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Emerging Markets: Vulnerability and contagion risks... Fragile vs. anti-fragile countries

Research & Macro Strategy

Emerging Markets: Vulnerability and contagion risks... Fragile vs. anti-fragile countries*/**

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Abstract

This article is aimed at analysing contagion within the emerging world in the past decades, and at presenting investment strategies to limit negative effects of contagion and / or to benefit from it.

We first analyse nine very different cases of contagion (crises and sharp declines without crisis, with different triggers, with different contagion effects) which could be identified in the emerging world over the last 40 years: i) the Latin American debt crisis of the 1980's, ii) the Mexican crisis of 1994, iii) the Asian Crisis of 1997, iv) the Russian Crisis of 1998, v) the Brazilian crisis of 1999, vi) the Argentine crisis of 1999-2001, vii) Fed tapering of QE in 2013, viii) the "boom and burst"crisis in Chinese stock markets in 2015-2016, and ix) restrictive trade and monetary policies in the United States in 2018.

(*) A first version of this article has been prepared for an Amundi advisory board meeting (24 October 2018). The author wishes to thank all participants for their valuable comments.

(**) This discussion paper is part of a pack of 3 articles on EM economies and EM markets. One of the three deals with the typology of EM economies (how to discriminate EM countries and EM markets), and another one deals with the hard and soft power of EM countries and with the question of leadership (US vs. China vs. Europe, and USD vs. RMB vs. EUR). For further information, see references page 57 and visit our website http://research-center.amundi.com.

(***) The terminology "fragile" and "anti-fragile" is inspired by Nassim Taleb, even if it was developed in a totally different context and for specific purposes, though (Taleb N. (2012) "Anti-fragile: things that gain from disorder", Random House, New York).

We have shown in this Discussion Paper that contagion factors have evolved over time. Over the years, banking ties and foreign trade have given way to factors of anticipation and market sentiment. Ultimately, in the (near) future, given the growing role of emerging economies, contagion could stem mostly from economic factors. It is also clear that it is difficult to guard against this contagion, it can be sudden, and it affects all emerging markets. Indeed, even if the emerging world is not really a block, it is quite rare that an external shock does not have an overall impact. To avoid this, the shock must be purely specific, and the risk of contagion is absent. External vulnerability (and lack of vulnerability) is already an important factor for discriminating countries as regard the magnitude of contagion or even the presence of contagion

> “Financial crises that are caused by financial contagion can in principle be predicted through the monitoring of macroeconomic variables. Pure contagion, by contrast, hits countries regardless of their level of economic integration and is hard to predict or to quantify.”
>
> *OECD - December 2008*

We then analyse contagion as regard economic characteristics of more than 20 EM countries, especially as regard their external vulnerability. The results are crystal-clear: vulnerability allows to discriminate EM countries and investing in the least fragile countries is rewarding, both in terms of performance and in terms of drawdowns and recovery.

What is also clear in this article is the strong correlation between the capital flows of the different countries that make up the emerging world. In all crises, the capital recurs.

In order to benefit from the significant rebounds of the vulnerable countries and their better performance during external shocks, **it seems very judicious to overweight during the more difficult period the solid countries, which we have called “anti-fragile”:** certainly, they do not constitute strictly speaking, macro-hedging markets (they move in the same direction), but they can useful to manage shocks and protect themselves against the weaknesses of vulnerable countries, which may appear exaggerated in times of crisis and / or fragility and contagion.

Keywords:Emerging countries, contagion, vulnerability, anti-fragile

Table of contents

Executive summary

1. The year 2018 has been a difficult one for emerging markets (EM), but there has not really been a crisis. Fears of a trade war, triggered by the United States, tighter than expected US monetary policy, a rise in US Treasury yields in the first part of the year, the appreciation of the dollar, the downward revision of world growth prospects and the rise in risk aversion were factors that drove capital flows out of emerging countries and sought refuge largely in the United States. This obviously accentuated the decline in emerging markets (equity, fixed income and currency markets). There was no panic, but the downward movement was substantial. Specific risks have also materialised in some countries (Argentina, Turkey, etc.), that also amplified the movement…

2. 2018 was a year with few precedents on the financial markets. Never in the last 40 years had more than 95% of the asset classes (listed and denominated in US dollars) offering negative performances. In that sense, last year was far worse than 2008, the year of the Great Financial Crisis! Similarly, roughly 5% of these asset classes had delivered a negative return in 2017, the best year in a decade. On this criterion alone (negative performance in USD), 2018 would, according to some studies, even be the worst year since the beginning of the 20th century (and 2017 the best)! In other words, it is no surprise that all countries have been heavily impacted (December 2018 was, for US equities, the worst December in 8 decades!), and it is no surprise that the emerging world has not been an exception.

3. We analyse 9 very different crisis / contagion periods (with different triggers, and different contagion effects) which occurred in the EM world over the last 40 years:

- The Latin American debt crisis of the 1980's,
- The Mexican crisis of 1994,
- The Asian Crisis of 1997,
- The Russian Crisis of 1998,
- The Brazilian crisis of 1999,
- The Argentine crisis of 2001 – 2002,
- Fed tapering of QE in 2013,
- The "boom and burst" crisis in Chinese stock markets in 2015-2016,
- Restrictive trade and monetary policies in the United States in 2018.

4. Crises were at first increasingly coming from the banking sector and increasingly from a perception problem (confidence, sentiment, etc.). History recalls that contagion from emerging to developed countries was increasingly dependent on effective financial links or bank exposure (banking regulation is undoubtedly an element that has helped to reduce

systemic risks in the past decade). It is now increasingly dependent on the perception of risk (which directly affects consumption and investment, for example) and on the reaction of financial markets (which can generate significant wealth effects). Risk perception may also be eroded depending on external financing needs. Ultimately, **in the (near future), given the growing role of emerging economies, contagion could stem mostly from economic factors.**

5. Discriminating EM countries is a worthwhile investment. It is possible to discriminate emerging countries and considering the emerging world as a block is a mistake. Not only has the contagion in the emerging world changed over time, but focusing on discrimination between countries is a worthwhile investment.

6. We analysed the "vulnerable" countries and the "solid" countries, in reference to our scoring. It appears that the weight of vulnerable countries is low compared to solid countries, both in terms of GDP (nominal GDP (3% vs. 24%) or GDP at PPPs (4% vs. 33%)), population (3% vs. 42%), market cap (1% vs. 6%) or outstanding loans (1.5% vs. 20%). It therefore seems rather unjustified that problems in vulnerable countries have a strong impact on the emerging world, particularly the strong ones, and it also seems unjustified that this can affect all financial markets. The contagion should remain limited. The situation is a little different with regard to the weight of the debt (total debt, household debt, or corporate debt). The gap between strong and vulnerable countries is not very large. However, what makes the difference, for example between Turkey and China, is the dependence on foreign capital flows, and that is what makes Turkey's vulnerability greater.

7. We also analysed the correlations of equity, foreign exchange and interest rate markets of "vulnerable" countries and "solid" countries. The results do not really allow to conclude that vulnerable countries behave differently than solid countries. The correlation between all the markets tend to prove than discrimination is difficult.

8. Discriminating through a risk factor is possible, though… and external vulnerability is a good way to do it. When we then looked at the relative performance of FX, equity and debt markets for these two groups (equal weighted long/short portfolios), the results tend to prove that vulnerability is a real criterion of discrimination: the performance of "solid countries" is significantly better than the performance of "vulnerable countries": gaps of +16% on equities in 2018, +6% on EMBI markets and +10% on FX markets. For the whole period (2011-218), despite the strong recovery of vulnerable countries during "quiet periods", the outperformance of solid countries is still significant: more than 2% on both equity and fixed-income markets, and close to 4% for FX markets.

9. On equity markets, vulnerability is not a discriminatory factor in normal periods, but it tends to be an important discriminatory factor in times of trouble, i.e. in 2018. **On fixed income markets, vulnerability / solidity are systematically discriminatory factors,** which is legitimate considering that vulnerability / solvency are key criteria on sovereign debt. However, it was not the case in 2018, where contagion was significantly high: all kind of portfolios – portfolios including a vulnerability factor, optimised portfolios without any constraint, and portfolios biased to vulnerable countries or to solid countries - tended to behave similarly. On FX markets, the results are similar (vulnerability is important), even if diversification seems more important than vulnerability.

10. We could not analyse different crisis episodes, and our study cannot be generalised. But all in all, in order to benefit from the significant rebounds of the vulnerable countries (when risk aversion evaporates), **it seems judicious to overweight during challenging times the solid countries, which we will refer to as the "anti-fragile"**. They do not constitute, strictly speaking, macro-hedging instruments (they evolve in the same direction), but they make it possible to weather the shocks and to protect oneself against the weaknesses of vulnerable countries which, at times, may seem overblown. Our approach can also be part of overlay strategies.

11. For the contagion to materialise, some criteria must be met:

- **An increase in risk aversion** which, in some cases, acts as a "wake-up" call;
- **The perception that the affected countries are a block;**
- **Economic or political similarities:** economic proximity (not necessarily geographical) or the existence of common factors are often the source of contagion. An obvious example is the group of commodity-producing countries against the group of commodities-consuming countries. An increase in commodity prices will affect groups differently.
- **Dependence on foreign capital flows,** and in particular on the affected countries, is another fragility that can guarantee contagion. If China falls, the rest of Asia will be hurt, while project financing in Africa will undoubtedly be greatly impacted, for example. When Turkey experiences difficulties, its vulnerability and dependence on capital flows are crucial.
- **The existence of a common external factor:** a sharp appreciation of the dollar, a sudden and/or excessive rise in US rates, a financial crisis in developed countries... have in the past caused many crises in emerging markets. An unwelcome trade war or monetary tightening by the Fed are two critical (and additional) common factors for emerging markets today.

12. The question of the impact of the financial sphere on the real economy is also raised. The financial crisis of 1929, the collapse of the tech bubble in 2000, or, more recently, the crisis of 2008, all had serious repercussions on the level of economic growth, creating a recession - sometimes severe - in the developed world; a new global crisis would almost certainly have the same impact, while a "simple" revaluation of risk premiums would be less damaging, particularly if interest rates remain low.

13. There are four different scenarios for the future:

- Scenario # 1: Appeasement (end to fears trade war, better growth prospects, etc.),
- Scenario # 2: A contagion to all emerging markets due to a common factor to all EM markets: lack of capital flows, risk aversion, misunderstanding of the US monetary policy...),
- Scenario # 3: A major crisis affecting both advanced and emerging markets (a serious common factor such as a "full-scale" trade war or a massive and economic recession),
- Scenario # 4: "Successive crises" in emerging markets only mainly due to the continuation of the global economic slowdown and to specific risks that could (re)surface in some EM countries.

14. For the scenario # 1 to materialise, it will be necessary i) that fears of a trade war disappear, ii) that the Fed's rate hikes are stopped for the year and iii) that growth prospects improve. Then risk aversion would decline and capital flows would continue to go back to emerging countries. If not, if growth continues to slowdown, and in the absence of a major shock, the "successive crises" scenario seems most plausible.

15. Scenarios # 2 and # 3 refer to contagion, within EM countries only (Scenario # 2) or to all countries both emerging and advanced (Scenario # 3). The magnitude of the contagion would depend on the magnitude of the slowdown, the magnitude of trade war fears, and on the existence of common risk factors, on EM or on all countries. Note that any rise in oil price would have important impact: the countries that would suffer most from the rise in oil prices (combination of net oil / GDP imports and energy weight in the CPI) are Romania, Poland, Portugal, Turkey, Hungary, Cambodia, the Czech Republic and Spain. The countries that would benefit the most are Canada, Ecuador, Norway, Nigeria, Saudi Arabia and Venezuela.

16. Scenario 4 (successive crises) does not lack interest. The sequence could be as follows: After the first wave of countries that are at the heart of the turbulence for specific reasons (such as Argentina, Venezuela and Turkey), a second wave could emerge, with the heavily open economies being affected by the current trade war fears (should they intensify further) and by the economic slowdown (countries such as Chile, Colombia, Malaysia, Thailand...). In this case, there would be a general

economic slowdown, i.e. a decline of the US growth below its potential growth, an additional weakening in Europe, especially if trade measures hit Germany... In turn, it would affect oil exporting countries (third wave), particularly those most dependent on oil and/or vulnerable.

17. Risk aversion and emerging markets: What risk of contagion? What kind of contagion? In the absence of a large-scale trade war, of a hard landing by China, of a massive economic slowdown, contagion from EM countries to advanced countries should be limited and contagion within the emerging world should also be limited to common factors (predominance of specific risks over systemic risks).

Introduction

The rise of emerging economies and emerging markets in the portfolios of large institutional investors is a fairly recent phenomenon: it dates back to the 1980s. And it must be admitted that the share invested in these economies is far from commensurate with their weight and their role in the world economy. The lack of knowledge of these markets, the low liquidity of certain market segments, their level of risk (considered too high) or the contagion prevailing between these countries are often the reasons given to justify these under-investments. We have recently shown (Ithurbide (2019a) that it is possible to discriminate between emerging countries and that considering the emerging world as a block was a mistake. We will show in this publication that not only has the contagion in the emerging world changed over time, but focusing on discrimination between countries is a worthwhile investment.

2018 was a difficult year for emerging markets (EM), but it was not a crisis. Specific risks have materialised in some countries (Argentina, Turkey, etc.). The strength of the dollar, the rise in US rates, the downward revision of growth forecasts, fears of a trade war were nonetheless potential triggers of a crisis. Here was contagion, no crisis.

For contagion to materialize, certain criteria must be met:

- **An increase in risk aversion** which, in some cases, acts as a "wake-up call".
- **The perception that the countries affected are a block:** one often talks about a dollar block, a European block, a EM block... being a member of a block means vulnerability increases when another member is injured. The best example is the EM block: a block that is readily available as soon as the situation deteriorates sharply, but is disappearing during periods of strong expansion and low volatility, where selectivity is very enriching.

- **Economic or political similarities:** economic proximity (not necessarily geographical) or the existence of common (internal) factors often guarantee contagion. An obvious example is the group of commodity-producing countries against commodity consuming countries. An increase in commodity prices will affect groups differently.
- **Dependence on capital flows,** and in particular on the affected countries, is another fragility that can ensure contagion. If China falls, project financing in Africa will undoubtedly be greatly affected.
- **An external common factor** (sharp appreciation of the dollar, sudden and/or excessive rise in US rates, financial crisis in developed countries) has caused many crises in emerging markets.

There are also **three main types of contagion:**

- Contagion within emerging markets;
- Contagion from emerging economies to advanced economies and global financial markets;
- Contagion from the financial sphere to the real global sphere.

Table 1: Type of contagion and contagion channels

Type of contagion	Contagion channels
Contagion within the emerging world	1. Membership in the "so called" EM group 2. Economic similarities and domestic factors (trade deficit, excessive debt, excessive inflation, overvaluation of the currency, etc.)...
Contagion from EM countries to advanced countries and global financial markets	1. Repricing of risk premiums 2. Financial linkages among countries (including banks)...
Contagion from the financial sphere to the real sphere	1. Impact on confidence indices 2. Impact on consumption 3. Impact on investment 4. Impact on credit...

A crisis in the advanced economies will always have an impact on the EM, but the opposite is not always true. The extent of contagion will also depend on how advanced countries react, including the US government and the Fed. It should also be recalled that, although this is much less true today, the ability to set up firewalls in the advanced countries has always been disproportionate to the means available to their emerging counterparts, which has caused very different contagion (magnitude, length...) from the EM countries to the advanced countries and from the advanced countries to the EM countries to date.

I. Contagion phenomena: Lessons from the past

Since the 1980's, we have had nine episodes of "crises / contagion" in emerging markets:

1st episode - The Latin American debt crisis of the 1980's

When we think about emerging debt crises, Latin America comes first. It has to be said that debt crises have been quite numerous, and still large in scale (see Box 1). In the 1970s and 1980s, indeed, US commercial banks made large loans to Latin American borrowers, mainly the major governments. The US government encouraged this behaviour, while the Fed (with Chairman Arthur Burns) was rather critical, highlighting the excess of loans and the accumulation of risks in US banks' balance sheets.

In total, the exposure of US banks to the emerging world in general, and in Latin America in particular, has become enormous: in 1982, according to estimates from Sachs and Huizinga (1987), it had reached nearly 290% of the capital of the nine largest US banks (of which 180% for the sole Latin America). All US banks' exposure to EM word was around 190%, of which 120% to Latin America. It should also be remembered that Argentina and Brazil accounted for a very large share of emerging debt indices (just under 40%), hence the impact of this debt crisis.

Large current account deficits in Latin America, rising oil prices, a sharp rise in US rates (the US exited the 1980 recession and entered a sharp monetary policy tightening cycle, with Fed funds rate at 20%) and the weakness of the global economy triggered a debt crisis in 1982. The solvency of major US banks (heavily involved in Latin America) thereby became one of the major concerns of the government and the Fed, which finally had to coordinate an international debt restructuring agreement.

Note that the exposure of US banks to the EM world never achieved again such a magnitude. From the Mexican crisis on, the total amount (in % of US banks' capital) oscillated between 20% and 40%.

Several studies (including that of Calvo, Leiderman and Reinhart (1993) and Choueiri and Kaminski (1999)) show that US monetary policy was unquestionably the trigger for the crisis in some countries, especially the failure of the 1981 Alemann plan in Argentina and the speculative attack that occurred in 1995 (a few years after the introduction of the convertibility plan).

Box 1:
Debt crises and Latin America: a quick refresher

There have been four major debt crises, and each time the sequence was the same: overheating in developed countries, a capital glut, some of which went to Latin American countries, an increase in debt, and finally a recession or stock market crash in the developed countries that laid Latin America down.

- **The crisis of around 1826 - 1850** began with the financial crash of London Square in 1829;
- **The crisis of 1876 - the early twentieth** century followed the Vienna stock market crash of 1873, which in turn was followed by a New York stock market crash;
- **The crisis of 1931 - the late 1940's** - was the shock after the 1929 Wall Street crisis;
- **The root of the 1982 crisis** was the massive rise in Fed interest rates in 1979 and the global economic recession of 1980 - 1982. Several episodes of crisis have followed: Mexico in 1994-1995, Argentina between 1998 and 2002, Brazil in 1997-1998...

All four crises have lasted between 15 and 30 years, and all have affected almost all the countries in the area. On each occasion, it has had the suspension of payments from many countries. Between 1826 and 1850, almost all countries had recourse to this solution. In 1876, as many as 11 countries in the Latin American continent were in default. In the 1930's, 14 countries declared a moratorium. And between 1982 and 2002, Mexico, Peru, Ecuador, Bolivia, Cuba, Argentina, and Brazil suspended payments for several months.

Suspension of payments is often appropriate as it generally allows for renegotiation with creditors and the re-establishment of conditions more conducive to the resumption of payments. Studies (D. Felix (1987) show the value of this solution, even when it is pushed to the extreme (total repudiation of debt). Paying at all costs drives the country into the economic, social and political crisis, and renegotiating the debt enables us to avoid this and to restore some room for manoeuvre.

2nd episode - The Mexican debt crisis in 1994-1995

In Mexico, as a result of the run up to a major election year, the government pursued an abnormally lax fiscal policy, which in 1994 resulted in the issuance of a large amount of debt with short maturities denominated in US dollars. The sequence that followed is now "classic":

political uncertainty led to capital outflows, a sharp devaluation of the peso, a panic and the inability to refinance debt. As in the 1980s, but a smaller extent, the US monetary policy did not help.

The exposure of US banks was much lower in the Mexican pre-crisis, comparing with the Latin American debt crisis of the 1980s. The Fed even recalled that "*a Mexican default would have been painful, but not fatal*" for US commercial banks, at the opposite of the previous contagion episode. Alan Greenspan and the Fed decided nevertheless to help Mexico and the Mexican peso, using for example the US Treasury's Exchange Stabilisation Fund. Greenspan declared that "*when the house next door catches fire, there is always a risk that it spreads to the United States*". The trade connection of Mexico and the US was a clear justification to help the Mexican economy and the Mexican peso, but the risk and the contagion risk were not big enough to prevent the Fed from monitoring mainly internal factors ad from raising interest rates at the very beginning of 1995.

3rd episode - the Asian financial crisis of 1997

At the very beginning, the Asian crisis starts as a "classic" currency crisis. Prior to 1997, massive inflows of capital more than offset external imbalances. But in May 1997, the worsening of Thailand's external deficit provoked speculative attacks against the THB (Thai Baht), which finally floated on July 2nd. The THB lost 50% of its value in 6 months and the other Asian currencies give in turn (Malaysia, Philippines, Indonesia ...) except two of them: the Chinese yuan (non-convertible), and the Hong Kong dollar (interest rates went up from 7% to 300% to protect the HKD and the central bank decided to mitigate the constraints of the currency board). The crisis then becomes banking and economic: falling equity markets, bank failures, economic recession. Why such a crisis?

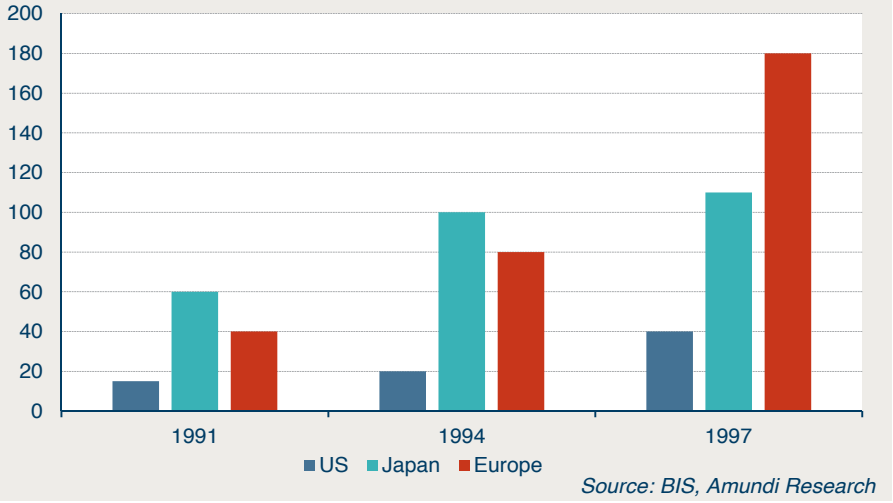
- **First, Asia has received massive capital inflows… but mainly short-term capital, which is inherently extremely volatile.** Between 1990 and 1996, the nine largest Asian countries received USD 370 billion of short-term capital flows. Central banks have accumulated foreign exchange reserves… which has led to an increase in the money supply, a sharp rise in consumption, imports… and external imbalances. The too rapid liberalization of emerging markets, "dubious" and sometimes mafia-like political and economic regimes have amplified capital outflows at the time of the debacle, and the financial market has become the vector of crises and their contagion.
- **Then, in the second quarter of 1998, the crisis spreads to Japan.** In 1997, Asia accounted for 41% of Japanese exports and 23% of its investment flows (and USD 250bn in additional bad loans).

The fall of the Japanese yen weakened the countries of the Asia zone, Hong Kong and China were in the eye of the cyclone, and the deflationary shock was amplified, with the further decline in the price of commodities and the sharp depreciation of the so-called "Commodities - Currencies". The flight to quality nevertheless favoured the appreciation of US and European markets.

- Finally, fears of a further devaluation of the Chinese yuan were growing. This risk was difficult to control, to assess and to include in risk scenarios because it is a purely political decision (note that the previous devaluation of the yuan was 40%, hence the fears of contagion).

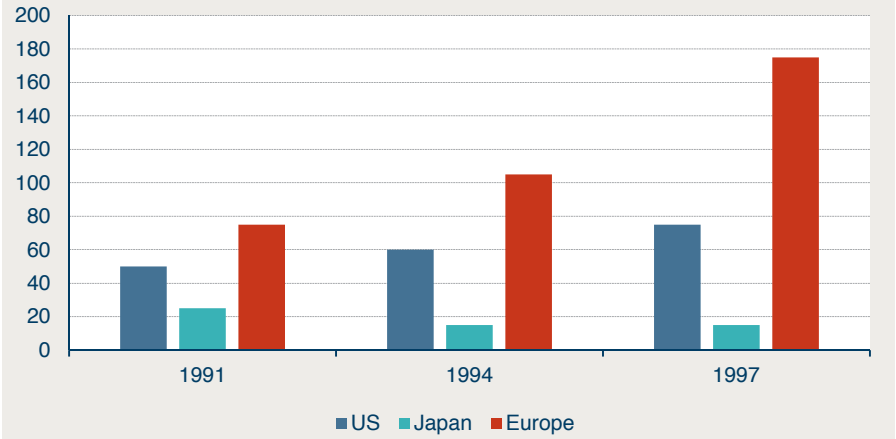
In sum, the Asian crisis which started in Thailand in July 1997, and then spread to Asia as a whole. Contagion to all developed countries was well controlled. European banks were much more exposed than US or UK banks, due to weak European growth and continued profitability outside domestic markets. European banks accounted for 60% of international commitments compared to 48% in the early 1990s: Germany alone accounted for 17% and France 11%. European banks have lent massively to foreign (non-European) economies given weak growth in Europe notably, while US and UK banks have done the opposite (new paradigm era in the US, stronger growth in UK and capacity to restore profitability internally). The preponderance of European banks is visible in Eastern Europe (almost 80% of commitments), but also in Latin America (more than 50%).

Graph 1:
Banking credits in Asia (excluding Japan, Hong Kong and Singapore) from US banks, UK banks and European banks in 1991, 1994 and 1997



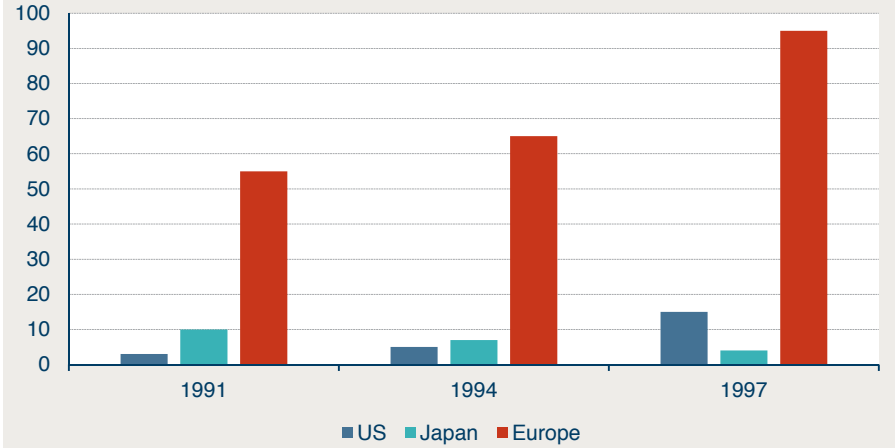
Source: BIS, Amundi Research

Graph 2:
Banking credits in Latin America from US banks, UK banks and European banks in 1991, 1994 and 1997



Source: BIS, Amundi Research

Graph 3:
Banking credits in Eastern Europe from US banks, UK banks and European banks in 1991, 1994 and 1997



Source: BIS, Amundi Research

4th episode - The Russian crisis of 1998

Until the great financial crisis of 2008, the Russian crisis was undoubtedly the most serious of all post-war crises on a purely financial level. On August 17, 1998, following heavy speculation against the rubble, and after trying to

support the exchange rate and consumed almost all of its foreign exchange reserves, the Russian central bank throws in the towel and decides to widen the margin fluctuation of the rubble. The rubble collapses, and the exchange rate against USD is multiplied by 7 in six months! Then come inflation, unemployment, recession and large capital outflows (especially on GKOs, short-term negotiable debt securities issued by Russia). Due to the recession in Asia and slowing global growth, oil sales are also falling. The Russian government has participated in this "bubble" because of its inability to control deficits: it is heavily indebted, and much in the short term. The widespread distrust of Russia, the fall in the price of commodities, the downward pressure of the rubble and finally the sharp devaluation of the rubble (the anchoring to the dollar, one of the pillars of the stabilization program is abandoned) as well as unilateral (and temporary) suspension of payments of part of the debt caused a major crisis. We then witness an extension of default risk to all emerging countries (investors go from "flight to quality" to "flight to safety", and from "flight to safety" to "flight to safe liquidity").

Between August and October 1998, the worst-case scenario occurred: the economic, financial and political crisis in Russia has intensified growing, as well as the collapse of the stock markets, especially the American ones. Continued deflationary shock led to further decline in commodity prices and a further wave of devaluations / depreciations on the foreign exchange markets. By the end of summer 1998, Russia's debt crisis had caused heavy losses and created a threat of contagion to US banks. The September 1998 FOMC meeting mainly focused on the collapse of the LTCM hedge fund and its potential impact on the financial sector: the Fed worried about the unusual and excessive counterparty risk taken by banks with LTCM, and Alan Greenspan thereby expressed his concern about the possibility of a stronger global contagion. High volatility, collapsing equity markets, widening credit spreads, heavy losses by investment banks pushed the Fed to coordinate very actively the LTCM bailout and to switch its monetary policy into an accommodative stance.

As in the case of the Latin American crisis, contagion has been strong, both on financial markets and on economic activities.

The next episodes to be developed below point out that the usual transmission channel of the 1980s and, to a lesser extent of the 1990s, i.e. contagion from emerging countries to the US or to other advanced countries through loans and exposure from what are now called systemic banks has become much less active. This is essentially due to two main factors:

- A much stricter banking regulation which has reduced significantly the amount of risks,
- A greater capacity to hedge the existing risks.

5th episode: the Brazilian crisis of 1999

At the end of the 1990s, Brazil was the world's ninth largest economy, accounting for 3% of global GDP, and nearly 45% of Latin America's GDP. A crisis in this country could not in principle have no global consequences. Latin America was somehow "hostage" to what was going to happen in Brazil, which had the same weakness as Asia: the excessive external indebtedness of corporates... and the same weakness as Russia: a relatively high fiscal deficit. In contrast, Brazil had two major advantages over Russia: a real domestic market that provided local financing (non-residents held only 10% of the debt versus more than 40% in Russia), and much more high credibility of political, monetary and financial authorities. The international crisis and the elections, however, had caused a bit of "laxness" in 1997 and 1998:

- A primary deficit up to 1% of GDP and a public deficit up to 7% of GDP,
- A trade deficit of 4% of GDP,
- A sharp rise in public debt to almost 40% of GDP,
- An average maturity of the debt increasingly short (less than 7 months at that time,
- A monetary policy a little too accommodating,
- An increase in the proportion of floating rate debt, above 50% (compared to less than 20% a year earlier),
- In other words, more "risky" fundamentals in 1998 than a year earlier and capital outflows that became less and less "sustainable" for the "crawling peg" exchange regime: the authorities had determined a path for the exchange rate, relying on an annual depreciation rate of "only" 7.3% against the dollar.

At the beginning of September 1998, three disappointments aggravated the situation:

- An easing of the monetary policy (interest rates go from 19.75% to 19%),
- The announcement of a reduction in the depreciation rate under the crawling peg,
- The downgrade of Brazilian domestic and foreign debts by Moody's.

The Brazilian crisis, however, was not a repeat of Russia's credit market crisis, for at least three main reasons:

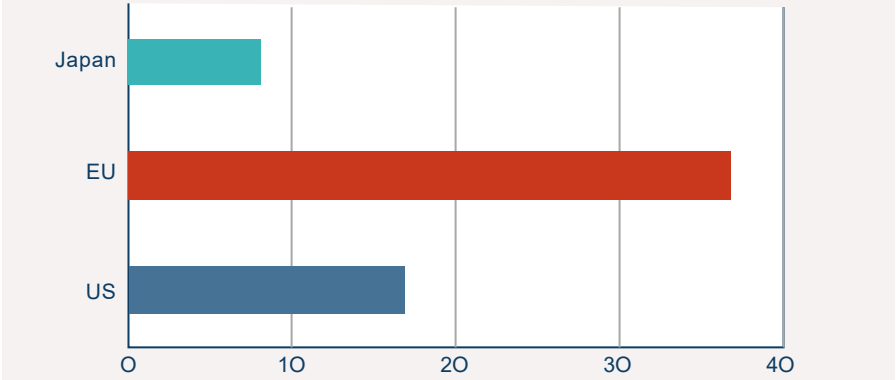
- There were fewer commitments from banks to emerging countries since the Russian crisis;
- The Fed reacted quickly;
- There was no credit crunch on the fixed income markets.

The Cardoso project also reassured: he announced he wanted to reduce the public deficit to 3 - 3.5% of GDP within three years, reform the social security system by the end of 1998, reform the labour market in 1999 and continue the privatizations. Admittedly, the probability of devaluation of the real had nevertheless increased significantly in September / October 1998, even if the Fed had been able to limit the pressure. On 18 January 1999, Brazil was forced to abandon the crawling peg regime and adopted a floating rate regime. Quickly, the real lost nearly 70% even though the weight of the debt in USD imposed a stabilization of the real. The intervention of the central bank was not enough, and interest rates soared.

The contagion of the Brazilian crisis operated via four channels of transmission:

- **Trade flows**: Brazil accounted for more than 30% of Argentine exports, and 20% of US exports to Latin America;
- **Exposure of US and European banks**: European banks were however more exposed (see Graph4), but the global impact was nevertheless less critical than the one which occurred during the Asian and the Russian crises;
- **The impact on confidence indices** in the industrialized world;
- **The impact on interest rates in Latin America**, with the essential risk of a worsening of the recession already underway.

Graph 4:
Banks' exposure to Latin America (as a % of capital - 1998)



Source: BIS, Amundi Research

In total, the contagion was rather limited to Latin American countries, with Argentina in the lead. Contagion to other EM countries (Asia or Europe) has been extremely limited, as well as contagion to advanced countries.

6th episode: The Argentine crisis 2001 - 2002: a long-lasting crisis, with a very limited contagion though

The Argentine crisis was multifaceted, with notably a currency crisis, a sovereign crisis and a risk of default... Three essential reasons for triggering this crisis can be mentioned:

1. On the one hand the recurrent difficulty of the government to revive the economy which had been in recession for three years, and knew deflation for a year;
2. Then, the continuation of the increase in indebtedness, favoured by the economic situation which weighs on the tax receipts and the budgetary rooms of manoeuvre. The debt represented USD 128 bn in 2000 (around USD 140 bn at the end of 2001, of which USD 88 bn in foreign debt), with a debt service equal to 4% of GDP. The rejection at first reading of the austerity plan (in March 2001) revealed the difficulties on the possibility of having the various assemblies and the population adopt harsh measures (lowering of wages, pensions and reduction of public expenditures).
3. Finally, the unwise modification of the tariff policy on commercial transactions (excluding petroleum products). The government paid a subsidy to exporters and imposed a tax on importers, all this based on the evolution of the peso against the dollar. This measure was perceived as an infringement of the currency board regime, and was quickly perceived more as a FX measure than as a real tariff measure.

It must be remembered that Argentina has been in difficulty for a long time, and that stabilization plans have followed one another since the mid-1960s, with little success (see the analysis of the numerous stabilisation plans conducted from the mid-1960s to the beginning of the 2000s - Box 3). It might explain why the contagion to other EM countries, and the contagion to advanced countries were limited.

Box 2: Argentina: Many stabilisation plans... and as many resounding failures ... without much contagion

The first stabilisation plan (Vasena Plan) was introduced in March 1967 and lasted a little over three years. The weak internationalization of the economies and the low capital mobility at that time did not prevent a significant devaluation of 14%.

The second stabilisation plan (Gelbard Plan), set up in May 1973 by Finance Minister Jose Gelbard, lasted about two years and resulted in a 100% devaluation and a significant foreign exchange loss (-56%). A dozen devaluations occurred during the year 1976, of which one of the essential characteristics will have been the appearance of an inflation rate of 300%.

The third stabilisation plan (Tablita Plan) is the continuation of the military coup of June 1976. Argentina has opted for greater trade and financial liberalization, including the reduction of tariff barriers and the full convertibility of the peso. These are the measures that best reflect the spirit of the December 1978 Tablita Plan. Strong monetary expansion and improved fiscal balances were two of the most visible consequences. The deterioration of the current account balance and the adoption of extremely strict anti-inflationary monetary policies in the industrialised countries (notably with the Volcker episode in the US) caused a banking crisis in Argentina and doubts about the fixed exchange rate regime of the peso. Consequences: three devaluations (10% in February 1981, 34% in April and 38% in June), the adoption of a dual exchange rate regime with full flexibility of the financial exchange rate (and an immediate devaluation of 70%).

The fourth stabilisation plan (Alemann Plan) was set up in December 1981 by Mr. Alemann, the Minister of Finance, to counter the acceleration of inflation, one of the causes of which can be found in the bailout plan for banks. This program reunified the exchange rate regime and allowed a contraction in domestic credit... but the situation again deteriorated rapidly. In April 1982, the Falklands war began with a sharp increase in military spending which affected the budget balances.

The impact of the global recession, falling commodity prices, rising interest rates in industrialized countries and the debt crisis have done the rest: the central bank has lost more than 20% of its reserves foreign exchange, the peso devalued 148%, capital controls were reintroduced and the dual currency regime reactivated.

Inflation reached 6000% in 1985 when the Alfonsin government announced a **fifth stabilisation plan (the Austral Plan)** which did not, however, prevent inflation from receding sufficiently. In mid-1986, it was still above 100% and the fixed exchange rate regime of the peso was once again abandoned. The Central Bank lost 60% of its reserves from January to September 1987 and the stabilisation plan was abandoned. The commercial peso was devalued by 16% in September and 33% in October.

The sixth stabilisation plan (Primavera Plan) was announced in August 1988 with the objective of limiting inflation to 4% per month and conducting a gradual devaluation of the peso. Two exchange rates (one for trade) coexisted, and wage controls were decided. Inflation declined, and the peso depreciated by an average of 4.5% per month. The prospect of elections (May 1989) and the abandonment of fiscal and tax rigour nevertheless quickly led to a crisis of confidence in the peso and de facto dollarisation began. Inflation exploded again and the peso devalued by nearly 400% in April 1989.

The seventh stabilisation plan (BONEX89 plan (BONos EXternos)), announced in December 1989 and launched on January 2, 1990, was elaborated by the new government, under the presidency of Carlos Menem. One of the key ideas was the exchange of blocked term deposits in banks for five to ten-year government debt securities. Its failure was immediate: less than a year later, a new speculation against the peso led to two new - and important - devaluations in December 1989 and February 1990, of a magnitude of 220% for the latter... The peso floats once again.

The eighth stabilisation plan (known as the "convertibility plan") was introduced by Domingo Felipe Cavallo in April 1991 and it was still governing Argentina's economic and financial system in 2001. The plan aimed to deepen fiscal adjustment, accelerate the process of opening up and deregulating the economy, and speeding up the privatisation process, to regain leeway for the economic policy. One of the main features of the plan has been the introduction of a currency board against the dollar with a 1:1 parity. Financial deregulation measures, a privatization program and budget reforms have enabled this plan to be effective. Add to this that the international context was particularly favourable: interest rate cuts, the Brady plan for Mexico in 1989, capital inflows in emerging markets... with, as in the 1970s, a strong expansion of consumption, strong equity markets, and a deterioration of current accounts. However, inflation came back and a new plan is required

The ninth stabilisation (BONEX II) with Jorge Remes Lenicov as Minister of economy and Eduardo Duhalde as President (2002) has been an immediate failure. The reissue of the 1990 Bonex Plan was resisted by angry savers and the Parliament. The minister hoped to put a stop to the wave of withdrawals of deposits obtained through lawsuits and thus avoid a series bankruptcy of domestic and foreign banks whose parent companies refuse to provide fresh funds. The plan was not adopted due to the incentives of the Argentine President to roll away from IMF recommendations. This was the end of the parity between the dollar and the peso. To the despair of the Argentineans, most ATMs remained empty. The closure of the banks has accentuated the paralysis of economic activity, in depression for almost four years.

The rise in interest rates in the United States caused a credit crunch in Argentina in 1995, financial difficulties for banks, capital outflows, a perceptible crisis of confidence, the downfall in bank deposits, a severe recession, a fall in foreign exchange reserves... but for the first time there was no devaluation of the peso. The convertibility program and the

currency board thus appeared to be the only guarantor of the external value of the Argentine peso. It should also be noted that the currency board is an exchange rate system that has always been chosen in cases of extreme difficulty, both in Argentina (1991) and Estonia (June 1992), Lithuania (April 1994) and Bulgaria (June 1997). It is therefore easier to understand the desire to stay the course and maintain this exchange rate regime.

It is difficult to make the currency board responsible for the problems facing the Argentine economy, but it is clear that such a regime, by its harsh constraints and extreme rigidity, has tended to magnify the imbalances and to "hinder" the pro-growth economic policies. By depriving the government of the flexibility needed to deal with the impact of external shocks on domestic activity, the currency board has helped to deepen the recession. US monetary policy was unquestionably another trigger of the speculative attack that occurred in 1995 (a few years after the introduction of the convertibility plan). The other determining factors will have been the lack of temporal coherence of the monetary policy pursued in Argentina and the incessant rounds of return on fiscal policy and capital controls.

The break-up and abandonment of the currency board in Argentina at the beginning of 2002 revived the blame on such fixed exchange rate regimes, i.e. currency board (as in Argentina as the best example) and crawling pegs (Brazil until 1999). Contagion was fairly limited, due to specific situation of Argentina and the level of the world economy at that time.

7th episode - The announcement in 2013 of the end of the Fed's purchase programme

The Fed's asset purchase program allowed rates to drop (finally kept close to zero for almost 7 years), keeping long rates low (around 100 to 150 bps below the equilibrium rate) and the dollar was kept at a level of near-permanent undervaluation. All this represented undoubtedly three supportive factors to emerging markets. In addition, it is estimated that nearly 20% of the Fed's liquidity additions to the system have gone into emerging markets. In other words, the period following the Great Financial Crisis represented an extremely favourable combination for emerging markets. Some countries, China in the lead, have even abused credit as an additional "boost" for growth, an attitude that now represents one of its biggest weakness. The reversal of the Fed's balance sheet policy was expected to have major impacts, and it did. Emerging markets declined on the announcement of the end of the program.

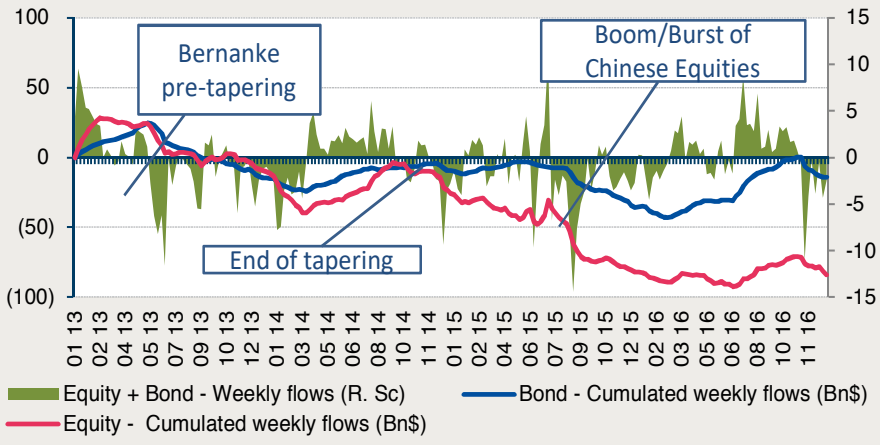
Contrary to what could be said or written at the time, it was not exactly "the end of QE", as the Fed announced it would continue to reinvest the entire quantity of maturing papers; as a consequence, the Fed stabilized its balance sheet for almost five years. But that was enough to weaken certain countries

or currencies: the dependence on capital flows, the existence of deficits and the overvaluation of the currency (the Brazilian real in particular, the most overvalued currency in early 2013) were the three reasons for this contagion almost all emerging countries, weakened by this event.

It has to be noted that the rise in US long-term rates and the decline in the stock markets of most advanced countries have their origin in the Fed's decision, not in any contagion from emerging markets. The impact on the real world has not been significant, while financial conditions remained very accommodative, in the US (no Fed funds rise for several years), in Europe, in China and in Japan, to name a few. The amount of liquidity being injected into the real economy remained high, with BoJ and ECB relaying / compensating the Fed's decision in terms of QE programmes.

Overall, capital outflows from the EM world lasted from 2013 to 2016 (Graph 5), without contagion to advanced countries.

Graph 5: Capital inflows and outflows from and emerging markets (bonds and equities) during the Fed's tapering phase out of QE



Source: EPFR, Amundi Research

8th episode - The Chinese stock market's "boom and burst" in 2015-2016

The flight of the Chinese stock market at the end of 2014, driven by an accommodative monetary policy, the larger capital inflows from foreign investors (facilitated by the launch of a dedicated platform allowing international investors to access Hong Kong-listed securities directly through Hong Kong and allowing Chinese investors to buy equities listed in Hong Kong) and the opening of 40 million Chinese securities accounts in less than a year, was stopped net in mid-2015 by strict capital controls.

At its peak of June 12, it had climbed more than 150% in 12 months. The desire to stop this "bubble" was clear but clumsy.

The day the market reached its peak, the China Securities Regulatory Commission (CSRC) announced its intention to limit the practice of margin trading for individuals. The next day, it also prohibited transactions with funds borrowed outside the system of these margin transactions... and the equity markets were closed for several days. When markets reopened, investors exited the markets, and the sell-off that followed created an uncontrollable movement.

At the end, a real debacle followed: in 3 weeks, the Shanghai stock market lost almost 40%. Fears of contagion have arisen, China's concern has led to the collapse of global stock markets, and it has also raised fears of a global slowdown (the words "global depression" have even been used by some pundits). That was not the case: thanks to significant measures, the debacle stopped: PBoC (People Bank of China) decided to provide liquidity to the China Securities Finance Corp, a public company financing margin trading operations, and the largest brokerage firms announced that they would invest close to USD 20 billion in Chinese equities. Although the Chinese equity's stock market crisis temporarily hurt advanced countries' equity markets, it did not fortunately prevent the growth cycle from expanding further and equity markets from rising further.

9th episode - 2018: US monetary policy tightening and aggressive trade policy

Different factors drove the emerging markets sell-off that occurred in 2018:

- The fears of escalating protectionism which could lead to a real trade war: The hardest hit areas were Europe and the EM;
- A stronger than initially expected rise in US rates, which translated into a rise in bond yields and an appreciation of the dollar: the worst affected areas were EM;
- On top of these two potentially systemic factors, additional specific risks have been added, such as for example Argentina or Turkey...

No doubt the trade war fears have hurt growth prospects, both in EM countries and in advanced countries. 2018 marks the intensification of the trade dispute between the United States and countries such as China, Mexico and Canada in particular. The current situation does not look like a trade war, but rather a dispute between "the United States against the rest of the world", should we rely on the level of the tariffs increases, far behind those prevailing in previous trade wars. Nevertheless, given the increased importance over the decades of the indirect effects of tariff increases (impacts on risk aversion, perception

of the risk of a global trade recession but also of global growth, wealth effects linked the potential impact on the financial markets, lower confidence indices and therefore consumption and investment...), the impact on both financial markets and on the real sphere was significant, in a legitimate way. Indeed, with a 10% increase in all tariffs in the world, global growth would be cut by 1%, US growth by 2%, and global trade by 2.5%. The losses could amount to 3 to 4 points of GDP (in the United States, China and Europe) if the current situation evolve to a "classical" trade war (a sharp rise in all tariffs similar to the previous trade wars) with a significant impact on financial markets and confidence. The impact would be similar to the damages during the Great Recession of 2008-2009, and it could be much worse for the very open economies (Ithurbide (2018)). In total, due to these fears, the contagion was complete: within all EM countries, within advanced countries, and from the financial sphere to the real sphere... but without any financial crisis and without any panic. The least we can say is that the US monetary policy tightening became gradually unwelcome, which explains the downfall of equity markets last December.

In total, a rise in risk aversion has hit EM countries particularly hard, especially countries with high dependency on external capital flows and/or higher vulnerability/lower solvency. As a result, growth prospects for 2019 and 2020 have been steadily revised downwards, and over the whole of 2018, losses in financial markets have at times been severe:

- In equity markets, -11% for MSCI world, -13.5% for MSCI Europe, -16.9% for MSCI emerging markets, -7% for S & P500, -18.3% for the DAX, -11.9% for the CAC40, -16.1% for the MIB, -17.3% for the Korean KOSPI, -13.6% for the Chinese Hang Seng... Only Brazil (+15%), Russia (+15.1%) and India (+5.9%) fared well (but their currency lost ground).
- Currencies also corrected sharply, particularly emerging currencies: -5.5% for the euro vs. USD, -6.6% for the Canadian dollar -8.1% for the Australian dollar, -18% for the Brazilian real, -15.8% for the rubble, -16.4% for the South African rand, -12% for the Indian rupee...
- Emerging debt markets suffered badly from capital outflows: The EMBI global spread soared to 330 bp (+120 bp), with significant increases everywhere, in Latin America (550 bp, +145 bp), Africa (550 bp, +200 bp), Europe (330 bp, +110bp) and Asia (215 bp, +60 bp).
- Beset by fears of a sharp economic slowdown, and despite a tense geopolitical environment, the price of oil fell by almost 22% and gold by nearly 2%.

Table 2: Financial crises: Origins and contagion		
Event	**Origin of the crisis**	**Contagion**
1st episode - in the 1980s: The emerging market debt crisis	The debt market	Contagion to all Latin American countries and fears of contagion to the US due to the exposure of US banks to this area
2nd episode - 1994 The Mexican crisis	The foreign exchange market	Contagion to all Latin American countries
3rd episode - 1997 The currency crisis in Thailand, the Asian crisis	The foreign exchange market	Contagion to all EM economies (transition economies, developing economies (Asia, Latin America, Europe), contagion to all economic and financial sectors
4th episode - 1998 The Russian crisis	Debt and Foreign Exchange Markets	Contagion to all EM and ADV countries. Impact on the financial and real spheres
5th episode - 1998 The Brazilian crisis	The foreign exchange market	Limited contagion to EM world (limited to some Latin American countries, of which Argentina). Very limited contagion to the advanced world through banks' exposure
6th episode - 2001-2002 The Argentine crisis	Debt and Foreign Exchange Markets	Very limited contagion to EM world. No contagion to the advanced world. Argentina perceived mostly as a specific risk
7th episode - 2013 The announcement of the end of Fed QE	The US debt market	Contagion to all emerging markets (debt, equities and currencies). Impact on ADV capital markets. A limited impact on the real sphere
8th episode - 2015 The China's boom and burst crisis	Equity market	Financial contagion to all equity markets; very limited and very temporary contagion to the real sphere
9th episode - 2018 The restrictive US monetary policy & the aggressive US trade policy	Equity, Debt and Foreign Exchange Markets	Financial contagion to most emerging market, debt and currency markets... some equity markets remained isolated (Brazil, Russia and India). Contagion to all advanced countries. Contagion to the real sphere

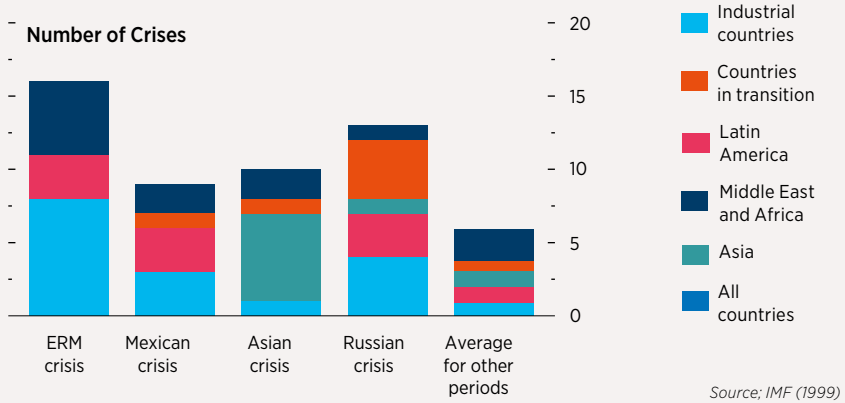
In summary, it is important to note that over the past four decades, the main channel of risk of contagion from emerging to advanced economies has changed: Initially linked to financial (banks) links, it is now more dependent on the perception of risk. As the Latin American, Asian, and Russian crises threatened the banking system (mainly the US banking system for the first crisis, and rather the European banking system for the other ones), tighter regulation and risk management helped reduce both direct exposure via bank loans and indirect exposure via investments in financial assets. It should also be noted that, over time, the growing weight of emerging markets in the global economy and the growing correlation between global risk premia will strengthen the contagion channel from emerging to advanced countries (which would result in lower short-term and long-term rates, a widening of credit spreads and a fall in stock markets). The table 2 above summarises the nine contagions periods analysed above.

In sum, there are three types of crisis... that can coexist or appear one after the other:

- **Foreign exchange crises**: strong speculation against a currency (or a group of currencies) that leads to drastic interest rate hikes, massive interventions by the central bank in question (or a group of central banks) and finally a devaluation or a sharp depreciation. There are many examples: the exchange rate crises of the European Monetary System in 1991-1992 and in 1993, the Mexican crisis in 1994-1995, the Russian crisis in 1998, the Ecuadorian currency crisis in 2000, the Turkish lira crisis in 2001, the Thai Baht crisis in 1997, the Brazilian real crisis in 1999...
- **Banking crises**: loss of confidence in the banking system related to a liquidity crisis, a sharp rise in the insolvency of the system, which force the government to intervene to avoid cascading bankruptcies and / or contagion to the entire economy. The case of Japan in the 1990s is typical of this kind of crisis.
- **External debt crises:** in such a crisis, a country can no longer face the payment of debt service, whether sovereign or private. The Russian crisis of 1998 is one of the most recent examples.

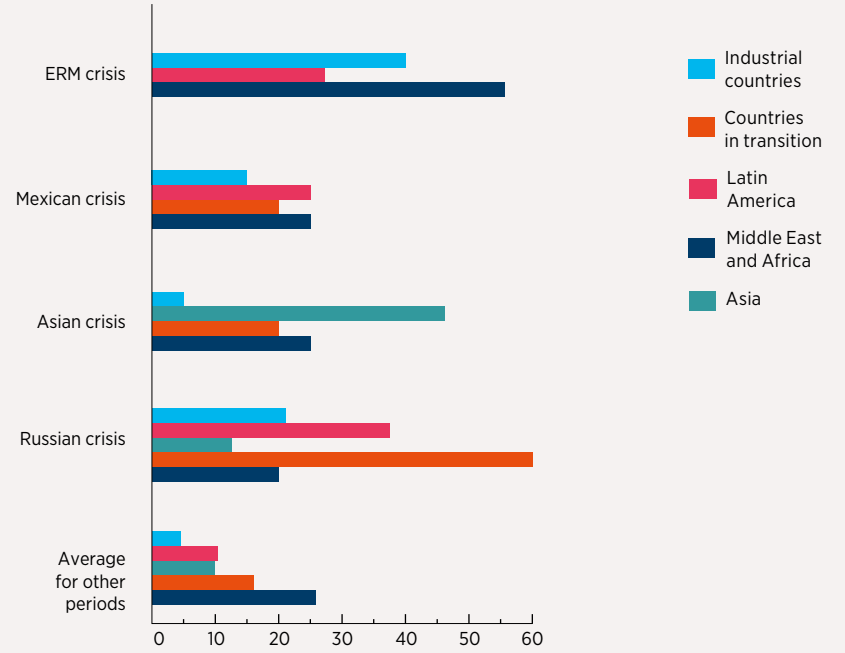
Contagion may be small or large, but it is simply unavoidable. According to the IMF (1999), 17 economies were found to have experienced substantial currency pressures during the European exchange rate mechanism (ERM), 9 during the Mexican episode, 10 during the Asian episode, and 13 during the Russian episode (Graph 6). During the Russian crises about 30% of the countries experienced currency pressures, while in the Mexican and Asian crises 15–20% were affected. In terms of geographic distribution, the Mexican crisis mainly affected Latin American countries but also other emerging market economies outside Asia. During the Asian crisis, mostly Asian economies were impacted. And during the Russian crisis, mainly the eastern European transition economies but also some Latin American countries, especially Brazil have been impacted (Graph 7).

Graph 6:
Incidence of currency crises during the 1990s



Source; IMF (1999)

Graph 7: Frequency of crises, by country group
(% of countries in country groups experiencing crisis)



Note: the Mexican crisis occurred during December 1994 through May 1995; the Asian crisis, July through December 1997; and the Russian crisis, August through November 1998.

Source; IMF (1999)

The dominant contagion factors can be monitored through a "historical" perspective. With this angle, it appears that it is more the commercial links that the economic proximity (the "wake-up call" effect) which favour the effects of contagion. Trade links tend to favour regional crises, while financial ties tend to generate global (or systemic) crises. The financial links have, in the phenomena of contagion, a greater responsibility than the economic proximity or the commercial exchanges. Over the course of the crises, the fundamentals gradually decreased in importance in favour of trade flows, themselves gradually outweighed by financial ties, and especially expectations (Obstfeld (1986)). It is therefore increasingly difficult to control crises, to counter the premises and to avoid the suddenness of crises. But as OECD noticed in 2008, "*even strong performers are not shielded against "pure" financial contagion, but once confidence is restored, they may well recover quickly*". This statement seems to comfort the necessity to discriminate EM countries through vulnerability.

II. Contagion: Is vulnerability an effective criterion of discrimination for the emerging world?

At least three important questions arise:

- Are vulnerable countries large enough to derail the EM economy and markets, and eventually the world growth?
- Is vulnerability a good - and profitable - criterion to select countries in investment?
- Is it possible to detect optimised portfolios (which incorporate the vulnerability criterion) adding value in investments?

2.1. Can vulnerable countries derail the world economy?

We highlighted (see tables 3 and 4 below) the vulnerable countries and the solid countries, in reference to our scoring. It appears that the weight of vulnerable countries is low compared to solid countries, both in terms of GDP (nominal GDP (3% vs. 24%) or GDP at PPPs (4% vs. 33%)), population (3% vs. 42%), market cap (1% vs. 6%) or outstanding loans (1.5% vs. 20%). **It might seem a priori rather unjustified that problems in vulnerable countries are having a major impact on the emerging world, particularly the solid ones, and it also seems far from legitimate that this could affect all financial markets. The contagion should remain limited.**

The situation is a little different with regard to the weight of the debt (total debt, household debt, or corporate debt). The gap between strong and vulnerable countries is not very large. What makes the difference, for

example between Turkey and China, is the dependence on foreign capital flows, and that is what makes Turkey's vulnerability greater.

Table 3: Vulnerable and solid countries: What weight in the world economy?

Country	GDP (% Global)	GDP PPA (% Global)	Population (% Global)	Imports (% Global)	Market cap (% Global)	Outstanding loans (% Global)
Vulnerable countries V6						
Turkey	0.9%	1.7%	1.1%	1.0%	0.07%	0.4%
South Africa	0.4%	0.6%	0.8%	0.5%	0.74%	0.2%
Czech Republic	0.3%	0.3%	0.1%	0.8%	0.02%	0.2%
Argentina	0.6%	0.7%	0.6%	0.4%	0.04%	0.2%
Malaysia	0.4%	0.7%	0.4%	0.9%	0.29%	0.3%
Hungary	0.2%	0.2%	0.1%	0.5%	0.04%	0.1%
Total Vulnerable countries	**2.9%**	**4.2%**	**3.1%**	**4.1%**	**1.2%**	**1.4%**
Solid countries S6						
Brazil	2.2%	2.5%	2.8%	1.1%	0.89%	1.3%
Russia	1.9%	3.1%	1.9%	1.5%	0.44%	0.6%
Peru	0.3%	0.3%	0.4%	0.2%	0.05%	ND
China	16.0%	18.7%	18.4%	10.9%	3.60%	16.4%
Thailand	0.6%	1.0%	0.9%	1.2%	0.29%	0.4%
India	3.2%	7.8%	17.8%	2.7%	1.11%	1.4%
Total Solid countries	**24.2%**	**33.4%**	**42.2%**	**17.7%**	**6.4%**	**20.0%**

Table 4: Vulnerable and solid countries: debt in % of GDP

Country	Total Debt (%PIB)	Government Debt (% PIB)	Non-Financial Corporation Debt (% PIB)	Household Debt (% PIB)
Vulnerable countries V6				
Turkey	124.74	32.32	75.33	17.09
South Africa	128.24	56.80	38.37	33.06
Czech Republic	126.56	36.44	57.89	32.24
Argentina	104.44	79.13	17.38	7.94
Malaysia	187.39	51.91	68.69	66.79
Hungary	161.37	75.91	67.01	18.46
Solid countries S6				
Brazil	155.12	87.31	40.62	27.18
Russia	78.77	15.12	47.16	16.49
Peru	ND	26.00	ND	ND
China	256.56	48.49	157.12	50.96
Thailand	148.69	32.68	47.96	68.04
India	124.99	68.43	45.31	11.25

It should be noted that for the last 5 years, the list of "vulnerable" countries and "solid" countries has been very stable. Five of the six countries are in the same category: China, Brazil and Russia remain among the strongest countries, while South Africa, Hungary and Turkey are among the most vulnerable countries. However, we see that the lists are still evolving, and that some countries, such as China, are becoming, in relative terms, less solid over time, especially since the crisis "boom and burst" of 2015 - 2016.

Table 5: Solid and vulnerable countries according to our vulnerability index

Q4 2014	Q4 2015	Q4 2016	Q4 2017	Q4 2018
China	China	Brazil	Brazil	Brazil
Brazil	Brazil	Taïwan	Taïwan	Russia
Russia	Russia	China	China	Peru
Taïwan	Thailand	Russia	Russia	Taïwan
Peru	Taïwan	Thailand	Thailand	China
Philippines	Peru	India	Peru	Thailand
Thailand	Philippines	Peru	Bulgaria	India
India	India	Philippines	India	Bulgaria
Croatia	Romania	Romania	Philippines	Croatia
Argentina	Argentina	Croatia	Croatia	Philippines
Romania	Indonesia	Indonesia	Colombia	Colombia
Colombia	Poland	Bulgaria	Indonesia	Indonesia
Indonesia	Colombia	Colombia	Romania	Romania
Poland	Bulgaria	Hungary	Mexico	Poland
Chile	Mexico	Chile	Chile	Mexico
Malaysia	Croatia	Mexico	Poland	Chile
Mexico	Chile	Poland	Hungary	Hungary
Czech Republic	Hungary	Argentina	Malaysia	Malaysia
Hungary	Turkey	Malaysia	Argentina	Argentina
Bulgaria	Malaysia	Czech Republic	South Africa	Czech Republic
South Africa	South Africa	Turkey	Czech Republic	South Africa
Turkey	Czech Republic	South Africa	Turkey	Turkey

2.2. Is vulnerability an effective criterion for discriminating the "emerging world" and for limiting the effects of contagion? A correlation analysis

One question is needed at this stage: if, in times of stress, all emerging markets are suffering, does it reveal greater pain for vulnerable countries than for "strong" countries? If so, there would be relative discrimination (relative outperformance and underperformance) rather than absolute discrimination (the existence of markets totally insulated from stress).

2.2.1. Correlation of FX markets

One of the striking results from our study is to reveal the low correlation between FX returns of EM world during crisis. Apart from Hungary and Czech Republic, the correlation of FX markets was quite low during 2018, and even during the whole period (1995-2018). This is due to the link the two currencies have vis-à-vis the euro: they move in tandem. The correlation is far below 20% during the 1995-2019 period. During crisis episodes, the correlation jumps to levels around 50%-60%, but it is difficult to differentiate vulnerable countries and solid countries. Note that some regional contagion surface in specific crises.

Table 6: 2018

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	35%	19%	24%	4%	26%	16%	28%	8%	5%	7%	18%
	South Africa	35%	100%	51%	31%	31%	58%	43%	49%	50%	33%	40%	37%
	Czech Republic	19%	51%	100%	15%	41%	88%	19%	26%	41%	32%	37%	28%
	Argentina	24%	31%	15%	100%	7%	24%	37%	15%	23%	7%	0%	13%
	Malaysia	4%	31%	41%	7%	100%	39%	21%	19%	24%	56%	47%	32%
	Hungary	26%	58%	88%	24%	39%	100%	21%	29%	38%	32%	39%	32%
Strong Countries	Brazil	16%	43%	19%	37%	21%	21%	100%	37%	34%	16%	14%	15%
	Russia	28%	49%	26%	15%	19%	29%	37%	100%	37%	14%	22%	15%
	Peru	8%	50%	41%	23%	24%	38%	34%	37%	100%	16%	26%	24%
	China	5%	33%	32%	7%	56%	32%	16%	14%	16%	100%	55%	31%
	Thailand	7%	40%	37%	0%	47%	39%	14%	22%	26%	55%	100%	32%
	India	18%	37%	28%	13%	32%	32%	15%	15%	24%	31%	32%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 7: All Period: 1995-2019

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	28%	21%	3%	4%	27%	24%	7%	10%	4%	7%	13%
	South Africa	28%	100%	42%	4%	13%	51%	38%	16%	21%	13%	14%	27%
	Czech Republic	21%	42%	100%	3%	12%	77%	24%	10%	14%	11%	16%	21%
	Argentina	3%	4%	3%	100%	1%	3%	6%	1%	3%	4%	0%	2%
	Malaysia	4%	13%	12%	1%	100%	12%	9%	2%	8%	11%	24%	17%
	Hungary	27%	51%	77%	3%	12%	100%	31%	14%	17%	12%	15%	28%
Strong Countries	Brazil	24%	38%	24%	6%	9%	31%	100%	12%	27%	8%	8%	21%
	Russia	7%	16%	10%	1%	2%	14%	12%	100%	9%	5%	3%	11%
	Peru	10%	21%	14%	3%	8%	17%	27%	9%	100%	7%	7%	15%
	China	4%	13%	11%	4%	11%	12%	8%	5%	7%	100%	12%	17%
	Thailand	7%	14%	16%	0%	24%	15%	8%	3%	7%	12%	100%	16%
	India	13%	27%	21%	2%	17%	28%	21%	11%	15%	17%	16%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 8: Asian Crisis: 01/07/1997- 16/08/1999

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	6%	14%	13%	-8%	27%	-10%	-1%	2%	7%	7%	8%
	South Africa	6%	100%	14%	-2%	18%	8%	6%	13%	18%	7%	-5%	6%
	Czech Republic	14%	14%	100%	5%	3%	56%	-6%	3%	1%	1%	5%	10%
	Argentina	13%	-2%	5%	100%	5%	8%	-6%	9%	23%	8%	-6%	6%
	Malaysia	-8%	18%	3%	5%	100%	2%	3%	-1%	10%	-1%	17%	10%
	Hungary	27%	8%	56%	8%	2%	100%	-10%	-1%	-9%	4%	5%	-2%
Strong Countries	Brazil	-10%	6%	-6%	-6%	3%	-10%	100%	5%	8%	11%	3%	-3%
	Russia	-1%	13%	3%	9%	-1%	-1%	5%	100%	18%	4%	-1%	14%
	Peru	2%	18%	1%	23%	10%	-9%	8%	18%	100%	7%	-1%	0%
	China	7%	7%	1%	8%	-1%	4%	11%	4%	7%	100%	2%	-3%
	Thailand	7%	-5%	5%	-6%	17%	5%	3%	-1%	-1%	2%	100%	9%
	India	8%	6%	10%	6%	10%	-2%	-3%	14%	0%	-3%	9%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 9: Russian Crisis: 01/07/1997- 16/08/1999

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	-3%	6%	1%	0%	3%	1%	0%	-3%	1%	5%	-4%
	South Africa	-3%	100%	29%	-3%	3%	17%	5%	11%	18%	4%	20%	1%
	Czech Republic	6%	29%	100%	-8%	10%	59%	4%	-2%	-4%	5%	24%	-9%
	Argentina	1%	-3%	-8%	100%	4%	-7%	-4%	-1%	-3%	3%	-2%	-1%
	Malaysia	0%	3%	10%	4%	100%	13%	0%	-4%	3%	2%	-3%	5%
	Hungary	3%	17%	59%	-7%	13%	100%	9%	5%	-1%	-3%	24%	3%
Strong Countries	Brazil	1%	5%	4%	-4%	0%	9%	100%	-1%	23%	-4%	4%	-1%
	Russia	0%	11%	-2%	-1%	-4%	5%	-1%	100%	2%	1%	-6%	0%
	Peru	-3%	18%	-4%	-3%	3%	-1%	23%	2%	100%	-2%	4%	-5%
	China	1%	4%	5%	3%	2%	-3%	-4%	1%	-2%	100%	3%	9%
	Thailand	5%	20%	24%	-2%	-3%	24%	4%	-6%	4%	3%	100%	0%
	India	-4%	1%	-9%	-1%	5%	3%	-1%	0%	-5%	9%	0%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 10: End of US QE: 10/05/2013- 18/04/2014

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	56%	24%	22%	29%	51%	43%	46%	29%	1%	26%	28%
	South Africa	56%	100%	34%	12%	34%	64%	56%	53%	44%	5%	31%	39%
	Czech Republic	24%	34%	100%	-2%	25%	63%	26%	31%	20%	5%	24%	23%
	Argentina	22%	12%	-2%	100%	2%	4%	11%	18%	9%	-2%	2%	8%
	Malaysia	29%	34%	25%	2%	100%	38%	33%	36%	32%	16%	68%	51%
	Hungary	51%	64%	63%	4%	38%	100%	48%	64%	35%	9%	35%	34%
Strong Countries	Brazil	43%	56%	26%	11%	33%	48%	100%	45%	40%	-1%	33%	26%
	Russia	46%	53%	31%	18%	36%	64%	45%	100%	36%	4%	35%	32%
	Peru	29%	44%	20%	9%	32%	35%	40%	36%	100%	10%	42%	23%
	China	1%	5%	5%	-2%	16%	9%	-1%	4%	10%	100%	13%	7%
	Thailand	26%	31%	24%	2%	68%	35%	33%	35%	42%	13%	100%	49%
	India	28%	39%	23%	8%	51%	34%	26%	32%	23%	7%	49%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 11: Chinese Boom and Burst: 15/05/2015- 30/12/2016													
		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	44%	18%	1%	21%	26%	25%	18%	20%	8%	13%	18%
	South Africa	44%	100%	32%	6%	38%	43%	54%	46%	39%	27%	34%	22%
	Czech Republic	18%	32%	100%	11%	11%	86%	21%	4%	16%	12%	15%	2%
	Argentina	1%	6%	11%	100%	1%	8%	-5%	3%	4%	9%	2%	2%
	Malaysia	21%	38%	11%	1%	100%	18%	31%	40%	28%	36%	55%	38%
	Hungary	26%	43%	86%	8%	18%	100%	30%	14%	25%	16%	18%	6%
Strong Countries	Brazil	25%	54%	21%	-5%	31%	30%	100%	51%	43%	16%	26%	25%
	Russia	18%	46%	4%	3%	40%	14%	51%	100%	36%	14%	25%	30%
	Peru	20%	39%	16%	4%	28%	25%	43%	36%	100%	17%	19%	19%
	China	8%	27%	12%	9%	36%	16%	16%	14%	17%	100%	26%	28%
	Thailand	13%	34%	15%	2%	55%	18%	26%	25%	19%	26%	100%	27%
	India	18%	22%	2%	2%	38%	6%	25%	30%	19%	28%	27%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

2.2.2. Correlation of equity markets

The correlation is higher than the one which prevailed on FX markets, but it may not be as high than generally thought. Correlation are nevertheless high enough to refer to contagion in period of crisis. Contagion was definitely higher during the Russian crisis and the Asian crisis, but as in FX markets, the differentiation between solid and vulnerable countries does not appear, even in 2018.

Table 12: 2018													
		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	38%	7%	18%	17%	26%	13%	28%	26%	29%	21%	18%
	South Africa	38%	100%	26%	30%	37%	43%	26%	37%	49%	60%	34%	39%
	Czech Republic	7%	26%	100%	1%	19%	29%	-2%	20%	7%	22%	23%	34%
	Argentina	18%	30%	1%	100%	8%	8%	37%	14%	49%	24%	13%	16%
	Malaysia	17%	37%	19%	8%	100%	28%	9%	18%	9%	40%	35%	35%
	Hungary	26%	43%	29%	8%	28%	100%	17%	32%	21%	36%	34%	31%
Strong Countries	Brazil	13%	26%	-2%	37%	9%	17%	100%	29%	45%	18%	7%	5%
	Russia	28%	37%	20%	14%	18%	32%	29%	100%	35%	30%	20%	20%
	Peru	26%	49%	7%	49%	9%	21%	45%	35%	100%	43%	21%	23%
	China	29%	60%	22%	24%	40%	36%	18%	30%	43%	100%	45%	37%
	Thailand	21%	34%	23%	13%	35%	34%	7%	20%	21%	45%	100%	38%
	India	18%	39%	34%	16%	35%	31%	5%	20%	23%	37%	38%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 13: All Period: 1995-2019

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	32%	27%	23%	17%	41%	36%	50%	29%	12%	14%	20%
	South Africa	32%	100%	37%	35%	31%	42%	46%	48%	41%	41%	38%	33%
	Czech Republic	27%	37%	100%	27%	28%	50%	31%	41%	30%	28%	16%	34%
	Argentina	23%	35%	27%	100%	23%	34%	50%	32%	46%	27%	25%	18%
	Malaysia	17%	31%	28%	23%	100%	30%	26%	33%	21%	45%	47%	24%
	Hungary	41%	42%	50%	34%	30%	100%	45%	49%	34%	26%	21%	29%
Strong Countries	Brazil	36%	46%	31%	50%	26%	45%	100%	48%	55%	30%	28%	29%
	Russia	50%	48%	41%	32%	33%	49%	48%	100%	36%	31%	28%	27%
	Peru	29%	41%	30%	46%	21%	34%	55%	36%	100%	25%	19%	28%
	China	12%	41%	28%	27%	45%	26%	30%	31%	25%	100%	40%	32%
	Thailand	14%	38%	16%	25%	47%	21%	28%	28%	19%	40%	100%	18%
	India	20%	33%	34%	18%	24%	29%	29%	27%	28%	32%	18%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 14: Asia Crisis: 01/1997- 12/1997

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	-8%	25%	36%	6%	80%	43%	70%	47%	-34%	-7%	35%
	South Africa	-8%	100%	53%	39%	43%	23%	59%	52%	26%	62%	36%	60%
	Czech Republic	25%	53%	100%	23%	20%	32%	22%	53%	-1%	42%	18%	27%
	Argentina	36%	39%	23%	100%	26%	61%	84%	55%	60%	23%	37%	36%
	Malaysia	6%	43%	20%	26%	100%	19%	52%	41%	24%	15%	50%	30%
	Hungary	80%	23%	32%	61%	19%	100%	66%	87%	49%	12%	21%	65%
Strong Countries	Brazil	43%	59%	22%	84%	52%	66%	100%	71%	65%	14%	41%	65%
	Russia	70%	52%	53%	55%	41%	87%	71%	100%	56%	34%	22%	73%
	Peru	47%	26%	-1%	60%	24%	49%	65%	56%	100%	10%	-24%	37%
	China	-34%	62%	42%	23%	15%	12%	14%	34%	10%	100%	26%	31%
	Thailand	-7%	36%	18%	37%	50%	21%	41%	22%	-24%	26%	100%	17%
	India	35%	60%	27%	36%	30%	65%	65%	73%	37%	31%	17%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 15: Russia Crisis: 08/1998- 08/1999

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	44%	19%	43%	22%	36%	51%	72%	63%	10%	17%	3%
	South Africa	44%	100%	32%	78%	49%	61%	77%	61%	67%	65%	75%	4%
	Czech Republic	19%	32%	100%	41%	42%	71%	39%	39%	40%	21%	29%	56%
	Argentina	43%	78%	41%	100%	68%	56%	65%	53%	74%	63%	84%	-13%
	Malaysia	22%	49%	42%	68%	100%	60%	45%	32%	56%	60%	82%	1%
	Hungary	36%	61%	71%	56%	60%	100%	58%	57%	63%	19%	46%	26%
Strong Countries	Brazil	51%	77%	39%	65%	45%	58%	100%	65%	87%	41%	58%	25%
	Russia	72%	61%	39%	53%	32%	57%	65%	100%	71%	27%	43%	-6%
	Peru	63%	67%	40%	74%	56%	63%	87%	71%	100%	42%	57%	-1%
	China	10%	65%	21%	63%	60%	19%	41%	27%	42%	100%	78%	3%
	Thailand	17%	75%	29%	84%	82%	46%	58%	43%	57%	78%	100%	-15%
	India	3%	4%	56%	-13%	1%	26%	25%	-6%	-1%	3%	-15%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 16: End of US QE: 05/2013- 05/2014

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	51%	21%	19%	24%	29%	23%	41%	26%	29%	35%	36%
	South Africa	51%	100%	35%	12%	30%	29%	26%	43%	22%	48%	32%	41%
	Czech Republic	21%	35%	100%	15%	23%	30%	18%	27%	17%	29%	15%	27%
	Argentina	19%	12%	15%	100%	7%	16%	35%	28%	28%	18%	12%	14%
	Malaysia	24%	30%	23%	7%	100%	12%	15%	22%	15%	47%	38%	31%
	Hungary	29%	29%	30%	16%	12%	100%	21%	39%	18%	19%	7%	19%
Strong Countries	Brazil	23%	26%	18%	35%	15%	21%	100%	24%	48%	35%	19%	31%
	Russia	41%	43%	27%	28%	22%	39%	24%	100%	25%	39%	26%	31%
	Peru	26%	22%	17%	28%	15%	18%	48%	25%	100%	29%	26%	32%
	China	29%	48%	29%	18%	47%	19%	35%	39%	29%	100%	40%	43%
	Thailand	35%	32%	15%	12%	38%	7%	19%	26%	26%	40%	100%	39%
	India	36%	41%	27%	14%	31%	19%	31%	31%	32%	43%	39%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 17: China Crisis: 05/2015 - 11/2016

		Vulnerable Countries						Strong Countries					
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	Thailand	India
Vulnerable Countries	Turkey	100%	44%	35%	28%	30%	33%	31%	43%	33%	30%	36%	36%
	South Africa	44%	100%	49%	36%	47%	45%	43%	59%	42%	50%	42%	49%
	Czech Republic	35%	49%	100%	24%	39%	48%	37%	42%	30%	33%	36%	42%
	Argentina	28%	36%	24%	100%	20%	32%	39%	40%	47%	32%	29%	26%
	Malaysia	30%	47%	39%	20%	100%	35%	32%	41%	25%	50%	41%	43%
	Hungary	33%	45%	48%	32%	35%	100%	29%	47%	29%	39%	40%	40%
Strong Countries	Brazil	31%	43%	37%	39%	32%	29%	100%	48%	57%	35%	27%	33%
	Russia	43%	59%	42%	40%	41%	47%	48%	100%	44%	42%	41%	40%
	Peru	33%	42%	30%	47%	25%	29%	57%	44%	100%	30%	31%	33%
	China	30%	50%	33%	32%	50%	39%	35%	42%	30%	100%	50%	54%
	Thailand	36%	42%	36%	29%	41%	40%	27%	41%	31%	50%	100%	53%
	India	36%	49%	42%	26%	43%	40%	33%	40%	33%	54%	53%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

2.2.3. Correlation of fixed income (EMBI) markets

Same conclusion for EMBI markets. The correlation is much higher than the one prevailing in FX markets, but it is not possible to differentiate vulnerable countries and solid countries.

Table 18: 2018

		Vulnerable Countries						Strong Countries				
		Turkey	South Africa	Czech Republic	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	India
Vulnerable Countries	Turkey	100%	62%	-5%	51%	-1%	27%	35%	39%	35%	8%	18%
	South Africa	62%	100%	-5%	38%	8%	42%	48%	55%	57%	13%	39%
	Czech Republic	-5%	-5%	100%	-11%	4%	28%	5%	1%	4%	27%	34%
	Argentina	51%	38%	-11%	100%	-7%	12%	57%	25%	36%	-8%	16%
	Malaysia	-1%	8%	4%	-7%	100%	13%	1%	-4%	9%	43%	35%
	Hungary	27%	42%	28%	12%	13%	100%	36%	39%	53%	35%	31%
Strong Countries	Brazil	35%	48%	5%	57%	1%	36%	100%	36%	61%	17%	5%
	Russia	39%	55%	1%	25%	-4%	39%	36%	100%	48%	15%	20%
	Peru	35%	57%	4%	36%	9%	53%	61%	48%	100%	38%	23%
	China	8%	13%	27%	-8%	43%	35%	17%	15%	38%	100%	37%
	India	8%	21%	16%	-1%	47%	24%	17%	13%	31%	82%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 19: All Period: 2012-2019

		Vulnerable Countries					Strong Countries				
		Turkey	South Africa	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	India
Vulnerable Countries	Turkey	100%	66%	23%	22%	41%	43%	43%	49%	30%	30%
	South Africa	66%	100%	22%	32%	49%	53%	52%	58%	36%	36%
	Argentina	23%	22%	100%	1%	13%	26%	21%	22%	-1%	3%
	Malaysia	22%	32%	1%	100%	32%	23%	17%	33%	62%	50%
	Hungary	41%	49%	13%	32%	100%	33%	42%	45%	38%	38%
Strong Countries	Brazil	43%	53%	26%	23%	33%	100%	39%	70%	27%	22%
	Russia	43%	52%	21%	17%	42%	39%	100%	41%	17%	21%
	Peru	49%	58%	22%	33%	45%	70%	41%	100%	43%	33%
	China	30%	36%	-1%	62%	38%	27%	17%	43%	100%	70%
	India	30%	36%	3%	50%	38%	22%	21%	33%	70%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 20: End of US QE: 05/2013- 05/2014

		Vulnerable Countries					Strong Countries				
		Turkey	South Africa	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	India
Vulnerable Countries	Turkey	100%	76%	18%	46%	55%	58%	54%	60%	45%	44%
	South Africa	76%	100%	19%	57%	59%	59%	60%	60%	54%	50%
	Argentina	18%	19%	100%	4%	12%	21%	23%	18%	4%	5%
	Malaysia	46%	57%	4%	100%	46%	44%	32%	47%	80%	65%
	Hungary	55%	59%	12%	46%	100%	44%	52%	46%	46%	45%
Strong Countries	Brazil	58%	59%	21%	44%	44%	100%	52%	85%	40%	34%
	Russia	54%	60%	23%	32%	52%	52%	100%	47%	24%	26%
	Peru	60%	60%	18%	47%	46%	85%	47%	100%	44%	37%
	China	45%	54%	4%	80%	46%	40%	24%	44%	100%	68%
	India	44%	50%	5%	65%	45%	34%	26%	37%	68%	100%

Source: MSCI, Datastream, Amundi Research Daily Data

Table 21: China Crisis: 05/2015 - 11/2016											
		Vulnerable Countries					Strong Countries				
		Turkey	South Africa	Argentina	Malaysia	Hungary	Brazil	Russia	Peru	China	India
Vulnerable Countries	Turkey	100%	63%	26%	13%	43%	39%	51%	51%	17%	18%
	South Africa	63%	100%	25%	15%	50%	48%	57%	53%	12%	16%
	Argentina	26%	25%	100%	-1%	21%	31%	34%	32%	0%	0%
	Malaysia	13%	15%	-1%	100%	26%	13%	10%	20%	55%	53%
	Hungary	43%	50%	21%	26%	100%	30%	40%	45%	28%	33%
Strong Countries	Brazil	39%	48%	31%	13%	30%	100%	43%	66%	9%	9%
	Russia	51%	57%	34%	10%	40%	43%	100%	42%	-3%	1%
	Peru	51%	53%	32%	20%	45%	66%	42%	100%	29%	23%
	China	17%	12%	0%	55%	28%	9%	-3%	29%	100%	84%
	India	18%	16%	0%	53%	33%	9%	1%	23%	84%	100%

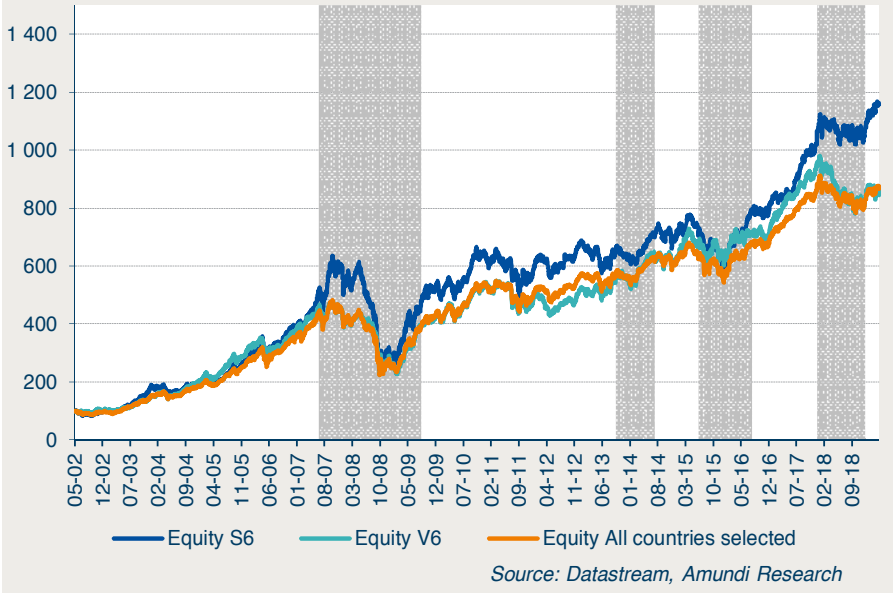
Source: MSCI, Datastream, Amundi Research Daily Data

2.3. Is vulnerability an effective criterion for discriminating the "emerging world" and for limiting the effects of contagion? A portfolio analysis

The results do not really allow to conclude that vulnerable countries behave differently than solid countries. The correlation between all the markets tend to prove than discrimination is a priori difficult.

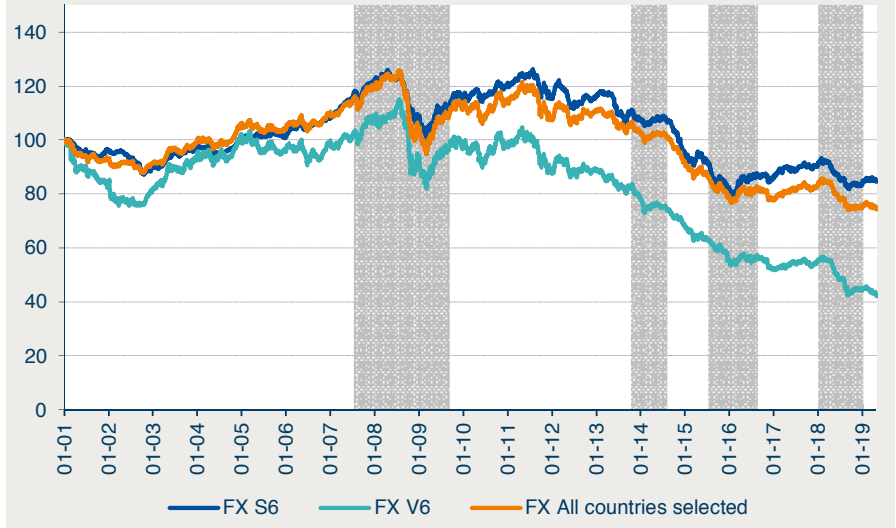
However, when we then looked at the relative performance of FX, equity and debt markets for these two groups (equal weighted long/short portfolios), the results tend to prove that vulnerability is a real criterion of discrimination: the performance of "solid countries" is significantly better than the performance of "vulnerable countries": +16% on equities in 2018, +6% on EMBI markets and +10% on FX markets (tables 22 and 23). For the whole period (2001-2018), despite the strong recovery of vulnerable countries during "quiet periods", the outperformance of the solid 6 is still significant: more than 2% on both equity and fixed-income markets, and close to 4% for FX markets. The performance of the most solid countries is stronger that the performance of a portfolio that includes all countries: in other words, low vulnerability seems as important as diversification.

Graph 8: Performance of "solid countries" vs. "vulnerable countries": equity markets



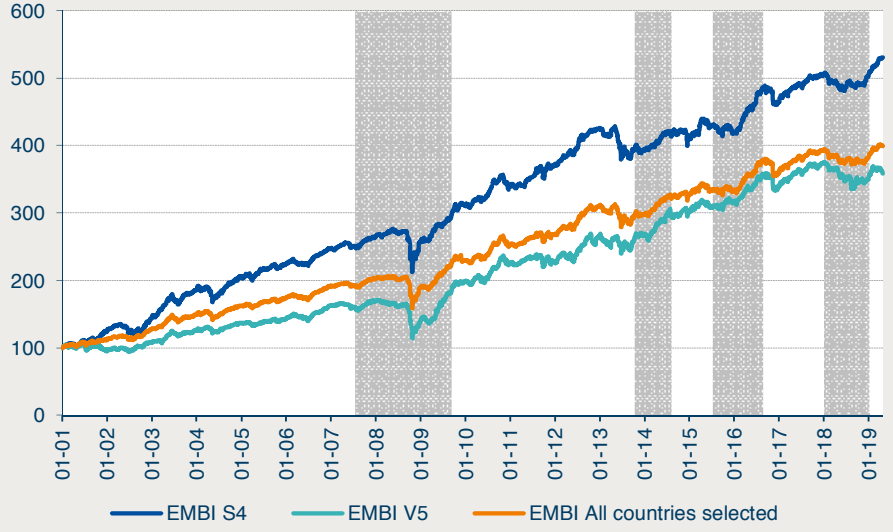
Source: Datastream, Amundi Research

Graph 9: Performance of "solid countries" vs. "vulnerable countries": FX markets



Source: Datastream, Amundi Research

Graph 10: Performance of "solid countries" vs. "vulnerable countries": EMBI markets



Source: Datastream, Amundi Research

Table 22: Performance of "solid countries" vs. "vulnerable countries": 2018

2018	Equity markets performance	FX (vs. USD) performance	EMBI markets performance
All countries (our sample)	-5.2%	-9.8%	-3.1%
V6 Group	-13.7%	-18.8%	-6.5%
S6 Group	+2.5%	-8.2%	-0.5%
S6 – V6	+16.1%	+10.6%	+6.0%

Table 23: Performance of "solid countries" vs. "vulnerable countries": 2001 – 2018

2001 - 2018	Equity markets performance	FX (vs. USD) performance	EMBI markets performance
All countries (our sample)	+13.6%	-1.6%%	+7.8%
V6 Group	+13.4%	-4.6%	+7.2%
S6 Group	+15.6%	-0.9%	+9.5%
S6 – V6	+2.1%	+3.7%	+2.3%

NB: for fixed income markets, due to lack of some data, the study covers 5 vulnerable countries and 4 solid countries.

Some takeaways before exploring optimal portfolios:

- First, as in advanced countries **in a crisis situation, group behaviour, contagion and correlation both have a clear tendency to increase**.
- Then, if we analyse performances in relative terms, we can easily see that within the EM group, **several profiles stand out, including the sub-group of "vulnerable countries" and the subgroup of "solid countries".** In equity markets, foreign exchange markets and fixed income markets, discrimination is possible and performances vary widely.
- We also note that **the profile of the "vulnerable countries" is often more hectic than that of the "solid countries"**, their vulnerability provoking excesses during a marked downturn in the markets, and their under-valuation once the crisis has gone on, exaggerating the recovery phases.

All in all, **in order to benefit from the significant rebounds of the vulnerable countries, it therefore seems wise to overweight during the more difficult period the solid countries, which we will now call the "anti-fragile countries"**: they do not constitute, strictly speaking, markets for macro-hedging (they evolve in the same direction), but they make it possible to better pass the shocks and protect themselves against the weaknesses of the vulnerable countries which, at times, may seem exaggerated. Taking into account the "anti-fragile" countries thus allows to better pass periods of crisis and / or fragility and contagion.

2.4. "Fragile" and "anti-fragile" EM countries: an optimal portfolio

Our study points that discrimination via vulnerability is rewarding, especially in times of crisis. **We went one-step further, analysing optimised equity portfolios, FX portfolios and fixed income portfolios with a constraint based on our vulnerability indicator**... and comparing this portfolio with an optimised unconstrained portfolio and an equally-weighted portfolio during 2018, while EM have been hurt (the set of data in not sufficient to check the behaviour of portfolios for a longer period, including other EM markets trouble).

The target is to look at optimal portfolios that make it possible to benefit from the protective nature of the anti-fragile in the downturn and the potential of fragile countries in the recovery phase.

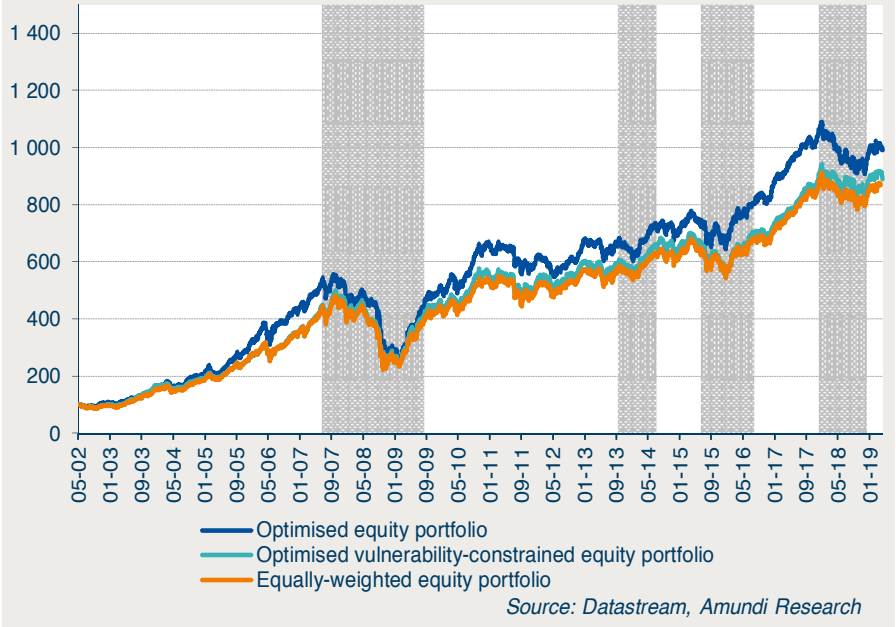
Optimization is based on constraints that we have defined ex ante. The vulnerability index is used to set the maximum weight of fragile countries and the minimum weight of the anti-fragile countries in our optimized portfolio. In addition, each anti-fragile country cannot be less

than 5% of the portfolio. As for the other countries (the fragile and the others), they cannot exceed 5% of the portfolio.

After calculating the weights of countries constrained by their score and their ranking as regard vulnerability, we obtain a **new equity portfolio**, with 50% of "anti-fragile" countries (8.9% Brazil, 0.6% Russia, 5% China, 7.9% Peru, 14.2% India and 13.3% Thailand)...) and 17% of fragile countries (2.9% Hungary, 5.1% Malaysia, 2.9% Czech Republic, 4.2% Argentina, 0.5% South Africa and 0.8% Turkey). The maximum weight of each "neither solid - nor fragile" country has been set at 5%. During the 2018 contagion period, the optimised portfolio integrating vulnerability as a weighting factor is the best portfolio: -4.4% vs. -11.2% for the optimised unconstrained portfolio and -6.6% for the equally-weighted portfolio (see Graph below). The results are pretty clear: if the optimised unconstrained portfolio (with a bias for vulnerable countries) outperforms in terms of performances, its behaviour is worse during 2018, with a higher maximum drawdown, and a longer duration of maximum drawdown.

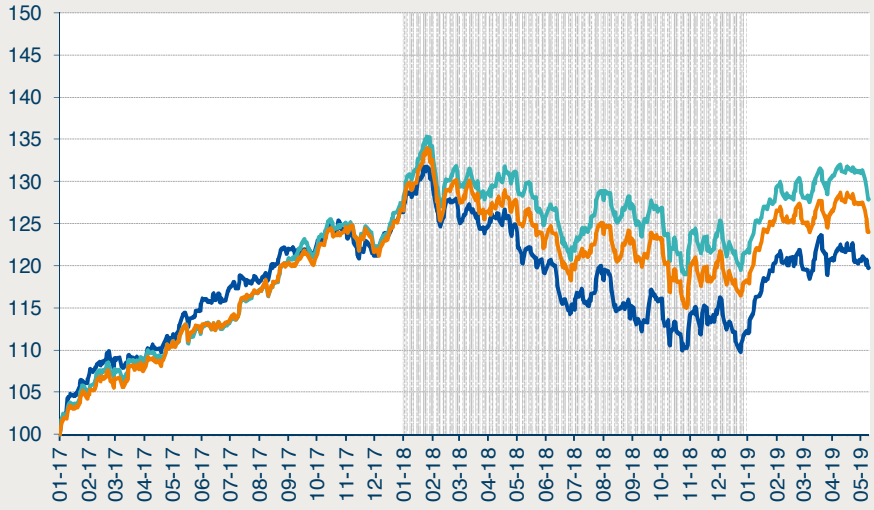
In sum, on equity markets, vulnerability is not a discriminatory factor in "normal" periods, but it tended to be an important discriminatory factor in times of trouble, i.e. in 2018.

Graph 11: Equity markets: equally-weighted vs. optimised portfolios – 2002-2019



Source: Datastream, Amundi Research

Graph 12: Equity markets: equally-weighted vs. optimised portfolios – 2017-2019



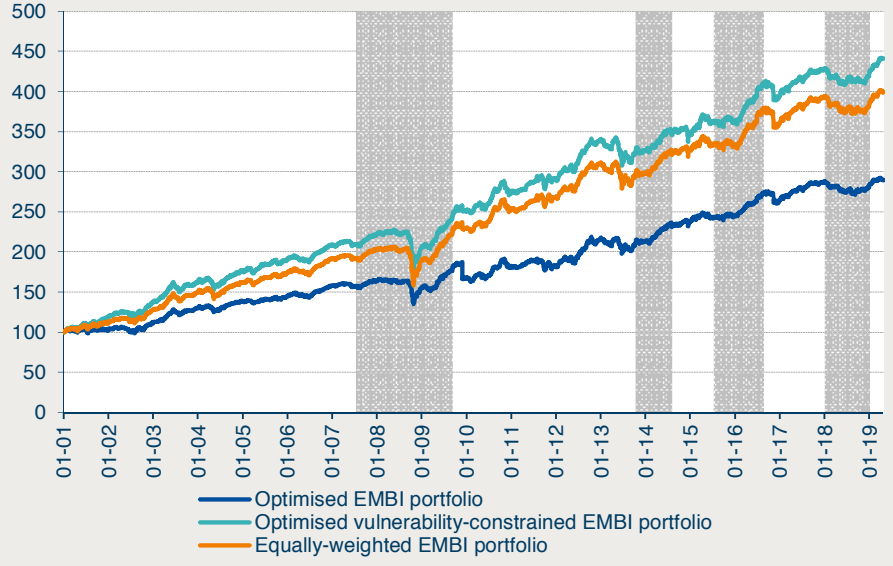
Source: Datastream, Amundi Research

With the same methodology, we also obtain a **new FX portfolio** and a **new fixed income portfolio, but one has to recognise that the results are not similar.**

On fixed income, due to lack of some data, the optimised constrained portfolio is made of four "anti-fragile" countries, representing 50% of the portfolio (10% Brazil, 20.1% Russia, 10% China, 9.9% Peru)) and of three fragile countries, representing 17% of the portfolio (12.2% Hungary, 3.6% Malaysia, 4.2% Argentina; South Africa and Turkey are not included in the results of the optimisation while Czech Republic was not integrated due to lack of data). The maximum weight of each "neither solid - nor fragile" country has been set again at 5%.

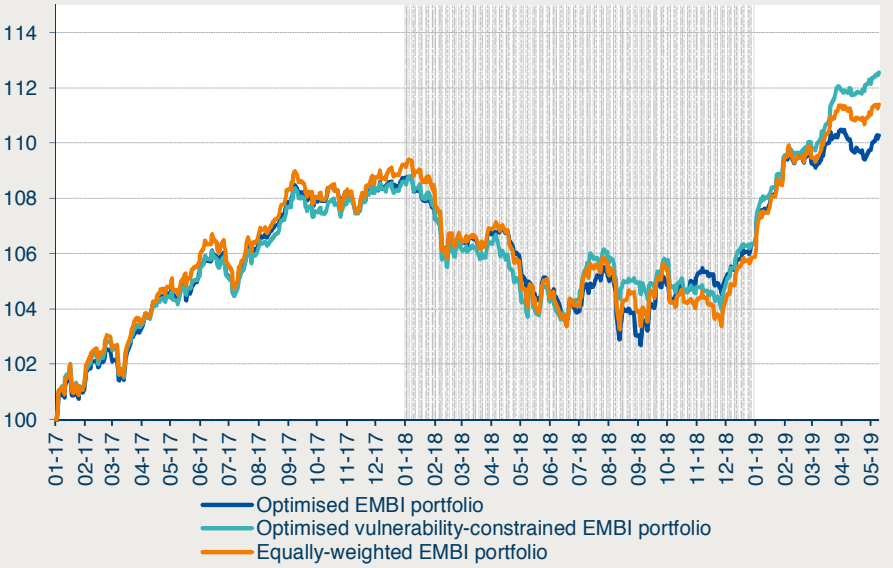
Unlike equities, the optimised constrained portfolio outperforms all portfolios, but the behaviour in 2018 was similar for all of them. **It seems that, on fixed income markets, vulnerability / solidity are systematically discriminatory factors, which is legitimate considering that vulnerability / solvency are key criteria on sovereign debt. However, it was not the case in 2018, i.e. in times of trouble, where contagion was significantly high.**

Graph 13: EMBI markets: equally-weighted vs. optimised portfolios – 2002-2019



Source: Datastream, Amundi Research

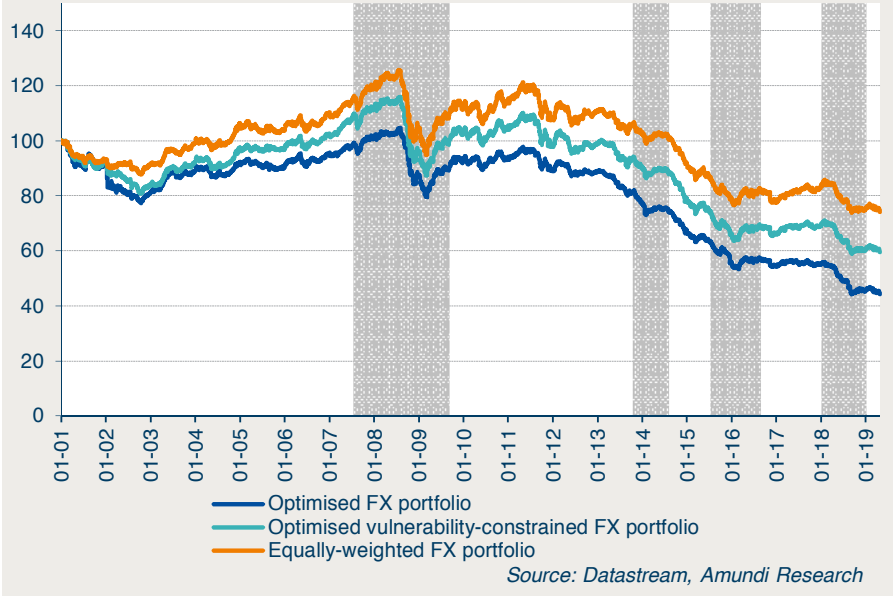
Graph 14: EMBI markets: equally-weighted vs. optimised portfolios – 2017-2019



Source: Datastream, Amundi Research

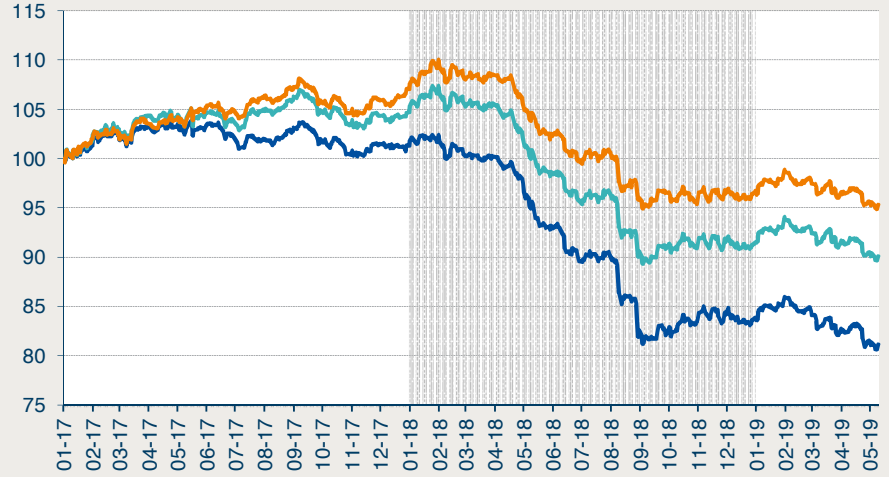
On FX markets, the results are a little different, but they go in the same way. The equally-weighted portfolio outperforms (in both performance and maximum drawdown) the two optimized portfolios: i) the unconstrained portfolio (which gives greater weight to vulnerable countries (33% versus 27% in currencies of solid countries) and ii) the portfolio constrained by a vulnerability criterion (which gives more weight to the solid countries (47% versus 15% in the currencies of vulnerable countries). This may mean that **the most important thing about the foreign exchange market is diversification, not vulnerability**. Taking into account the volatility which prevails in the foreign exchange markets in general, and in periods of risk aversion, as in 2018 in particular, this is not totally surprising. However, our results demonstrate again, as it was the case on fixed income and equity markets, that **the vulnerability-constrained optimised portfolio is much better than the optimised portfolio that is not constrained**. This is true in terms of performance and in terms of drawdown also (magnitude, duration and recovery time). In other words, **in the foreign exchange market also, vulnerability is a discriminating criterion that is best taken into account**.

Graph 15: FX markets: equally-weighted vs. optimised portfolios – 2002-2019



Source: Datastream, Amundi Research

Graph 16: FX markets: equally-weighted vs. optimised portfolios – 2017-2019



Source: Datastream, Amundi Research

III. Contagion: different scenarios for the future

It seems evident that investing in solid / anti-fragile countries is a rewarding strategy. But it should be recalled that, with few exceptions, the spill-over effects are inevitable and all countries tend to be impacted in times of trouble. This is mainly related to economic and financial globalisation, but also to the nature of the crisis. If the shock affects a specific country or area and if non-residents have invested little in that country or area, contagion remains small. However, correlations between asset classes (especially bonds and equities) have increased sharply in the wake of the major financial crisis of 2008 and the "bubble perception" on these markets is now in their fate. Consequently, the question arises of the contagion of interest rates to equity markets (and vice versa) and of the contagion to the real sector.

What would happen in a global crisis?

- In the event of a bond market crisis, a negative contagion of sovereign bond yields to equities can be expected: a decline in bond prices (higher bond yields) would have a negative impact on equities;

- In the event of an equity market crisis, we should expect a positive contagion from equities to sovereign bonds: weaker equities would favour a rise in bond prices (lower bond yields);
- The question of the impact of the financial sphere to the real economy is also being asked. The financial crisis of 1929, the collapse of the tech bubble in 2000, or, more recently, the crisis of 2008, all had serious repercussions on the level of economic growth, creating a recession - sometimes severe - in developed countries; a new global crisis would almost certainly have the same impact, while a "banal" repricing of risk premia would be less damaging to reality, particularly if interest rates remain low.

With regard to the current crisis in emerging economies and emerging markets, what are the different scenarios and which is most likely? Four different scenarios are plausible:

- **Scenario # 1: Appeasement** (end to fears trade war, better growth prospects...). A positive contagion would follow suit.
- **Scenario # 2: A contagion to emerging markets only** due to a common factor: lack of capital flows, risk aversion, misunderstanding of the US monetary policy, a rise in US bond yields and short-term rates / a sharp appreciation of the USD... Contagion would affect EM world only.
- **Scenario # 3: A major crisis affecting both advanced and emerging markets**: the materialisation of a common risk factor such as a "full-scale" trade war or a massive and sudden economic recession (or expectations of recession) could be the triggers of such a scenario, with global contagion, on both EM and advanced world, and on both the financial and the real spheres.
- **Scenario # 4: "Successive crises" in emerging markets** only mainly due to the continuation of the global economic slowdown (Les Cahiers Verts (2018)).. Specific factors would impact different groups of countries (weak vs. high external vulnerability, commodities-producing' vs commodities-consuming' countries, capacity to have autonomous growth vs. highly world growth-dependent countries, countries having – or not – the capacity / leeway to boost internal growth...)

The scenario of appeasement (scenario # 1) is the most favourable ... but for this scenario to materialise, it will be necessary i) that fears of a trade war disappear, ii) that the Fed's rate hikes are stopped for long and iii) that growth prospects improve. Then risk aversion will decline and capital flows will go back to emerging countries. If not, if growth continues to slowdown, and in the absence of a major shock, the "successive crises" scenario seems most plausible.

Scenarios # 2 and # 3 refer to contagion, within EM countries only (Scenario # 2) or to all countries, both emerging and advanced (Scenario # 3). The magnitude of the contagion would depend on the magnitude of the slowdown, the magnitude of trade war fears, on the existence of common risk factors, on EM or on all countries. Two additional risks may also be crucial:

- **Risk 1**: **the end of financial repression and capital controls in China.** It is almost certain that the very high level of total debt is under control as long as interest rates are below growth, i.e. as long as there is financial repression that results in capital controls. Otherwise, China would no doubt generate significant capital outflows, as seen in 2014. Can China and China abandon this logic? We do not believe that is feasible.
- **Risk 2: Massive outflows from emerging markets**. Many emerging markets have a structural external deficit and must therefore attract foreign capital. Any uncertainty about global or regional growth and any increase in risk aversion would likely cause such capital outflows. This occurred in 2013 (announcement of the end of the Fed's asset purchase programme) and 2015-2016 (fall of the Chinese stock market). In that case, bet on emerging market currency depreciation and rising local interest rates. Economic activity will also decline, but probably without serious contagion to developed markets, as they are positively driven by US growth... so far.

Note that any rise / decline in oil price would also have an important impact (see Box 3).

Scenario # 4 (successive crises) does not lack interest. In the absence of a major shock, the sequence could be as follows: countries that have been in the midst of the 2018 summer turmoil (first wave) for specific reasons (including Argentina and Turkey) would see their situation improve if they have been able to make the necessary adjustments and rely on their domestic markets. The current trade war would spare emerging economies strongly open to external relations (second wave), and economic deceleration in open economies such as Chile, Colombia, Malaysia and Thailand would be expected. A general economic slowdown would occur (convergence of the US towards potential growth, weakening Europe, especially if trade measures hit Germany...). In turn, it would affect oil exporting (third wave) countries, particularly those most dependent on oil and/or vulnerable, such as Angola, Venezuela and the United Arab Emirates.

In short, in the absence of large-scale trade war, a hard landing for China, or a major economic slowdown, there should be a limited contagion from emerging to advanced countries, and the contagion within the emerging world should be limited to common factors. The necessity to discriminate between EM countries is therefore compulsory.

Box 3:
Towards important cycles of oil price: what consequence?

The price of oil may continue to show significant cycles (and significant price variations), due in particular to 3 different factors:

- # The lag between oil prices and investments in exploration and production: low investments in 2015-2017, and then higher oil prices from 2018... are we moving towards excessive investments in the very near future?
- # Alternating periods of cooperation and lack of cooperation between oil-producing countries;
- # Business cycles and global growth

However, the role of shale oil has changed the context: when oil prices rise, the production of shale oil increases, and vice-versa. As a consequence, the magnitude of oil price movements tends to be much softer in the current context.

The effects of the major oil price cycles are nevertheless clearly identified:

- # They also involve larger growth cycles for oil-importing and oil-exporting countries;
- # They create permanent difficulties for central banks in OECD countries, because there will be a systematic conflict of objectives between growth and inflation;
- # They can generate a higher variability of inflation, expected inflation, long-term interest rates and stock prices

Winners and losers

- # The countries that would suffer most from the rise in oil prices (combination of net oil / GDP imports and energy weight in the CPI) are Romania, Poland, Portugal, Turkey, Hungary, Cambodia, the Czech Republic and Spain
- # The countries that would benefit the most are Canada, Ecuador, Norway, Nigeria, Saudi Arabia and Venezuela.

Conclusion

Like any other group (dollar block, Eurozone…), the emerging world cannot be considered as a block. It is indeed quite easy to point those economic divergences, structural characteristics and vulnerability, particularly to capital flows, can vary widely across countries. Looking at data and history, the magnitude of external deficits (or, more generally, the vulnerability of countries to foreign capital flows) is undoubtedly one of the most interesting factors of discrimination among countries. This was the angle for a previous article aimed at defining typology of EM countries (Ithurbide (2019b)). Note that even if countries have different intrinsic characteristics and risk factors, financial market reactions fail to detect systematically such a discrimination: **it looks like capital flows exiting all EM countries with market events… as if risk were perceived and treated globally, without worrying about whether particular countries represent different levels of risk in nature and magnitude**. Note that the picture is not massively different concerning advanced countries, though… except that, **in advanced countries, safe haven assets and currencies exist, which allows to soften the downside cycles of financial assets. It is not the case with EM markets**, unfortunately… so far.

In summary, it is not difficult to point out i) the **high degree of economic heterogeneity across countries**; second, ii) **strong correlations between capital flows and between asset classes** (currencies, equity markets and fixed income markets), and iii) the **difficulty of discriminating**, apart from FX markets, to some extent.

Discriminating through a risk factor is possible, though… and external vulnerability is a good way to do it. The most solid countries tend to outperform systematically the most vulnerable countries, both on FX markets, equity markets and fixed income markets, especially in times of crises, contagion or risk aversion.

On equity markets, vulnerability is not a discriminatory factor in normal periods, but it tends to be an important discriminatory factor in times of trouble, i.e. in 2018. **On fixed income markets, vulnerability / solidity are systematically discriminatory factors**, which is legitimate considering that vulnerability / solvency are key criteria on sovereign debt. However, it was not the case in 2018, where contagion was significantly high: all kind of portfolios – portfolios including a vulnerability factor, optimised portfolios without any constraint, portfolios biased to vulnerable countries or to solid countries - tended to behave similarly. **On FX markets**, the results are similar, even if diversification seems to be more important than vulnerability.

Table 24: Vulnerability as a discriminatory factor: a synthesis		
	Quiet periods	Stress period
Equity markets	Vulnerability is not a discriminatory factor	Vulnerability is a discriminatory factor
Fixed Income markets	Vulnerability is a discriminatory factor	Vulnerability is a discriminatory factor
FX markets	Vulnerability is a discriminatory factor but diversification seems more important	Vulnerability is a discriminatory factor but diversification seems more important

We could not analyse different crisis episodes, and our study cannot be generalised. But all in all, in order to benefit from the significant rebounds of the vulnerable countries, **it seems judicious to overweight during challenging times the solid countries, which we will refer to as the "anti-fragile"**. They do not constitute, strictly speaking, macro-hedging instruments (they evolve in the same direction), but they make it possible to weather the shocks and to protect oneself against the weaknesses of vulnerable countries which, at times, may seem overblown. Our approach can also be part of overlay strategies.

List of boxes

List of tables

List of graphs

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