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Risk and Trend Mapping – No 14

Macrofinancial risks for 2014

Market experts' analyses

AUTORITÉ DES MARCHÉS FINANCIERS

AMF

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Preface

As part of its monitoring of the risks to the maintenance of orderly markets and financial stability, the AMF has reinforced its system of communication with the financial sector, in accordance with its New Strategy Proposals, so that a regular dialogue with the finance industry about the kinds of vulnerabilities that could affect the financing of the economy can take place, enabling the regulator to adjust financial regulation accordingly.

This collective analysis of risks and trends for 2014 (Risk and Trend Mapping) is the first publication of this kind, and it brings together the voices of some of the experts whose views are sought by the AMF within the informal financial sector network that emerged in 2013 from a desire to create a forum for discussion between the regulator and recognised individuals within the main financial institutions.

The very varied analyses in this publication obviously only reflect the opinions of their authors, but they reveal diverse and complementary approaches and views. We need to understand these properly in order to grasp the situation and challenges facing economic and financial players in France and throughout the world at the beginning of 2014.

Although the start of 2014 seems to herald economic recovery in Europe, there are still risk factors—both internal and from other geographical areas—present, which need to be carefully analysed so that the efforts made by the authorities and businesses for several years now to achieve a swift exit from the economic crisis are not frustrated.

I therefore wish the AMF and the experts who want to work with it the greatest success with this dialogue, so that they can continue contributing to the confrontation of ideas necessary to identify and control the macrofinancial risks that could disrupt the role of the financial markets or hamper economic growth.

Gérard Rameix, President of the AMF

1 – Towards further debt restructuring in the euro area?

SYLVAIN BROYER AND ALAN LEMANGNEN - NATIXIS [1]

Written on 20/12/2013

Despite repeated denials by the European authorities and the apparent calm reigning over bond markets for over a year now, many commentators now believe it will probably be necessary to restructure the debt of one (or more) European countries in the relatively near future. At a time when countries around the Mediterranean, particularly the so-called 'periphery' countries, are finding it extremely difficult to reduce their government deficits, the Greek precedent has shown that a default (even partial) can no longer be ruled out in a developed country.

So what is the truth of the matter?

Let us remember that a default, or a restructuring of debt, is justified where the agent concerned (in this case the State) finds itself to be insolvent. Insolvency means that the State is unable to honour its commitments (interest payments plus repayment, or rollover, of the principal), and it can arise either as a result of sudden impairment of the State's ability to generate revenue, or because of a sudden increase in its volume of debt, with the consequence that it becomes impossible—all other things being equal—to service this debt. In the current environment, we should consider two types of risk that can lead to insolvency. The first, a macroeconomic risk, relates to the constraint known as the 'intertemporal solvency' of the State; the second, which we will return to in more detail later on in this article, concerns the risk to governments of having to bail out their banking and finance sectors again.

As far as the macroeconomic risk is concerned, the intertemporal solvency equation tells us that most of the 'periphery' countries run a high risk of insolvency, regardless of the specification for insolvency. Given interest rate levels (still relatively high) and growth prospects (still relatively low), stabilisation of government debt levels requires reduction of the primary deficit[2] (i.e. excluding interest) by more than 2 percentage points of GDP for Italy, 4 percentage points for Ireland, 6 percentage points for Spain, 8 percentage points for Portugal, and so on... So in the majority of cases, this means drastic austerity measures that these countries' governments can decide not to inflict upon themselves.
Aside from the macroeconomic risk—which has not gone away despite hints of recovery that optimists have detected in some of the more advanced indicators—a change in the banking risk seems to us to be the main factor that would determine, in the short term, a possible resurgence of sovereign debt crisis in Europe. Since its inception, the crisis has been fuelled by a strong correlation between banking

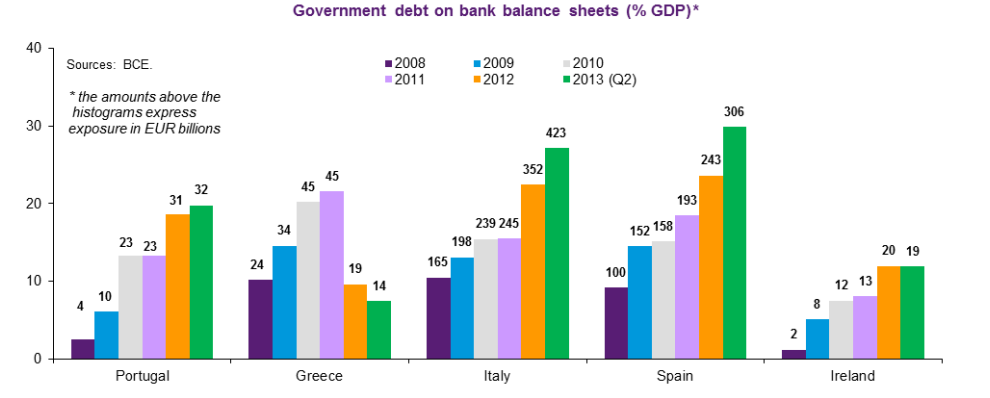
[1] The views expressed in this analysis are the authors' personal views and do not necessarily reflect the position of Natixis. All copying, distribution or reproduction of this study, in full or in part, requires express prior written agreement from the AMF.
[2] Or an increase in surplus. For the solvency of a country to be assured, an adequate condition is that its ratio of debt to GDP is stable. A 'stable' primary deficit is given by multiplying the debt by the difference between the interest rate and the growth rate in value terms. Our reasoning here is based on current interest rate levels and our latest forecasts for 2013 (debt) and 2014 (growth in value terms).

risk and sovereign risk, with shocks coming sometimes from the impact of the public finances on the banking system (Greece, Portugal) and at other times from the repercussions of the banking crisis for the public finances (Ireland, Spain, Cyprus). The major issue is the volume of public debt on the books of Europe's banks, which was further increased by their buying of securities issued by governments to bail them out (and finance their deficits).

Consequently, stabilising the euro has meant breaking this vicious circle between bank balance sheets and sovereign debt. From governments to banks, the contagion now seems to be more or less under control. Mario Draghi's announcement on 26 July 2012 that the ECB was prepared to purchase as many sovereign bonds as necessary on the secondary market (Outright Money Transactions, or OMTs) sustained the value of peripheral securities and wrongly banished the spectre of a disorderly default in the euro area. Institutional steps taken to reinforce supervision and fiscal governance in the euro area has theoretically reduced the risk of external and public accounts sliding out of control. Under the effect of these measures, the summer of 2012 marked the start of a period of calm in the sovereign debt market, which has lasted until now; bond yields are reconverging, lifting the sword of Damocles hanging over European governments and the European banking system.

But does this period of calm necessarily mean that the banking risk has gone for good and sovereign risk has been immunised against it? Unfortunately not: there are still too many underlying risks, despite various safety nets.

Firstly, the loop linking banking risk to sovereign risk has strengthened. Given a massive central liquidity boost in two (three-year) long-term refinancing operations (LTROs), the banks of the periphery countries have kept buying up vast quantities of public debt, particularly of their own governments (see graph below). This trend looks set to continue in the short term; sovereign bond issuance will remain strong in 2014 (around EUR 870 billion) with strong demand, stimulated particularly by changes in prudential regulation at European level. And that is the paradox of the institutional reforms currently under way: on the one hand there is a declared political will to '*break the link between banks and sovereigns*', and on the other the reinforcement of prudential requirements is encouraging the banks to purchase public debt. The new European Capital Requirements Directive (CRD IV) applies low weightings to sovereign securities in calculations of risk weighted assets (RWA), with the outcome that, by using this type of asset to replace others that the regulator considers more risky, banks can artificially improve their capital ratios.



So the loop linking sovereign risk and banking risk remains, and investors overestimate the reach of the safety net that for the moment is preventing its reactivation. While OMTs are an effective tool for staving off potential sovereign debt crises, they do nothing to solve the problem of budgetary solvency—which is the responsibility not of the ECB but of the Member States. When the ECB buys securities, this does not cancel debt (the treaties forbid this). The level of debt remains the same, and the Member State concerned still has to service it. Furthermore, the ECB's action is limited to securities in the 1- to 3-year segment, which in practice means that, whatever happens, investors still carry the sovereign risk for longer maturities. OMTs are a very effective firewall, when all is said and done, because of their credibility to investors, but ultimately they will not solve the fundamental problem, which is that without sufficient growth, debt will continue to rise and the solvency of governments will remain under threat.

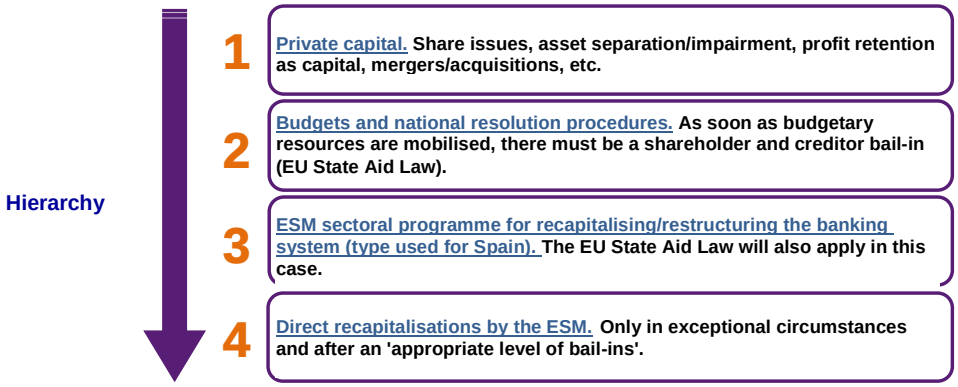
Going around the loop in the opposite direction, the banks in some countries also remain in a fragile state. The real devaluation strategy pursued by peripheral economies has particularly caused the financial position of businesses and households to deteriorate, to the extent that increasing numbers of them are finding themselves unable to honour their commitments to the banks. Evidence of this is a constant increase in bad debts, which reached record levels in 2013: 47% of loans in Cyprus, 28% in Greece, 17% in Ireland, 12% in Spain, 8% in Italy, and 7% in Portugal. National politicians can take their share of the responsibility for this. The balance sheet cleansing that was required when successive banks were bailed out never took place. For budgetary reasons, bad banks—where they exist—are often too small to deal effectively with the problem of legacy assets from the financial crisis. From the point of view of households and businesses, governments (with the notable exception of Ireland and to a lesser extent Spain) have been slow to introduce suitable bankruptcy regimes that would lessen the weight of private debt and reduce levels of non-performing loans.

With the comprehensive assessment conducted jointly by the ECB and the EBA beginning last November, investors are looking again at the euro area, and more specifically at the solvency of its banks. With its credibility as future banking supervisor at stake, the ECB will be wanting to conduct the exercise as rigorously as possible. This comprehensive assessment could reveal further capital needs that have to be met, with the risk this entails for the sovereigns. The ECB is planning to publish the results of its assessment in October 2014, before taking on its supervisory role the following month. Until then, the challenge for Europe's leaders will be to provide the euro area with adequate protection to avoid reactivating the banking risk/sovereign risk loop if further recapitalisations are needed. While OMTs and fiscal discipline have been able to protect the banks from the sovereigns, the sovereigns now need to be immunised against banking risk.

What role could banking union play in this? In the short term, only a limited one. Significant progress was of course made at the end of 2013 with the compromises reached on the second pillar of banking union, the Single Resolution Mechanism (SRM), and the Bank Recovery and Resolution Directive (BRRD) and Deposit Guarantee Scheme Directive (DGS). Eventually, the instruments introduced by these texts could certainly mitigate the risk of contagion from banks to sovereigns. But they will not come into force until after 2015, by which time most bank

restructuring operations will have to have taken place[3]: bail-ins by senior creditors, the main tool for absorbing losses, will not come into force fully until January 2016, while the Single Resolution Fund provided for under the Single Resolution Mechanism to cover the cost of debt restructuring, will contain only EUR 5.5 billion. In other words, the current crisis management architecture will have to manage any potential capital requirements, and it will have to do so on a decentralised basis. The support mechanisms unveiled last November by the European Ministers of Finance (see diagram below)[4] are essentially national schemes, with the European instruments only coming into play once private sources (share issues, asset separation/impairment, profit retention as capital, mergers and acquisitions) and budgets (after shareholder and junior creditor bail-ins)[5] have been exhausted. Budgetary positions, national legislation on bail-ins[6], and sizes of eligible liabilities are so diverse that the risk of embedding crisis management at national level is that as many methods of crisis resolution are created as there are Member States in the banking union. Worse still, with this architecture, crisis management remains subject to political uncertainty; if (electoral or budgetary) interests collide with the interests of resolving the crisis, there is vast political scope for interference. The risk would then be that, with no clear vision, the markets would transform the diversity of national positions into a new sovereign spread-widening episode, particularly if losses were unevenly distributed within the euro area and concentrated in the most fragile countries.

Backstops put in place by the Ecofin Council on 15/11/13



Source: Ecofin

By avoiding bringing the instruments for the decorrelation of banking and sovereign risk forward to 2015, Europe is being careful not to succumb to the excesses of a 'total bail-in', which some governments believe would have a particularly destabilising effect on markets that are still fragile. But the corollary of this choice is the maintenance of a form of State guarantee for bank balance sheets. So despite recent institutional progress, banking risk in the short term will remain the main

[3] From the publication of the results of the ECB's comprehensive assessment in October 2014, problematic banks will have six to eight months in which to take the remedial action required by the new supervisor. Beyond that, restructuring operations could be envisaged involving the SRM, which will become operational in January 2015.

[4] Council statement on EU banks' asset quality reviews and stress tests, including on backstop arrangements

[5] There are few incentives for using them (conditionality of the ESM sectoral programmes for the banking sector) and mobilising support for them is politically difficult (strong SPD opposition to the idea of direct recapitalisations, though Bundestag approval is necessary for such operations).

[6] For example, German legislation (the 2011 Bank Restructuring Act) now allows the resolution authority to make senior debts contribute.

determinant of sovereign risk, making the ECB's comprehensive assessment one of the biggest issues in the 2014/2015 period. Regardless of the results of this assessment, and in spite of the current fragile recovery, economic theory suggests that the possibility of a further restructuring of debt in the longer term cannot be ruled out.

However, we should remember that a restructuring of debt is not necessarily the same thing as a unilateral default and that its purpose is precisely to prevent this worst-case scenario. The Greek precedent showed, despite its limitations, that it was possible to mount an orderly operation negotiated between debtor and creditors, enabling debt to be reduced while limiting losses for investors. Last April, the IMF declared that sovereign debt restructuring had, until now, always been too little and too late to be truly effective. Thus the IMF revived the debate on the potential benefits of greater institutionalisation of the use of sovereign debt restructuring. It remains to be seen whether this is the direction Europe will take.

2 – American monetary policy risks for 2014

JEAN-BAPTISTE PETHE ET PIERRE-OLIVIER BEFFY [7]
EXANE BNP PARIBAS

The Fed has had difficulty communicating about its exit strategy for 2013, causing bond yields to slip midway through the year. It has nevertheless managed to uncouple expectations of an increase in key rates from expectations concerning its end-of-year balance sheet policy. The Fed should therefore be able to avoid any sudden increases in bond yields in the coming months. However, its job will become more difficult as summer approaches, with QE due to end in November. A strong US economy in the first half of the year could give credence to the idea that the Fed is lagging behind. Although we expect a very gradual exit by the Fed, one of the major risks for 2014 is that the markets doubt that it will happen this way. If this is the case, we can expect another wave of depreciation in emerging markets and tensions in the periphery countries' bond markets.

Monetary policy is sometimes compared with driving a car. Central bankers put their foot on the accelerator when the economy slows down and on the brake when the economy is going fast enough. Ben Bernanke commented in a recent talk that there were two reasons why this was an imperfect analogy. On the one hand, the impact of monetary policy decisions on the economy is not immediate, but spreads over several quarters or even several years. On the other, the effects of monetary policy depend a great deal on how the market anticipates future monetary policy will evolve. Yet we do not ask a car to anticipate what its driver will do next.

The 2013 slippage: 'tapering talk'

Until the start of 2013, conducting monetary policy was relatively straightforward. The Fed wanted to give the economy more support and used all the tools at its disposal to do this: zero rates, a commitment to keep them low for a long time, balance sheet expansion. This highly accommodative policy paid off because it enabled US long-term real rates to be reduced to around -0.5%, where Europe and Japan had higher real rates, at 1%.

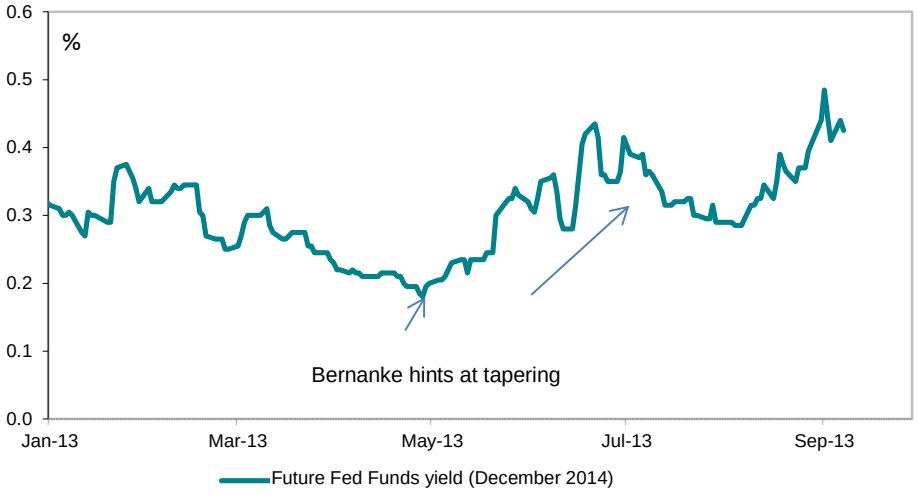
Improvement of the US employment market spurred the Fed to start implementing its exit strategy in the spring of 2013. The idea was to begin with a very gradual tapering of its asset purchases. As the Fed's balance sheet was still expanding, this tapering was equivalent, according to Ben Bernanke, to reducing pressure on the accelerator rather than to starting to apply the monetary policy brake. At the same time, the establishment of quantitative criteria for a first interest rate rise should have contained the increase in bond yields, particularly at the short end of the curve.

However, this strategy did not work as well as expected. When the Fed Chair announced in May that the tapering of asset purchases could begin in the next few meetings, the bond markets nearly left the road. They saw this announcement as the signal for a general

[7] The views expressed in this analysis are the authors' personal views and do not necessarily reflect the position of Exane BNP Paribas. All copying, distribution or reproduction of this study, in full or in part, requires express prior written agreement from the AMF.

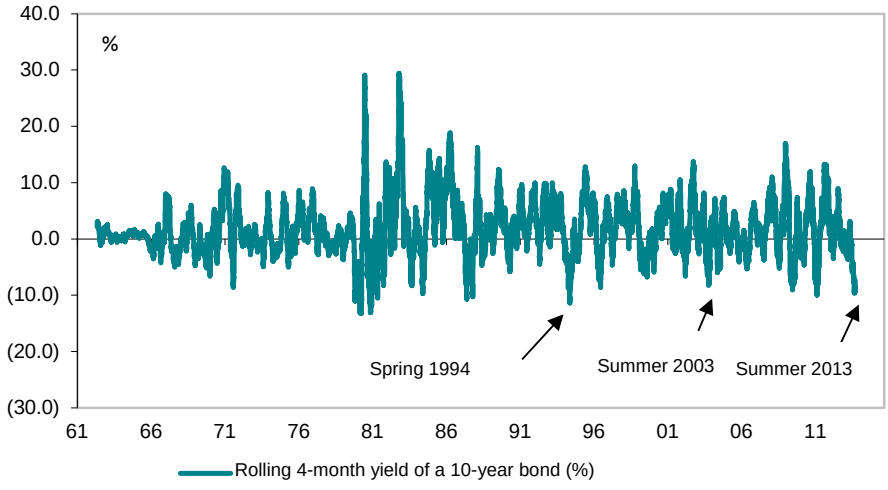
tightening of monetary policy. They started to anticipate Fed Funds rate rises in the second half of 2014, contrary to the commitments made by the Fed. The long-term rate rise between May and September ended up being as rapid as it was during previous monetary exits in the spring of 1994 and the summer of 2003, raising questions about the usefulness of the Fed's efforts at communication.

Graph 1: Initially the markets did not distinguish between rate rises and announcements on QE



Source: Exane BNP Paribas

Graph 2: Bond markets suffered as much as in spring 1994 and summer 2003



Source: Fed, Exane BNP Paribas

Some people might say that this kind of bond market volatility was unavoidable because yields had been so low since the start of 2013. It was necessary, in a way, to 'lance the boil' and make it clear that the direction of monetary policy was going to change.

A few minor errors were still made by the Fed last spring. The announcement of a change in monetary policy came when fiscal policy was still very tight, which might have surprised some people. As regards form, the Fed did not really reveal its internal discussions about the costs of the asset purchase programme, which were important for understanding its decision. Above all, it was too keen to set quantitative indicators, going as far as giving an unemployment rate of 7% as the point for bringing the asset purchase programme to a definitive end. But unemployment fell much more quickly than it anticipated. This merely contributed to the uncertainty about how US monetary policy would evolve, which undoubtedly added to the unnecessary market volatility.

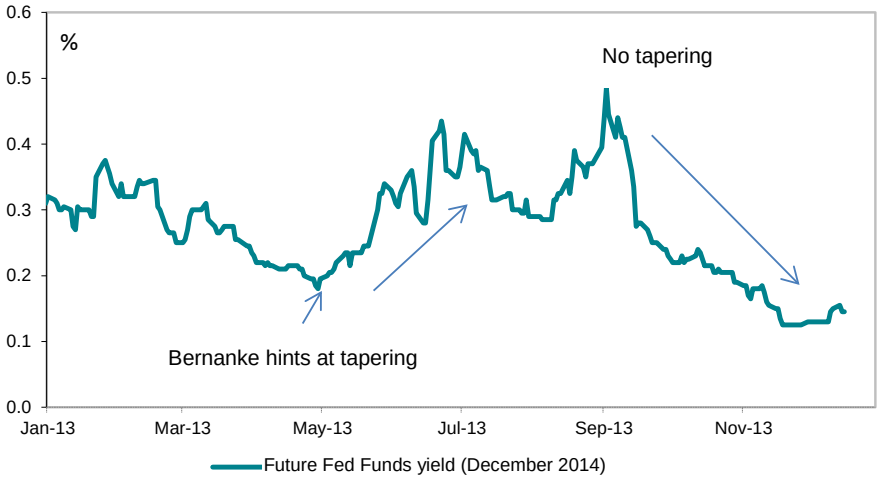
At the end of 2013, the driver is apparently back at the wheel

The Fed resumed control by postponing the tapering of Quantitative Easing in September. Ordinarily central bankers do not like giving surprises. But without this delay, expectations of a Fed Funds rate rise would have gained momentum and long-term yields would have increased even more.

In the weeks following this decision, expectations of a first key rates rise were put back to the third quarter of 2015, which was entirely consistent with the FOMC's own forecasts. Better still, December's good employment figures did nothing to change these expectations, even though economists had revised upwards the probability of asset purchase tapering in December. The Fed could then congratulate itself on having managed to uncouple expectations of an increase in key rates from expectations concerning its balance sheet policy. Tapering was becoming possible, with renewed emphasis being placed on the commitment to keep rates low if inflation stayed too low.

In the first part of 2014, the Fed's policy has started to become clearer. Unless job market figures stop improving or there is a strong rebound in prospects for inflation, the Fed should reduce its monthly purchases by USD 10 billion at the next few meetings and end its asset purchase programme in November or December. This clarity is good news for the markets, which can bank on a monetary policy that is accommodative but that also offers the prospect of gradual normalisation.

Graph 3: The September delay put back expectations of rate rises



Source: Exane BNP Paribas

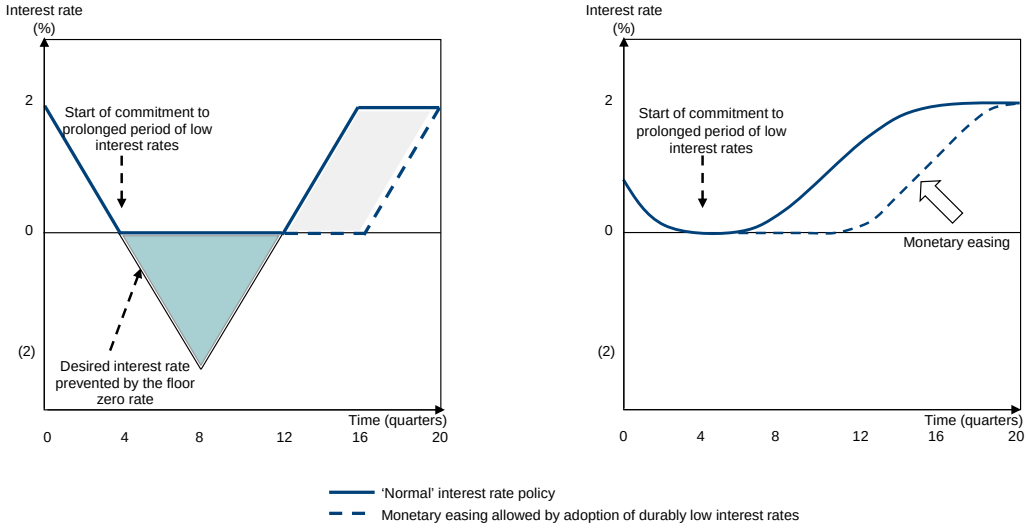
Mid-2014: another bend in the road to negotiate

A new problem is looming from the second quarter of 2014. The unemployment rate will probably then be at around the 6.5% threshold, which is a necessary, but not sufficient, condition for a key rate rise. The Fed will also be well into the reduction of its asset purchase programme. We know that the markets often try to second-guess the next monetary policy action—for example they predicted the first rate increase in 2004 more than a year in advance.

Consequently, the Fed probably intends to put off any expectations of a key rate rise by means of its communications. Its target is not only to reduce the unemployment rate but also to have sufficiently high inflation to be able to dampen any recessionary shocks. It will therefore be seeking a monetary policy that is accommodative in the long term. Theoretically, forward guidance is highly effective for softening monetary conditions when rates are already at zero. It involves persuading the markets that the key rate rise cycle is further off or slower than currently predicted. Janet Yellen mentioned this in her speech on monetary policy in June 2012.

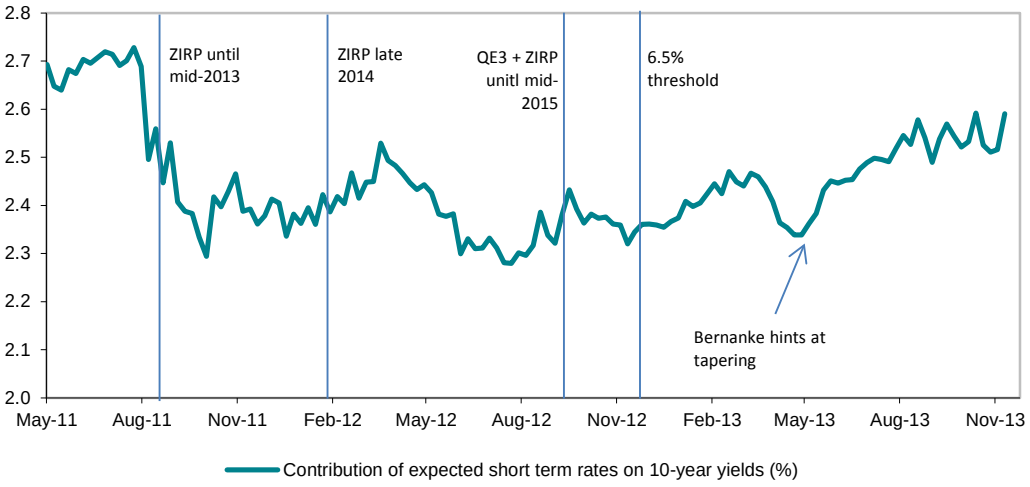
But in practice, forward guidance has much less of an impact than in models, because of the uncertainty of central bank forecasts. This is particularly true for longer-term predictions. By using a model that separates the term spread from the impact of key rate expectations on US bond yields, we can estimate that the introduction of forward guidance in August 2011 reduced 10-year rates by 15 to 20 bps. At that time, expectations of a rate rise were put back by a year. Moreover, the introduction of quantitative thresholds of 6.5% for unemployment and 2.5% for inflation at the end of 2012 meant that it was not possible to reduce bond yields. Calendar-based forward guidance therefore seems to be most effective, despite having certain disadvantages.

Graph 4: Theoretically, forward guidance reduces current bond yields



Source: Exane BNP Paribas

Graph 5: In practice, the impact of forward guidance on rates is limited



Source: Fed, Exane BNP Paribas

Clearly, there is a risk that the Fed will not control key rate rise expectations as well as it would like from the second quarter of 2014. Obviously it can step up forward guidance if it is not happy with the way the markets are reacting, for example by lowering the unemployment threshold to 6.0% or stressing its target for inflation. But the impact of this tool has been somewhat limited in the past, especially if the horizon for forecasts is a long way off. The bond market could therefore tighten up again, with 10-year rates increasing to 3.5% or more, which is likely to have negative consequences for some financial markets.

Potential collateral damage: the emerging economies, Europe

The increase in US bond yields caused a sudden portfolio reallocation and widespread selling of emerging assets in the summer of 2013. A recent study by American economist Barry Eichengreen showed that the countries most affected were those with the most liquid financial markets, which had allowed their currencies to appreciate to the detriment of their current account balance. Other fundamentals such as growth and public finances had little impact.

In 2014 emerging currencies remain at risk if US rates rise suddenly, for example if markets try to second-guess the Fed's first key rate rise. However, it seems likely that there will be greater discrimination on the basis of fundamentals. Some countries have made significant progress with adjusting their public policies, particularly by increasing their real rates and announcing budgetary restraint. Brazil falls into this category. Others need to keep up their efforts to restore their external accounts and contain inflation, even if this means lower growth in the short term. India and Indonesia fall into this category.

Table 1: Increasing discrimination between emerging countries in 2014 (from the most to the least vulnerable)

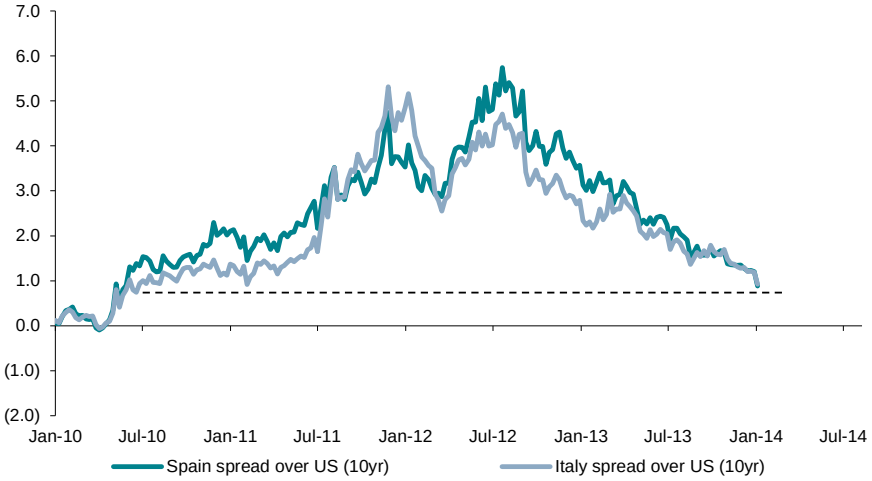
	External position	Fiscal policy	Real interest rate
	current account	primary balance	
	% GDP, 2012	% GDP, 2013	2013
Turkey	-7.4	0.7	-1.2
Chile	-4.6	-0.5	3.5
South Africa	-6.1	-2.1	-0.5
Peru	-4.9	1.1	1.2
Indonesia	-3.4	0.0	-1.3
India	-4.4	-3.8	-3.8
Colombia	-3.2	0.7	1.4
Thailand	0.1	-2.2	1.0
Brazil	-3.4	1.9	3.2
Argentina	-0.8	-1.3	0.2
Mexico	-1.3	2.5	0.6
Russia	2.9	-0.2	2.0
Philippines	2.5	1.8	0.6
Korea	4.6	0.5	1.8
Malaysia	3.5	-3.0	0.2
China	2.5	0.0	2.8
Nigeria	3.2	-0.1	-5.3

Source: Exane BNP Paribas

What is new is that a rise in US rates could become a more significant problem for Europe in 2014. Last year, rates in the core euro area countries rose slightly, but narrowing spreads enabled rates in the periphery countries to continue falling. For the first time since the spring of 2010, Spanish and Italian rates fell below 4% at the start of 2014. This suggests that financing conditions in the euro area are converging, raising hopes that a macroeconomic convergence might begin.

However, there is probably a limit to how much spreads can narrow in the euro area. Measured in terms of the difference between them and US yields, Italian and Spanish spreads are now below 1% over 10 years. Yet credit and liquidity risks persist in these markets. For example, Spain's government deficit is far from being cleared, and the pace of reform to revive potential growth in Italy has slowed significantly. Leaving aside the prospect of the pooling or serious monetisation of public debt by the European Central Bank, which seems unlikely in the short term, it will be difficult to keep these bonds at the current rates if American rates rise to 3.5%. Stopping rates from falling in periphery countries, or indeed increasing them, could restart the debate on the sustainability of public debt in the euro area, especially if the economic recovery remains modest.

Graph 6: There is probably a limit to how far peripheral spreads can narrow



Source: Exane BNP Paribas

Finally, we should not forget that too rapid a rate rise would harm the American economy itself. The recovery of the housing market—by far the most sensitive sector to interest rates—could be brought to a standstill if rates rise more quickly than incomes from employment. Housing affordability for households would fall to 1990s levels if 10-year rates went back up to 4%, and would reach housing bubble levels if rates went anywhere near 5%. This obviously means that too rapid a rise in US real rates would be followed by easing, unless there was a crisis of confidence—to do with inflation—for example.

Table 2: US rates and housing affordability*

10 year bond yields	Housing affordability
3.60%	Still 10% above 1990s levels
4.00%	Back to 1990s levels
4.80%	Back to 2006 bubble levels

*Affordability on an average income with a 30-year mortgage and a 20% deposit

Source: NAR, Exane BNP Paribas

No monetary exit without a bumpy ride

In conclusion, Janet Yellen inherits a very difficult vehicle to manoeuvre. It offers even less visibility than normal because structural changes make it very difficult to assess the output gap, and therefore inflationary pressures. Overdrive (quantitative easing) has been engaged without anyone really knowing its full effects, and the communication pedal has never had such heavy use. Coordinating all these levers will probably be more difficult than the manuals say, making a bumpy ride very likely, particularly as the prospect of a key rate rise approaches. In view of the leading role played by the US bond market, there may be significant collateral damage. Whereas emerging markets were the first victims of the change of tack in US monetary policy, Europe, and particularly the periphery countries in the euro area, could suffer even more from a tightening of US monetary policy in 2014.

3 – Emerging economies and external vulnerability

DANIELA ORDONEZ[8], ROMAIN SARRON[9] - COE REXECODE[10]

The financial turmoil of the summer has highlighted the vulnerability of some emerging countries to a drying up of global liquidity. After a brief period of calm in September, the turmoil continued throughout the last three months of 2013. By analysing macroeconomic balance in each of the emerging economies, we can find out which will be most sensitive to reversals in capital inflows. The economies with major imbalances, whether external (current account deficit) or internal (inflation, degraded public accounts), are the most vulnerable. Of these economies, India, South Africa, Turkey, Indonesia, Ukraine, Argentina and Brazil seem to be particularly exposed.

Extremely accommodative monetary conditions, a consequence of the monetary policies adopted in developed countries in the wake of the 2008-2009 crisis, combined with improved growth prospects in the emerging economies, have prompted massive inflows of capital into these countries in the last three years. However, the Fed's announcement last May that it would start normalising its monetary policy from September drastically reduced the emerging economies' attractiveness to investors. While a general slowdown in activity had been apparent in these economies for several quarters, the prospect of a drying up of global liquidity has led to a massive outflow of foreign capital, generating serious financial instability. The result has been major adjustment on the main emerging economies' stock exchanges, soaring risk premiums and heavy currency depreciation. The aggregated stock exchange index of the emerging countries greatly underperformed that of the developed countries, evidence of the lack of enthusiasm among investors for this type of asset. Although these tensions have since subsided, the vulnerabilities of certain emerging economies, highlighted by the turmoil of the summer, are still present since the chronic imbalances of some emerging countries have decreased very little since.

However, the degree of vulnerability to a reversal of capital inflows is not the same for all the emerging economies. Investors now seem to be discriminating between them more on the basis of their macroeconomic fundamentals. So economies with serious macroeconomic imbalances, whether external (current account deficit) or internal (inflation, degraded public accounts), could be subject to greater financial volatility over the coming months.

Varying degrees of vulnerability in which current account position is the first criterion of discrimination

The turmoil of summer 2013 did not affect all the emerging economies to the same degree. The countries with current account deficits were the ones most affected by currency depreciation. The currencies of Latin American countries (Brazil, Argentina) some emerging countries in Asia (India, Indonesia), Turkey and South Africa were particularly affected. Apart from Argentina, whose current account is close to balance but is on a downward trend, the current account deficits of these countries expressed as a percentage of GDP are the

[8] Economist, Euro area and Latin America

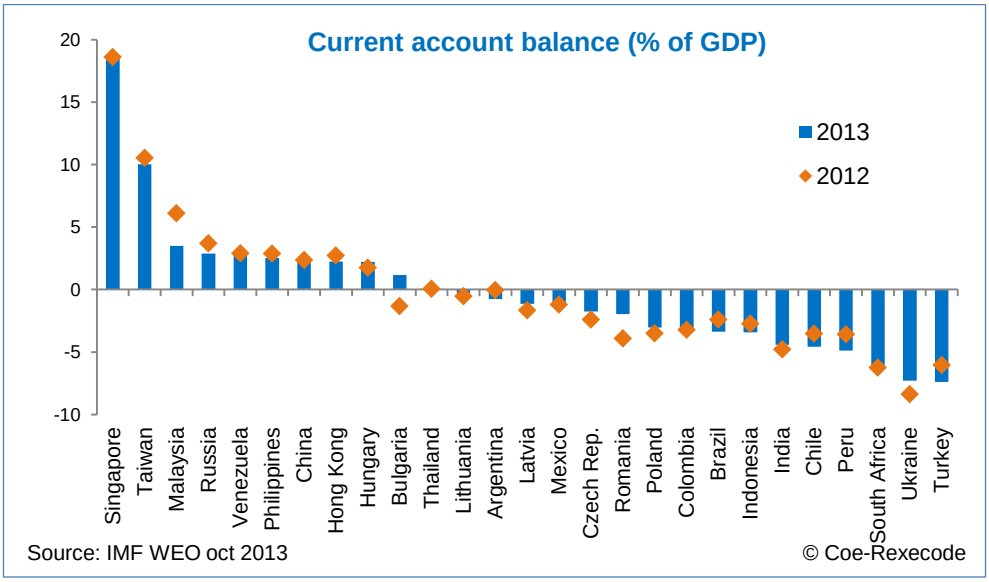
[9] Economist, Germany and Eastern Europe

[10] The views expressed in this analysis are the authors' personal views and do not necessarily reflect the position of COE Rexecode.

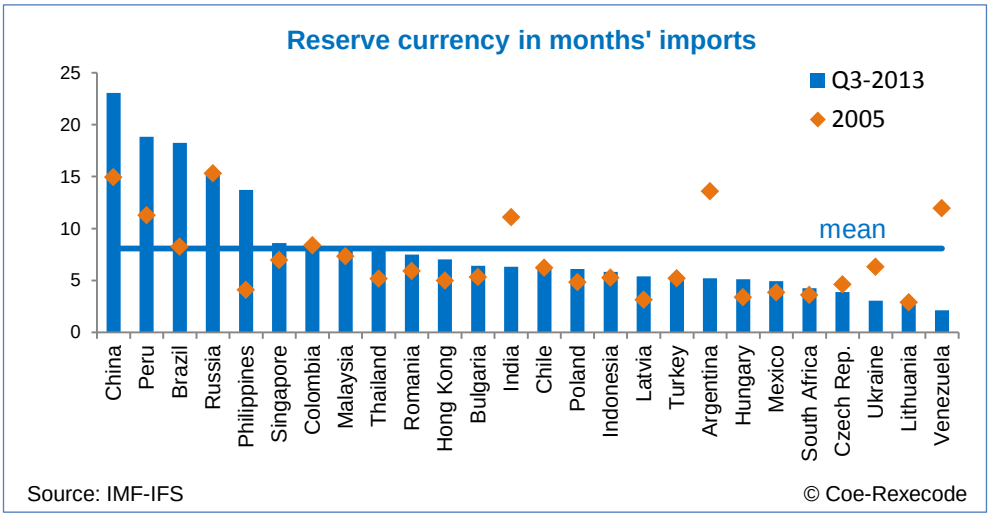
largest of the emerging economies, the result of overspending on internal revenues leading to a requirement for external financing.

Aside from the purely monetary aspects, this situation has highlighted inherent weaknesses in the growth models of these economies. Capital inflows in the last three years have certainly contributed to the upturn in activity following the 2008-2009 crisis. But increased liquidity in these economies as a result of capital inflows, and also of particularly accommodative national monetary policies, has led to the rapid expansion of borrowing directed particularly at consumption and the housing market, but has not significantly boosted production-oriented investment or the development of infrastructure or the national productive fabric. In some cases this has resulted in the formation of supply bottlenecks when faced with dynamic private demand. Furthermore, demand has been sustained by fairly low unemployment rates and high wage inflation. With domestic resources unable to meet domestic demand, the gap between supply and demand has caused persistent external imbalances as well as pressure on prices.

Until now, these external imbalances have largely been financed by new foreign capital inflows. There is generally seen to be a correlation between fiscal surpluses and current account deficits in emerging countries. But investment inflows in the last few years in countries running a deficit have mainly consisted of short-term capital, which is internationally very mobile (hot money) and therefore highly sensitive to reductions in global liquidity. So the same monetary forces that helped activity in emerging economies in deficit to bounce back after the Lehman Brothers crisis are now a major source of instability and vulnerability if a 'sudden stop' occurs. In particular, investors fear that a reduction in global liquidity will cause the conditions of access to external financing for these emerging countries to tighten, making available capital scarcer but also increasing financing costs and thus making it difficult to finance their external deficit. Consequently, the countries most vulnerable to the Fed's commencement of its monetary policy normalisation are those with a current account deficit. According to the IMF's latest estimates, only the Eastern European countries running a deficit in 2012 improved the balance of their external positions in 2013, but this was done 'from the bottom up', with sluggish domestic demand keeping a lid on imports. Turkey's current account deficit is now 7.4% of GDP, South Africa's is 6%, India's 4.4% and Brazil's 3.4%. The current account deficits of Peru, Chile and Colombia are also growing, going above 3% of GDP. Argentina's current account balance has slipped away, leaving a slight deficit of around 0.8% of GDP.



The vulnerability of emerging countries to a reversal of foreign investment inflows also depends on the means at their disposal to dampen the effects on their exchange rate of a sudden capital withdrawal. Reserve currency held by the central banks of each of these countries is used as a kind of financial cushion to compensate (for a limited period at least) for a lack of external financing, reducing the risk of an exchange rate crisis. Brazil stands out in this area for holding reserve currency equivalent to 18 months' imports in the third quarter of 2013. Indonesia and India, which are holding reserve currency equivalent to 5.8 and 6.3 months' imports respectively, are also in a fairly comfortable position. With five months' imports, Turkey has slightly less room for manoeuvre, while South Africa appears to be in a more tricky position with reserve currency equivalent to only four month's imports.



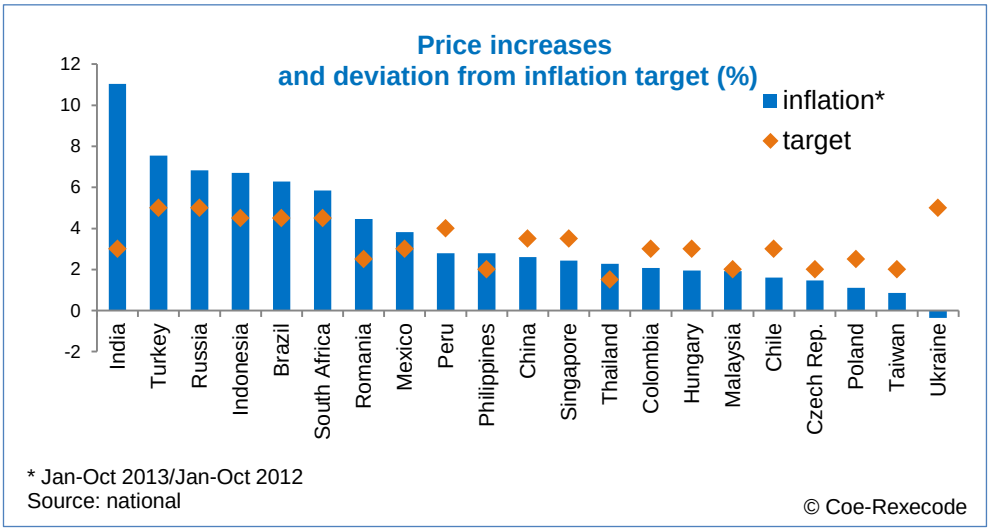
Where do inflationary risks lie?

Massive inflows of capital to some emerging countries have essentially sustained domestic demand, causing the coupling of supply to demand to be lost, and this has led to inflationary

pressures in economies experiencing major deterioration of their external position. So we can see that there is a positive correlation between size of current account deficit and deviation from the central inflation target set by the monetary authorities. The countries facing the worst inflationary risks are Brazil, India, Indonesia, Turkey and South Africa, where consumer price movements have come out well above the inflation targets set by their respective central banks.

Inflationary pressures are also evident in some emerging countries that have a current account surplus. This is notably the case with Russia. Although high inflation there is largely explained by high food prices, a recurrent lack of investment is eroding the country's productive fabric, putting pressure on prices. In China, inflationary pressures are not obvious at first sight. But property prices are still rising fast. The rate of increase is even accelerating in some cities, and house prices are one of the authorities' main concerns. In these economies, no major external imbalances have been generated by abundant global liquidity because they export on a large scale (oil from Russia, manufactured goods from China). But there are latent domestic inflationary imbalances.

If there was a sudden aversion to emerging risk, countries facing upward pressure on prices could be seen as particularly risky. Of course this is not a major risk (one that could cause a currency crisis) while the country is running a trade surplus (China, Russia), but it could still generate a certain amount of financial volatility, forcing the authorities in these economies to act when faced with a sudden withdrawal of foreign capital. For countries with a current account deficit, the emergence of inflationary pressures is likely to accelerate the withdrawal of capital and do rapid damage to their financial solidity.



* Jan-Oct 2013/Jan-Oct 2012
Source: national

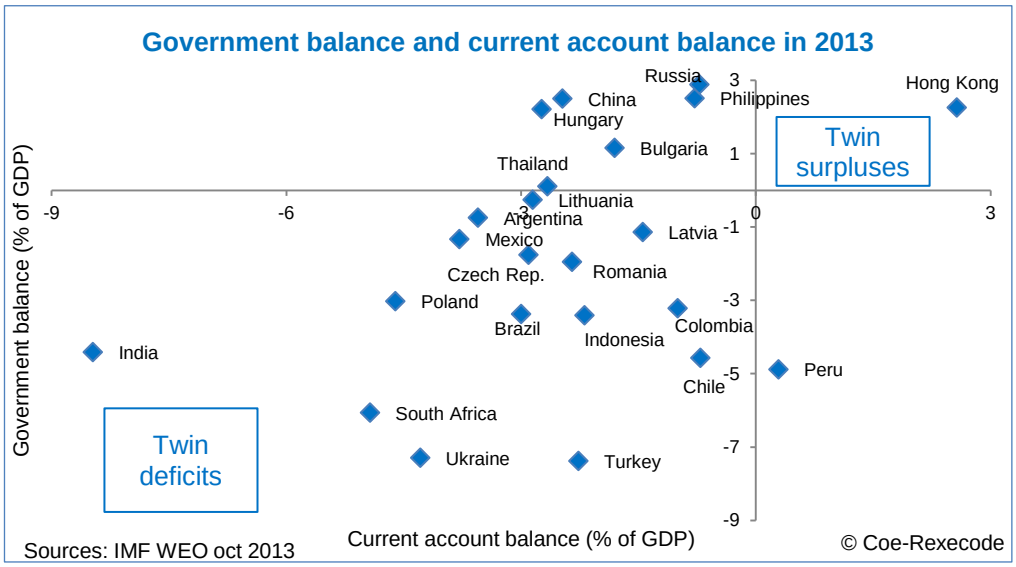
Twin deficits

As in the past, concern could arise as a result of deteriorating public accounts in emerging countries. The public finances of the Eastern European countries seem to be in a particularly bad way, with fiscal stimulus plans in 2008-2009 combined with a slow (or indeed zero) recovery of activity after the crisis having eaten into the public accounts on a large scale. These countries have also been affected by the sovereign debt crisis in the euro area (withdrawal of the banks, sluggishness of exports), which has severely constrained activity

and curbed efforts to improve their public finances. Despite everything, these economies are generally still pursuing fiscal consolidation, with ambitious targets for deficit reduction and for stabilising public debt.

Aside from the Eastern European countries, the public finances of the emerging countries generally seem to be fairly healthy, despite the fact that recent developments could prove to be a cause for concern. According to the IMF's latest estimates, government deficit expressed as a percentage of GDP is particularly high in Venezuela (15%), India (8.5%), South Africa (5%), Poland (4.6%), Malaysia (4.3%) and Ukraine (4.3%). It is also high, but less pronounced, in Mexico (3.8%), Argentina (3.5%), Taiwan (3.1%) and Brazil (3%). All the other countries had budget deficits below 3% of GDP or budget surpluses in 2013.

Of the countries with a government deficit above 3% of GDP, those with twin deficits (a fiscal deficit and a current account deficit) are the most exposed to turmoil on the international markets. As long as the external position of a country is in surplus, the government deficit can be financed by local agents, making it less vulnerable to reversals of foreign capital inflows. This is notably the case with Malaysia.



The situation in Argentina seems more worrying. There, the current account balance is heading into the red. Argentina's budget deficit is monetised on a vast scale by its central bank, putting pressure on prices. Foreign capital only plays a small part in financing the government deficit. Furthermore, Argentina has not regained access to the international financial markets on the grounds that it is still in dispute with some of its creditors following its default in 2001. So despite having a small external deficit, Argentina suffers from some profound imbalances, which fuel the risk of financial instability.
Mexico and Brazil also have twin deficits, but their positions still seem to be under control. Their current account deficits remain very small. Financing of the budgets of South Africa, Ukraine, and especially India is the real cause for concern. This is particularly vulnerable to a reversal of capital inflows because of the external deficit of these countries with respect to the rest of the world. If global liquidity were to suddenly dry up, monetising these budget deficits seems an unlikely and fairly risky thing to do because of the inflationary pressure this could cause, bearing in mind that prices are already rising fairly strongly in these three

economies. The most likely scenario would be that interest rates would be increased on government bonds, forcing the authorities to reduce the government deficit.

External vulnerability of the emerging countries

To sum up, the emerging countries most vulnerable to a sudden withdrawal of foreign capital are those running a current account deficit. If global liquidity were to dry up, this would tighten up the conditions for accessing external finance for these countries (in terms of both amount and cost), making it difficult for them to finance their external deficit. This applies particularly to India, South Africa, Indonesia, Turkey, Ukraine and Brazil. This vulnerability obviously depends to a large extent on the resources available to the countries' monetary authorities for dealing with a massive capital reversal (their reserve currency). Sensitivity to large-scale foreign capital reversals can also be accentuated by domestic macroeconomic imbalances such as inflationary pressure (Brazil, India, South Africa, Turkey) or degraded public finances (India, South Africa, Ukraine).

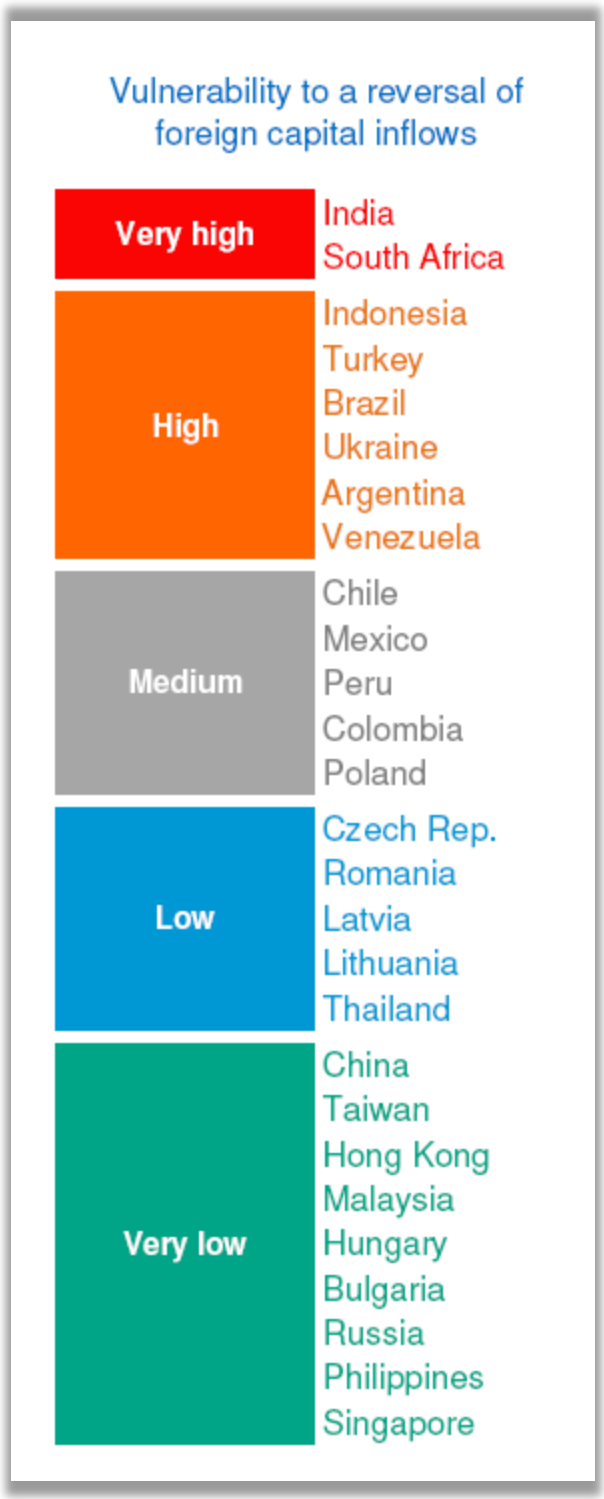
Emerging economies with a current account surplus (Venezuela) or only a slight current account deficit (Argentina) are at increasing risk of instability because their external position is rapidly deteriorating as their reserve currency dries up. Often they are also beset by upward pressure on prices and deteriorating public accounts.

Finally, we have seen how vast capital inflows into some emerging economies in the last few months have made domestic imbalances worse, though without actually causing a current account deficit. Inflationary pressures in Russia and property prices in China are good examples of this. Debt levels of resident non-financial agents (particularly local authorities) and the threats associated with the development of 'shadow banking' are also causing the Chinese authorities concern.

In the light of this analysis, India and South Africa look like the countries most at risk from a reversal of foreign capital inflows, followed by Indonesia, Brazil, Turkey and Ukraine. The rapid deterioration of their external positions means that Argentina and Venezuela are also very vulnerable.

The other Latin American countries (Chile, Mexico, Peru, Colombia) seem less vulnerable. They are running current account deficits, but they have comfortable reserve currency levels. Their public accounts are fairly healthy and inflationary pressure is under control. Poland also features in this category. Poland does have a current account deficit and its public finances are still in a poor state, but its remarkable correction of its external imbalances (trade balance now in surplus, rapid reduction of current account deficit) in the last few years suggests that Poland is much less vulnerable than it was to a sudden withdrawal of foreign capital.

Finally, countries running slight current account deficits or current account surpluses, whose macroeconomic imbalances are non-existent, under control or in the process of correction, are exposed very little or hardly at all to the risks of a scenario of this kind.


Vulnerability to a reversal of foreign capital inflows
Very high
India
South Africa
High
Indonesia
Turkey
Brazil
Ukraine
Argentina
Venezuela
Medium
Chile
Mexico
Peru
Colombia
Poland
Low
Czech Rep.
Romania
Latvia
Lithuania
Thailand
Very low
China
Taiwan
Hong Kong
Malaysia
Hungary
Bulgaria
Russia
Philippines
Singapore

4 – Equity markets and potential growth in the United States[11]

CATHERINE BRUNEAU[12] AND JEAN-PAUL NICOLAÏ[13,14]

In December 2013, the start of tapering (a gradual reduction in bond purchases) by the Federal Reserve prompted equity markets to rise where, six months earlier, the announcement of tapering had caused international financial markets to falter. How should we interpret this? Have share prices been artificially inflated by the liquidities resulting from unconventional policies? To answer these questions, we need to understand what the fundamentals of equity markets are and, more specifically, what role is played by expected future growth. To do this we have empirically identified the fundamental value of the S&P500 index from 1970 to the present. GDP (seen as national income) and long-term interest rates seem to be the two factors that determine this fundamental value. Alongside these there is a third—unobservable—factor, as for example the Gordon-Shapiro model shows, and this is the difference between the risk premium and expected future growth. The 'ex ante' risk premium π is the premium demanded by equity investors; the expected future growth can be explained as the trend potential of the US economy as viewed by these investors (expected growth rate, g). In our model, we take the view that only rare and lasting changes in expectations can alter the fundamental value of the stock exchange index; it therefore seems appropriate to include the possibility of changes in this value on the dates of so-called 'structural breaks'. There have been only a limited number of these over the last 50 years, which is the period we are looking at. These sporadic changes are on top of the changes due to the constant evolution of observed determinants such as GDP and interest rates.

It is generally accepted that the market fluctuates around this fundamental value as natural adjustments take place within the market, but it has a force that always draws the market back towards it. However, the fundamental value itself changes because of variations in its determinants.

Looking at long-term interest rates is particularly important in this regard if we are referring to the unconventional policies of quantitative easing and the recently-observed beginnings of tapering. In some ways it would almost be possible to say that long-term rates are dictated by the Fed in the same way as money market rates (short-term rates) in the context of conventional monetary policy; if we assume a certain regularity in the rate curve giving a stable spread between long-term and short-term rates over a long period of time, and if we believe that the short-term rate is an important instrument of 'conventional' monetary policy, we should expect long-term rates to react to inflation and growth—or to expected inflation—particularly via the difference between growth and potential growth, just as short-term rates do. GDP and inflation would then be fundamentals of long-term rates because their influence is permanent. As explained above, changes in inflation or growth expectations complete these fundamentals in the form of structural breaks.

[11] The authors would like to thank the reviewers for their comments and suggestions, particularly Stéphane Gallon and Philippe Humbert from the Caisse des Dépôts.
[12] PSE, Commissariat Général à la Stratégie et à la Prospective.
[13] Commissariat Général à la Stratégie et à la Prospective.

Consequently[15], the monetary authority can then influence future stock exchange evolutions not so much by providing liquidity to allow rates to stay low but by influencing expectations. Low rates allow the stock exchange to stay at high levels, which are now clearly overvalued in view of real growth. But this imbalance can be favourably resolved if unconventional monetary policy supports more optimistic expectations, with the result that potential growth is confirmed and/or the risk premium can fall. The fundamental value of the stock exchange index would then be mechanically increased.

There are then two discussions to be had: firstly about the exit strategy from this unconventional policy, which should allow time for the favourable expectations to bed down; and secondly, and more importantly, about the durability of US growth and about its own fundamentals.

Risk premiums and long-term growth

Prices are formed on a market by means of a testing process. It is therefore natural to expect a price to change over time around its fundamental value. If you start looking at a share index that is representative of a whole economy, like the S&P500, you need to look at what its fundamentals might be and what transitional forces make it oscillate around them. The diagnosis reached—overvaluation or undervaluation—will differ according to the size of these fluctuations, a characteristic of price formation.

Based on the assumption that share prices are dictated by economic fundamentals—the activity of companies, interest rate levels, etc.— we believe that there are long-term trends common to these prices and their determinants, which can be identified using statistical techniques. In other words, we are looking for a long-term relationship between these series; this relationship is considered to be a 'long-run equilibrium' because, over this length of time, only trends matter. This relationship, which expresses the level of share prices as a function of their fundamentals, defines the 'fundamental value' of the market prices.

We can use the Gordon-Shapiro model as a more specific reference for this. This model links the current value of an asset (share or index) with the expected future dividends and the expected yield of the asset. This expected yield is the sum of the so-called 'risk-free' interest rate (the yield of a treasury bond) and the (expected) risk premium, π.

In our study, the S&P share index rate is considered a function: of observable fundamentals—income received for holding shares, which is assumed to be directly linked to the GDP of the US[16], and the long-term interest rate; and non-observable fundamentals—the expected risk premium (π) and the expected growth rate of the dividends over the next few years or, based on our hypothesis, the expected growth of GDP (g). In fact, the Gordon-Shapiro formula says that it is the difference between these two expected variables (π-g)—the risk premium minus future growth—that matters when it comes to share price valuation.

[15]The arguments developed below are taken from a forthcoming working document of the Commissariat Général à la Stratégie et à la Prospective entitled 'Surévaluation des marchés et politique monétaire – Quelques effets du non-conventionnel', Catherine Bruneau and J-P Nicolaï.

[16] For this it should be assumed that the dividend distribution rate remains stable and the long-term trend for GDP is the same as the income of major US corporations. Obviously the increasing globalisation of US corporations makes their income dependent on growth in the rest of the world, but America's GDP is itself a function of this, which justifies our hypothesis as an initial approximation.

The index increases if GDP increases or if its expected growth increases, and dips if rates rise or the risk premium increases. Obviously this model is something of a blunt instrument, but it has the advantage of being particularly parsimonious.

The long-term relationship is never strictly observed at the current dates because there are always differences between the market listing and the fundamental value, though these differences are limited by the mechanism explained above, which draws the listing towards the fundamental value. The long-term balance in fact acts as a target and causes temporary fluctuations to correct these differences, in a kind of 'error-correction' mechanism. In some ways, it is the price formation mechanism, using a process of trial and error, which is at work. Every day new information comes along that disrupts the balance forming on the fundamental value and makes the market move again. By taking a step back, it is possible to see prices oscillating around their fundamental value over time.

Meanwhile, the fundamental value does not remain static; from a macroeconomic point of view it changes whenever GDP changes or whenever rates change. It also alters if new information comes along that challenges the 'fundamental' expectations of economic agents, causing either the risk premium or growth forecasts to change.

As we explained earlier, the idea behind our approach—corroborated empirically—is that significant changes in these non-observable 'fundamental' variables are rare. We call them structural changes to the 'long-term target' around which the market fluctuates and we associate them with lasting changes in expectations.

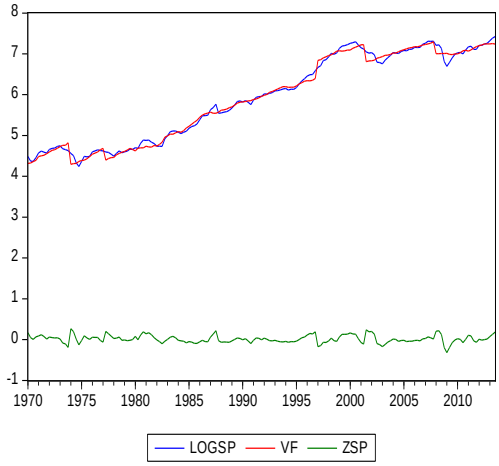
In our process, the non-observable series (π-g), corresponding to expectations, is modelled as a series of persistent shocks at key dates in economic and financial history, in other words a step function in which the steps are irregular and can go up and down. Ultimately the fundamental value of the index is expressed as a function of GDP, long-term interest rates and a succession of breaks at dates to be identified. The identification process, and the estimation of the coefficients affecting each of these variables, require special econometric techniques. In effect an inference has to be drawn from non-stationary variables in a context of structural breaks, which means building ad-hoc tables of statistical tests (see working document).

The results obtained show that the elasticity of the index to economic growth is greater than 1, which is fairly normal (the revenue of listed companies is itself more elastic than GDP to the economic situation[17]): all things being equal, one extra percentage point of economic growth increases the share index by 1.4%. Moreover, a drop of 100 basis points in long-term rates causes a 4.4% rise in the fundamental value of stock market prices.

Finally, only five structural breaks have been identified in more than forty years: in the first quarter of 1974, the second quarter of 1977, the first quarter of 1997, the third quarter of 2001 and the first quarter of 2008. We do have a parsimonious representation of the fundamental value of stock market prices. The graph below shows the change in the index (as a logarithm: LOGSP) and its fundamental value (VF) over the whole period and the difference between these two variables (ZSP):

[17] An elasticity other than 1 raises the long-term issue that more than 100% of national income cannot be distributed! Taking account of income from the GDP of other countries could justify the coefficient of 1.4. There are two other possible hypotheses though: completely rational investors hold an 'endogenous growth' representation of the economy; or totally short-sighted investors have too much of a bias towards the short term. We will leave it to readers to make up their minds.

Graph 1



All the structural breaks, except the one in 1997Q1, correspond to a drop in the average level of the fundamental value of the index, which should be associated with an increase in the risk premium and/or a reduction in the expected growth rate of the economy. It is reasonable to see such movements in 1974Q1, after the first oil crisis, in 2001Q3 after the dotcom bubble burst, and finally in 2008Q1 at the time of the latest crisis. The effects of the 1987 crash did not last long enough to statistically justify its categorisation as a break. The break in 1977Q2 can be explained by tensions over nuclear disarmament in March, when the US defence budget was reduced, by the policies of the new American President (the Democrat, Jimmy Carter) and perceptions of these policies in business circles, and by political developments in Libya and sub-Saharan Africa.

As far as 1997Q1 is concerned, the positive sign of the break coefficient indicates optimistic expectations for the second half of the 1990s. The period 1996Q1 to 1999Q2 is often referred to as the 'long boom'. Inflation was then contained (at between 2% and 3% per year), and there was sustained growth in GDP (of 4.4% per annum from 1996 to 1999) and a drop in unemployment (from 5.6% at the start of 1996 to 4% in 1999), all of which gave cause for optimism. This was the period of the 'new age' and globalisation, dominated by expectations of potential growth and risk reduction. The 2001 break compensated for the 1997 break very precisely.

Today the index appears to be well above its fundamental value. The overvaluation is not as big, but it is confirmed by studying the temporary fluctuations around the fundamental value by means of a detailed econometric analysis of the dynamics of the three-variable system (GDP, long-term rates, share index), particularly the direct and indirect effects on each other, often apparent later on, of the different variables (this 'impulse response' causality analysis is available in the working document referred to above).

The 'disappearance' of the 2008 structural break caused by a further change in expectations (risk premium minus potential growth), which was the same size but in the opposite direction, reset the market to its 'correct' value by cancelling out the apparent overvaluation, and could be interpreted as a permanent recovery from the crisis. However, despite everything, at the end of 2013 the statistical indicators for a structural break having occurred were not significant enough to confirm that a rebalancing of this kind had taken place.

Term spread and monetary policy

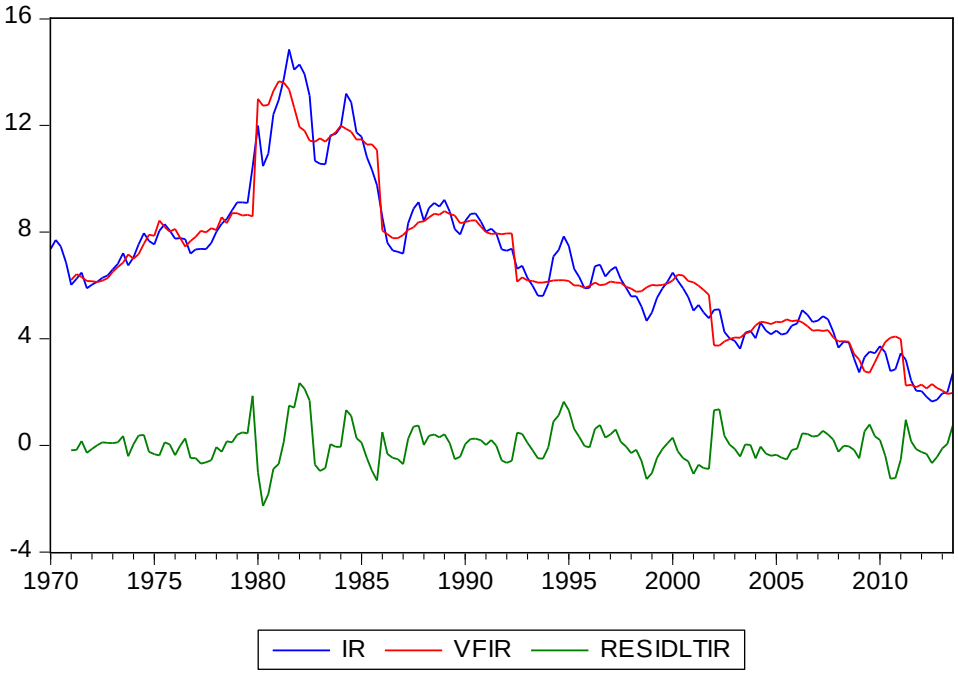
The rebalancing also depends on the level of long-term rates in the next few quarters. The fundamentals traditionally used to describe changes in long-term rates are short-term interest rates, in a relationship known as the 'yield curve'. Holding a security for a long period of time is achieved by rolling forward a position on a shorter security. Ignoring the risks of altering short-term rates, the stability of the spread between long-term and short-term rates should be close to zero. However, uncertainty still means that a 'term spread' still appears; the term spread depends on what the agents are expecting to happen and therefore on the determinants of monetary policy, which are generally inflation and expected inflation through growth or through the difference between growth and potential growth. Besides the 'yield curve' relationship, there is also a relationship between short-term rates, inflation and growth This models the 'best response' of the monetary authorities, which raise or lower short-term rates depending on inflation and expected inflation. The 'reduced' equation (in which the short-term rate is replaced in the yield curve function by its fundamentals) then gives growth and inflation as the fundamentals of long-term rates.

In addition to these fundamentals there are variables that represent supply and demand in securities. Sometimes government deficit, or the current deficit and the exchange rate, are used, indicating a need for financing by foreign investors, etc. The idea here is to check whether a long-term relationship can be identified that specifies the long-term rate as a 'best response function', as normally happens with a short-term rate, generally considered to be a monetary policy instrument. A representation in which the long-term rate is a function of inflation and growth (and non-observable expected variables) could therefore be interpreted as a reduced form of a yield curve and a best response function for monetary policy, and in recent times possibly as a best response function directly for the monetary authorities. The so-called 'unconventional' intervention by the monetary authorities encourages such an interpretation: the policy of purchasing government securities enables the Federal Reserve (to a certain extent) to set the level of long-term rates. This approach has been used before, at the start of the 1990s, during the Savings and Loan crisis. At the time, the asset price targeting strategy was discussed as part of a macroprudential policy approach to supervising different asset prices to avoid bubbles or credit crunches.

The fundamental value of long-term rates is ultimately established as a function of the growth rate of nominal GDP and of the inflation rate (both on a year-on-year basis). Breaks in level and trend are introduced on the same basis as described for the share index rate. These breaks can be interpreted as structural changes: in the term spread, the expected potential growth rate and expected inflation.

The fundamental relationship for long-term rates estimated econometrically gives the following results (see working document for details): the coefficients of the (nominal) GDP growth rate and inflation rate variables are positive (giving greater weight to price than to volume). An inflation percentage point is still not reflected in the long term unless there is an increase in the long-term rates of around ½ percentage point (real rates fall if there is high inflation). One percentage point of growth produces an increase in long-term rates of little more than a tenth of a percentage point. The graph below shows the change in the long-term rate and its fundamental value over the whole period.

Graph 2: 10-year bond yield, its fundamental and the associated spread variable



As far as structural breaks are concerned, impacts that increase fundamental value only occurred before 1981, the year in which the downward trend for rates (and inflation), which continues to the present day, began. The first two structural breaks, in 1975Q2 and 1980Q1, followed the two oil crises. The second crisis was the biggest, producing an increase of more than 400 basis points. Both crises are naturally interpreted as an increase in expectations of inflation (possibly via a decrease in production potential).

From 1981, we see only reductions in the fundamental value when the breaks occur:

- 1986Q1: oil counter-shock, with a major reduction in expected inflation and therefore long-term rates (300 basis points, the biggest during the 1980s and 90s).
- 1992Q3 : another major structural reduction (200 basis points) associated with recession in the United States following the Gulf War: The Fed cut rates from 6% in mid-1991 to 3% in October 1992 because unemployment was continuing to rise even though activity had started to improve (a 'jobless recovery'). Expectations had then flipped from a renewed increase in inflation linked to a recovery of activity to one of a return to growth without inflation returning. This was the start of a change of paradigm for many analysts, who were surprised throughout the 1990s that the monetary authorities carried on fighting a battle that no longer needed to be fought.
- 2002Q1: bursting of the dotcom bubble, end of the 'new age', and downwards revision of potential growth and expected inflation: a structural drop of 170 basis points.
- 2011Q2: this marked the start of QE2 and the announcements hinting that it would last as long as necessary. It is worth noting that, although QE2 officially ended in June 2012, QE continued and transitioned smoothly into QE3.

Interestingly, the first QE programme did not come at the start of the crisis period. However, it seems that, during this period, the programme had been a response to a fundamental

change that already justified a rate reduction. Furthermore, increases in public spending and the advent of a new President prompted movements aimed more at an increase in long-term rates.

Entering the winter of 2013/2014, long-term rates were slightly above their fundamental value; bond overvaluation (long-term rates below their fundamental value) had been corrected following the announcement in the spring of 2013 that QE would soon be brought to an end. The complete disappearance of QE could still correspond to the disappearance of the effect highlighted in the last break identified econometrically, which would effectively mean a 180-basis point correction of the fundamental could be expected. Another way of estimating the negative effect of tapering would be to simulate up to the present time the fundamental value estimated for the pre-crisis period. This gives a smaller bond overvaluation and a risk of a long-term rate rise of only 110 basis points. If we assume that this summer's correction of around ¾ of a percentage point has taken us some way along the road, we can—barring overshooting—expect an adjustment of only 105 basis points, or even 35 basis points, depending on the calculation used. All things being equal, the truth is probably somewhere in between these two figures. Operators might find this range rather wide, but a more precise diagnosis is not easy to do.

Adjustments of this kind have a moderate impact on equity markets, because of the elasticity we have identified: they correspond to variations in the fundamental value of the S&P share index of between 2 and 5%. Moreover, movement can be quite slow, lagging behind by as much as three quarters of a year (as was the case, for example, with the bond market crash in March 1987 and the stock market crash in October of the same year). The bond rate correction can also serve as a trigger if expectations should be radically altered.

Exit strategy and potential growth

The Federal Reserve announced in December that it was beginning its exit from QE at the rate of 10 billion less per month, starting from the 85 billion per month figure current in 2013. It stressed that this rate could be altered—or even reversed—depending on macroeconomic indicators, particularly those for employment. It also pushed back the unemployment rate target (from 6.5% to 6%) that would trigger the normalisation of monetary policy (an increase in money market rates). Finally, it emphasised qualitative aspects, particularly concerning the labour market (long-term unemployment, participation rates, etc.). This news was welcomed by the equity market; the bond market registered only a modest adjustment. This is a favourable situation if it offers both the time and the opportunity for expectations of future growth and a drop in the risk premium demanded on equity markets to take root.

However, nothing can be taken for granted. Risks are currently being reduced by this programmed normalisation, and by the first progress on the budget made between democrats and conservatives. But the global economy has not really regained its pre-crisis momentum and there are still many destabilising factors. Japanese strategy (Abenomics) is risky, Europe is not entirely reassured, and China and some of the other major emerging economies are trying to find a second wind. The risk premium demanded for an equity investment should remain high, if only because the pension investment portfolios of US investors have suffered and in some cases have not been reconstituted.

But above all, the potential growth of the US economy may be scarred by the crisis for some time to come. The growth figures for the third quarter of 2013 show a certain amount of vigour, but the contribution from inventories was quite high and the contribution from

investments in equipment and household consumption remained modest. More fundamentally, we have pointed out elsewhere[18] the spectacular rise in the long-term unemployment rate caused by the crisis in the United States. Now, hysteresis is fuelled specifically by long-term unemployment. An increase in the number of 'discouraged' unemployed, which weakens the growth rate of the active population, and a reduction in the productivity of those who find a job again after a long period out of work, are two major sources of loss of potential. Fracking may counteract a reduction of this kind in potential growth linked to labour, but in order to properly bed down the exit from the crisis, which would justify a structural break eliminating the effects of 2008 and restoring solid prospects of upward movement to equity markets, employment has to be normalised, and the US monetary authorities have realised this.

[18] Nicolaï (2013) 'Quatre ans de crises : quelles conséquences macro et micro-économiques ?' in 'Quel avenir pour la Protection sociale ?' Proceedings of the EN3S symposium, 2013

5 – A survey of the potential risks following a property market crash

STÉPHANE GALLON, PASCAL CORET AND SYLVAIN BAILLEHACHE[19]
Caisse des Dépôts et Consignations

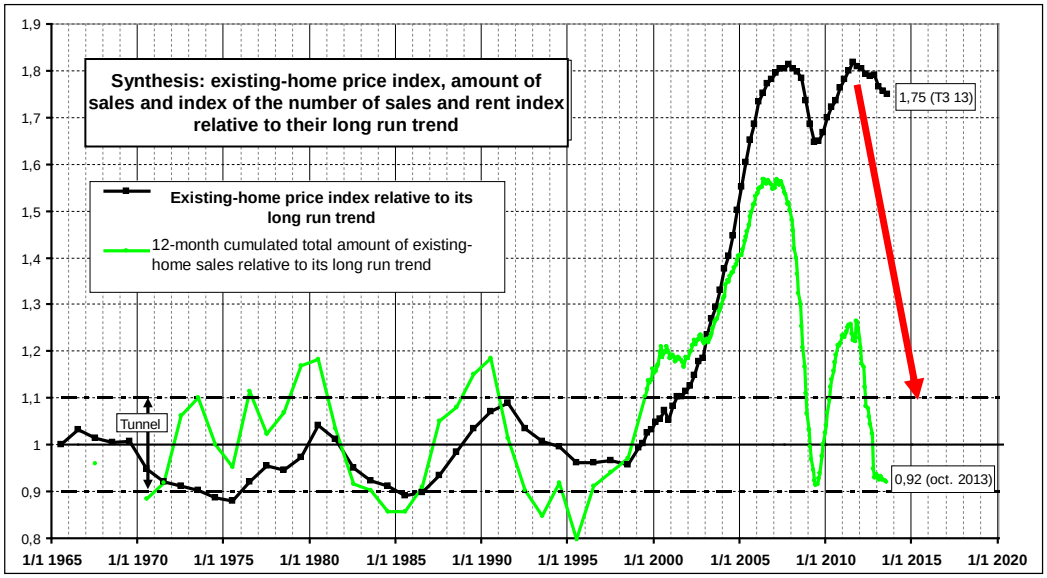
In France, house prices increased by more than 70% in real terms between 2000 and the third quarter of 2013. This growth was much higher than growth in household incomes over the same period (less than 20%), fuelling fears that the high prices are unsustainable. Following the quantification of a property price crash scenario, the economic and financial consequences described in this study enable us to examine the impact of this scenario and the associated risks for the financial sector.

1. The extreme risk scenario of a 50% fall in real property prices over 5 years.

In order to quantify a house price crash, our first step should be to look at baseline studies by international institutions. In its 2006 study, *Recent House Price Developments: The Role of Fundamentals*, the OECD estimated that the downward phase of the property cycle in France would normally be characterised by a fall in prices by 18% in real terms, with the fall spread over 5 years. The IMF, in its *World Economic Outlook* in April 2009, believed that prices in France were overvalued by around 25% in 2008; prices in 2013 are at the same level in real terms as prices were in 2008.

A more significant drop can be envisaged if we look at the 'Friggit tunnel', as the figure below shows. House prices in France in relation to household income oscillated (within about 10%) around an average that had been stable since 1970; this is referred to as a 'tunnel'. That was the case until 2001, when prices broke out of this band and soared to record levels. If the ratio of prices to income was to return to this band, prices would have to fall by between just under 40% and 50% in real terms (assuming household income was constant in real terms). This change is shown by the red arrow on the graph below.

[19] The views expressed in this analysis are the authors' personal views and do not necessarily reflect the position of the Caisse des Dépôts et Consignations. All copying, distribution or reproduction of this study, in full or in part, requires express prior written agreement from the AMF.



Source: CGEDD after Tax Department, INSEE, notaries' databases, seasonally adjusted Notaires-INSEE indices. About existing-home sale price, amount and number, see § 2 of this file about property prices in France in the long run (in English) and § 2.3.1.1., 5.1.2. and 5.2.1. of this paper about house prices in France in the long run (in French). About the relative growth of income per household and rents in France, see this paper about Rents and Income per Household since 1970 (in French).

One criticism of the 'tunnel' concept is that it fails to take account of credit conditions when assessing house price levels: longer loan terms or lower interest rates can justify higher prices with constant household incomes. The variables generally used in the literature for simulating house prices add to household incomes minima for interest rates and maxima for other indicators of supply of credit. A house price model taking account of these extra variables can be used to build a stress scenario based on the reversal of these variables (for example, a sudden rise in interest rates accompanied by a shortening of loan terms). This gives a slightly more moderate fall in house prices of 30%.

Lastly, we can look at house price crashes in other countries. In Ireland, there was a 100% rise in nominal house prices from 2000 to 2007, followed by a 50% fall from 2007 to 2012[20] (this brought nominal house prices in 2012 back down to 2000 levels). In the US, a recent article by the NBER[21] reveals house price falls of around 50% in real terms over several decades. Although other countries' experiences cannot directly be extrapolated to France (notably because some were preceded by excess construction and others were not), according to the NBER[22] there was a 50% fall in real terms in France between 1935 and 1941.

Suppose we imagine a 50% fall in house prices in France over a period of 5 years. This is an extreme scenario—a stress test—affecting the whole country equally[23]. As for rents, we know that these are much more stable in France than prices; in France it is prices that shift when rental returns diverge from their long-term trend. Suppose we assume that this price

[20] In real terms, this is also a drop of around 50%, since average inflation in Ireland was almost zero between 2007 and 2012.
[21] A Nation Of Gamblers: Real Estate Speculation And American History Edward L. Glaeser, NBER Working Paper No. 18825, February 2013.
[22] What explains house price booms?; history and empirical evidence Michael D. Bordo & Johan Landon-Lane, NBER Working Paper No. 19584, October 2013.
[23] The atypical increase in the house price/income ratio shown by the 'Friggit tunnel' appears to apply to the whole of France (broken down by region, which is the smallest geographical unit for which INSEE/notarial price indexes are available).

adjustment will take place without any impact on rents, causing an increase in rental returns. We will ignore the effects on new-build house prices[24] and we will not discuss here any factors linked to non-residential property, particularly offices.

2. Financial and economic consequences

Effect on financial institutions

Because it provides most of the finance for housing in France, we should now look at the banking system and try to imagine what impact this fall in the value of the collateral for property lending would have.

We will start with a simulation based on simple but realistic hypotheses.
Imagine that every year a bank grants the same amount of loans with constant annual payments (constant L+i), a 15-year term and a Loan to Value (LTV) of 85%.

Before the price crash, the average maturity of all the loans is 7.5 years, with 58% of the loan capital reimbursed. The bank's exposure is therefore 85%*(1 - 58%), or 35.7% of the original average value of the assets across its whole portfolio.

The important variable here is of course the LTV rate, which expresses how commercially aggressive the bank has been and its level of confidence. It can be seen historically that, for a given market, the default rates on loans increase in line with the LTV rate. The repayment method of the loan also matters. The norm in France of starting to repay the capital from the very first instalment gives the bank greater protection than repayment of the capital at the end, which is often the case in the Netherlands for example.

In other words, unless the bank changes its behaviour (maintenance of conservative lending practices over a long period of time), there will have to be a 2/3 fall in the price of the assets in one year for the bank's balance sheet to be affected.

Obviously this type of calculation does not take account of the fact that only a small proportion of loans will be defaulted on. This is the leading risk carried by the bank.

The fact that most mortgage lending in France is on a fixed-rate basis, the limit on the debt that can be taken on as a ratio of borrowing household income, the impossibility of abandoning the asset or the loan in cases of negative equity[25] are all factors that reduce the risk of default compared with other markets.

However, this broad-brush approach based on total loans does not take account of the recent behaviour of French banks as regards property market lending. Although French banks overall do less property lending (relative to the size of their balance sheets) than their European counterparts, they have significantly increased their exposure in recent years: between December 2006 (pre-crisis) and November 2013, it rose from €570 to 876 billion, meaning that French banks alone were the source of nearly half of the increase in property lending in the euro area.

[24] Based on past observations, new-build house prices would also adjust downwards, but to a lesser extent than those of the existing housing stock.
[25] In France, unlike in the USA, the borrower is still liable for the loan even if the asset is sold or seized by the bank, if the asset value is less than the amount for repayment.

	Property loans (€ billions)	property loans/total assets		Variation in property lending
		Nov-13	Dec-06	
Euro area	3858	12.3%	12.3%	20.4%
France	876	10.6%	9.2%	53.7%
Germany	1020	13.2%	13.6%	4.5%
Spain	612	19.0%	21.8%	10.9%
Netherlands	389	16.7%	20.1%	5.1%

Source: ECB, CDC calculations

We can therefore assume that a significant number of property loans on the balance sheets of French banks were granted on the basis of high valuations of the underlying assets. We know historically that the most recent loans are at the greatest risk of default.

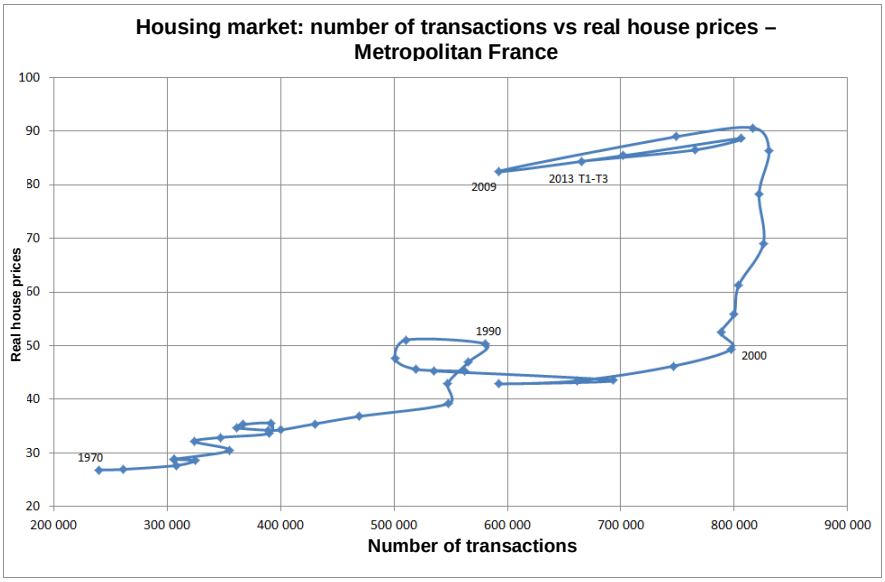
This increase in property loan exposure is undoubtedly linked to the development of the mortgage bonds market. While these bonds leave the underlying loans on the asset side of bank balance sheets, they make the investors carry the risk. But mortgage bonds are a long way from refinancing all loan production, and transparency surrounding the composition of loan pools is still not adequate so the markets, because they are not exactly sure where the risk lies, would probably associate high risk premiums with both mortgage bonds and bank signature loans.

It should be remembered that at the height of the recent crisis, the ECB's first asset purchase programme was on Pfandbriefe since the market in them was practically closed, even though collateralised bank debt could be considered fundamentally safe.

So at this stage, a housing price crash would not have a major impact on bank balance sheets, and any impact would depend on the procyclical nature of the granting of bank loans in recent years. The same would apply to insurers, who bear the housing risk directly: with an investment smoothed over a long period they would only be exposed on recent flows, since the sharp rise at the start of the 2000s would have protected earlier purchases (if the crash followed a period of price stability, the risk would be different). In addition, it appears that, in France, insurers made the most of this rise to reduce their holdings in this asset class.
We should remember particularly that the default rate on loans is the discriminating variable, because it determines both the real impact on bank balance sheets and the risk premium, which markets will be particularly keen to associate with banking risk when they are not sure exactly where it lies.

In other words, house price risk could amount in practice to a risk to bank liquidity, and by this means it can also spread to the rest of the economy.

Effect on the public finances: conveyance tax, capital gains, etc.
A fall in house prices will naturally erode tax receipts from the taxation of capital gains. The more the number of transactions would be reduced by a price crash, the bigger the impact on the public finances would be. In France, a drop in the number of transactions generally precedes a fall in prices, as the graph below shows.



A crash would therefore mean a contraction in both volumes and prices, and this would have a major impact, in terms of both volumes and prices, on local public finances via conveyance tax. For example, if there is a drop in the number of transactions similar to the one in 2008-2009 (from approximately 750,000 to 590,000 transactions per year), receipts from conveyance tax will fall by around 10% (from €20.6 billion to €18.4 billion per year). This could affect local authorities' finances and indirectly affect their investment capability and their ability to borrow.

Effect on demand (consumption, investment)

In the real economy, it does not look like a housing market crash would have a big impact on the consumption of French households, which to date has never been sensitive to the wealth effect, as a recent review of the literature by Valérie Chauvin and John Muellbauer[26] shows. Their work even suggests that there is a negative wealth effect in France, explained by an increase in saving by those wanting to enter the housing market when housing prices are rising. In any case it seems uncontentious to assume that the wealth effect would be limited. In addition, as explained above, the risk of households defaulting on their property loans also appears to be low. Anyway, this risk has more to do with the reasons for house prices falling in the first place than with the house price fall itself (a recession combined with a big rise in unemployment presents a greater risk than a simple adjustment of the housing market alone).

As far as investment in property is concerned, a fall in house prices would probably encourage people to put off their decision to invest. Although it accounts for only a small share of GDP (just under 6%), investment by households could therefore exert downward pressure on growth. For example in 2009 it contracted by 12%, automatically shaving 0.7 percentage points off growth and probably more if indirect effects are taken into consideration (for example through the impact on the construction sector and property services). One possible resilience factor could be the lack of physical overinvestment prior to

[26] Consumption, household portfolios and the housing market: a flow of funds approach for France. Valérie Chavin & John Muellbauer. ECB Conference. 1-{}-7 September 2013.

the crash, which was not the case in Spain, for example. Households could therefore turn more towards financial saving.

* *
*

Overall, a housing market crash in France would be nothing like the kinds of crashes seen in other countries: the direct impact on financial institutions and household consumption would be minimal, and the impact on the public finances would be limited. But the indirect effects on risk premiums and therefore the liquidity of the banking system would be significant, and similarly GDP would be affected by a depressed construction sector and weak investment in housing.

6 – Less bank financing and more market financing: what new issues – and risks – does that present?

CLÉMENTINE GALLES – SOCIÉTÉ GÉNÉRALE[27]

The way in which economic activity is financed has changed significantly since the economic and financial crisis. New constraints have emerged and prudential rules have been tightened, thus reducing the lending ability of banks, particularly European banks'. Market financing thus plays an increasingly important role in financing non-financial companies.[28] The interest rate context, characterized by very low rates resulting from extremely accommodating monetary policies overall, has also encouraged this shift by stimulating demand for the issuance of private debt. This shift from intermediated (bank) financing towards greater direct (market) financing is generally referred to as "disintermediation."

This process of financial disintermediation has observed since 2008 at several levels. First, cross-border bank financing has dropped sharply overall in terms of inter-country capital flows. In response to this decline, large companies in emerging countries are turning increasingly to the bond markets to finance their external debt. Disintermediation in developed countries is particularly visible in the Eurozone, specifically in France. Before the crisis, banks played a dominant role in financing non-financial companies in the monetary union, contrary to the long-standing situation in the United States. Today, the reduction in their financing capacity is transforming corporate finance there.

The first part of this paper presents a status report on this disintermediation process to illustrate its breadth. The second part lays out the factors that may speed or slow this process in the short- and medium-term; specifically, the impact of future regulatory changes. The last part highlights the new issues and risks inherent in this transformation in corporate finance.

1 – How have financing models changed since the financial crisis?

After the financial crisis and the prudential tightening that followed, banks faced changes leading them to modify their role in the financing of economic activity. Banks in developed countries had to quickly reduce the size of their balance sheet and change its composition by deleveraging. When the crisis turned into a sovereign debt crisis in the Eurozone, pressure grew on the funding of European banks, thus encouraging continued deleveraging. We will show first that this process affected the composition of cross-border financing, with European banks playing a significant role. We will then focus on its impact on corporate finance within Eurozone countries and, particularly, in France.

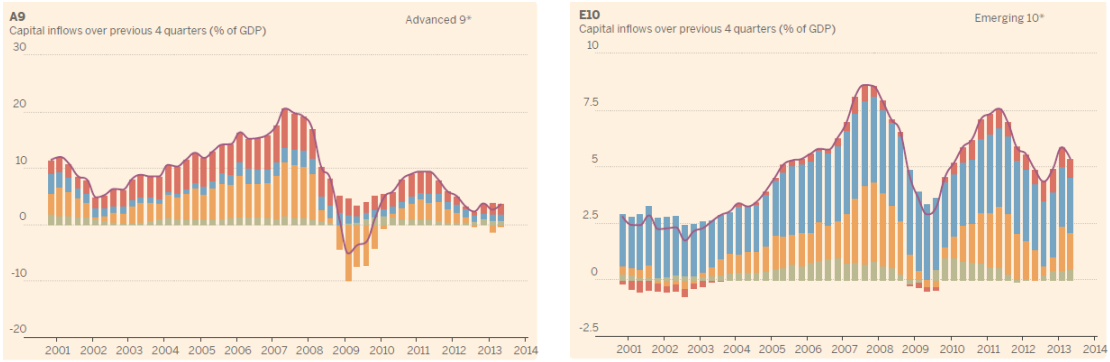
[27] The views expressed in this study are the authors' personal views and do not necessarily reflect the position of Société Générale. All copying, distribution or reproduction of this study, in full or in part, requires express prior written agreement from the AMF.

[28] States remain financed largely by the bond markets, while household debt is still primarily in the form of bank lending.

1.1 – Disintermediation can be seen in cross-border capital flows

Graph 1 shows the change in capital flows worldwide. The immediate observation is that five years after the crisis, capital flows remain at levels sharply below those of 2007.[29] Another important observation concerns the change in the composition of these flows. The markets have financed an increasingly large share of debt since 2007, at the expense of bank lending. Cross-border bank lending has fallen since the crisis, while bond financing – which had dropped in 2008 – rose again quickly. However, this overall change in flows obscures large disparities between emerging and developed markets that should be analysed.

Graph 1: Change in capital flows

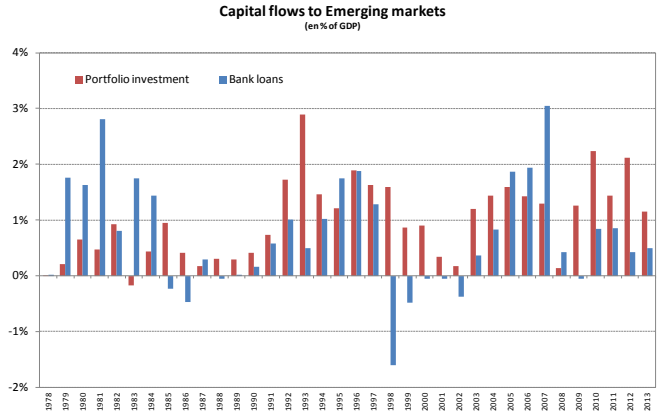


Captions: Red: bonds; Blue: direct foreign investment; Orange: other investment (primarily bank lending); Green: shares.
Source: FT article referred to in the footnote on page 2.
The graph on the left shows capital flows for nine developed economies: Australia, Canada, France, Germany, Italy, Japan, South Korea, the United Kingdom and the United States. The graph on the right shows capital flows for 10 emerging economies: Argentina, Brazil, China, India, Indonesia, Mexico, Russia, Saudi Arabia, South Africa and Turkey.

Cross-border bank lending nearly stabilized **among emerging markets as a whole** during the crisis (see Graph 2) and has since resumed a moderate pace. Using data published by the Bank for International Settlements (BIS), we can analyse the change in the leading banks' exposure to emerging markets. On one hand, the exposure of European banks vis-à-vis these markets appears to have stabilized since 2010, while on the other, that of Japanese, U.S. and Australian banks increased slightly. Simultaneous with this moderate recovery in bank lending, emerging markets have benefited from strong portfolio flows as of 2008, with an increasingly large share of their financing via the markets. The zero interest rate policies adopted by the developed countries have stimulated demand for bond debt issued on emerging markets. They have increased the issuance of bond debt significantly since 2010 (see Shin (2013)).

[29] Cf. Committee on International Economic Policy and Reform (2013): "Banks and Capital Flows : Policy Challenges and Regulatory Responses" FT article (January 2014).

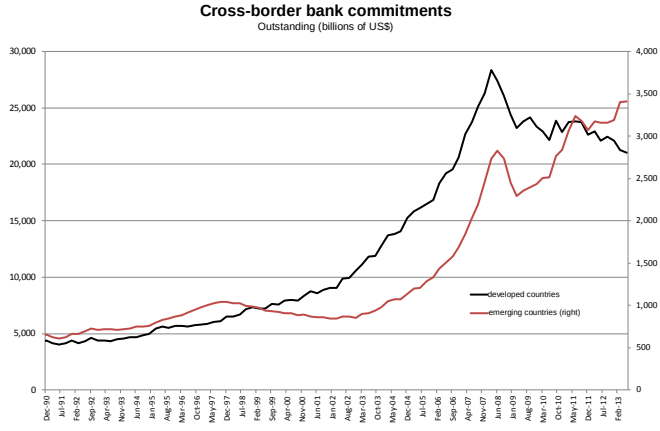
Graph 2



Source: IIF

With regard to capital flows to **developed markets**, the shift toward an increasingly large share of market financing has resulted primarily from a decline in cross-border bank lending. The development of the economic crisis and the prudential changes have led banks, particularly European, to reduce the size of their balance sheet (deleveraging). This is very visible in Graph 3, which shows a sharp decline in commitments among banks in developed markets. However, this decline in cross-border bank financing represents particularly a decline in commitments among banks, primarily European, with regard to interbank markets and the public debt.

Graph 3



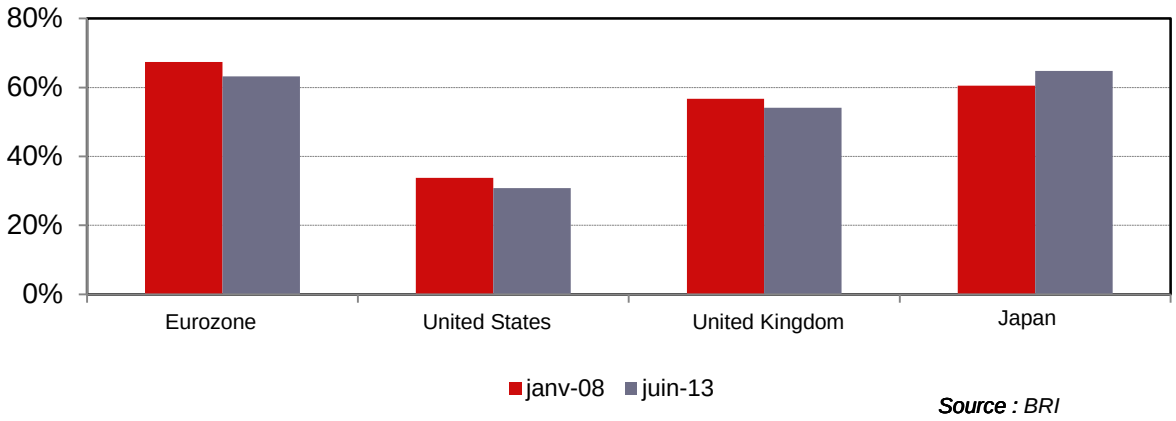
Source: BIS

1.2 – Disintermediation appears pronounced throughout the Eurozone, but varies by country

Beyond cross-border flows, the evolution of internal financing calls for a closer look. Graph 4 shows the change in the share of bank lending in the financing of the entire non-financial private sector. The disintermediation process is visible, except for Japan. The data in this graph, provided by the BIS, cover the entire non-financial private sector and thus include household debt.

Graph 4

Total non-financial private sector: share of bank lending in financing the debt

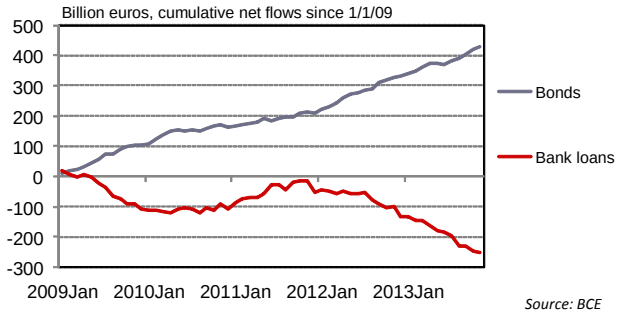


Source : BRI

Historically, bank financing in the Eurozone has constituted a major share of private sector financing and, more specifically, of non-financial company debt (nearly 75% compared to 25% in the U.S.). The shift in financing of non-financial companies that has occurred since early 2009 - away from bank lending and toward market debt - is clearly visible (Graph 5). On an aggregate basis up to November, bank lending fell by more than 250 billion euros, while bond issuance (net of repayment) exceeded 40 billion euros.

Graph 5

Eurozone: Debt financing of non-financial companies

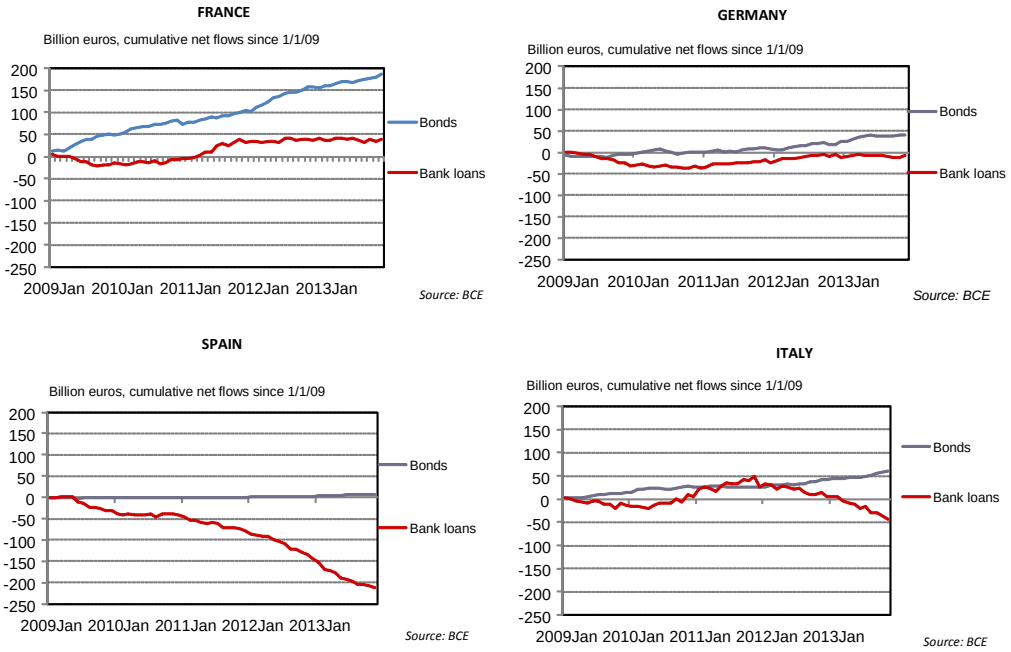


Source: BCE

However, this obscures considerable disparities among countries. Disintermediation was most pronounced in France, although nearly non-existent in Spain. The disparities are also large based on the size of the company, with the largest turning to the markets.

Disintermediation is particularly visible **in France.** Net bond issues exceeded 180 billion euros on an aggregate basis from early 2009 to November 2013, while bank lending increased by nearly 40 billion euros. Several factors explain why this shift was particularly pronounced in France: the market structure already exists, large companies (CAC40) with easy access to markets predominate and French banks are actively transforming.

Graph 6 – Non-financial company debt



2 – Factors that may slow or speed the disintermediation underway

Since the crisis, banks have been encouraged to make substantial adjustments in terms of both size and structure of their balance sheet. However, some of the prudential regulations in Basel 3 have not yet been implemented, so the process will continue. In particular, liquidity and leverage constraints will prompt banks to continue to increase capital and stable resources (liabilities) and modify their assets in favour of shorter-term loans and, particularly, more liquid and highly-rated bonds.

This process and the uncertainties about the new macro-financial constraints are described at length in Garnier (2012).[30] He emphasizes the adjustments that are necessary to avoid over-penalizing long-term financing of the economy, which still appear to be relevant. Indeed, adjustments are still needed to find new financing solutions for borrowers who cannot easily issue market debt. Simultaneously, the allocation of financial savings must also be adjusted to increase the share of long-term savings and, thus, ensure that the banking sector's reduced transformation capability does not have an excessive impact on long-term financing.

2.1 - Disintermediation for all?

Borrowers' access to market financing remains mixed. In Spain, for example, access to the bond market for non-financial companies still appears very limited. For now, the bond

[30] Chapter 3, by Olivier Garnier, in the French Council of Economic Analysis 2012 report on the financing of economic activity in the new regulatory environment, "Vers quel nouveau modèle de financement de l'économie en France et dans la zone euro ?".

markets do not offer an alternative to the fragmentation of bank financing visible today in the Eurozone.
Most large companies in France have access to the markets. However, access to financing for medium-, small- and average-sized companies remains more problematic and specific measures have yet to be implemented. The recent initiative by the Bank of France and the Chamber of Commerce and Industry[31] should allow for financing through private placements, which do not require rating and allow lower minimum amounts than bond issues.

Another way that banks can reduce their risk-taking involves **securitization**; that is, creating financial products allowing them to sell their debt securities on the markets and thus retain only part of the risk. For now, this process is still in its infancy in terms of financing for non-financial companies in the Eurozone. The European Commission and the European Investment Bank have launched initiatives to implement it. However, the Basel III rules and the Solvency II rules continue to penalize securitization relative to other kinds of equivalent investments in terms of risk.[32] Stimulating investor demand for this kind of product will require adaptation.

Alongside these initiatives, intended to promote disintermediation, **specific regulatory changes to market activities** could, on the other hand, slow them. For example, the proposal to impose a European financial transactions tax (FTT) could reduce the attractiveness of market financing and, in the end, limit the financial sector's ability overall to take on the risks of financing economic activity.

1.2 – Can savings take over?

The **structure of savings** in France continues to show a clear preference for liquidity and security.[33] In addition, recent changes in the tax treatment of savings have strengthened this preference, including raising the ceiling on the Livret A (tax-free, state-guaranteed savings accounts) and abolishing the flat-rate withholding tax. Only the recent creation of a PEA-PME, a small and mid-cap share savings plan (or even, perhaps, future "Euro-growth" life insurance funds) might prompt households to redirect part of their financial savings to longer-term, more risky investments.

3 – What will be the consequences for issuers and savers?

Financial disintermediation appears to be well underway, particularly in France, and is likely to continue in the coming years. The ultimate goal of the prudential changes guiding the restructuring of the banking system is to increase its stability. However, this process could simply shift part of the banking sector's transformation risks to other economic sectors, without reducing overall risks (see Garnier (2012)).

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[31] "Aider les ETI à se financer grâce aux placements privés (Euro PP)," Banque de France and the Paris Ile-de-France Chamber of Commerce and Industry (January 2014).
[32] Mersch (November 2013): "SMEs, Banking Union, and securitisation – exploring the nexus."
[33] Paris Europlace report (2013): "Financement des entreprises et de l'économie française : pour un retour vers une croissance durable."

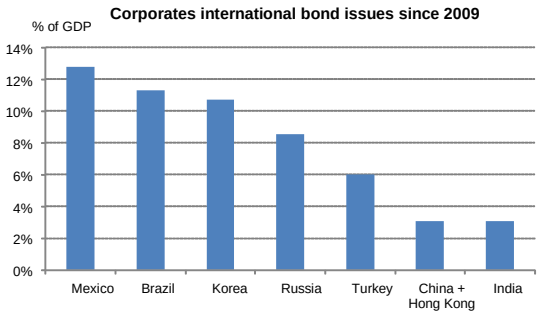
First, **part of the risk will shift inevitably to savers**. As mentioned above, a portion of the risk will certainly be transferred to households. They will thus have to bear greater variation in their financial savings,[34] but may lack adequate financial expertise.

Next, **issuers will also have to bear part of the risk directly**. The bond markets may experience greater variability in prices and available financing. Businesses may have to bear the transformation risk, given the difficulties of issuing very long maturities.

Last, disintermediation may again create **excess debt risks in certain countries/sectors**. Shin (2013) notes the potential systemic risks resulting from excess bond issues by companies in emerging countries today. He observes that while the 2003-2008 period was characterized by excessive overall debt created by banks, the most recent period shows excessive debt in emerging bond markets. For now, this risk appears contained with regard to the amount of issues relative to the GDP of the issuing companies' countries (Graph 7). Nonetheless, the risk of new credit bubbles in certain markets remains, particularly in the context of continued very low interest rates.

More generally, this raises the relevance of macro-prudential measures applied only to banks. Indeed, an important aspect of prudential reforms of the banking industry involves the macro-prudential aspect. The objective of these “macro” measures is to maintain stability overall, not just at each banking institution, specifically by limiting the credit bubble risk. However, disintermediation transfers part of the risk, currently borne by banks, to other market actors, which means that macro-prudential measures would no longer directly control this risk.

Graph 7



Source: Bloomberg, Datastream

[34] On this point, Basel 2.5 (CRD3) could accentuate market movements. These measures increase capital requirements associated with holding bonds, thereby reducing the ability of market makers to absorb volumes.

7 – Lessons from the French financial transaction tax (FTT)

NICOLAS MEGARBANE – AUTORITE DES MARCHES FINANCIERS

This paper[35] assesses the impact of the French financial transaction tax, which took effect on 1 August 2012, on the French equity market. The analysis addresses the questions raised when the FTT was implemented; specifically, whether the tax would lead to a **reduction in trading volumes, a decline in liquidity and a transfer of volumes** to other European stock exchanges or to derivatives. The study also **identifies those investors whose behaviour has been affected by the FTT**.

The analysis of the French FTT highlights certain risks associated with the adoption of such a measure. **We must thus bear in mind that, for the European tax, the rates applied, tax base and exemptions may have significant impacts on trading volumes and the quality of the market**.

1. For reference

The financial transactions tax that took effect on 1 August 2012 is actually a triple tax. It includes a tax on:

- **share purchases**;
- **high-frequency transactions**; and,
- **sovereign credit default swaps (CDSs)**.

The table below summarizes, for each of these three taxes, the scope of application, tax rates and exemptions.

Type of financial transaction tax	Scope of application	Rate	Exemption conditions							
			Primary market transactions	Clearing house and central depository transactions	Transactions in the context of market-making activity	Transactions in the context of a liquidity contract	Intra-group transactions and restructuring transactions	Reverse transactions	Transactions in the context of employee savings	Transactions involving bonds exchangeable or convertible into shares
Share	An acquisition for valuable consideration resulting in a transfer of ownership of securities issued by a French company with market capitalisation of > €1 billion.	0.2% of the amount of the securities purchased covered by the tax	√	√	√	√	√	√	√	√
HFT	A transaction conducted by a company operating in France involving equity securities for its own account via automated processing systems.	0.01 % of the orders cancelled or modified exceeding one percentage point of those issued on a trading day.			√					
CDS	A CDS involving a Member State of the European Union and a naked purchase by a French resident.	0.01% of the notional amount of the contract.			√					

It is important to emphasize the exemption applied to **market making activities**. The definition of these activities in the French General Tax Code and its application are left to the assessment of the market participants. The code also specifies that the **exemption extends**

[35] It is based on several AMF reports (2013) and participation in discussions within the financial community.

to equity hedges of positions arising from market making activities on other instruments (for example, options, swaps and CFDs) or from activities for third parties.

The analysis focuses only on the first aspect of the tax because the tax on CDSs has become irrelevant since the prohibition against the naked short selling of sovereign CDSs took effect under the European short selling rule. In addition, the tax on high frequency trading (HFT) concerns only French actors, who are minimally affected as a result of the market making exemption and the very high thresholds.

2. Impact on volumes

a. Impact on lit volumes

To assess the impact of the tax on volumes, the AMF modelled securities trades that are subject to the FTT, using several explanatory variables that are not affected by the tax. Other approaches may be taken to assess the impact on volumes. In this regard, we note the thorough academic study conducted by Jean-Edouard Colliard and Peter Hoffmann,[36] which addressed the problem from a different perspective but reaches similar conclusions.

The study involves primarily an **analysis of daily volumes** before and after the FTT was implemented. The window of analysis began 18 months prior to implementation and continued for 10 months following.[37] To estimate the tax's impact on trading volumes, the model takes into account all trading volumes on regulated markets and transparent Multilateral Trading Facilities (MTFs) (lit volumes) for various European indices, as well as other explanatory variables, such as market volatility, to assess the tax's impact on trading volumes.[38] The detail of the model is presented below.

[36] "Sand in the chips: Evidence on taxing transactions in an electronic market," Jean-Edouard Colliard and Peter Hoffmann.
[37] Many external factors have a significant influence on trading volumes on the market (such as the development of liquidity programs, including the SLP and RMF programmes). Consequently, the impact of the FTT alone becomes increasingly difficult to identify. For this reason, the analysis does not extend beyond 10 months so that it is not subject to multiple biases.
[38] The model uses trading volumes on the DAX, AEX, FSTE MIB[38], BEL20, VCAC and VDAX indices as explanatory variables (with a still-higher correlation coefficient).

Notes:

$Volume_i$: The Napierian logarithm of trading volumes on the primary market of index i .

$Volatilité_i$: Implied volatility on index i .

TTF : A parameter equal to 1 if the FTT is in place and 0 otherwise.

TTF_TEMP: A parameter equal to 1 for the first five days of August and 0 otherwise.

Linear regression:

The objective is to find a linear relationship among all of these parameters:

$$Volume_{CAC} = x_0 + TTF + TTF\_TEMP + x_1.Volatilité_{CAC} + x_2.Volatilité_{DAX} + x_3.Volume_{BEL} + x_4.Volume_{DAX} + x_5.Volume_{AEX} + x_6.Volume_{MIB}$$

The regression was conducted over 435 days, from 1 January 2011 to 1 June 2013.

Results:

The result obtained by the least squares method is as follows:

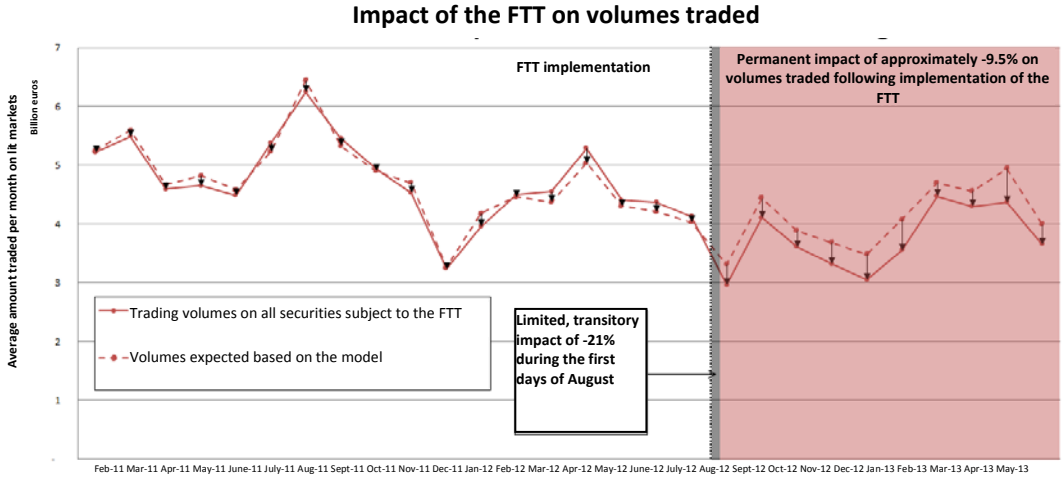
$$Volume_{CAC} = 1.17434 - 0.09383.\text{TTF} - 0.12535.\text{TTF\_TEMP} + 0.01281.Volatilité_{CAC} - 0.0117.Volatilité_{DAX} + 0{,}2146.Volume_{DAX} + 0.24139.Volume_{AEX} + 0.13217.Volume_{MIB} + 0.32471.Volume_{BEL}$$

The parameters, together, are significant at a 0.1% threshold and the model's R^2 equals 0.93.

The overall impact of the FTT over the period is in the regression's FTT parameter.

Over the entire period, the **impact of the FTT is estimated at -9.5%** with a 95% confidence interval between -11.8% and -7.3%.

An illustration of the results obtained using this model appears below:



The analysis reveals a decline in lit volumes of approximately 10% over the long term. However, a considerably larger transitory impact of approximately 20% is observed during the first week following introduction of the tax. These results agree with those of the ECB study and are similar to the figures cited by the market actors.

b. Impact on OTC volumes

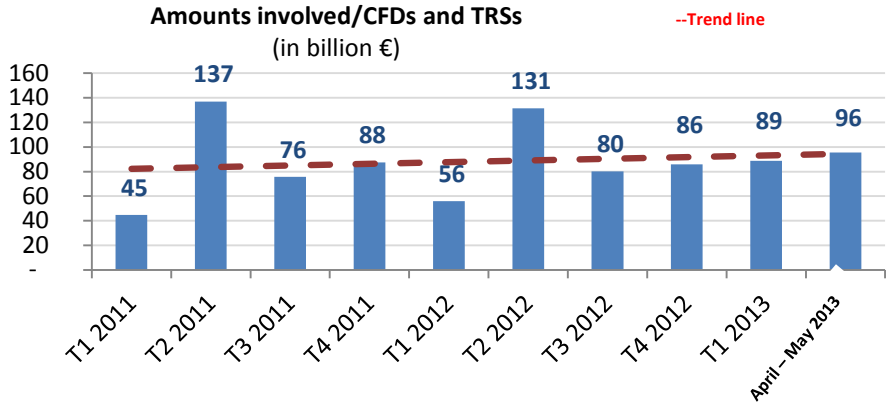
OTC volumes were not included in the analysis because they are highly seasonal and thus difficult to incorporate in the model. However, the ECB's academic study[39] on this issue seems to identify a reduction in the largest OTC transactions, benefiting average-sized transactions, and, thus, a **decline of approximately 40% in OTC volumes**.

3. There is no evidence of a transfer of flows from French securities to other assets

Since the tax was introduced, the press has reported a growing interest among investors for alternative solutions, such as CFDs[40], and among institutional clients for other European securities substitutes.

The AMF could not confirm the hypothesis of a transfer of volumes toward substitute securities because it is difficult to distinguish volumes traded by institutional clients from other volumes in the available data.

With regard to non-taxable investment vehicles, such as CFDs and TRSs, the study of the data (reported) does not show that volumes have increased significantly, as is reported regularly in the press. While there has been a slight upward trend since early 2011, CFD and TRS volumes (single underlying asset) reached €353 billion in 2013, only +3% over 2012.



Source: SESAM, amounts involved declared in the CFD and TRS categories (Contract for Difference and Total Return Swap)

Comment: The cyclic nature of the CFD and TRS volumes in the second quarter is the result of tax optimization strategies linked to dividend payments.

However, the apparent contradiction with press reports should be qualified. The strength of the CFDs could have a bearing on other asset classes that are not reported to the AMF (and are not taxed). CFDs on indices and on Forex, which are not declared, may thus explain the growth the brokers cite.

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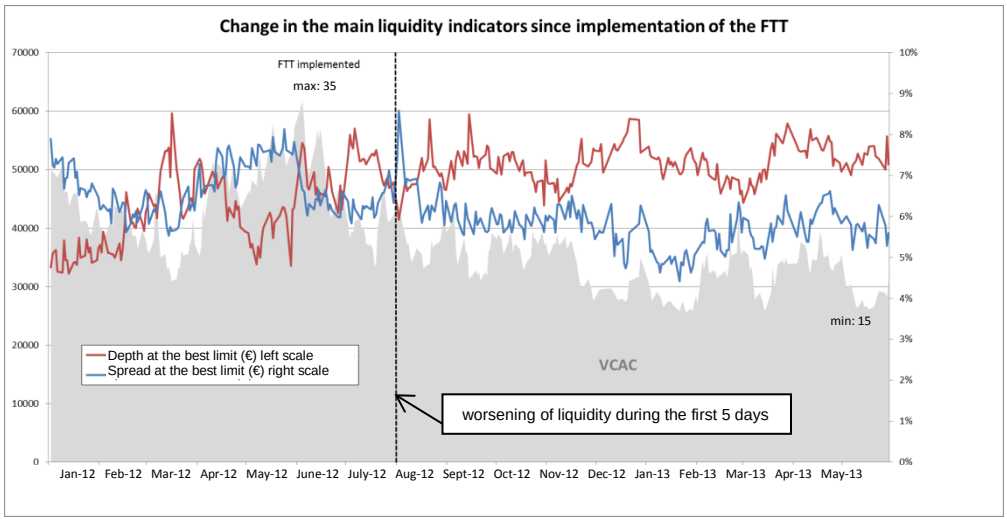
[39] "Sand in the chips: Evidence on taxing transactions in an electronic market," Jean-Edouard Colliard and Peter Hoffmann.
[40] Because they are not subject to it. The press estimated the growth of CFD volumes at between 25% and 30% for 2012.

The analysis of the transaction data on CFDs and TRSs declared to the regulatory authority do not reveal an upward trend for this kind of asset.

4. Impact on other liquidity indicators

Because the study of volumes provides only a very partial view of market liquidity, the AMF analysed the change in the spread and available quantity at the best limits on Euronext as additional indicators. As these indicators are strongly correlated with market volatility, the volatility effect was filtered out. Following a limited deterioration of these indicators during the first week of August, the FTT does not appear to have changed liquidity on an on-going basis, as shown by the graph below.



Market makers make a significant contribution to maintaining a low spread, while providing liquidity to the best limits. As these actors are not subject to the FTT, they were not required to reduce their activity, which explains why these liquidity indicators did not experience significant variation. However, the very limited deterioration in early August may be explained by a sharp decline, during the first days after the tax was introduced, in the activity of certain actors in the high frequency market believed to have a strong presence at the best limits.

In addition, it should be noted that these liquidity indicators are influenced by many external factors, such as commercial initiatives targeted at liquidity providers (for example, the Euronext SLP programme). **It is thus difficult to isolate and identify the impact of the FTT.**

While the drop in volumes is indeed real, it is difficult to identify the long-term effect of the tax on other liquidity indicators, such as spread and quantities available at the best limits (only on Euronext), apart from a strong negative impact during the first days following its introduction. This is because these indicators result primarily from the activity of market makers, who are exempt from the tax.

5. The Italian FTT

To assess the risks associated with the different parameters and thresholds of the tax, the AMF compared the impact of the cash leg of the Italian FTT with that observed on the French market.

Italy was the second European country, after France, to institute a tax on financial transactions. This tax, which is also based on net purchases and includes an HFT component, differs from the French model in two key ways:

- the taxation of equity derivatives; and,
- a difference in taxation (rate) between trading volumes on the lit market (that is, regulated market and MTF) and those traded in other trading venues (**designated as dark** and including OTC and BCNs).

The table below summarizes the main principles of the Italian and French taxes with regard to the **equities section**, the only component analysed here.[41]

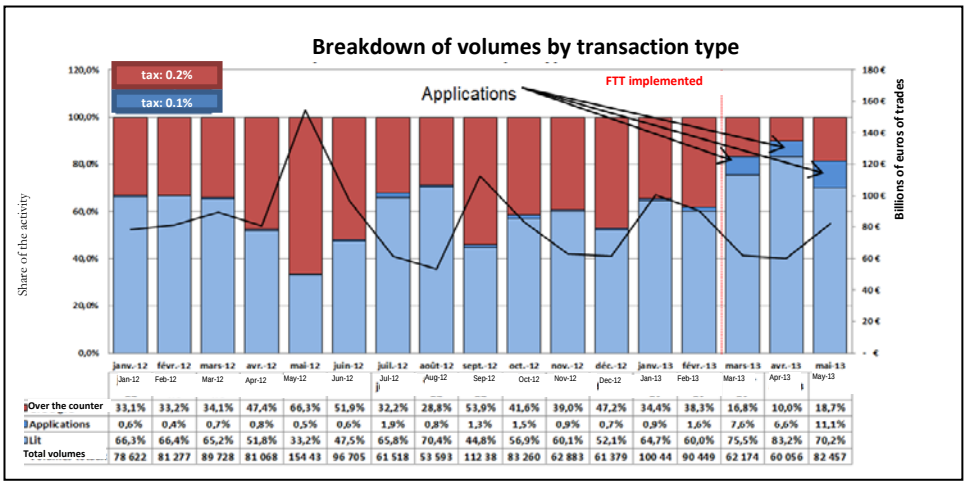
Feature	Italian FTT		French FTT
Date implemented	1 March 2012		1 August 2012
Tax base	Capitalisation >€500 million		Capitalisation >€1 billion
Tax rate	0.1% on net long positions on regulated markets or MTFs	0.2% on net long positions traded in dark pools	0.2% on the net long position
	These rates are increased by 0.02% until December 2013 in Italy		
Exemption for market making activities	yes		yes

The impact analysis focuses on the action of the tax and on all volumes (lit and dark) over the three months following implementation of the tax. This history is strongly affected by seasonality, as over-the-counter trading volumes in the second quarters are generally higher and can vary considerably by year. This is why the AMF did not perform careful calculations of the impact, as was done for the French tax. However, a comparison of total volumes between 2012 and 2013, limited to the same period (March-May), shows a **significant decline in volumes**.[42]

Specifically, the tax – whose rate differs based on whether trading occurs in dark or lit pools - had very uneven impacts on these two perimeters.

[41] More details on the scope and application procedures are available at: http://www.clearstream.com/ci/dispatch/en/cic/CIC/Annnouncements/ICSD/Tax/Italy/2013/A13031.htm?yawlang=fr.

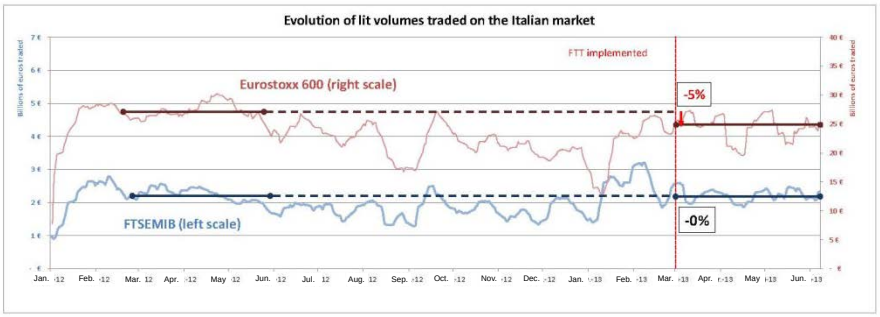
[42] A fall of approximately 35% over all volumes.



The impact **on dark volumes** is quite clear**.** While dark volumes are usually high between April and June, they fell sharply during the period after the introduction of the Italian FTT, constituting 50% of total volume in March, April and May of 2012, compared to 15% for the same months in 2013.

The above graph also shows that **OTC trading has shifted, in part, toward applications** recorded on the regulated market (in dark blue on the graph). These applications, which were virtually non-existent before the tax, now represent nearly 11% of total volumes.[43] In addition, the share of trading volumes on lit markets increased when the FTT was introduced.

Contrary to the situation noted on dark markets, **lit volumes** rose slightly with the introduction of the FTT (excluding applications), compared to the other European stock exchanges. On lit markets alone, trading on Italian blue chips has remained stable since March 2013, while those on the Eurostoxx 600 posted a drop of approximately 5%, as the graph below shows.[44]



A **significant transfer from dark to lit markets** thus seems to have taken place, in part towards applications.

[43] The shift of dark volumes to the applications does not necessarily improve the price formation mechanism, which operates primarily on Lit volumes (excluding applications).

[44] Average Eurostoxx volumes increase by an average of 4% since 1 March 2013 compared to the prior year's volumes. They rose 7% on the FTSE MIB. In addition, compared to the months of March, April and May 2012, FTSE MIB volumes remained stable, which they fell by approximately 5% on the Eurostoxx.

8 – Will 2014 be a turning point for high frequency trading? -

OLIVIER VIGNA – Autorité des marchés financiers

The year 2013 was again marked by a series of operational and technological incidents across several continents that could lead to extreme reactions on the markets. This raises the question, yet again, of the resiliency and soundness of the infrastructure and its actors and, thus, their ability to withstand severe shocks. While high frequency trading (HTF) is hardly the only factor cited to explain this sequence of events and prevent a potentially systemic impact, it is so significant today that its risks must be understood clearly. In principle, adverse scenarios, in which HFT strategies could play a role, could arise again in 2014. In particular, the expected completion of European negotiations on revising the markets in financial instruments directive should mark an important step forward in improved oversight of HFT.

To contribute to the proper operation of the financial markets, it is thus critical to correctly assess the issues associated with HFT and anticipate additional regulatory responses on the part of authorities.

1. What does HFT represent today?

The first challenge in analysing the risks posed by HFT is defining it, which largely determines its role and significance.

a) A difficult definition

The European Securities and Markets Authority (ESMA, 2011a) proposes a definition of HFT based on the interpretation of market signals using sophisticated algorithmic technologies, which make it possible to generate own account high-frequency orders, with strategies often similar to those of market makers or arbitrageurs, as positions are closed at end-of-day. U.S. regulators (SEC, 2010, and CFTC, 2012) added to this definition by specifying that many of these orders are cancelled just before sending and that firms that practice HFT often use colocation and data feed services to reduce latency. The current draft revision of the markets in financial instruments directive (MiFID) views HFT as the combination of three factors: infrastructure or systems (such as colocation) that minimize latency; lack of human intervention in determining or executing orders; and, a high intraday rate of messages, orders and cancellations, even if a very fast algorithm might move only one order/day.

With regard to academic researchers and those working in the field, the economic literature adopts the preceding definition and combines it with a notion of HFT via an approach that is both direct (based on the main activity: approach taken by Zhang, 2012, and Brogaard et al., 2013, regarding the Nasdaq, which identifies HFT actors as such) and indirect (based on the volume of orders sent and the weakness of positions opened at the end of the day, as taken by Kirilenko et al., 2011, and Jovanovic et al., 2012). In sum, all these criteria and bodies of

evidence should thus be used to properly understand the role and significance of HFT today, emphasizing that it benefits from three characteristics of contemporary financial markets:

- Automated intermediation;
- Market fragmentation; and,
- Wealth, dissemination and digitisation of information.

b) Growing importance, although consolidation underway

Assessing the role and significance of HFT obviously depends on its definition. Three kinds of institutions are the main practitioners of HFT: investment banks and brokerage firms, with desks that trade for their own account; proprietary trading firms; and, hedge funds. Some of these entities may also undertake "pure" HFT, while others – specifically, commercial banks – take a mixed approach.

Furthermore, HFT is difficult to define because these actors generally follow multiple strategies:

- Market making, intended to provide liquidity to other participants (Hendershott et al. 2012, Foucault et al., 2013a), which facilitates the compression of spreads and reduces market volatility;
- Arbitrage, by benefiting from opportunities arising from price differentials between platforms (Kozhan et al., 2012), typically via the purchase of an asset that will be resold immediately at a higher price on another market; market fragmentation and diversity of market rate structures are factors that allow or enhance the development of such a strategy;
- Directional strategies, based on the expectation of a change in an asset price; this conjecture depends on market information (for example, futures) and macroeconomic data that are used immediately (Scholtus et al., 2012).

Nevertheless, these methodological precautions aside, HFT has grown significantly in recent years. "Pure" HFT - that is, HFT that does not take investment banks' mixed trading into account – represents approximately 20% of transactions on Euronext Paris today, or five times that of five years ago, and 60% of orders. Adding the investment banks' estimated HFT activity, it represents 40-45% of transactions on Euronext Paris. The relationship between orders and transactions there, which has been above 20 for nearly three years, spiked above 30 in the fall of 2011.

However, while HFT's profitability accelerated its growth for a time (Baron et al., 2012), its market share seems to have consolidated, if not declined, over the recent period. Some studies (WEF, 2013) have found that HFT's market share in Europe, measured in terms of amounts traded, was 41% in 2010 and 39% in 2012 (compared to 29% in 2008), while in the United States, in terms of numbers of transactions, it fell from 61% in 2009 to 51% in 2012 (compared to 21% in 2005). Other estimates (Cookson, 2013) suggest that the industry's profits have fallen in recent years, related specifically to the very high cost of the technological investments. The industry's entities tend to have a relatively short life expectancy. This uncertain profitability has led increasing numbers of HFT companies to revise their strategy frequently in terms of products (away from shares and towards currencies, bonds and derivatives), technologies (radio waves are faster than a fibre network) and the most profitable geographic areas.

2. Identified risks of HFT

The following categories of risks identified in 2014 as linked with HFT are listed below in order of increasing significance. They are not mutually exclusive but, rather, potentially interdependent.

a. Investor protection risk

When HFT allows large amounts of information useful to the market to be priced in more quickly, it can increase informational efficiency (Carrion, 2013). In this case, the presence of a large number of HFT firms is, obviously, favourable to investors. Conversely, if HFT firms take advantage of near-instantaneous market access (thanks to colocation services allowing them to locate their servers in close proximity to those used by trading platforms) and the resulting speed solely to create a price "trend" in their favour, those investors may be misled and market prices may be manipulated. A firm could then trigger a price uptrend to deceive other participants into thinking that such movement is "fundamental" - that is, not artificial -, encouraging a price run-up before that firm quickly sells its securities at a profit.

This so-called layering strategy, which involves placing a small number of orders on one side of the market (for example, a purchase at a low price) and a large number on the other (here, a sale at an increasingly high price as prices rise), is prohibited by regulation. This is because these orders are intended to deceive other traders by creating the false impression that a market trend is taking shape (for example, in terms of asset liquidity or return), but the orders will be cancelled before execution as soon as the first orders displayed are actually traded. The HTF firm's sole objective is then only to buy a security at a lower price or sell it at a higher one. Regulators have homed in on this kind of market manipulation because although such strategies are marginal, they harm investors' confidence in the financial markets, which is critical if the markets are to contribute to the financing of economic activity.

Quote stuffing is another example of a manipulative HFT strategy. It involves slowing other traders and interfering with their algorithms by placing a massive number of orders that will subsequently be cancelled. Egginton et.al. (2013) note that quote stuffing affected three-quarters of U.S. listed stocks in 2010, undermining their liquidity, raising trading costs and fuelling short-term market volatility. In their study of the Nasdaq, Gai et.al. (2012) stress that HFT aimed at flooding or overloading a platform by sending an inordinate number of messages is tantamount to an "arms race in speed," involving excessive technological investments without net social gain.

In the context of this technological arms race, where great expense is incurred to gain a few milliseconds in accessing or processing data, HFT does not appear to offer the end investor a positive externality (Biais et.al., 2013) because this spending could have been reallocated to more socially productive sectors and because such expenses could be passed along, in part, to the investor. This creates a real risk of a negative sum game:

- Uncertainty about the marginal profitability of technological investments: do they strengthen anti-selection, the "cartelization" of the HFT market and the lack of liquidity?
- Does the final investor benefit – at least partially – from the marginal gains from these investments? In the contrary case, the effect of the race to invest is similar to that of a private tax, which would redistribute and privatize profits.

b. Liquidity risk

While investor protection risks are of obvious concern, liquidity-related risks are equally significant. The issue of whether HFT generates real or ghost liquidity is critical to orderly markets. Several studies suggest that HFT can strengthen liquidity (Hendershott et.al., 2009, for DAX-listed equities on the Deutsche Börse, Hendershott et.al., 2011 on the New York Stock Exchange and Myers et.al., 2013, on a model) or improve market quality by reducing volatility and spreads (Hasbrouck et.al. 2013, on the Nasdaq), if, for example, the HFT firms are market makers (Hagströmer et.al., 2013, on the Nasdaq-OMX).

In contrast, based on a broad sample (12,800 equities on 39 markets over the period 2001-2009), Boehmer et.al. (2012) found that algorithmic trading, of which HFT is a component, increases volatility and even supplies less liquidity to the market when market making is difficult. Both the intention or the result of HFT firms acting as market makers may be to duplicate the liquidity supply across several markets before withdrawing it very quickly from a platform (Van Kervel, 2012). The study of the S&P 500 (Soohun et.al., 2013) confirms this ambivalent and uncertain impact of HFT, showing that a higher level of HFT does not necessarily increase liquidity.

Moreover, as high-frequency traders have an informational advantage over slower traders, the latter, crowded out of the market, may trade less frequently although they can provide liquidity. This crowding-out thus leads to adverse selection and relative market concentration, raising the question of whether the market is resilient and capable of supplying liquidity, rather than simply shifting it, particularly during periods of financial tension when liquidity is especially important. Research has shown that during periods of high volatility, HFT firms may actually reduce the liquidity they supply to the market (Aït-Sahalia et.al., 2013).

c. Financial stability risk

Last, the greatest risks to the financial markets are probably those linked to the systemic effects resulting from technology-related accidents and flash crashes, which may have a very strong impact on financial stability.

For example, during the 6 May 2010 flash crash in the U.S. the CFTC and the SEC (CFTC, 2010) stressed that algorithmic trading might have artificially inflated trading volume, while reducing liquidity and disrupting the markets, noting, “There was an unusually high level of ‘hot potato’ trading volume, due to repeated buying and selling of contracts, among the HFTs.” Indeed, automatic execution – that is, without human intervention - of a large volume of orders without proper consideration of market prices may cause the latter to experience extreme movements.[45] Studies of the same crash (Kirilenko et al., 2011; Foucault et al., 2013b) emphasized that HFT exacerbated volatility.

[45] “*Under stressed market conditions, the automated execution of a large sell order can trigger extreme price movements, especially if the automated execution algorithm does not take prices into account. Moreover, the interaction between automated execution programs and algorithmic trading strategies can quickly erode liquidity and result in disorderly markets.*”

In that regard, the heightened reactions, fed by this convergence of HFT strategies (Chaboud et al., 2013), could give rise to self-fulfilling spirals via an algorithm-driven sequence of cascading trades, potentially triggering and accentuating such shocks. In this configuration, the domino effect can be particularly troublesome for financial markets and the financing of real economic activity because most HFT firms operate outside the traditional prudential banking sphere and thus lack sufficient available capital to respond to the risks they create for the economy. These regulatory provisions should be analysed closely to ensure a rapid response to prevent such situations.

3. Key issues for HFT regulation

Traditionally, regulators respond only when market participants cannot internalize negative externalities. In the area of HFT, regulators are assigned responsibility only if risks are both identified and attributed to such practices. The regulatory tools intended to achieve a socially desirable objective include (adopted from Prewitt's 2012 typology):

- To maintain market quality:
  - appropriate approval rules;
  - more transparent means of acting and reporting;
  - taxation based on a very diverse base: exchanges, cable companies, information and/or order sellers (preferably, limited or cancelled orders);
- To detect and punish market abuse or manipulation:
  - strengthened audit trail;
  - regular review of algorithms;
  - deterrent system;
- To prevent risks of financial instability from occurring:
  - more explicit provisions for defining market making;
  - prohibition against behaviours or practices considered potentially dangerous (short selling of complex products);
  - circuit breakers to halt market contagion of destabilising events.

These measures are neither exclusive nor exhaustive. However, to ensure that they are implemented effectively, all authorities concerned must enforce them consistently and coherently, not just those in the European Union. Certainly at the European level alone, the MiFID, which took effect in 2007 and facilitated the emergence of trading platforms favouring the development of HFT, has been under review since 2010. The final version is expected to be completed soon. Yet despite the progress that this revision will represent thanks to a new directive - MiFID 2 - other regulatory initiatives must still be considered soon at the international level to ensure improved control over HFT-related risks.

a. European HFT regulation is likely to be strengthened in 2014

The MiFID review could lead to six positive results within the European Union that would improve regulation and supervision of HFT in Europe, if the directive retains the Council's measures.

(i) HFT firms would have to register as investment service providers and would thus be subject to stricter requirements in terms of internal organisation and reporting to their national supervisory body.

ii) Risk oversight within these firms would be improved by, for example, ensuring the robustness of IT systems and the quality of their internal control, which would reduce the market impact of any deficiencies.

iii) Algorithms may have to be flagged so that firms would have to link them with orders and make this information available to supervisory authorities on request, particularly to determine which algorithm is the source of which order.

iv) Some measures are intended to increase market viscosity, particularly by introducing a standardised minimum price tick (the smallest difference between two prices) which would prevent certain HFT actors from playing on ticks that are too small or disparate, based on the instrument and the platform.

v) ESMA is also expected to clarify the definition of trading platforms' rate structures within Europe. These rates should not thus encourage but, rather, penalise, excessive order volumes that are often cancelled immediately.

vi) Last, ESMA is also expected to provide more details and rules on colocation of HFT firms, which will contribute to a more diversified geographic colocation for HFT traders across more financial centres.

However, this expected 2014 review of the MiFID represents only one step – although an important one – towards enhanced regulatory coordination and implementation in the relevant jurisdictions. All regulatory initiatives affecting HFT and that have an international impact must be assessed carefully in advance, for example via pilot experiments, to avoid regulation shopping, where firms relocate their operations to the least attentive and most relaxed financial centres, and moral hazard, which would arise if a poorly-calibrated rule produced unforeseeable and potentially dangerous outcomes. For example, Jones (2013) shows that:

- an increase in transaction costs, initially by taxing HFT messages to prevent market congestion, could increase market volatility and affect liquidity; Hoffman (2013) also notes that taxing HFT could have socially negative effects by potentially eliminating an activity that could benefit the markets, particularly with regard to informational efficiency.
- imposing minimum order exposure times before a firm can cancel an order issues could discourage liquidity provision if the measure were poorly designed.

However, other courses of action should be analysed carefully to limit the risks associated with the growth of HFT, including:

- setting tick size granularity based on the characteristics of the markets and securities concerned to maintain their liquidity (Declerck et al., 2002; Buti et al., 2011 ; Dayri et al., 2013). Since narrow tick size encourages HFT, which has caused multilateral trading systems to outbid one another to attract HFT firms, some studies recommend increasing this tick size to restore the confidence of long-term investors and encourage them to make a greater contribution to financing economic activity (Weild et al., 2012). Such an increase would also help to regulate competition by price and not by speed by reducing the cost of entry. However, the effects of a poorly-designed increase would vary based on whether traders are fast or slow (Lallouache et.al., 2013) or even prevent the price variations that justify the existence of market makers. They could pull back from the tick-setting exercise if the order book is unstable, which would affect liquidity;
- establishing stress tests to improve the quality of internal control systems, help firms to better understand and master their algorithms and verify their financial ability to withstand external shocks;
- circuit breakers or kill switches for inappropriate orders (Harris, 2013).

In all cases, an experimental phase must precede regulation to evaluate overall impact (on market liquidity and volatility and based on the type of trader) by using very advanced methodological techniques. However, the impacts of national regulatory frameworks will continue to vary unless national authorities also standardize their supervisory practices.

b. The need for closer and standardized supervision of HFT

Controlling the risks associated with HFT poses many challenges for regulatory and supervisory authorities as well as for observers. How can a development be defined when it changes rapidly with every technological innovation and is characterized by a constantly evolving cast of players and set of strategies? Even after the MiFID review, many questions will thus remain before the supervisory authority can determine the actual risks that HFT poses:

- Access to a large quantity of data, whether HFT occurs on regulated markets or multilateral trading systems based outside of France (for example, Turquoise, BATS or Chi-X in Europe, where HFT represents a larger share of business than on Euronext);
- Processing and use of this data, which means that national authorities will need resources – particularly IT capability – to analyse the huge order quantities on the markets in question to recreate the strategies implemented and identify the traders concerned (on this point, the adoption of the Legal Entity Identifier, LEI, an international identifier to be included in firms' reporting, should allow available information to be used more effectively);
- Cooperation and exchange of relevant information among supervisory authorities, specifically from order books, to ensure that their respective regulations are applied properly.

*

In sum, 2014 is likely to be a year of progress in terms of academic research analyses of HFT. However, we can also expect – unsurprisingly – to continue to face the risks that accompany it. Indeed, studies remain divided on the benefits of HFT. Empirical research is divided as to whether it provides a clear net benefit for market liquidity or the financing of economic activity. Regulatory and supervisory authorities must thus continue to coordinate internationally, working closely with academic researchers, to gain a better understanding of its evolving technologies and ultimate impacts.

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