Country Risk Report

A Quarterly Guide to Country Risks

March 2018

(Data as of February 15th)

Summary

Country Risk

Ratings agencies

- **Colombia** and **Brazil** were downgraded by S&P. **Greece** was improved by S&P and Fitch, which also improved **Spain**, **Croatia** and **Indonesia**

Financial Markets

- Following the recent turmoil in equity markets during February, we have observed a **decoupling of different Global Risk Aversion (GRA) indicators**. While VIX and FTI have surged, both corporate and sovereign spreads continued declining
- **Markets seem to be giving much less value to the risk accounted for sovereign ratings. The tightening of sovereign spreads (CDS) is outstanding**. The difference between the spreads of countries with very different ratings is vanishing. For instance, nowadays about 80% of the countries' CDS we follow are now quoting below 100 bps despite ranging from ratings two notches below investment grade up to AAA
- Consequently, the **upgrade pressures** defined by the gap between CDS-implicit and Agencies ratings **continue growing across the board**, with particular intensity in Peripheral Europe, EM Europe and EM Asia

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- The years-long **private deleveraging process in Developed Markets** (DMs) and Emerging Europe has now **clearly lower their vulnerability** indicators. On the other hand, high public debt and external debt levels continue to be a concern in DMs. Private leverage levels seem now less of a concern in Emerging Markets (EMs)
- On the other hand, the **high growth in stock markets** observed in previous months **has increased several countries vulnerability**
- **Deleveraging continues in both DMs and EMs**, with few exceptions in some DMs. **The credit slowdown in China continues**. However, **housing prices continue growing strongly** in several countries including many which are clearly deleveraging
- The **warning signals from the banking system in EU Periphery are finally fading away**. **Exchange rates seem to be going through a period of low tensions**, especially when estimated at a regional level

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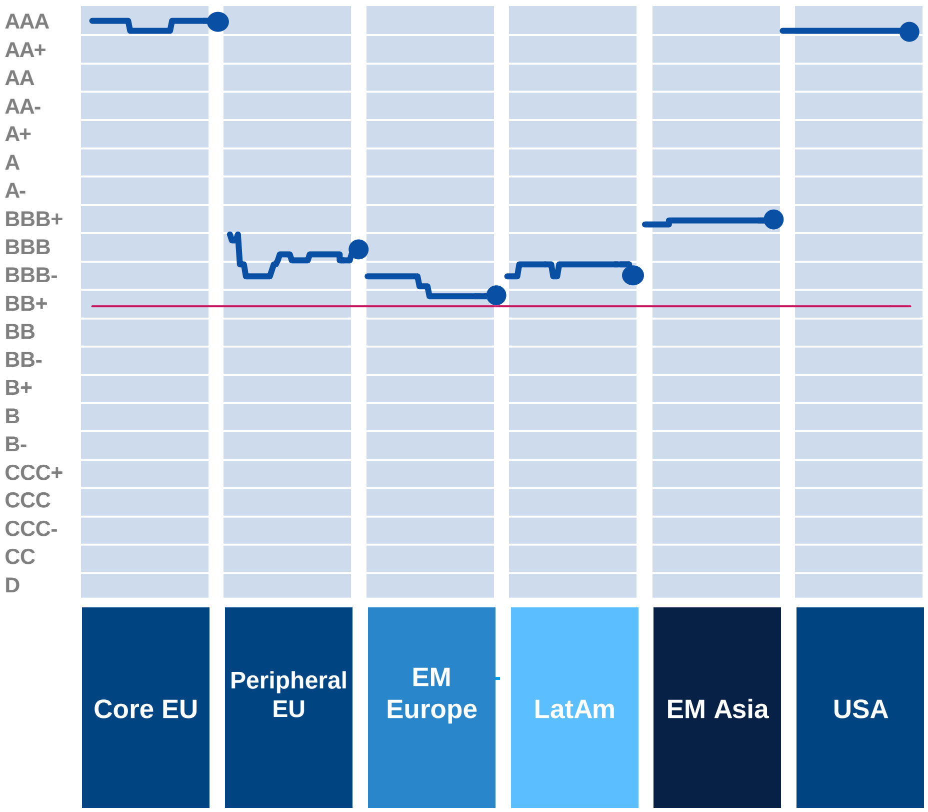
01

Sovereign Markets and Ratings Update

Evolution of sovereign CDS by country
Evolution of sovereign ratings
The great tightening of sovereign spreads: CDS vs Rating
Market downgrade/upgrade pressure

Sovereign markets and rating agencies update

Sovereign Rating Index 2011-18



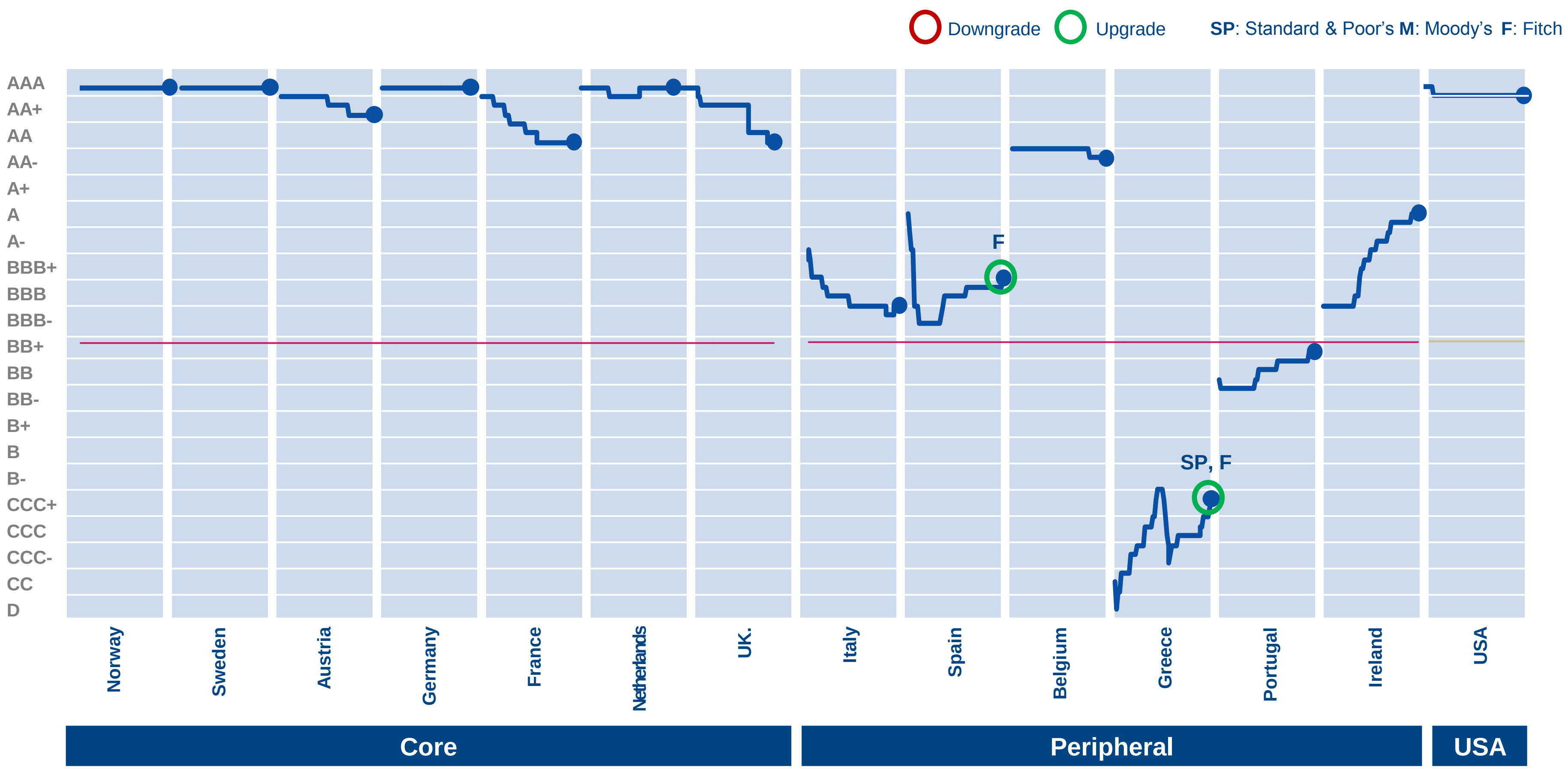
- LatAm median rating has deteriorated whereas Peripheral EU has improved.
- **Colombia** and **Brazil** were downgraded by S&P. **Greece** was improved by S&P and Fitch, which also improved **Spain, Croatia** and **Indonesia**.

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.

Sovereign markets and rating agencies update

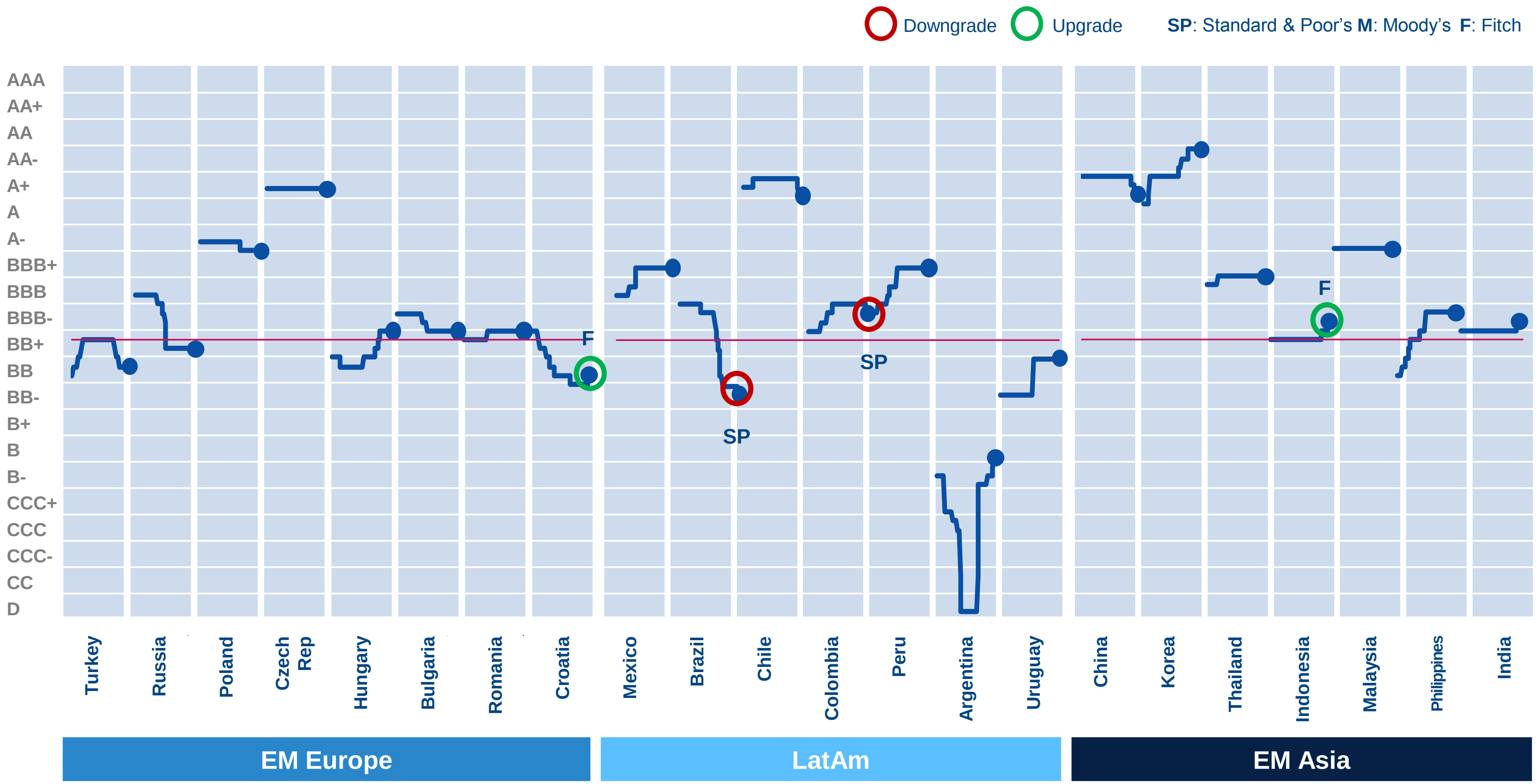
Sovereign Rating Index 2011-18: Developed Markets



Source: BBVA Research

Sovereign markets and rating agencies update

Sovereign Rating Index 2011-18: Emerging Markets



Source: BBVA Research

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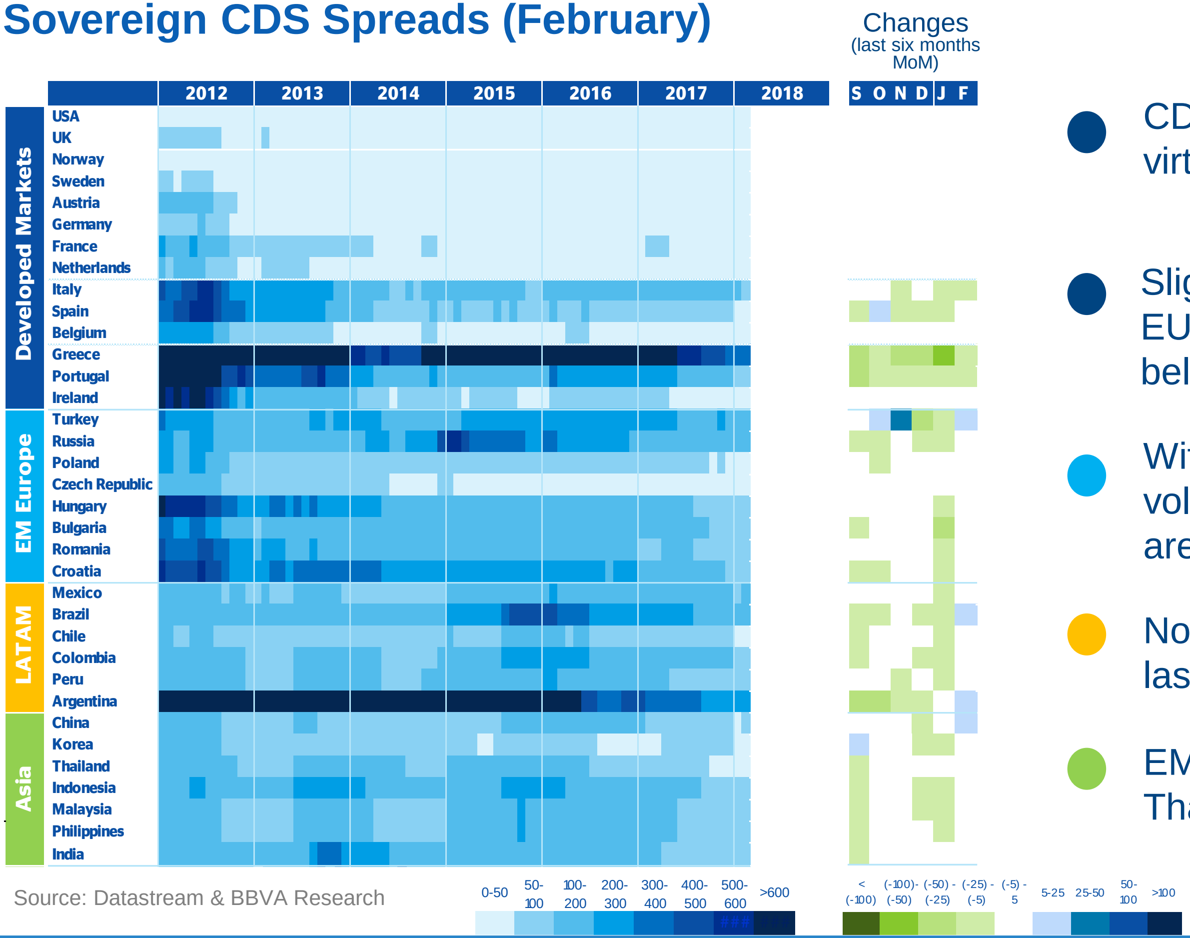
Sovereign Markets and Rating Agency Update

Sovereign CDS Spreads (February)



Source: Datastream & BBVA Research

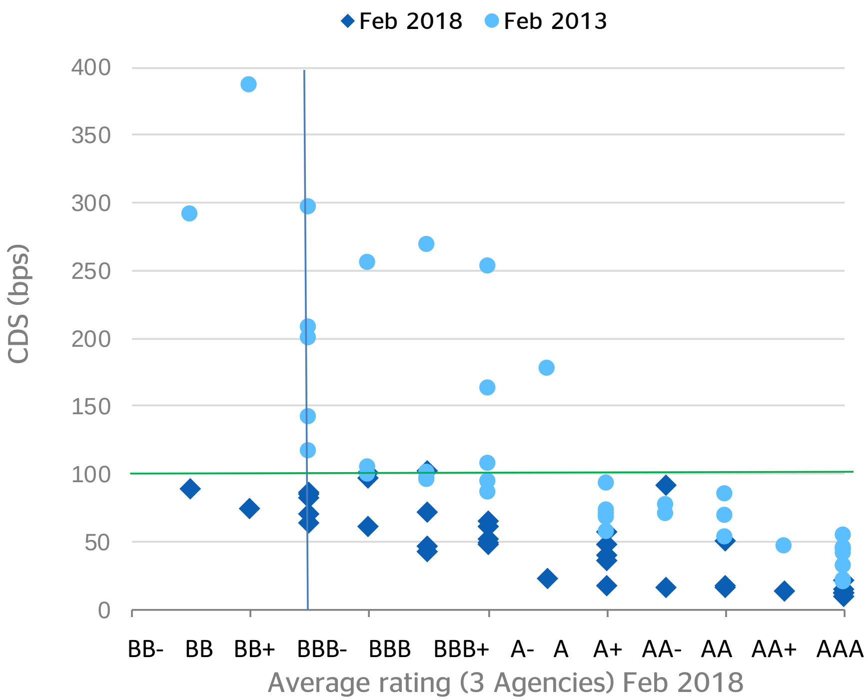
- CDS of Advanced Economies continue virtually unchanged
- Slight but sustained decreases in the EU periphery. All countries but Italy below 50 bps.
- With the exception of some slight volatility in Turkey, CDS in EM Europe are stable.
- No remarkable changes in LatAm in the last 3 months
- EM Asia remains stable. Korea and Thailand below 50 bps

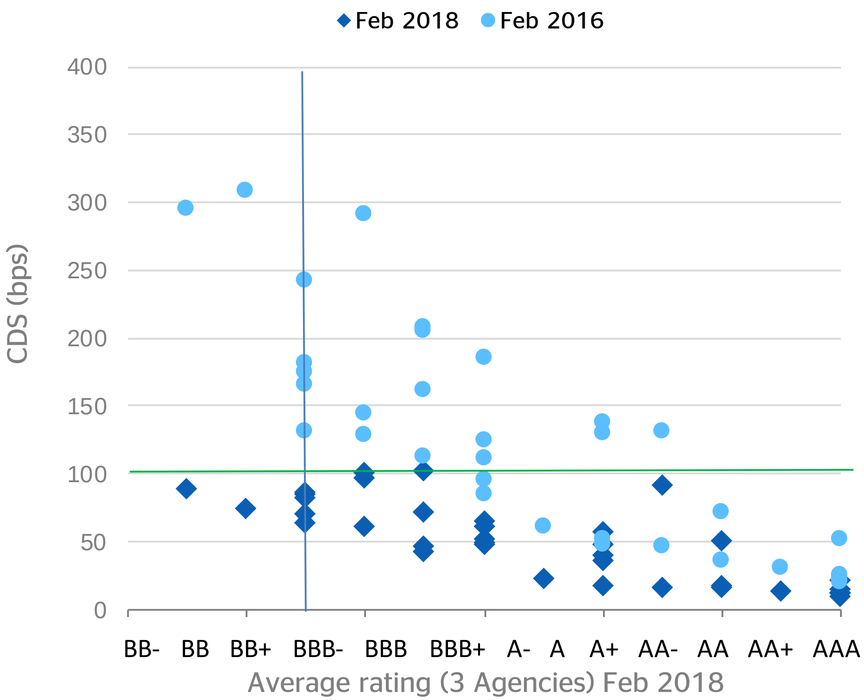
The stability and tightening of sovereign spreads continues despite the recent volatility in equity markets. About 80% of the countries' CDS we follow are now below 100 bps despite ranging from ratings two notches below investment grade up to AAA

Sovereign markets and agency ratings update

The great tightening of sovereign spreads: CDS vs Average Rating:

CDS of countries with current spreads below (or close to) 100 bps, against their current average rating in February 2018, compared to their spread 5 years before (Feb 2013) and 2 years before (Feb 2016)





The rating observed in 2018 does not need to coincide with the previous ratings, i.e. both CDS and ratings could have changed. We keep the rating of 2018 to facilitate the comparison

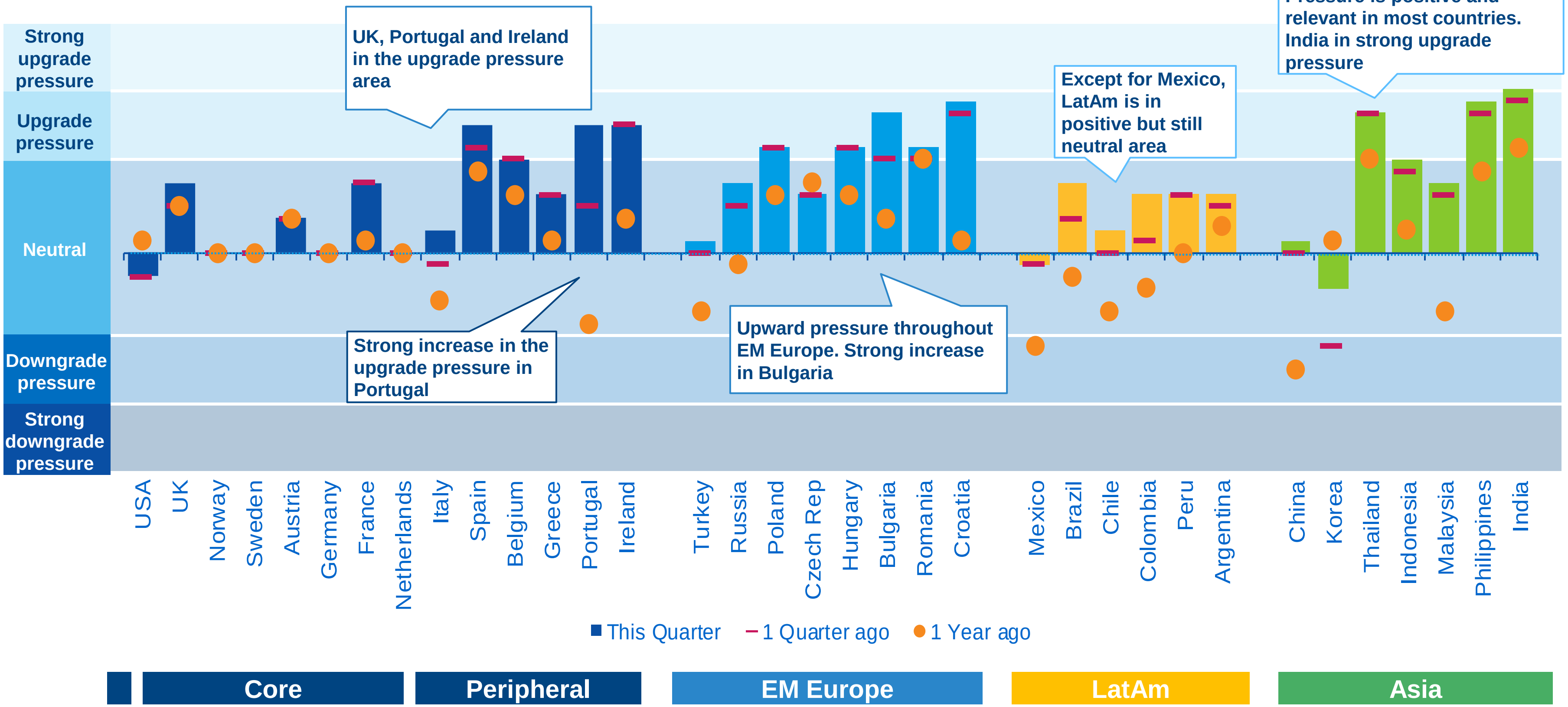
Source: BBVA Research

The difference between the spread of countries with very different ratings is vanishing and markets seem to be giving much less value to the risk accounted for in sovereign ratings.

Sovereign markets and agency ratings update

Agencies' rating downgrade pressure gap (February)

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



Source: BBVA Research

The tightening of CDS spreads continues increasing the upgrade pressure across the board, with particular intensity in Peripheral Europe, EM Europe and EM Asia.

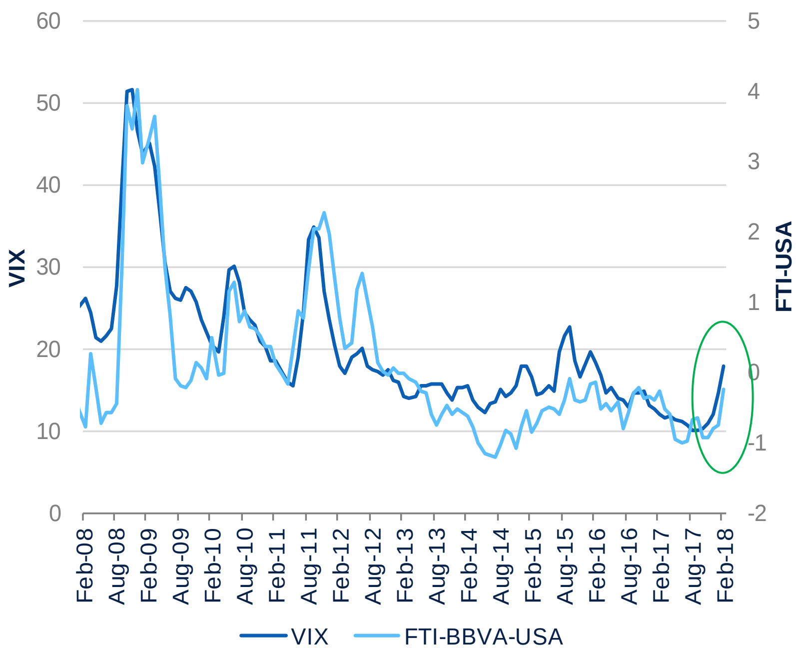
02

Financial Tensions and Global Risk Aversion

Global Risk Aversion Evolution according to Different Measures
Financial Tensions Index

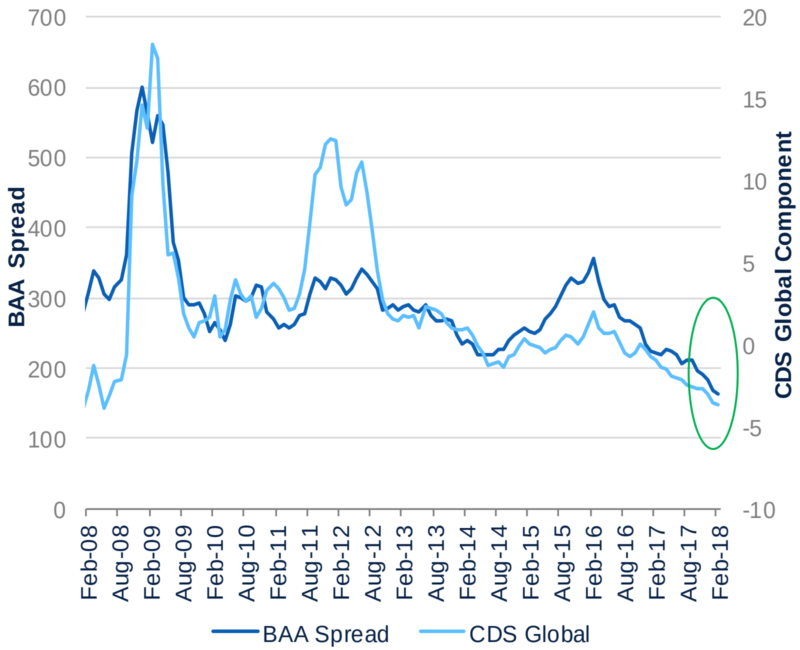
Financial Tensions and Global Risk Aversion (GRA)

Global risk aversion indicators: VIX & FTI
(Monthly average)



Source: Bloomberg and BBVA Research

Global risk aversion indicators: BAA Spread & Global component in sovereign CDS
(Monthly Average)

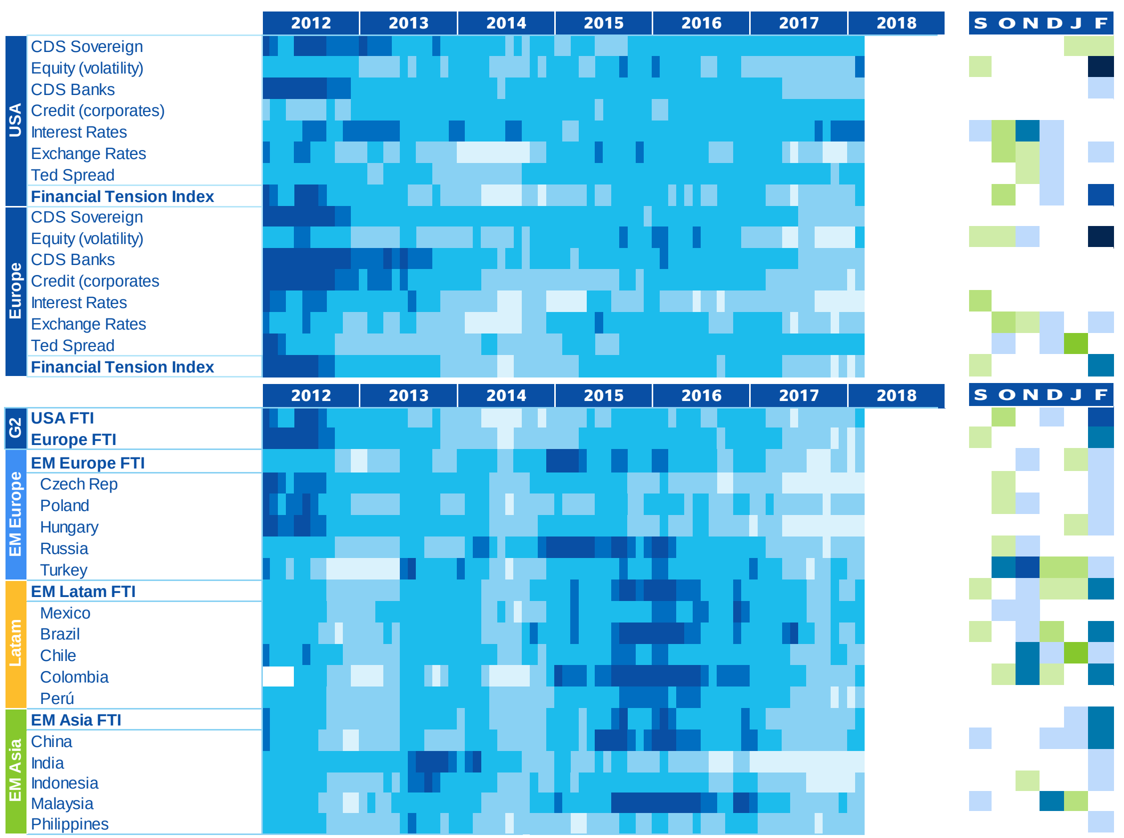


Source: FED and BBVA Research

Clear decoupling of the different GRA indicators. While VIX and FTI have increase significantly during February, both corporate and sovereign spreads have continued declining

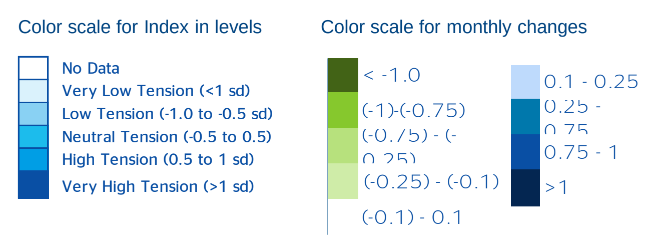
Financial tensions and global risk aversion

BBVA Research Financial Stress Map



Source: BBVA Research

- Volatility in equity markets in USA and Europe experienced its most important surge in the last two years.
- EM Europe was the region less affected and only saw minor increases in FTI
- LatAm FTI was dragged by the turmoil, and the surge was more intense in Mexico, Brazil and Colombia.
- EM Asia also affected, particularly China and India.



Intense rise in Financial Tensions across most geographies but driven almost exclusively by a surge in volatility in equity markets, mainly in USA. Tensions in FX rates and sovereign, corporate and banks spreads remain subdued

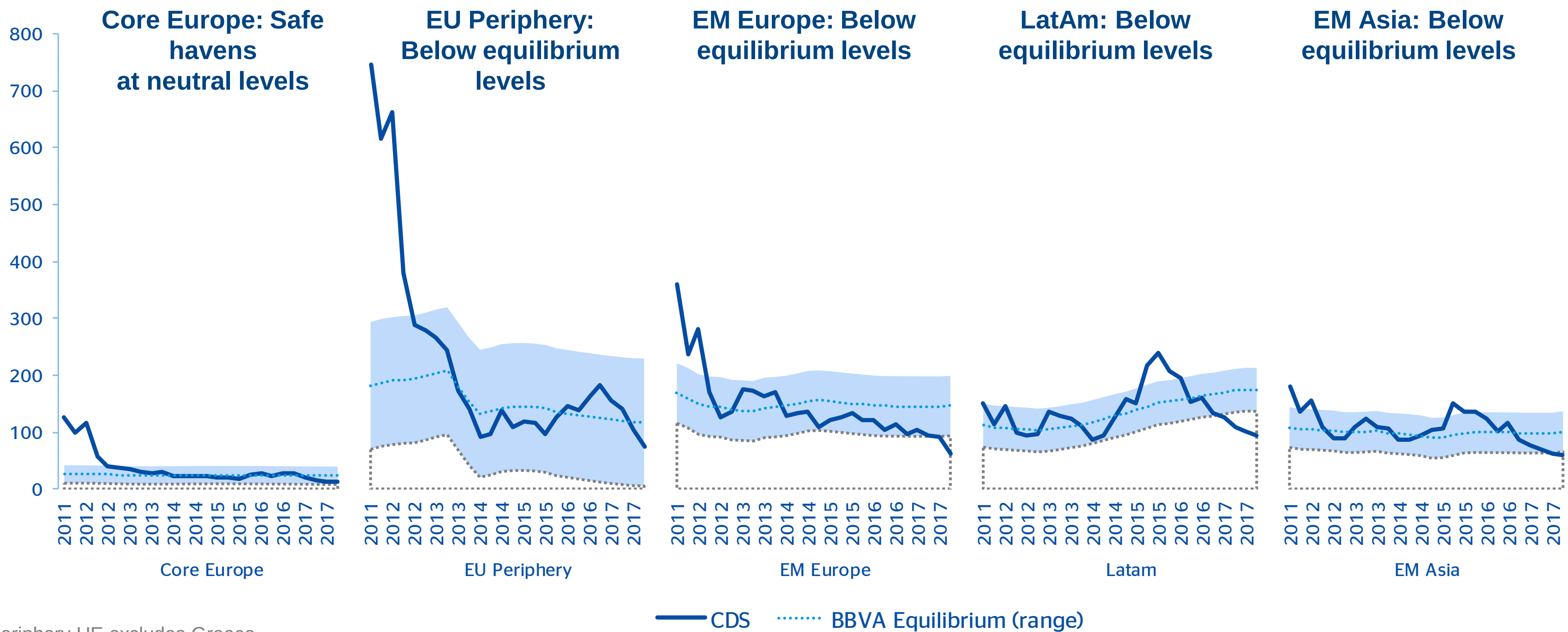
03

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

CDS and equilibrium risk premium: February



Periphery UE excludes Greece
Source: BBVA Research and Datastream

Historical low levels in several countries' CDS translate into significant gaps with respect to their "equilibrium" levels (according to long-term fundamentals and the long-term mean of the global risk premium proxied by BAA spread), especially visible in EM Europe, LatAm and Asia EM

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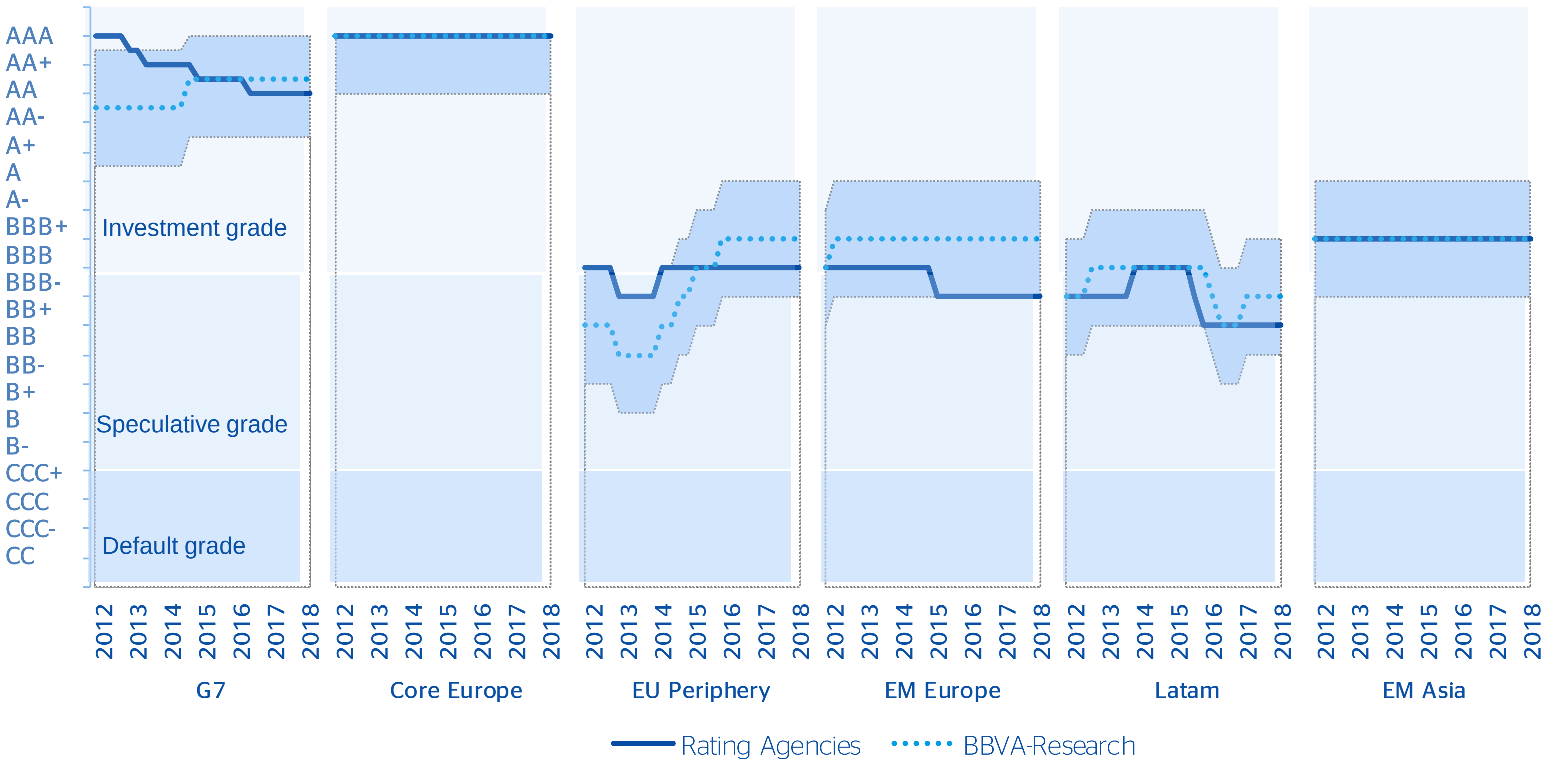
Macroeconomic Vulnerability and Risk Assessment

Agencies' Sovereign Rating vs. BBVA Research

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



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

Except for EM Asia and Core Europe, the average rating of the agencies continues to fall below our fundamentals-based rating (BBVA Research), also in line with the upgrade pressures seen in CDS sovereign markets

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Macroeconomic Vulnerability and Risk Assessment

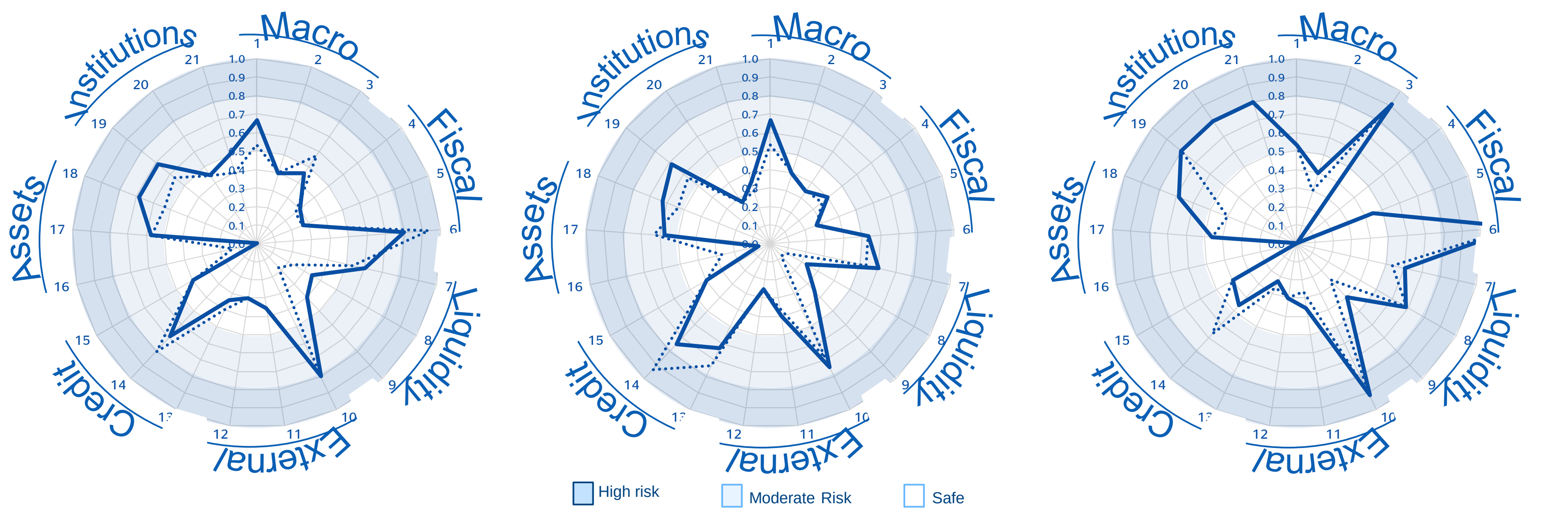
Developed markets: vulnerability radar 2018

(Relative position for the developed countries. Risk equal to threshold=0,8, Min risk=0. Previous year data is shown as a dotted line)

G7: Rising vulnerability from liquidity factors and from the stock market growth. Corporate leverage vulnerability decreases. High vulnerability remains from high public debt levels but is improving

Core Europe: Increasing vulnerability from the stock market growth. Corporate leverage decreases and its now at moderate risk levels.

Periphery EU: Unemployment, public & external debt levels and stock market growth remain as high vulnerabilities, as do institutional ones. Private leverage continues improving



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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Macroeconomic Vulnerability and Risk Assessment

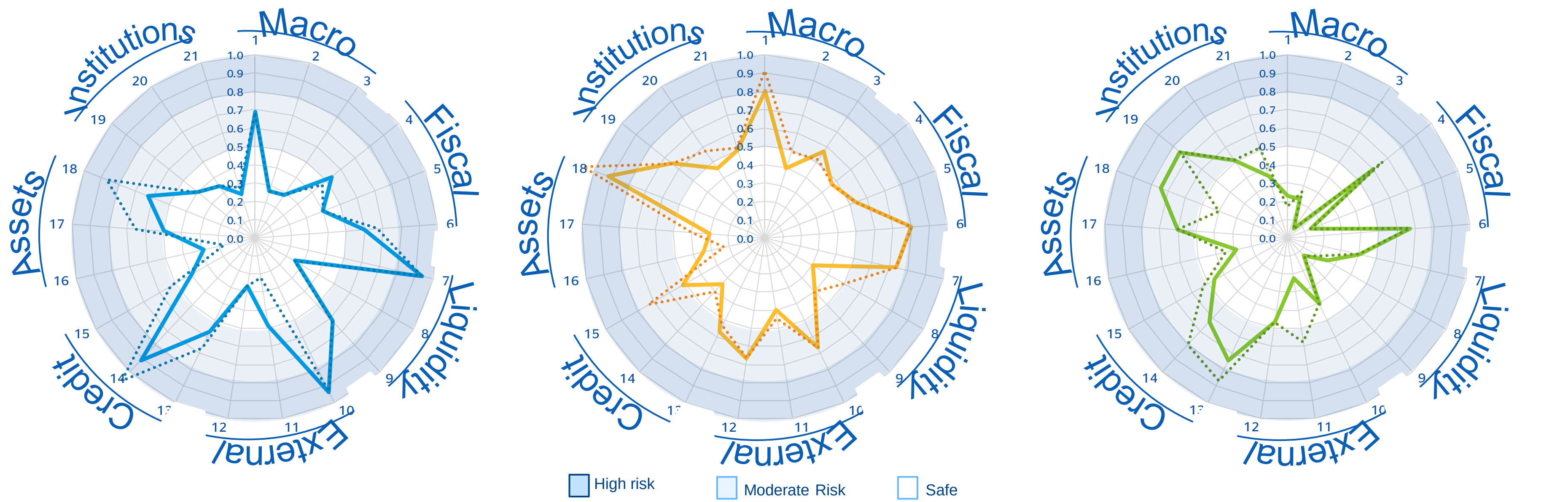
Emerging markets: vulnerability radar 2018

(Relative position for the emerging countries. Risk equal to threshold=0,8, Min risk=0. Previous year data is shown as a dotted line)

EM Europe: High vulnerabilities in corporate leverage, external debt and debt held by non-residents. Decrease in stock markets vulnerability.

LatAm: Stock market growth, low economic growth and high public debt levels stand out as high vulnerabilities, but are improving from previous year. Private leverage and financial needs also improving

EM Asia: Corporate & Households leverage improving. Stock markets vulnerability is worsening.



Macro: (1) GDP (% YoY) (2) Prices (% YoY) (3) Unemployment (% LF)
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05

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

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Assessment of financial and external disequilibria

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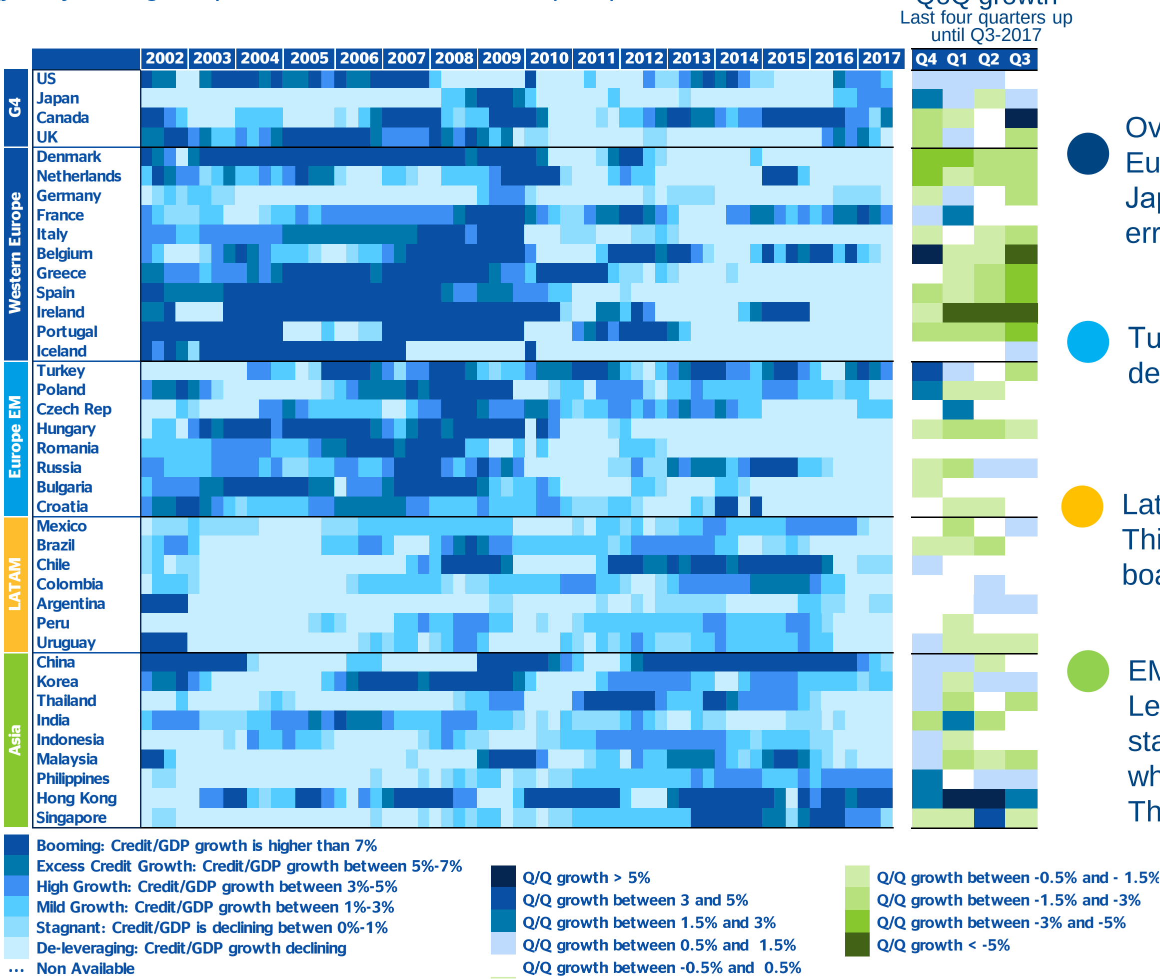
Deleveraging across the board with few exceptions (Canada and HK). Deleveraging is stronger in Western Europe, whereas in other regions a bit more mixed picture could be seen.

Private credit color map (2002-2017 Q3)

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

QoQ growth



- Overall reduction of leverage growth in Western Europe and UK. In contrast, in US, Canada and Japan leverage's behavior is more mixed and erratic.
- Turkey's leveraging slows down and converge to the deleveraging process prevalent across EM Europe.
- LatAm countries continue deleveraging or stagnant. This has been going for over a year and across the board
- EM Asia is the region with the more mixed behavior. Leverage in China continued to slow down. HK stands out as the only one with high growth rates, while Philippines shows a moderate growth. Thailand, India and Malaysia remain stable.

Source: IFS, BIS & BBVA Research,

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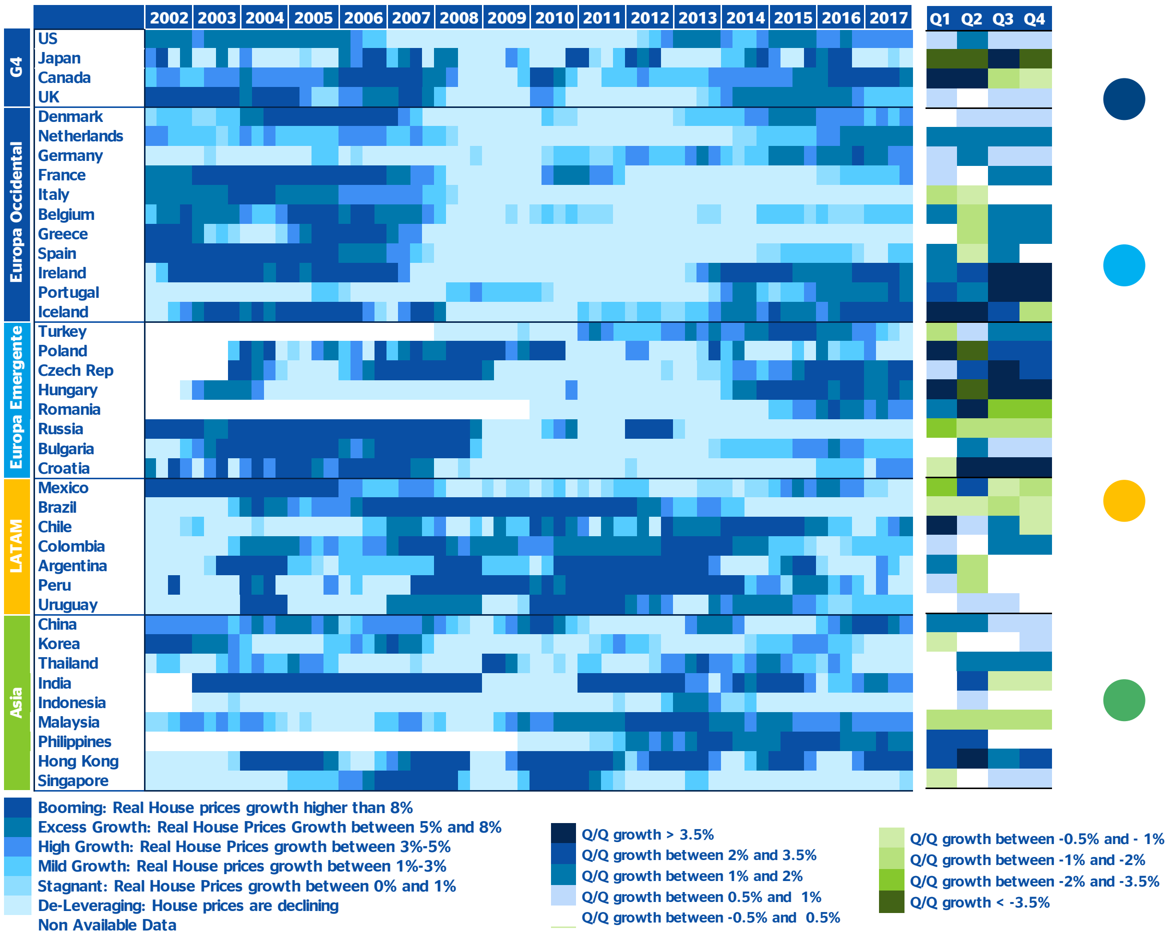
Assessment of financial and external disequilibria

Housing prices continue to rise in most DMs. A mixed growth pattern is observed in the rest of the geographical areas within EMs.

Real housing prices color map (2002-2017 Q4)

(yearly change of real housing prices YoY)

QoQ growth
Last four quarters up until Q4-2017



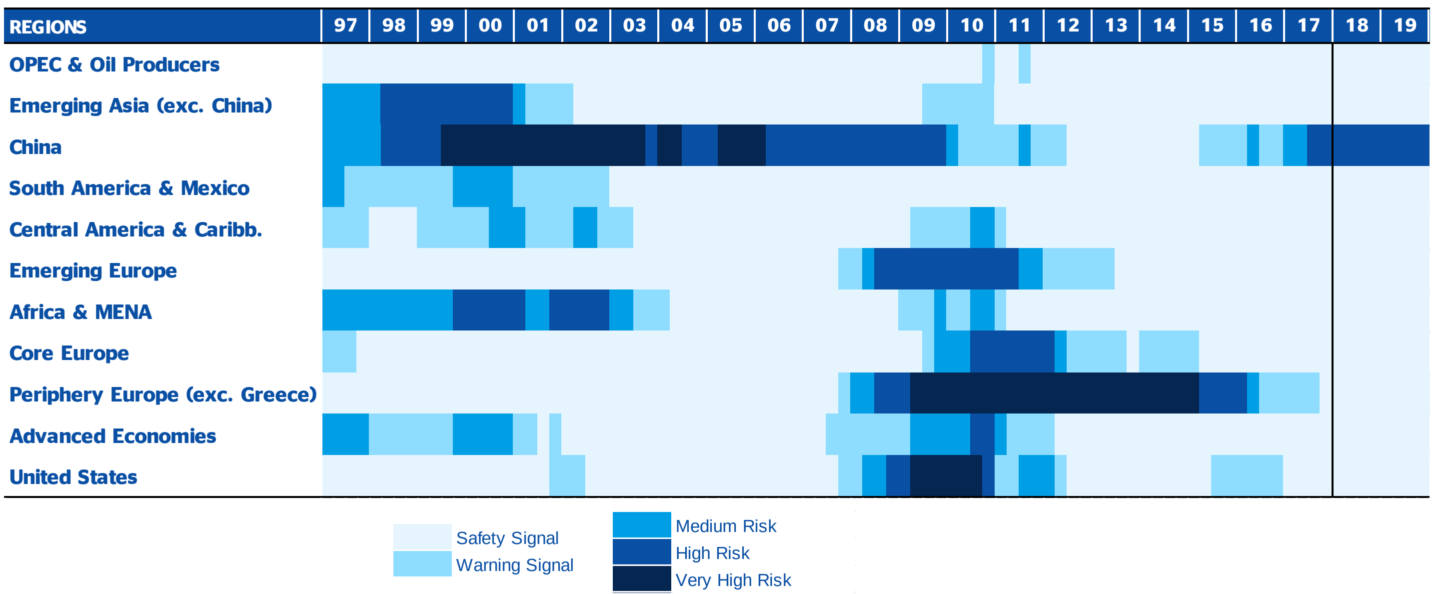
Source: BBVA Research, BIS, Haver and Oxford Economics.

- Strong housing price growth in most developed economies. Ireland and Portugal stand out.
- Less coordinated prices growth in Emerging Europe. Prices are growing in several countries but at different speeds. They are decreasing in Romania and Russia (in QoQ terms).
- The situation in LatAm is less buoyant. Prices are only growing in Colombia (in QoQ terms).
- Sustained but decelerating price growth in China. Similarly to the leverage growth's case, HK stands out in the region.

Assessment of financial and external disequilibria

Early warning system (EWS) of Banking Crises (1997Q1-2019Q4)

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



- The nascent slowdown in debt in China must be sustained in time to reduce the risk of a banking crisis in the country
- **The warning signals from the EU periphery are finally disappearing**

- 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

China's over-indebtedness continues to generate a relevant vulnerability of its banking sector in the coming years which must continue being tackled with macro-prudential and other economic policies oriented to reach a soft absorption of previous excesses.

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Assessment of financial and external disequilibria

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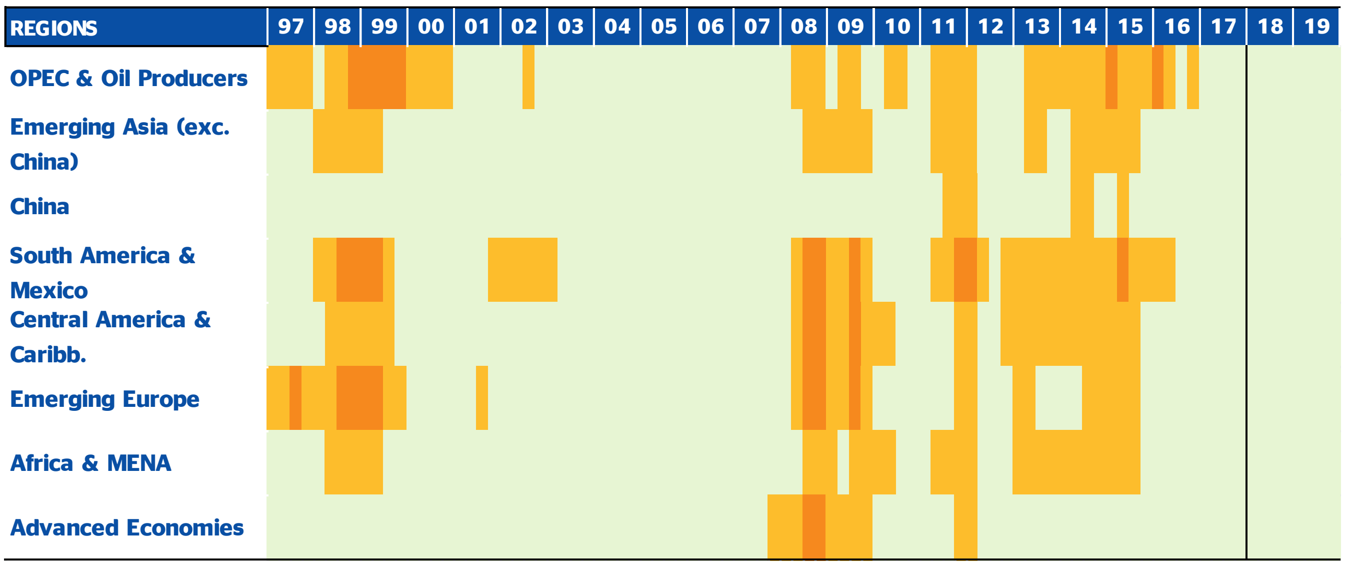
Early warning system (EWS) of Currency Crisis Risk: probability of currency tensions

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



According to our currency crisis early warning system, we do not expect significant risks in any of the regions analyzed during the coming months (at an aggregate level).

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.

Source: BBVA Research

Exchange rates seem to be going through a period of low tensions, especially when estimated at a regional level. We do not anticipate serious tensions in the coming months in these regions as a whole, although there may be tensions in countries within each region

Vulnerability Indicators table by country

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Vulnerability Indicators Table

Vulnerability indicators* 2018: developed markets

	Fiscal sustainability			External sustainability			Liquidity management			Macroeconomic performance			Credit and housing			Private debt			Institutional		
	Structural primary balance (1)	Interest rate GDP growth differential 2016-21	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	-1.7	-0.8	108	-2.6	99	-0.7	21	16	30	2.3	2.3	4.1	2.3	4.6	25.1	79	73	64	-0.4	-1.3	-1.7
Canada	-1.5	-0.6	88	-2.9	116	0.6	12	12	23	2.1	1.9	6.3	5.0	0.0	6.0	103	129	129	-1.2	-2.0	-1.8
Japan	-3.2	-1.0	240	3.8	74	-1.0	42	16	10	0.7	0.6	2.9	3.1	10.0	19.1	58	102	47	-1.0	-1.5	-1.4
Australia	-0.2	-1.4	42	-2.4	117	1.5	4	5	40	2.9	2.3	5.4	-8.1	7.5	7.8	125	81	134	-1.0	-1.8	-1.8
Korea	0.9	-1.9	38	5.4	26	-1.7	2	9	13	3.0	1.9	3.6	2.4	-0.8	21.8	98	98	97	-0.2	-0.4	-1.1
Norway	-11.0	-1.4	33	5.7	163	-0.5	-9	8	56	1.6	2.1	3.8	-10.1	1.0	20.2	102	150	132	-1.2	-2.2	-2.0
Sweden	0.3	-2.7	36	3.7	193	-0.5	3	11	39	2.4	1.5	6.3	7.7	5.9	3.9	87	157	194	-1.0	-2.2	-2.0
Denmark	-0.4	-0.1	37	7.0	167	0.5	4	9	32	1.8	1.6	5.8	-13.1	2.5	15.9	117	109	297	-0.8	-2.2	-1.9
Finland	-1.0	-2.0	63	0.4	167	-0.5	7	9	69	2.3	1.6	8.1	-0.8	-2.4	6.4	68	112	134	-1.0	-2.3	-2.0
UK	-0.5	-0.6	90	-3.3	324	-8.8	8	6	32	1.5	2.6	4.4	-3.6	2.2	7.6	87	82	57	-0.4	-1.9	-1.6
Austria	0.5	-1.2	78	2.2	185	1.3	7	8	73	1.9	1.9	5.3	-4.3	2.4	30.6	52	95	96	-0.8	-1.5	-1.8
France	-0.8	-1.3	97	-0.8	224	-0.1	15	12	56	1.8	1.5	9.0	4.1	2.8	9.3	60	132	110	0.1	-1.4	-1.4
Germany	0.9	-1.7	62	7.7	150	1.0	5	9	52	1.8	1.8	3.7	-1.6	4.2	12.5	54	54	88	-0.8	-1.8	-1.6
Netherlands	1.0	-1.8	54	10.0	573	0.8	7	14	48	2.6	1.5	4.9	-9.1	6.2	12.7	108	123	94	-0.9	-2.0	-1.9
Belgium	0.1	-1.1	103	0.0	252	1.7	28	25	60	1.6	1.7	7.3	-26.4	2.0	4.9	60	166	52	-0.5	-1.6	-1.4
Italy	2.8	0.8	131	2.3	126	-0.1	17	12	32	1.1	1.6	11.0	-4.7	-2.3	13.6	42	72	105	-0.4	0.0	-0.3
Spain	-0.1	-0.7	85	1.9	176	0.3	17	15	45	2.5	1.4	15.6	-9.6	1.0	7.4	63	99	105	-0.5	-0.5	-1.0
Ireland	1.3	-1.9	68	3.5	729	0.7	6	8	60	3.4	1.7	5.9	-45.3	11.8	8.0	54	261	53	-0.9	-1.6	-1.5
Portugal	2.2	-0.1	122	0.3	226	0.4	15	11	58	2.0	2.6	9.0	-10.2	9.3	17.8	70	110	128	-1.0	-1.0	-1.1
Greece	3.1	-1.8	184	-0.1	243	-0.5	15	9	82	2.6	1.1	20.7	-5.9	-1.6	24.7	58	62	147	0.1	0.1	-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 labour force (6) Financial system credit to deposit (7) Index by World Bank governance indicators

Vulnerability Indicators Table

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Vulnerability indicators* 2018: emerging markets

	Fiscal sustainability			External sustainability			Liquidity management			Macroeconomic performance			Credit and housing			Private debt			Institutional		
	Structural primary balance **(1)**	Interest rate GDP growth differential 2016-21	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	-0.5	0.4	24	1.9	70	0.7	4	2.0	44	3.2	1.6	6.4	-0.3	2.9	15.5	21	80	79	0.0	0.2	0.0
Czech Rep	1.0	-1.5	32	0.1	101	5.9	7	24	66	2.6	2.0	3.0	1.9	10.0	17.0	32	58	82	-1.0	-0.5	-1.1
Croatia	1.9	0.2	80	3.0	74	1.3	12	3.5	38	2.7	1.2	13.5	-2.0	3.2	-7.6	33	27	89	-0.7	-0.2	-0.4
Hungary	-0.5	-1.7	71	4.2	108	2.3	20	1.0	46	3.4	3.0	4.3	-6.0	9.6	23.0	20	80	84	-0.7	-0.1	-0.5
Poland	-1.2	-1.8	54	-1.2	70	0.2	9	1.7	48	3.3	2.6	4.0	-0.7	-3.1	23.2	36	96	109	-0.5	-0.7	-0.7
Romania	-3.9	-3.7	40	-2.9	52	-3.0	9	2.0	44	4.4	3.5	5.2	-1.0	4.8	9.4	17	38	79	-0.3	0.0	-0.3
Russia	-1.0	0.0	18	3.2	34	1.4	3	4.5	18	1.6	4.0	5.5	-1.1	-7.9	-5.5	17	51	111	0.9	0.9	0.8
Turkey	-0.6	-2.5	28	-4.6	47	0.6	6	0.8	38	3.5	9.5	10.7	3.6	0.6	47.6	19	75	124	2.0	0.2	0.2
Argentina	-2.9	-10.2	52	-5.3	34	-2.9	11	1.0	39	3.3	18.5	8.3	0.9	-17.9	77.7	7	12	65	-0.2	0.3	0.3
Brazil	-2.9	3.5	88	-0.6	34	1.8	16	4.7	9	2.1	4.3	12.7	-3.6	-3.9	26.9	23	42	92	0.4	0.4	0.1
Chile	-0.7	-1.4	28	-2.8	63	2.7	4	1.8	18	2.5	2.9	6.8	0.3	3.4	34.0	36	53	165	-0.5	-1.1	-1.1
Colombia	0.3	0.4	49	-3.6	40	-20.9	4	3.4	31	2.8	3.1	9.2	-0.6	2.8	13.6	21	25	113	1.0	0.3	0.3
Mexico	0.7	-0.7	52	-1.9	40	-4.9	9	3.3	33	2.0	3.8	3.5	-0.7	-1.5	10.4	17	27	82	0.8	0.8	0.5
Peru	-2.1	-1.4	27	-1.6	34	-5.0	5	6.5	37	3.8	2.5	6.7	-1.7	-1.0	28.3	15	26	99	0.2	0.4	0.5
China	-2.7	-5.6	71	1.2	11	-2.3	4	3.9	..	6.5	2.4	4.0	0.7	6.6	8.5	47	163	86	0.5	0.3	0.2
India	-1.3	-3.8	67	-1.5	19	6.0	11	4.1	6	7.4	4.8	3.5	-3.6	4.3	27.9	10	43	78	1.0	0.3	0.1
Indonesia	-0.8	-2.6	29	-1.8	35	1.4	5	2.5	59	5.3	3.7	5.2	-0.5	-0.5	20.0	17	23	100	0.4	0.4	0.4
Malaysia	-0.7	-3.0	54	2.2	63	-5.2	11	1.2	23	4.8	2.9	3.2	-3.1	3.9	9.4	92	--	109	-0.1	-0.1	-0.5
Philippines	0.8	-3.5	33	-0.3	18	-6.7	8	4.9	28	6.7	3.0	5.5	4.4	7.0	25.1	4	41	68	1.3	0.5	0.4
Thailand	-0.9	-1.5	40	8.1	36	0.7	7	3.2	12	3.5	0.7	0.7	-2.5	-0.2	13.7	72	50	100	0.9	0.4	0.0

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

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 Maps: 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

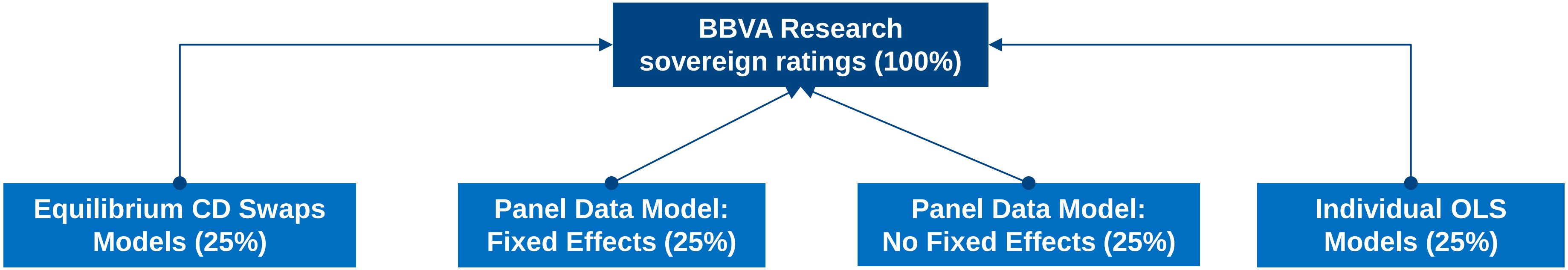
Methodology: models and BBVA country risk

- 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



Fuente: 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.

This report has been prepared by the unit of Global Modelling & Long Term Analysis

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