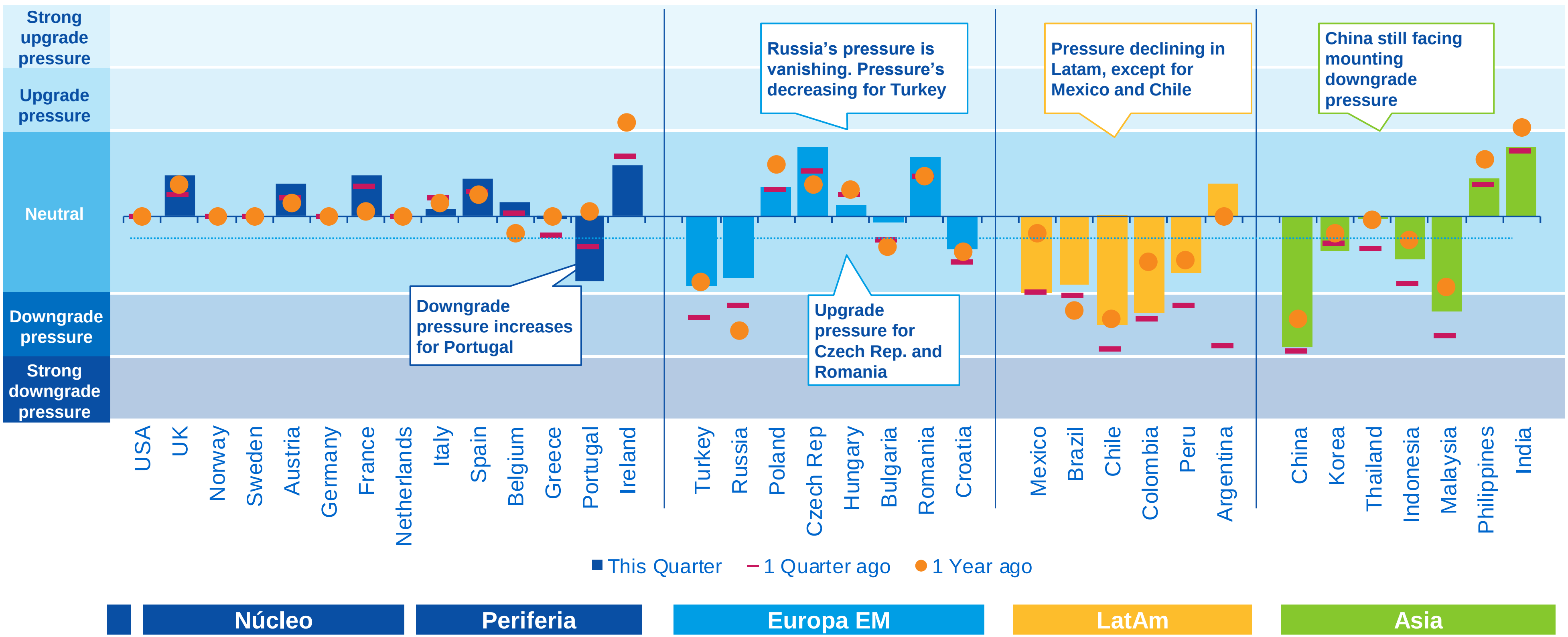
- Outright stability continues in advanced economies CDS
- Portugal CDS is going through a high volatility period, but clearly deteriorating
- Stability continues in EM Europe among the global reduction in spreads
- Latam has been the region with the worst performance in the last two months, with Mexico and Chile as the main drivers
- Very relaxed period in EM Asia's spreads

Sovereign markets and agency ratings update

Significant pressure rise for Portugal. China still faces the largest pressure. Markets signal a possible upgrade for Czech Rep. and India

Agencies' rating downgrade pressure gap (October 2016)

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



Source: BBVA Research

2 Financial tensions and global risk aversion

Financial tensions

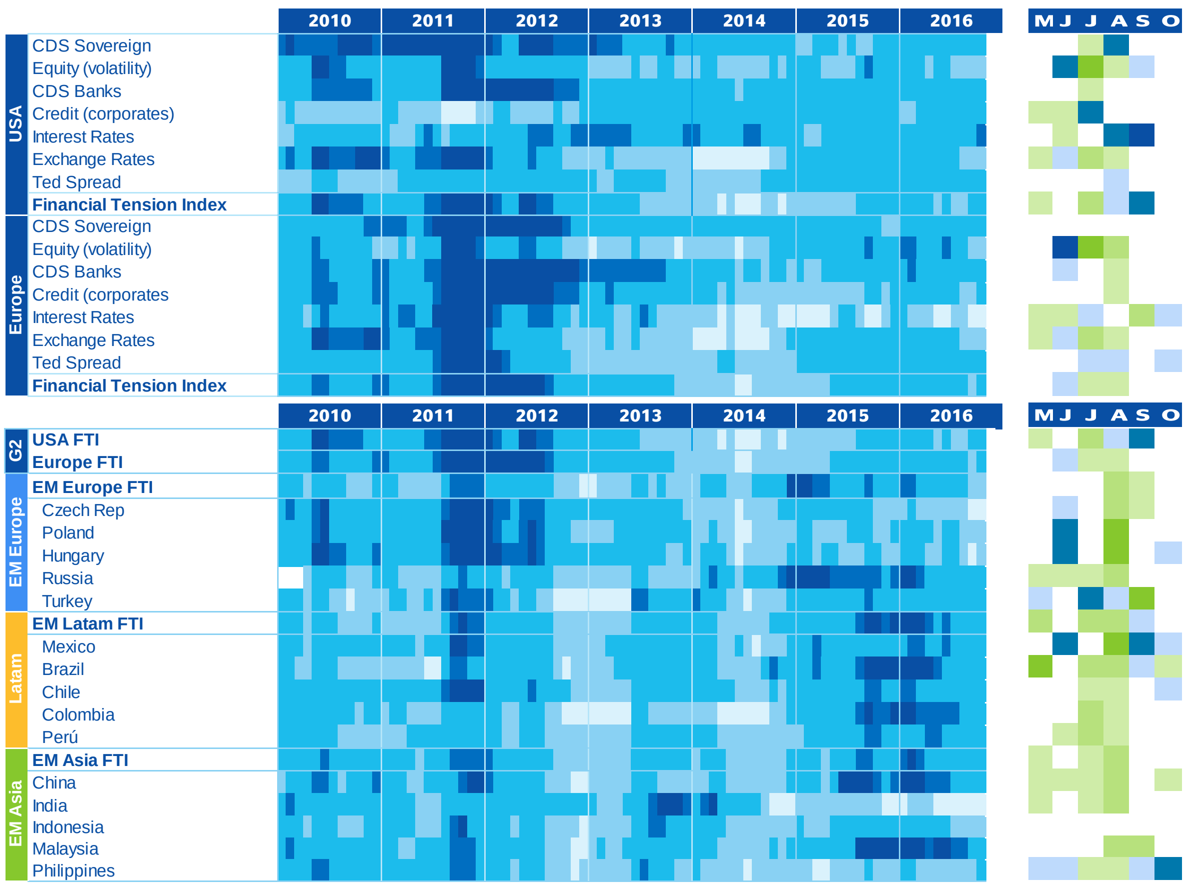
Global Risk Aversion evolution according to different measures

International financial markets, global risk aversion and capital flows

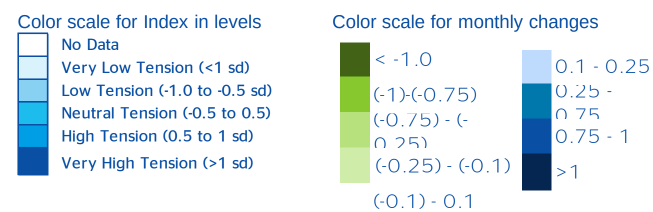
Financial tensions (FT) continued falling across the board with a slight rise during September

BBVA Research Financial Stress Map

Changes
(last six months MoM)



- Most factors have continued easing across Europe and US during the last six months. The surge in volatility in interest rates was the main driver of the September growth of FT in US.
- Financial tensions declining across EMs. EM Europe FTI now in the "low tension" area.
- FT have also decreased across Latam. Mexico has been the less benefited with some volatility in June and September
- Strong decline throughout EM Asia. Most of the region now in the "very low" or "low" area.

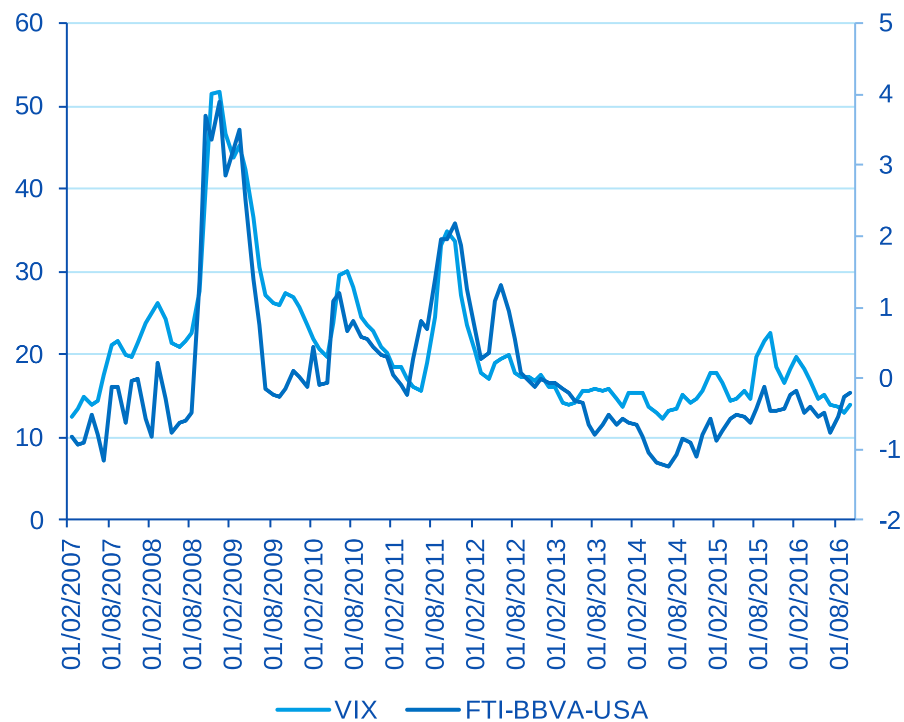


Source: BBVA Research

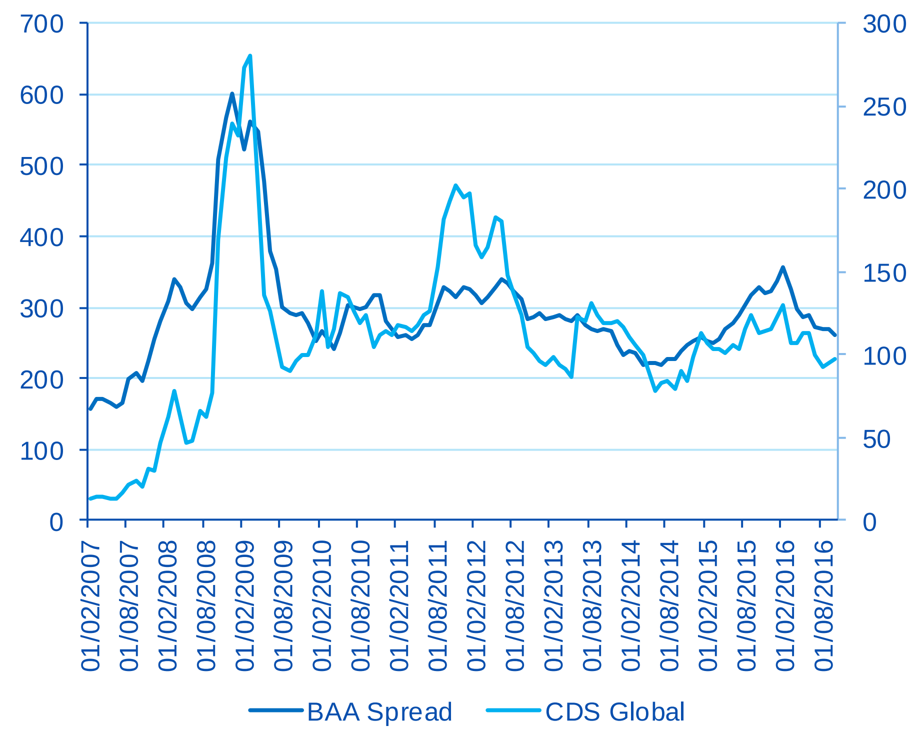
International financial markets, global risk aversion and capital flows

Global risk aversion has remained fairly stable or decreasing since February according to different measures

Global risk aversion indicators: VIX & FTI



Global risk aversion indicators: BAA Spread & Global component in sovereign CDS



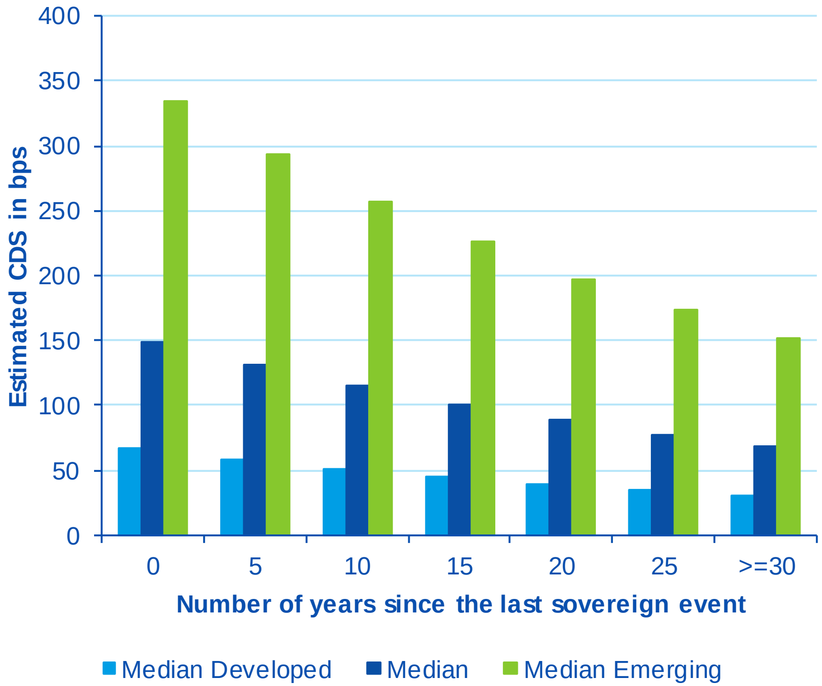
Source: BBVA Research

3 Special Topic 1: The protracted effects of a sovereign default event on CDS (risk) spreads

Special Topic 1: The protracted effects of a sovereign default on CDS spreads

Countries that have recently defaulted have a CDS spread more than twice the one of countries that defaulted more than 30 years before

Estimated CDS according to years after a sovereign default-like event (*) for a median country (**)



Source: BBVA Research

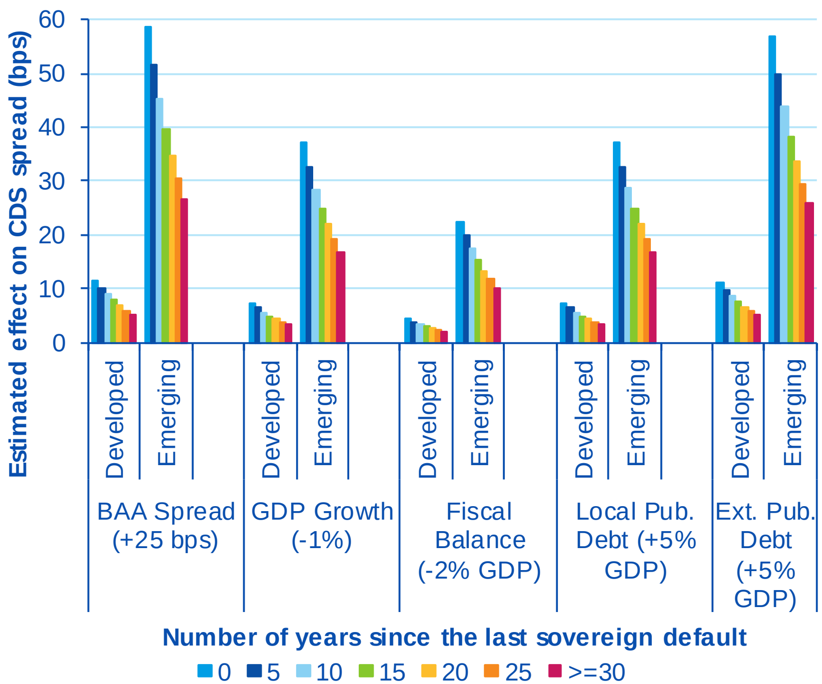
(*) Outright default, debt restructuring.
(**) All the factors determining CDS spreads are set at their median value in a sample of 48 advanced and emerging economies

- In our CDS panel-data model we now include a variable that measures the number of years that have passed since a given country has had a default-like event (*)
- In theory, after a country has defaulted on its sovereign debt, creditors lose confidence in the capability or willingness of such country to fulfill its obligations.
- Such loss of confidence could be severe and last several years to vanish and it could increase the perceived risk (and cost) of its sovereign debt significantly.
- We have estimated that the direct effect of this loss of confidence could be around 200 bps for a typical Emerging country, or 75 bps for a median country.
- Obviously, a country that has recently gone through a sovereign event is not a typical country, and other factors could also be highly deteriorated, which should increase the spread of such country much further.

Special Topic 1: The protracted effects of a sovereign default on CDS spreads

Similarly, the effect of a change in different determinants is more than double if a country has defaulted recently

Incremental effect due to a change in different explanatory variables (in bps)



- Given the non-linearity of our estimated model, the effect of any factor determining the CDS spread of a country indirectly interacts with the value of all the other factors.
- In this fashion, the higher the effect of the creditors loss of confidence, the higher the effect that a deterioration of say, GDP growth has on the perceived risk of such country.
- We have estimated that, for instance, the effect of an increase in external public debt of 5% of GDP has an effect of 25 bps in a typical Emerging country that has not suffered an event for 30 or more years.
- However, the same increase in external debt has an effect of 58 bps in a country that has just gone through a sovereign event.
- Similar stronger effects are depicted for changes in other variables such as global risk aversion (BAA spread), GDP growth, fiscal balance, public (local) debt, etc.

Source: BBVA Research

4 Macroeconomic vulnerability and in-house Regional country risk assessment

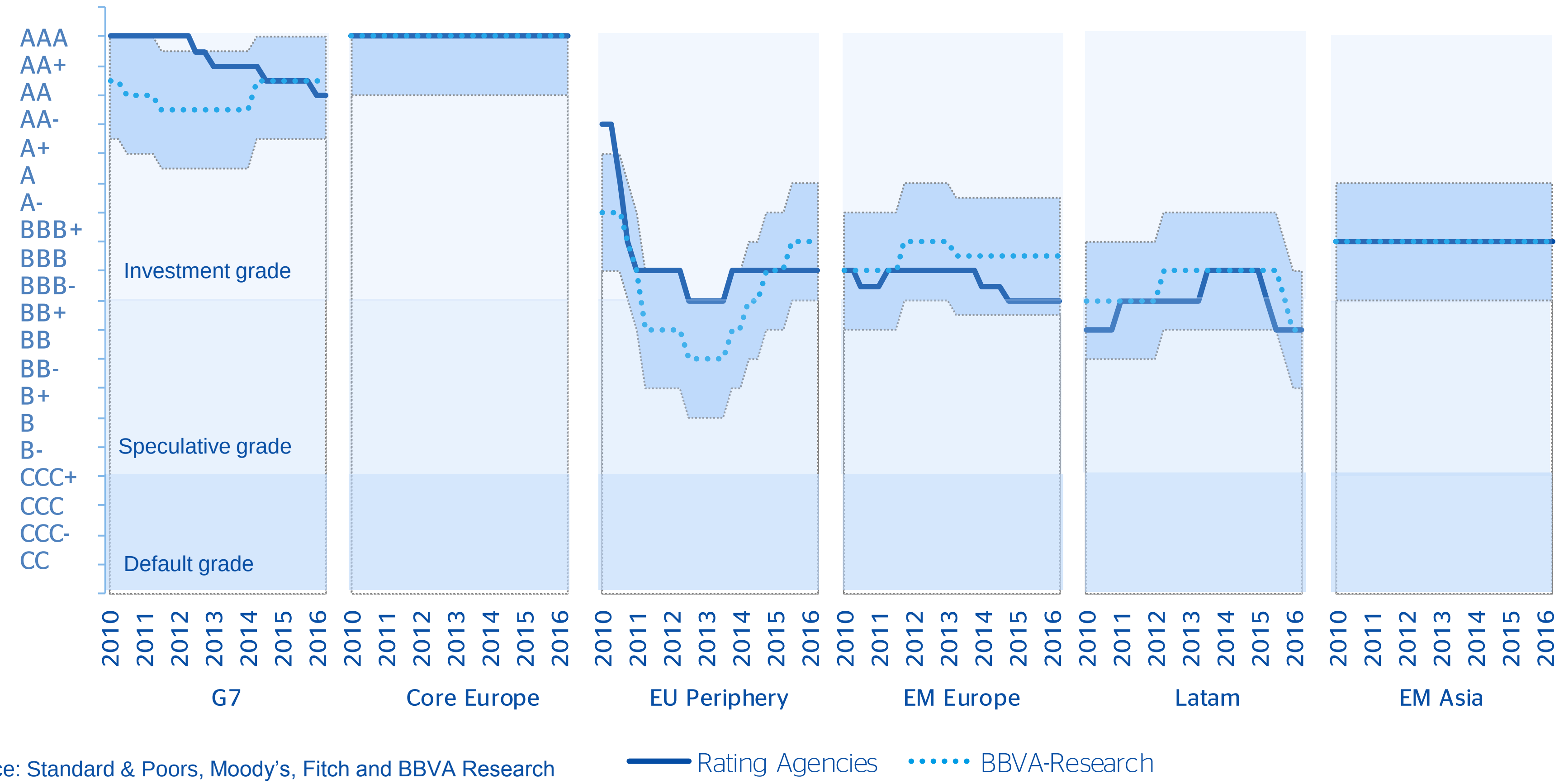
BBVA-Research sovereign ratings by regions
Equilibrium CDS by regions
Vulnerability Radars by regions
Public and private debt levels

Macroeconomic vulnerability and risk assessment

LatAm's 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)



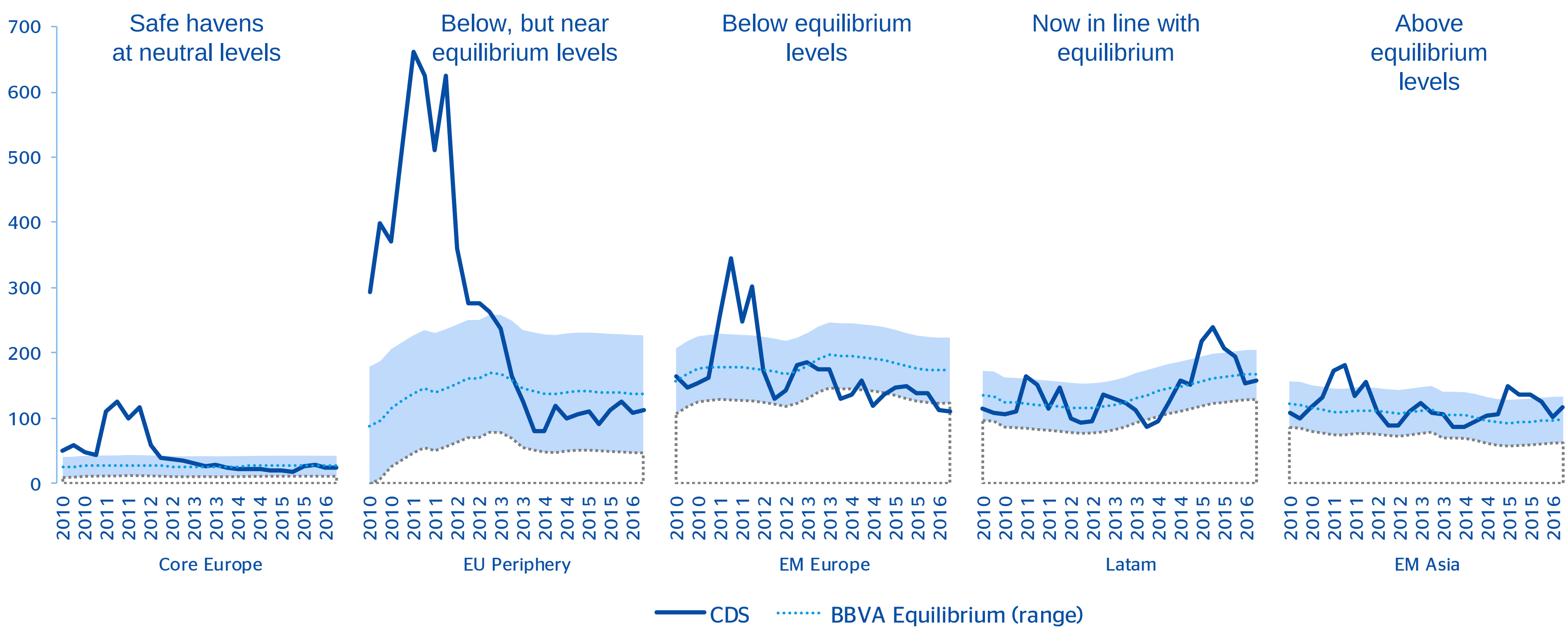
Source: Standard & Poors, Moody's, Fitch and BBVA Research

Macroeconomic vulnerability and risk assessment

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

CDS and equilibrium risk premium October 2016

(equilibrium: average of four alternative models + 0.5 standard deviation)



*EU Periphery excludes Greece

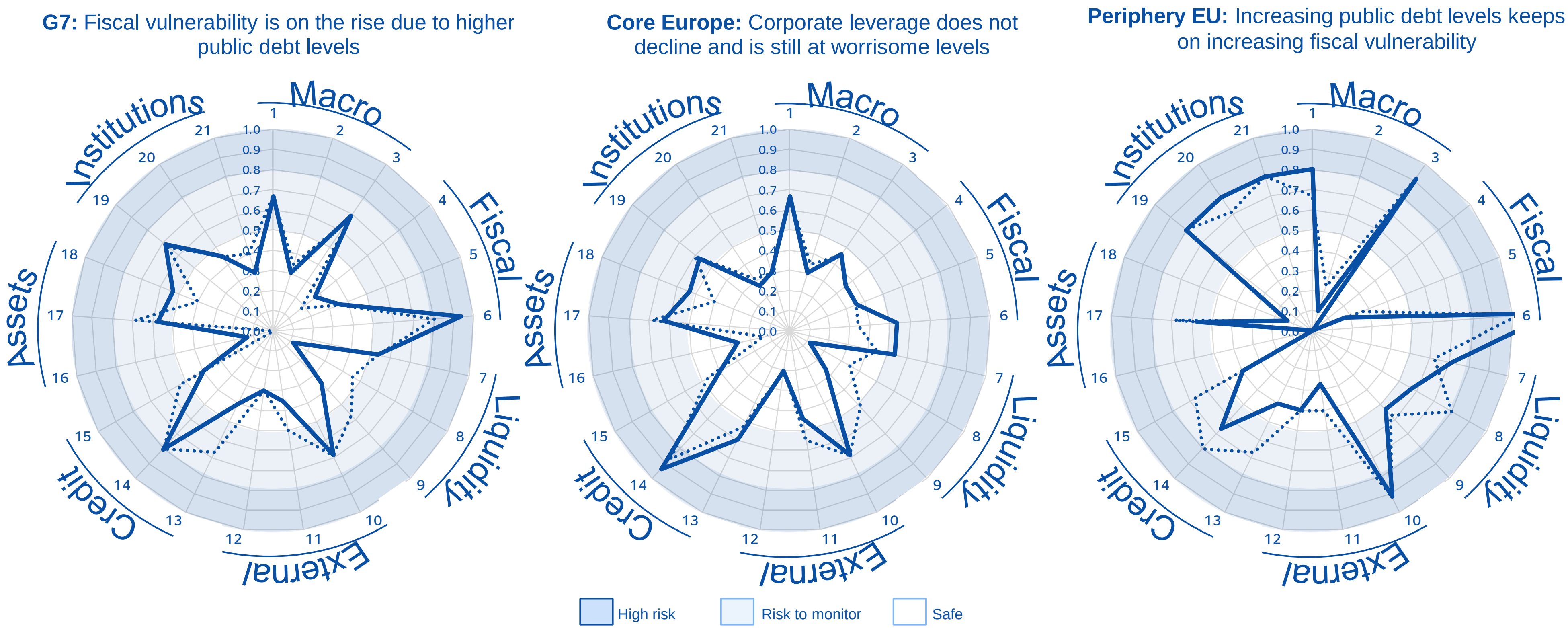
Source: BBVA Research and Datastream

Macroeconomic vulnerability and risk assessment

Private leverage significantly decreasing in Periphery Europe. Public 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.



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

Macroeconomic vulnerability and risk assessment

Low growth GDP is increasing vulnerability in EM Europe and in LatAm. Fiscal vulnerability remains high in EM Asia

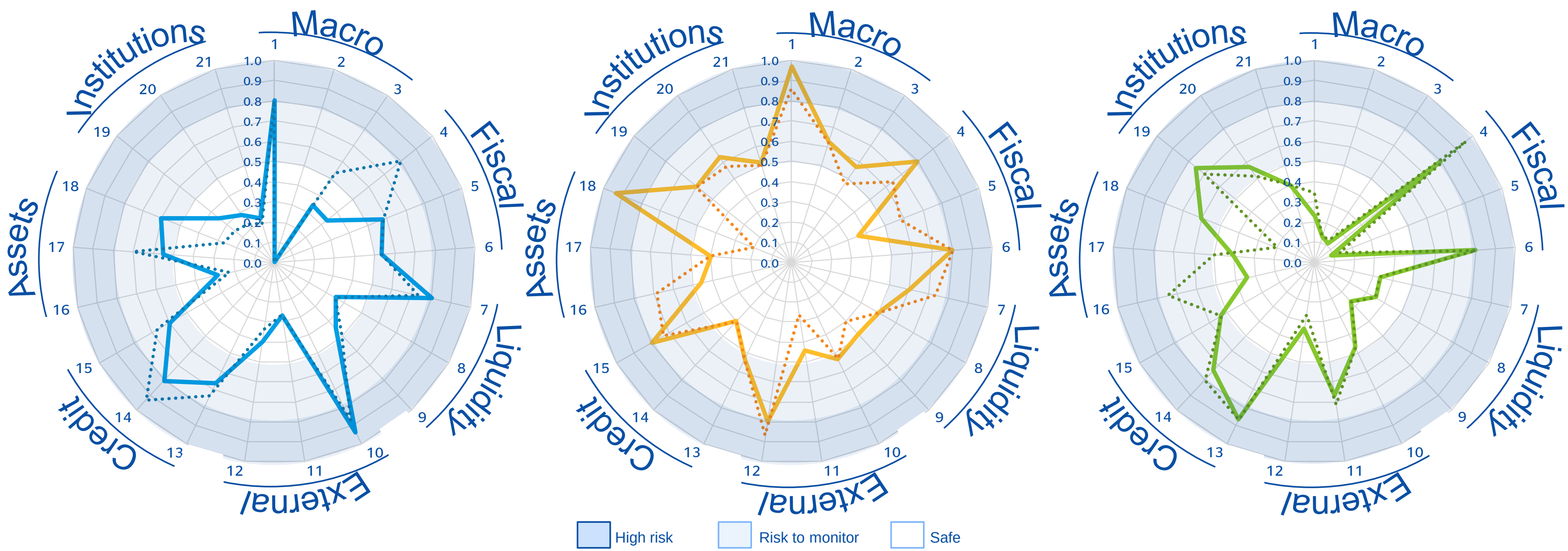
Emerging countries: vulnerability radar 2016

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

EM 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. Very high growth of equity markets in some countries

EM Asia: Public structural balances still the main vulnerability. Households leverage also at risky levels



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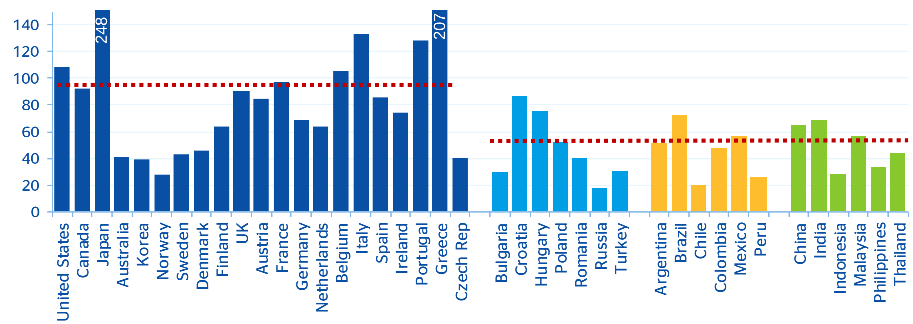
Macroeconomic vulnerability and risk assessment

Public and private debt ratios still high in some developed countries

Gross Public Debt 2016

(% GDP)

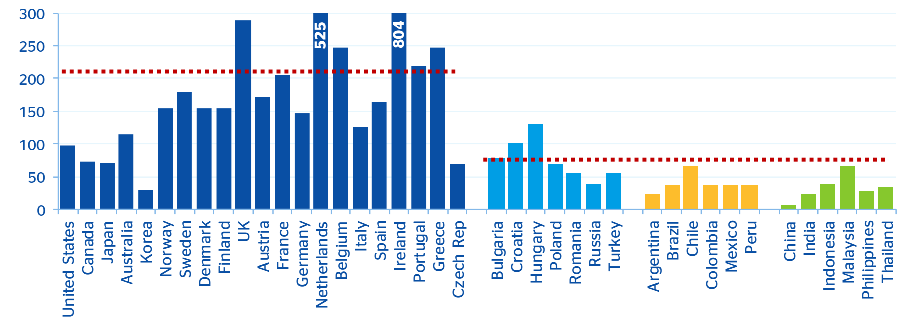


Source: BBVA Research and IMF

External Debt 2016

(% GDP)

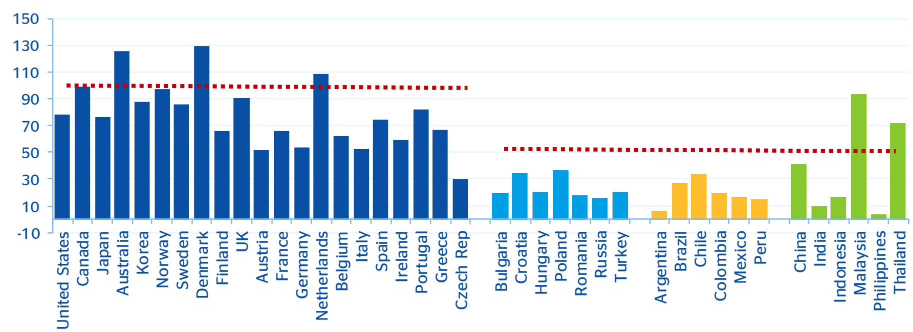
Risk thresholds



Source: BBVA Research and IMF

Household Debt 2016

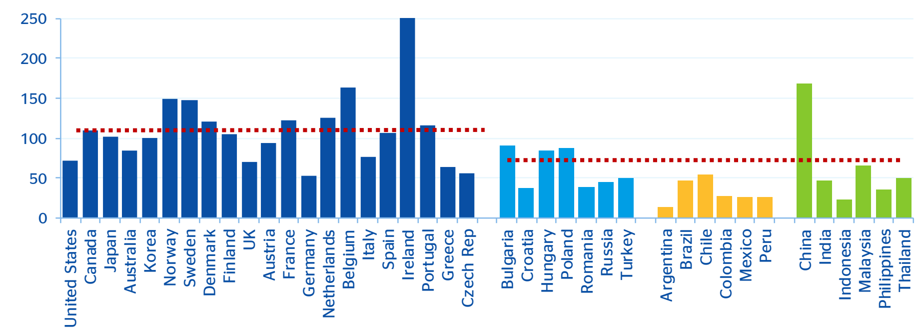
(% GDP)



Source: BBVA Research and BIS

Corporate Sector Debt 2016

(% GDP, excluding bond issuances)



Source: BBVA Research and BIS

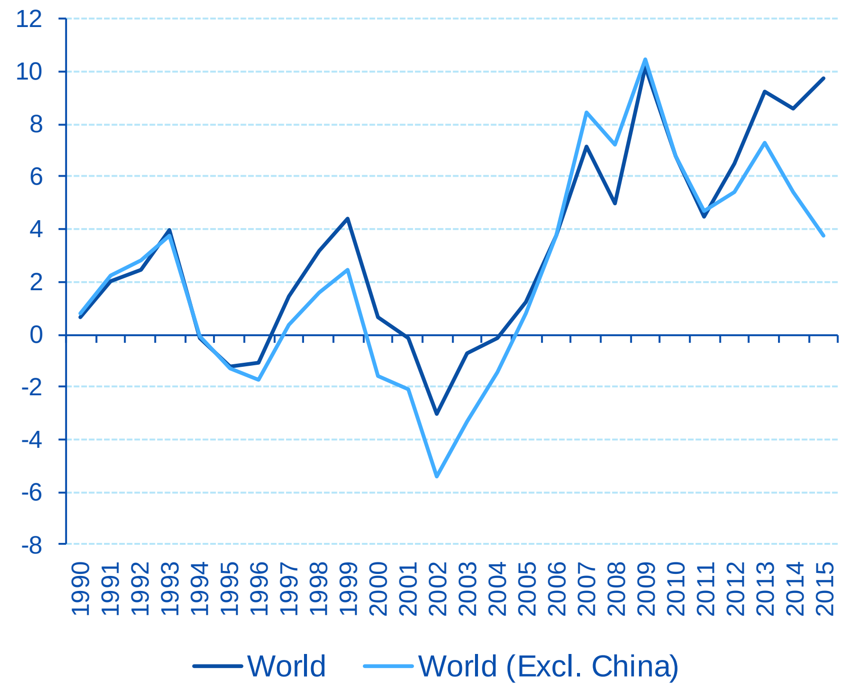
5 Special Topic 2: Estimated Global excess leverage

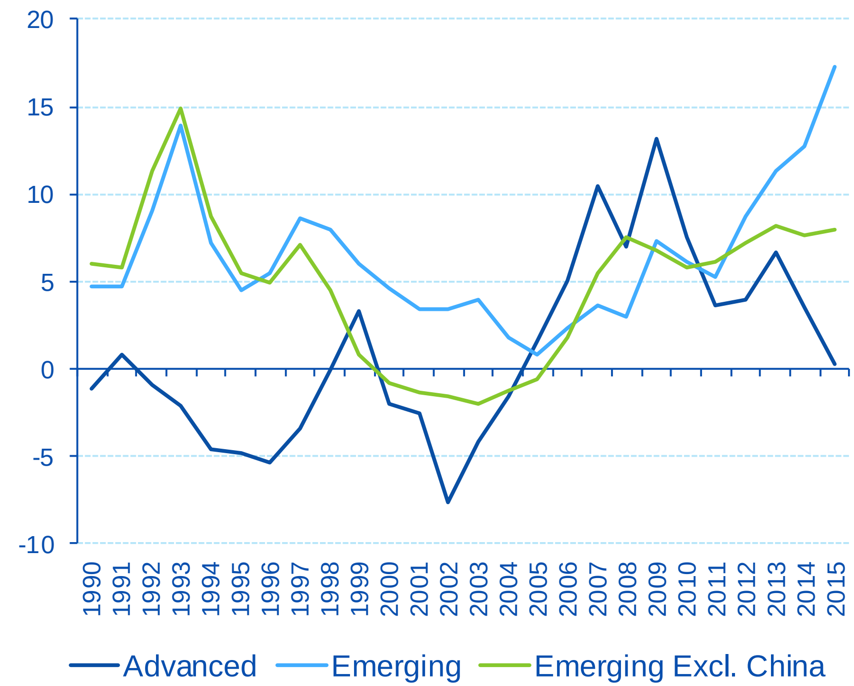
Special topic 2: Estimated global excess leverage

Our estimated measure of aggregate excess leverage has reached the same levels that in 2009 due to China's rapid leveraging and its rising weight in the global economy

Estimated excess leverage (Credit-Gap) worldwide (% of GDP, 1990-2015)

Deviation of actual Debt-to-GDP ratio from estimated long-term structural trend:
Weighted averages using the share of each country in global GDP measured in PPP-adjusted USD





Source: BBVA Research

6 Assessment of financial and external disequilibria

Private credit growth by country
Housing prices growth by country
Early warning system of banking crises by regions
Early warning system of currency crises by regions

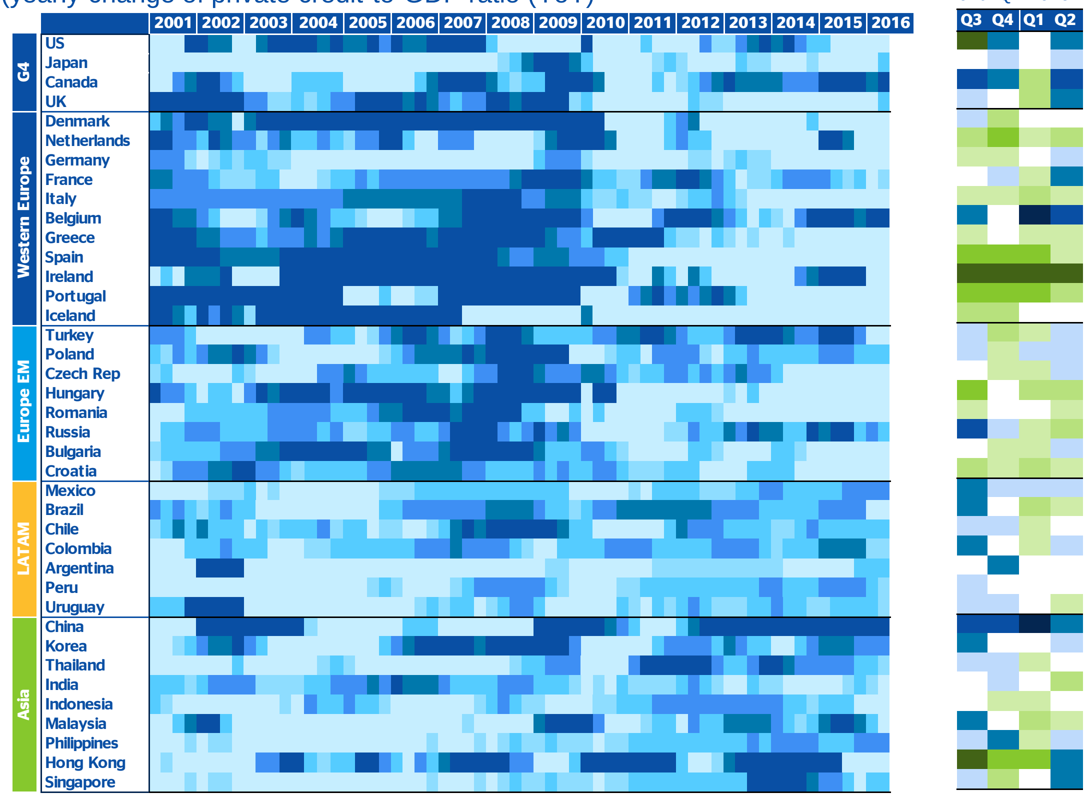
Assessment of financial and external disequilibria

Excessive leverage growth in China continues for yet another quarter. Belgium and Canada also keep showing signs of excess

Private credit color map (2001-2016 Q2)

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

QoQ growth
Last four quarters up until Q2-2016



Booming: Credit/GDP growth is higher than 7%
Excess Credit Growth: Credit/GDP growth between 5%-7%
High Growth: Credit/GDP growth between 3%-5%
Mild Growth: Credit/GDP growth between 1%-3%
Stagnant: Credit/GDP is declining betwen 0%-1%
De-leveraging: Credit/GDP growth declining
… Non Available

Q/Q growth > 5%
Q/Q growth between 3 and 5%
Q/Q growth between 1.5% and 3%
Q/Q growth between 0.5% and 1.5%
Q/Q growth between -0.5% and 0.5%

Q/Q growth between -0.5% and - 1.5%
Q/Q growth between -1.5% and -3%
Q/Q growth between -3% and -5%
Q/Q growth < -5%

Source: BBVA Research, IFS and BIS

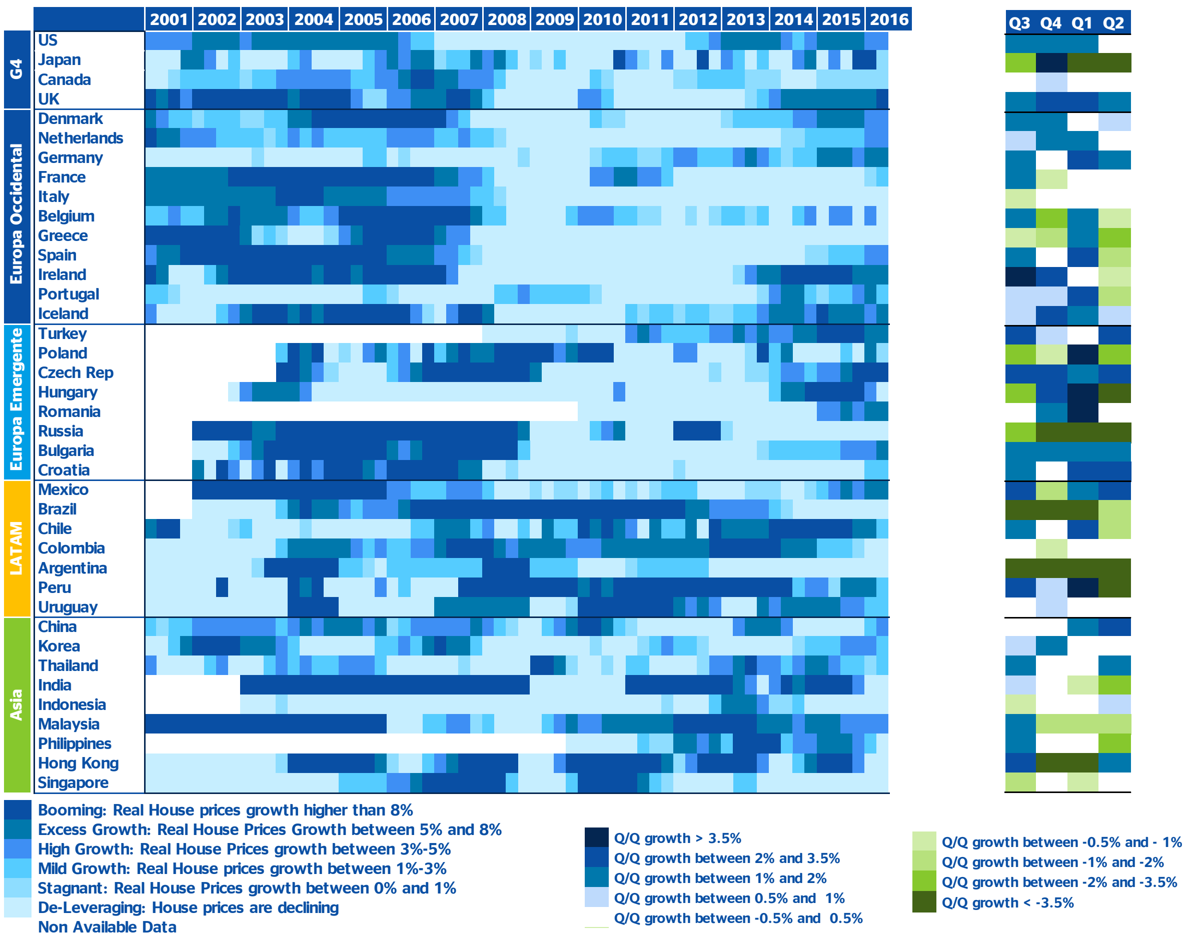
- Leverage growth accelerates again in Canada during the quarter. Moderate growth in USA, Japan and UK. **Belgium is showing clear signs of a booming leverage**. Rest of the region continues deleveraging
- Credit growth throughout most EM Europe is weak or negative.
- **Credit growth has also moderated throughout LatAm.**
- China's leveraging process does not moderate despite consensus about its excess. Credit's growth in India is gaining pace.

Assessment of financial and external disequilibria

Erratic evolution of housing prices in the last two quarters in both developed and Emerging Europe.

Real housing prices color map (2001-2016 Q2)
(yearly change of real housing prices YoY)

QoQ growth
Last four quarters up until Q2-2016



Source: BBVA Research, BIS and Oxford Economics

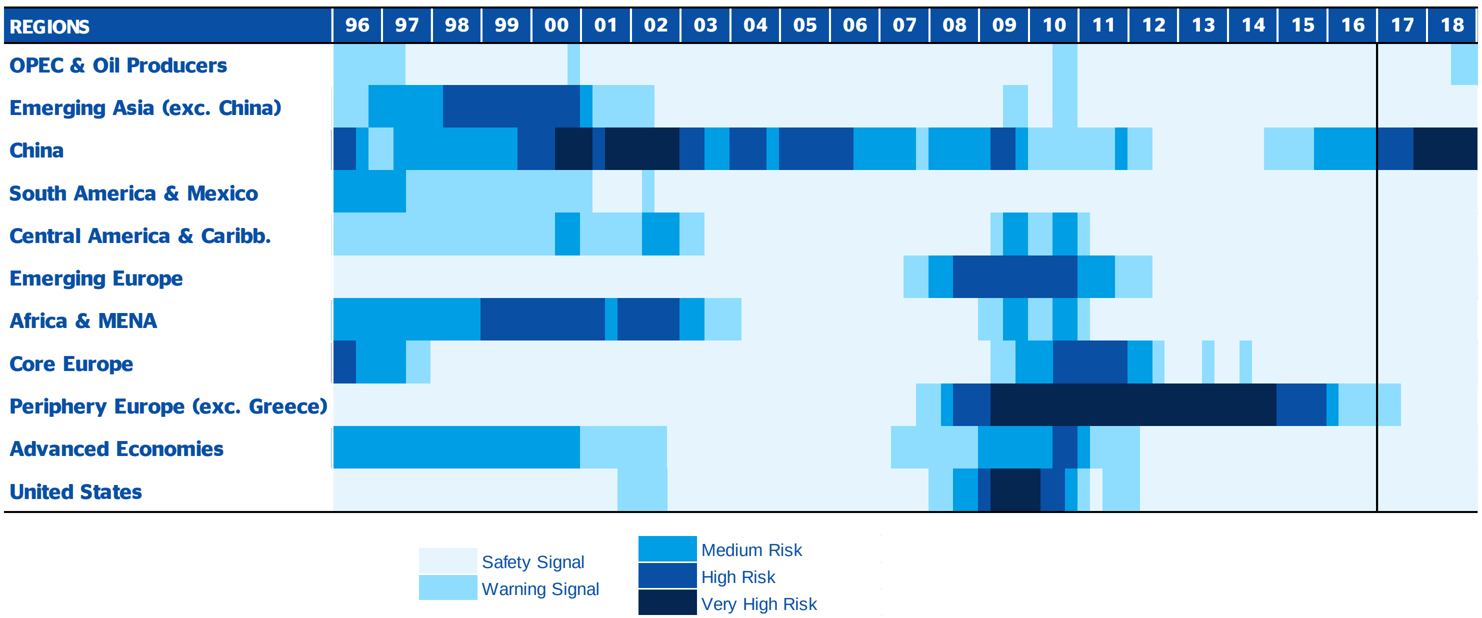
- Prices growth in US came to a halt in the last quarter. Excess growth continues in UK, although losing pace. Some signs of overheating in Germany. Prices throughout the region declined after a previous quarter of strong growth
- Another mixed quarterly data across EM Europe. Prices accelerate again in Turkey and Czech Rep. The contraction continues in Russia.
- **Prices growth in Chile came to a halt. Prices in Mexico are picking up quickly.**
- Prices in China are growing strongly one more time. Mixed evolution throughout EM Asia.

Assessment of financial and external disequilibria

Some oil exporters, China and some countries in the European Periphery are showing signs of warning for the next couple of years

Early warning system (EWS) of Banking Crises (1992Q1-2018Q4)

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



- The new oil price paradigm may trigger banking woes in Opec & Oil producers
- China's unbounded credit growth could likely cause a banking crisis in the coming years
- Some countries in Europe's periphery (ex. Greece) are showing renewed signs of banking stress.

- 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/r0BLbI 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.

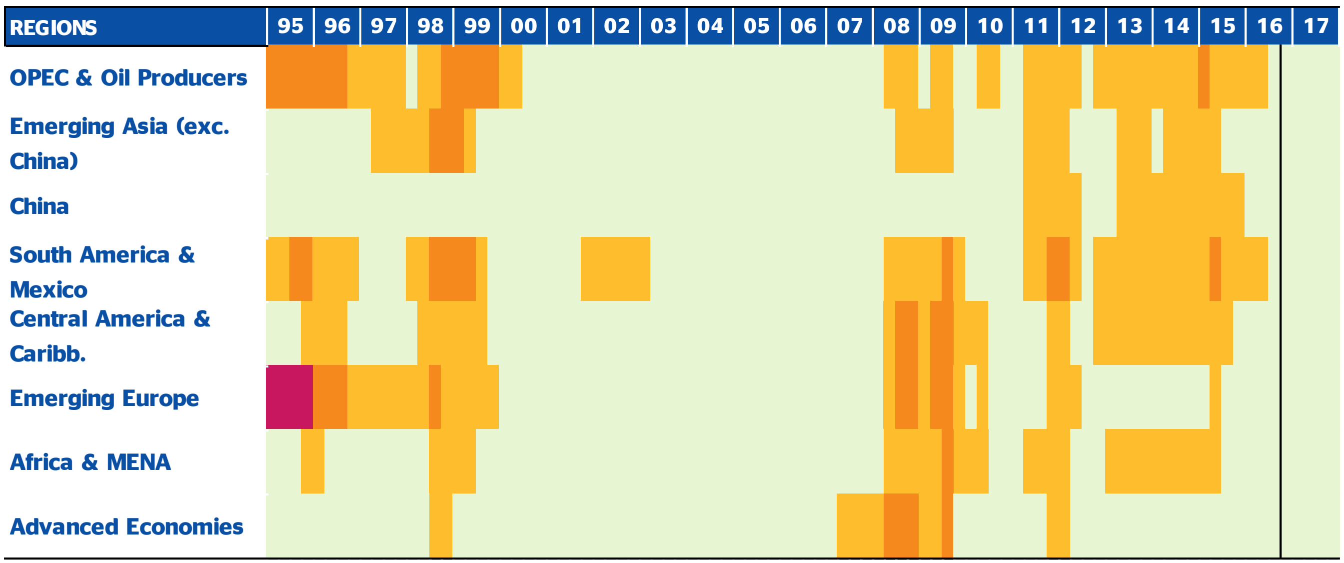
*The probability of a crisis in Q4-2016 is based on Q4-2014 data. Source: BBVA Research

Assessment of financial and external disequilibria

We do not envisage regional currency problems in the coming quarters (although there could be events in specific countries)

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



- As predicted in previous reports, several oil exporters (Angola, Azerbaijan, Nigeria & Venezuela) have suffered sharp devaluations in 2016
- Several countries in South America have also gone recently through events of significant devaluations, as warned by our EWS

- 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.

Source: BBVA Research

Vulnerability Indicators table by country

Macroeconomic vulnerability and risk assessment

Vulnerability indicators: developed economies

Vulnerability indicators* 2016: developed countries

	Fiscal sustainability			External sustainability			Liquidity management			Macroeconomic performance			Credit and housing			Private debt			Institutional		
	Structural primary balance (1)	Interest rate GDP growth differential 2016-20	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	-1.9	-1.2	108	-2.5	98	9.7	15	10	33	1.6	1.3	4.9	-1.4	4.6	12.4	78	71	63	-0.6	-1.3	-1.6
Canada	-1.6	-0.6	92	-3.7	72	-9.1	9	7	22	1.2	1.8	7.0	9.1	0.2	10.7	99	109	132	-1.2	-1.8	-1.9
Japan	-4.8	-0.8	250	3.7	71	7.2	33	11	10	0.5	-0.1	3.2	1.1	0.9	-5.4	77	102	48	-1.0	-1.7	-1.6
Australia	-1.3	-0.7	41	-3.5	115	-7.6	3	2	46	2.9	1.6	5.7	5.6	3.2	9.2	126	84	135	-1.1	-1.9	-1.9
Korea	0.0	-1.8	39	7.2	29	-0.5	1	4	13	2.7	1.3	3.6	3.9	2.2	4.1	88	100	96	-0.2	-0.5	-1.0
Norway	-11.0	-0.3	28	7.0	155	-7.3	0	0	47	0.8	3.0	4.7	9.7	2.1	6.7	97	149	129	-1.1	-2.2	-2.0
Sweden	-0.9	-2.5	43	5.0	178	-6.7	5	9	47	3.6	1.2	6.9	-3.8	8.0	1.6	86	147	196	-1.1	-2.1	-2.0
Denmark	0.2	-0.6	46	6.7	155	-1.2	6	6	33	1.0	0.4	6.0	-1.5	3.4	-2.7	129	120	299	-0.9	-2.3	-2.1
Finland	-0.4	-1.2	64	0.1	155	-2.1	4	2	82	0.9	0.9	9.1	0.4	1.6	12.3	66	105	133	-1.3	-2.2	-2.1
UK	-1.5	-0.7	90	-5.9	289	-6.0	9	6	31	1.8	1.5	5.0	2.0	8.1	13.8	90	70	58	-0.4	-1.7	-1.9
Austria	0.6	-0.5	85	2.6	171	-0.4	5	4	80	1.4	1.2	6.2	-2.3	8.1	7.9	52	94	97	-1.3	-1.4	-2.0
France	-0.6	-1.0	97	-0.5	206	-2.7	10	6	62	1.3	0.0	9.8	0.9	1.1	-0.2	66	123	110	-0.4	-1.3	-1.5
Germany	1.0	-1.3	68	8.6	146	-2.4	2	3	59	1.7	1.2	4.3	-0.3	6.6	8.8	54	53	91	-0.9	-1.8	-1.9
Netherlands	0.3	-1.2	64	9.1	536	-1.4	4	3	54	1.7	0.5	6.7	-9.7	4.4	7.4	109	125	98	-1.0	-2.0	-2.0
Belgium	-0.1	-0.6	106	0.1	248	-0.1	18	14	61	1.4	2.5	8.4	19.0	-0.2	10.4	62	163	52	-0.7	-1.6	-1.5
Italy	2.5	1.0	133	2.2	125	-3.3	11	6	38	0.8	-0.6	11.5	-4.9	-0.6	-23.0	53	76	106	-0.5	0.1	-0.3
Spain	-0.1	-1.7	85	1.5	165	-3.3	19	15	50	3.1	-0.3	19.6	-11.5	3.0	-8.2	74	106	108	-0.3	-0.5	-0.9
Ireland	1.3	-2.1	75	9.5	861	-3.9	6	6	70	4.9	0.7	8.3	-55.7	6.5	-2.1	60	256	55	-1.1	-1.6	-1.8
Portugal	2.5	0.8	128	0.0	219	-1.3	19	12	70	1.0	2.4	11.2	-12.2	2.5	6.4	82	115	133	-0.8	-0.9	-1.1
Greece	3.0	-1.8	207	0.0	247	-4.2	15	7	82	0.1	-0.1	23.3	-2.4	-2.0	-13.6	67	64	151	0.0	0.2	-0.3

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

*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

Macroeconomic vulnerability and risk assessment

Vulnerability indicators: emerging economies

Vulnerability indicators* 2016: emerging countries

	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	0.8	79	-4.6	4	2.6	44	3.0	-0.8	8.2	-1.9	5.9	14.1	20	90	81	-0.1	0.3	0.1
Czech Rep	-0.2	-1.4	40	1.5	68	-2.8	5	8	38	2.5	1.1	4.1	-0.5	10.1	-11.1	30	55	87	-1.0	-0.3	-1.1
Croatia	0.8	0.5	87	3.0	102	-2.7	16	3.4	41	1.9	-0.1	16.4	-5.6	1.4	15.2	34	36	98	-0.6	-0.2	-0.3
Hungary	1.6	-0.8	75	4.9	130	-6.3	18	1.9	55	2.0	0.8	6.0	-7.0	-0.8	32.4	21	84	93	-0.7	-0.1	-0.5
Poland	-1.0	-1.3	52	-0.1	70	-7.9	9	2.5	56	3.1	0.2	6.3	1.4	1.0	-5.5	37	88	110	-0.9	-0.6	-0.8
Romania	-1.7	-1.8	40	-2.0	55	-6.9	9	2.7	49	5.0	-0.3	6.4	-2.4	6.7	-0.6	17	38	87	-0.1	0.1	-0.1
Russia	-2.8	1.0	17	3.0	39	-12.6	6	6.5	14	-0.8	5.9	5.8	1.3	-14.2	20.4	16	44	104	0.8	0.9	0.7
Turkey	0.3	-2.2	31	-3.6	55	0.6	5	0.9	34	3.8	9.8	10.8	-0.6	6.9	3.1	20	50	125	1.1	0.1	0.0
Argentina	-4.7	-13.5	52	-2.3	23	-15.9	11	1.5	21	-1.1	38.0	9.5	1.1	-31.5	69.9	6	13	64	-0.1	0.6	0.9
Brazil	-1.5	4.1	73	-1.1	37	0.2	19	7.5	14	-3.0	7.2	11.8	-1.2	-18.9	29.5	27	46	110	0.0	0.4	0.1
Chile	-2.3	-1.8	20	-1.9	65	-1.3	4	2.2	20	1.7	3.5	6.8	1.9	2.7	9.0	34	54	151	-0.5	-1.5	-1.4
Colombia	0.4	0.2	48	-5.2	38	-28.5	5	3.6	28	2.2	5.2	9.7	0.7	-0.5	6.1	20	27	108	1.1	0.4	0.3
Mexico	-1.1	0.4	56	-2.7	37	-18.4	7	1.6	32	2.0	1.3	4.1	3.9	5.5	11.1	17	26	81	0.8	0.7	0.5
Peru	-1.6	-2.1	26	-3.3	36	-5.1	4	8.2	36	3.9	2.8	6.4	0.9	1.6	52.5	15	25	111	0.5	0.6	0.6
China	-2.1	-4.7	64	2.4	6	0.8	4	4.3	..	6.6	2.3	4.1	15.6	4.6	5.8	42	167	86	0.5	0.3	0.3
India	-2.1	-4.3	68	-1.0	23	5.8	11	4.1	6	7.6	5.3	5.5	-1.4	-2.8	6.5	10	47	81	1.0	0.5	0.1
Indonesia	-0.9	-3.2	27	-2.3	38	2.7	4	2.2	59	5.1	3.4	5.6	-0.9	-0.1	27.0	17	22	98	0.4	0.6	0.3
Malaysia	-1.7	-2.6	57	1.2	65	-6.5	10	1.1	27	4.3	2.1	3.2	-0.3	3.2	1.9	93	--	107	-0.3	-0.5	-0.6
Philippines	1.6	-3.9	33	1.8	27	-0.5	8	4.7	30	6.4	2.9	5.9	4.0	-2.5	10.7	3	35	64	0.7	0.4	0.3
Thailand	0.5	-2.5	44	9.7	34	-4.3	6	2.9	11	3.2	1.3	0.8	0.4	2.8	9.9	71	49	99	0.9	0.4	0.2

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

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

Methodological Appendix

Appendix

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.

Appendix

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

Appendix

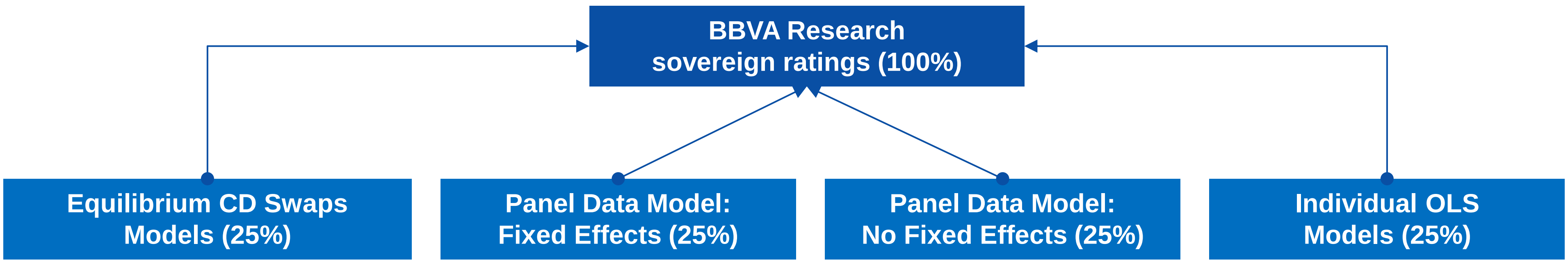
Methodology: models and BBVA country risk

- **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 CDS for 48 developed and emerging countries and 10 macroeconomic explanatory variables. The CDS equilibrium is calculated using the centered 5-year moving average of the explanatory variables weighted according to their estimated sensitivities. For estimating the equilibrium level, the BAA spread is left unchanged at its long-term median level (2003-2016). The values of these equilibrium CDS are finally converted to a 20 scale sovereign rating scale.
- 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: We used the estimates of the previous model but retaining only the contribution of the macroeconomic and institutional variables, without adding the country "fixed-effect" contribution. In this way we are able to account more clearly for the effect of only those macroeconomic variables that we can identify.
- 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.

Appendix

Methodology: models and BBVA country risk

BBVA Research sovereign ratings methodology diagram



Source: BBVA Research

Appendix

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

Appendix

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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