The resilience of future monetary union in emerging countries to international financial shocks: A new set of banking and financial regional criteria

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Abstract
This survey presents an analysis that incorporates the lessons of the positive literature on the "third generation of crises" into the traditional optimum currency area theory to propose a new set of criteria that ensure better resilience of a monetary union to financial contagion. The study stresses the fact that new banking and financial criteria must be considered to protect integrated economies against common international financial shocks. The 2007 US liquidity crisis that spread into the Eurozone and generated a considerable economic slowdown validates these propositions. It underlines the insufficiency of the Maastricht criteria, which do not incorporate these measures and do not make it possible to anticipate or resorb the spread of international financial crisis. These considerations could be integrated into the future monetary union projects in emerging countries organised today in common markets and allow for the circumvention of the disastrous economic and social effects generated by the spread of financial crisis in the real sector of these economies.

Keywords: monetary union, OCA theory, financial crises, financial contagion, banking and financial criteria, resilience.

1. Introduction

The spread of the liquidity crisis from US to European markets in 2007 underlines the fact that the euro area is not an optimal currency area. Moreover, this crisis episode demonstrates the limits of the Maastricht criteria as preventive indicators against the spread of international shocks. The European liquidity crisis, which was followed by the sovereign debt crisis, could have been avoided if the euro area had been able to anticipate or limit the asymmetric impact of the common financial shock.

The purpose of this article is to revisit the optimum currency area (OCA) theory in light of recent crisis episodes in emerging areas during the 1990s and in industrialised countries since 2007, raising an important question: What are the ex ante conditions necessary for implementing a monetary union that would be able to resist to financial contagion? The aim, therefore, is to propose a new set of ex ante criteria for monetary union, focusing on the role of banking and financial criteria as well as on the regional dimension to complete the traditional

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criteria proposed by the OCA literature. This is a necessary condition to avoid severe financial and liquidity crisis that spreads into the real sector and generates a drop in economic growth, a large increase in unemployment and harmful social effects.

Regarding the pioneering studies on the OCA theory (Mundell, 1961; McKinnon, 1963; Kenen, 1969), the answer to this question means analysing the macroeconomic costs linked to the abandonment of exchange rate flexibility and monetary policy independence in the event of shock. In a regional internal fixed exchange rate regime, countries are particularly vulnerable to external shock (Flood, 1979). In the case of a monetary union, the fundamental problem lies in these shocks' asymmetry. A common monetary policy can limit the adverse impact of a symmetric shock and, in the same way, generate common benefits for all the countries. In contrast, when a shock affects only one country or a group of countries to different extents, the optimal monetary policy differs from one country to another. Thus, it is necessary to find alternative measures to ensure the stability of the regime, that is, ones that make it possible to prevent or mitigate their negative effects.

The main contribution of this article is to underline the fact that today we cannot dissociate the issue of the ex ante conditions necessary to ensure the stability of a monetary union from that concerning the spillovers of the recent financial crises. This contribution consists in integrating a positive approach into the normative dimension of the OCA theory to derive a new set of financial criteria that complete the real traditional ones. In fact, the traditional criteria of the OCA theory are not sufficient today within the context of financial globalisation. The "third generation" of crisis models, which followed the Asian crisis of 1997, focused on the banking and financial sectors' significant fragility, which increases countries' vulnerability to external shocks, even if their macroeconomic fundamentals are stable. Structural imbalances in the banking and financial sectors (Corsetti, Pesenti and Roubini, 1998a, b, c) and a growing liquidity risk within a context of information asymmetry (Radelet and Sachs, 1998, 1999; Chang and Velasco, 1999, 2000) can cause speculative attacks in some countries inside a region that is economically integrated.

Furthermore, the phenomenon of shock propagation from a specific country to neighbouring economies through interdependencies between markets and by way of pure contagion, as observed during recent financial crises, must be taken into account at the regional level. The spread of shocks from real links between countries is difficult to contain. Consequently, solutions to the problem of contagion will be sought in the banking or financial sector.

The different effects of the US financial crisis on emerging and industrialised countries in 2007-2008 validate this affirmation. The economies that had adopted macro-prudential measures to structure their banking and financial sectors were not concerned by the financial contagion of the US liquidity crisis. In contrast, this financial shock spread directly to the real industrialised markets, particularly to the euro area. This situation underlines the fact that the Maastricht criteria are not sufficient to permit the long-run stability of the euro area. The current proposition envisaged to limit excessive risk taking in the banking and financial sectors at an international level (Basel III criteria, Dodd-Frank act) highlights the need for a new form of financial governance capable of encouraging decisions taken at a regional level. This reflection could influence the evolution of the currently emerging common market in Latin America and South East Asia towards monetary union in the long term.
The remainder of the paper is structured as follows. In the second part, we propose an analysis that incorporates lessons from the financial crises literature and the OCA theory. The third section addresses the new international and regional financial governance implemented today through macro-prudential measures to prevent future systemic crises. In the fourth section, we conclude, proposing a new set of regional banking and financial criteria that complete the traditional OCA theory.

2. The OCA theory and financial globalisation

Theoretically, the adoption of a monetary union between countries can be considered only after the attainment of a high level of economic integration. According to Balassa (1961), monetary union is the fourth of five stages of economic, financial and structural integration.

The formation of a monetary union is often far removed from the previous step (a common market with free regional mobility of goods and services and production factors and a common external policy) because it entails a high degree of coordination between the countries' national policies and the loss of two out of three economic policy instruments (monetary policy and exchange rate).

2.1. The asymmetry of shocks

The expected effects of domestic or external shocks on an economy is the subject of much theoretical work (Dornbusch, 1976; Clarida and Gali, 1994; Obstfeld and Rogoff, 1995; Agenor, 1998; Aghion, Bacchetta and Banerjee, 2001). However, Flood (1979) demonstrates that external shocks have a dominant effect. This point is confirmed by a set of empirical studies (Cushman and Zha, 1997; Kim and Roubini, 2000; Canova, 2005; Mackowiak, 2007; Rafiq, 2015) that show the importance of the real exchange rate as a transmission mechanism.

The empirical approach that makes it possible to measure the degree of asymmetry of shocks in a region has been the subject of most OCA studies over the last twenty years (Mongelli, 2002).

Several instruments are used for this purpose. One method is to analyse the correlation between different macroeconomic variables such as the real exchange rate, the price of financial assets or production (Eichengreen, 1990; Cohen and Wyplosz, 1995). However, this method does not allow to differentiate between the effects of the shocks and the responses of economic policies and thus to determine the degree of symmetry and the speed of adjustment after a shock. Consequently, even if the disturbance is the same for all countries and if some of them implement adjustment policies to limit the consequences of the shock, the degree of correlation is low and does not reflect the shock's symmetric profile.

The methods traditionally used are VAR (vector autoregression analysis) models (Calvo and Mendoza, 1998; Kim, 2001; Bordo and Murshid, 2002). However, the main criticism is linked to inaccuracy in the interpretation of results because of a lack of reference to an economic
structure in the identification of the model. Therefore, since the 1980s, economists (Sims, 1986; Bernanke, 1986; Shapiro and Watson, 1988) have developed the use of structural VAR models that make it possible to impose short-term and long-term constraints based on economic literature.

When identifying the model, the authors make distinctions between supply and demand shocks\(^1\), in reference to Blanchard and Quah’s (1989) analysis, and real and monetary shocks\(^2\), in reference to Gali (1992), and suggest the hypothesis of a small open economy\(^3\) (Dunguey and Pagan, 2000; Kim and Roubini, 2000), particularly in the case of emerging countries (Canova, 2005; Mackowiak, 2007). Furthermore, this method also offers the possibility of reflecting the shocks’ degree of symmetry across countries and comparing the speed of economies’ adjustment after a shock. This approach establishes the level of convergence of macroeconomic and financial structures that explains the asymmetry of countries’ responses to the same shock. Thus, in an economically integrated region, it is possible to identify a core of countries that have similar economic and financial profiles and thus the same reactions to common shocks.

Some studies analyse the impact of shocks on international commodity prices or real US shocks (production, technology, demand shocks) on the rest of the world (Canova, 2005; Mackowiak, 2007). This impact largely depends on the countries’ comparative advantages and on the economic interdependence between countries. The recent literature that focuses on the real effect of the economic slowdown in industrialised countries over the period 2009-2010 shows that emerging markets are vulnerable to a decrease in international demand for their exported goods (Blanchard Das and Faruqee, 2010).

In addition to real shocks, it is necessary to consider other types of shocks that generate large flows of capital on international financial markets and that can be affected by changes in US monetary policy or losses in international investor confidence.

Whereas the exchange rate channel remains essentially unchanged, the effects of external monetary shock vary depending on whether they are initiated by a change in the US interest rate characterising normal reactions of monetary policy, such as those observed in the pre-crisis period, or a strong growth in the base money coupled to a zero lower bound rate, as in the case of US unconventional policies from 2008 to 2015 and then since January 2015 in the Eurozone. This behaviour is partly explained by the fact that the exchange rate channel is doubled in the first period by the interest rate channel impacting the credit and in the second period by spillovers of long-term interest rates and securities flows. Beyond these differences, a US monetary base shock will have separate impact depending on the robustness of the country's fundamentals or the country’s ability to curb massive capital flows by implementing macro-prudential policies (Sahay et al., 2014). Indeed, an increase in the US interest rate causes a financial shock characterised by outflows of capital, which vary in magnitude between different countries. The real depreciation of the currency can cause an increase in demand and, therefore, in production but may also generate the opposite effect with a strong increase in interest rates (Kim and Roubini, 2000). In general, the first effect is predominant in industrialised countries. In contrast, emerging countries suffer from a rise in the interest rate, which significantly reduces their activity. Moreover, when exports are mainly denominated in US dollars, countries cannot benefit from the positive effects of their currency's depreciation. In addition, the countries most indebted in US dollars suffer from the increase in US interest rates, which makes their debt...
heavier. Finally, in reducing the gap between US and domestic interest rates, these countries limit the default risk on capital markets.

Canova (2005) assumes that the effects are more or less strong depending on a given country's degree of financial integration with the US and vary according to the exchange regime. Thus, in theory, countries with floating exchange rates are less exposed; they experience smaller changes in interest rates while inflation remains high. However, in practice, Canova (2005) notes that the negative effects on production are equivalent, depending on the exchange rate arrangement. This result can be explained by the country's "fear of floating" (Calvo and Reinhart, 2000), which pushes the monetary authorities to react, even in countries where the exchange rate is de jure flexible. Therefore, the effects are similar regardless of the monetary and exchange rate policies officially adopted.

External liquidity shocks, such as those observed since the financial crisis, places emerging countries financial markets and banking systems at the core of a series of spillovers (Mohanty, 2013; Shin, 2013). The US non-conventional policy directly affects the price of bonds issued in emerging countries in national and international currency, exposing them to a high foreign exchange risk, which is what happened after the announcement of the end of the quantitative easing policy by the Fed in May 2013. However, the magnitude of the impact depends on the macroeconomic and financial profile of the countries concerned. The return to stability was faster in economies with strong fundamentals and that have put in place policies that limit capital inflows. Thus, the countries of Southeast Asia, most affected by the inflection US monetary policy at the time of crisis in 1997, were much less contaminated with the international dissemination of the US monetary shock over the period 2010-2015 (Leung, 2015; Rafiq, 2015).

Finally, it is interesting to focus on the impact of the recent financial crisis episodes by integrating global financial shocks. The literature shows that even if the origins of the crises are different (the 1997 Asian crisis started on the foreign exchange markets, and the 2008 US subprime crisis began in the housing sectors), the spillover effects are the same. A crisis in a country induces international lenders' loss of confidence in financial markets and thus stock exchange volatility (Corsetti et al., 2005; Allen and Gale, 2007; Reinhart and Rogoff, 2009). This situation is at the origin of global portfolio reallocation that generates considerable outflow of capital from vulnerable economies (Frank and Hesse, 2009; Brunnermeier, 2009). International reserves in these economy decrease, which generates some pressure on the exchange rate, and the monetary authority may increase the interest rate, which can create economic slowdown.

A new set of ex ante criteria are elaborated in an attempt to prevent these massive outflows of capital and thereby avoid the negative consequences on the real sector.

2.2. A new set of criteria

In a context of low capital mobility, the OCA theory emphasises the need to make ex ante structural macroeconomic reforms to overcome the problem of shock asymmetry (Kenen, 2000). The theory of optimum currency areas, in reference to the seminal work of Mundell
(1961), was innovative in the 1960s because it defines a new global monetary system on a regional basis. Mundell (1961) focuses on the preconditions for the adoption of a perfect regional exchange rate to limit the adverse effects of shock asymmetry. The author assumes that prices and wages are rigid and mobility capital is too low to influence domestic policies. Therefore, the nominal exchange rate determines the real exchange rate, which in turn influences the current balance. The exchange rate instrument is assigned to external equilibrium and to domestic monetary and fiscal policy objectives. Under these assumptions, we can deduce that when the labour factor in a region is mobile, the use of a flexible exchange rate as an adjustment variable in the case of shock asymmetry is not justified, and a currency area may be considered.

Because of the exchange rate’s loss of flexibility within the monetary union, other solutions must be devised to prevent or reduce the potential asymmetric impact of real shocks disturbing the country. Structural reforms must be made to reduce the strength of the impact, for example, the diversification of production and exports of goods as a preventive solution (Kenen, 1969) and economic openness, enabling external equilibrium by domestic absorption without affecting domestic stability, as a shock absorption solution (McKinnon, 1963).

Ingram (1969) shows that complete labour mobility between countries is not sufficient to absorb the effects of possible asymmetric shocks and must be accompanied by free capital movements. This approach makes it possible to restore an equilibrium between areas in deficit and in surplus and to reduce the spread of interest rates within the region. This method supposes a convergence in institutional structures to allow for efficient reallocation of funds to the countries affected by the shock.

Finally, Fleming (1971) stresses the necessary convergence of monetary policy objectives in the long term, and thus of their macroeconomic and social structures, to meet the aforementioned criteria.

Although these criteria are essential to ensure the stability of a monetary union, the ability of countries to protect themselves from financial contagion by acquiring ex ante international investors’ confidence is a crucial issue. Since the 1960s, many changes in the international monetary system have been made, making these criteria insufficient. In particular, in light of the development of the international monetary system, these considerations can be enriched by integrating the issue of the economies’ considerable financial openness, which has also greatly influenced the mobility of capital and the countries’ vulnerability to financial crisis. This approach entails considering the lessons of the “third generation” of crisis theory. In particular, the contagion phenomenon, which was particularly pronounced during the last financial crisis, makes it necessary to expand the set of traditional macroeconomic regional criteria to incorporate a banking and financial dimension. There are different definitions of contagion, depending on whether we look at the fundamental or psychological aspect, and thus different transmission channels that can be considered. In the case of fundamental contagion, two channels are taken into account: the real channel, by means of trade between countries, and the financial channel, which includes both banking and financial relations between countries. In contrast, “pure” contagion (Masson, 1998) depends on both subjective and objective factors that are not determined by the level of or variation in the fundamentals. This psychological contagion reflects a situation in which the effects of an external shock are greater than that expected by fundamentals.
Fundamental contagion (Dornbusch, Park and Claessens, 2000; Claessens and Forbes, 2013), with reference to "non-contingent crisis" theories (Forbes and Rigobon, 2000), is caused by the real and financial interdependencies between countries. Empirical studies test the role of a crisis's different transmission channels through trade links (Glick and Rose, 1999); the financial channel, which includes both banking exchanges between countries, taking into consideration the role of the common creditor (Caramazza, Ricci and Salgado, 2000; Van Rijckeghem and Weder, 2001); and variations in financial assets following portfolio reallocations by international investors in countries with the same macroeconomic profile as the first country hit by the crisis (Calvo, 1999; Kaminsky and Reinhart, 1999; Schinasi and Smith, 1999; and Kodres and Pritsker, 2002). Two types of methods are commonly implemented to measure this fundamental contagion: probit/logit and non-parametric approaches. Regression models such as probit/logit models consider real and financial bilateral links between the first country hit by a crisis and every infected country and other control variables to determine the macroeconomic similarities between the countries affected (Eichengreen, Rose and Wyplosz, 1996; Glick and Rose, 1999). Moreover, some authors (Edwards, 1998) use GARCH models, generally employed to measure "pure" contagion, to assess the channel of macroeconomic volatility transmission between countries.

The magnitude of the adverse effects of these crises highlights the presence of a systemic risk. This phenomenon has been linked to an increasing vulnerability of banking and financial institutions and interactions between the financial and economic spheres causing its propagation throughout the whole economy.

The problem for banks arises from both a microeconomic point of view, because of the significant deterioration of their balance sheets, and from a macroeconomic one, because of their interactions in the context of information asymmetry. Indeed, financial market integration has increased competition among banks, which have provided a significant amount of credit, and thus also increased their foreign currency debt (Stiglitz, 2000, 2001). The problem of moral hazard, exacerbated by early and rapid financial liberalisation in emerging economies and the lack of effective supervisory measures, is at the core of the fundamental analysis of crises (McKinnon and Pill, 1998). The credit supply is facilitated by implicit guarantees from governments or international institutions. This situation generates an "overborrowing syndrome", which is reflected in a massive increase in bank loans, coupled with excessive risk taking in the banking sector. This phenomenon is visible at a national and international level. On the one hand, domestic banks are encouraged to offer credit, relying on governments that bail out banks to avoid economic crash. On the other hand, foreign banks in search of high returns for their investments do not hesitate in financing domestic banks that need liquidity, relying on guarantees from governments and institutions to reduce the risk of default. This response is followed by a surge in non-performing loans that generates an overinvestment problem with low profitability, an expansion of current account deficits and an increase in banks' debt in foreign currency and short-term maturities (Corsetti, Pesenti and Roubini, 1998a). These effects result in the increasing fragility of countries' banking systems. When the burden of bank debt in foreign currency exceeds the amount of reserves in the banking system, the situation becomes unsustainable.

This interpretation of the determinants of financial crises can be completed by considering the extent of the liquidity risk that could cause a crisis because of the self-fulfilling expectations of international investors. The idea is that the presence of banking and financial weaknesses,
revealed by a large decrease in reserves, increases economies' vulnerability to external shocks and changes market expectations. However, this situation can also occur in a strong financial system if the amount of short-term debt is much higher than the short-term assets held by the country. This liquidity risk was exacerbated in Southeast Asia by the massive short-term capital inflows that followed financial liberalisation in the 1990s (Radelet and Sachs, 1999). Domestic banks with a significant amount of short-term loans in foreign currency subsidised many long-term loans in national currency, thereby changing the maturity of loans and their terms and increasing the vulnerability of financial intermediaries. Chang and Velasco (1999), inspired by the work of Diamond and Dybvig (1983), highlight this phenomenon. The authors analyse the behaviour of financial intermediaries in a small open economy through the relationship between domestic and foreign lenders and national banks. Investors choose between short-term and long-term investments, whose performance is much more advantageous, with a risk of loss if they are liquidated before maturity. Equilibrium is achieved as long as banks are able to guarantee the amount of deposits. However, liquidity risk increases when the short-term asset does not cover the banks' debt; the financial intermediaries suffer from financial weaknesses, making them more vulnerable to investors' pessimistic expectations. In a context of uncertainty, a sudden loss of confidence among creditors produces a bank panic. The run on deposits leads to a "bad" equilibrium that confirms investors' expectations. To meet the demand for capital, banks conduct a hurried liquidation of their assets. A self-fulfilling liquidity crisis and a general fall in asset prices and exchange rate reserves ensue.

Furthermore, banks are interconnected through the interbank market. The default of one bank therefore has an impact on the entire banking system, exacerbated by a lack of prudential supervision. The difficulties of finding liquidity are amplified in times of crisis, which increase all banks' exposure to liquidity risk, like a default chain, and therefore contribute to the "domino effect" (De Bandt and Hartmann, 2000). Information asymmetry augments this phenomenon, generating non-productive investments because of adverse selection problems (Mishkin, 1999). In addition, during the period of "euphoria" before the crisis, agents fail to objectively measure the risks inherent in each economy, creating endogenous fragility of the system (Minsky, 1986). This situation is also amplified by a "disaster myopia" phenomenon, the distance from the last episode of financial crisis reducing the sensitivity of banks to systemic risk (Guttentag and Herring, 1986). In addition, banks seeking a high return invest in assets whose future value is difficult to predict, thus lessening economic agents' perception of the uncertainty horizon (Hellman, Murdock and Stiglitz, 2000).

On financial markets, the increase in systemic risk leads to the formation of bubbles (Blanchard and Watson, 1982). In the context of uncertainty concerning the value of fundamentals, the anticipation of an asset's future value is based on a set of beliefs shared by agents in the market, which increases the fluctuation of asset prices (Fratzscher, 1999). In addition, when the capital market is imperfect in the presence of information asymmetry, banks are unable to select firms that propose efficient investments. This situation causes a collapse of investment, which confirms the negative expectations and generates a decline in asset prices. This decline results in a massive withdrawal of capital from the banking system (Kugman, 2001) and contributes to the worsening of the exchange rate crisis.

The methods used to examine indicators of vulnerability of emerging countries to crisis during the 1990s are diverse. Qualitative analyses studying the evolution of variables immediately before crises are complemented by ones based on a comparison of indicators during crisis and
in normal periods. Finally, the non-parametric approach is used to establish a set of warning signals of crisis (see in Table 1). Whatever the method chosen, this literature underlines a set of crisis indicators: the amount of foreign reserves compared with short-term debt or money supply, the overvaluation of the real exchange rate, the amount of bank credit, the current account deficit and financial market volatility. A convergence of external debt to a reference level, notably caused by a low amount of short-term debt compared with the amount of international reserves available in the country, as well as the use of domestic credit not exceeding the amount of liquidities available in the banking system, are criteria for ensuring market confidence and thus limiting market volatility (Gimet, 2007). Thus, regardless of the crisis episode, banking and financial stability following strict banking and financial constraints makes it possible to secure the confidence of international lenders and avoid the spread of crisis. This is the case for most emerging countries that have learned lessons from the 1990s crisis and adopted a prudential policy (Dufrenot, Mignon and Péguin, 2011).

### Table 1. Financial crisis indicators: A sample of empirical studies addressing the emerging market crisis of the 1990s

| External sector                      | CPR (98) | MR (98) | RS (99) | BM (99) | RV (99) | T (99) | GKR (00) | V (00) | KSS (01) | W (01) | BC (02) | BF (02) | CDM (02) | C (03) | E (03) |
|-------------------------------------|----------|---------|---------|---------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|
| International reserves (-)          | X        | X       |         | X       | X       | X      | X       | X      | X       | X      |         |        |         |        |
| External debt (+)                   |          | X       | X       |         | X       |        | X       |        | X       |        |         |        |         |        |
| Real exchange rate (+)              | X        | X       | X       | X       | X       | X      | X       | X      | X       |        |         |        |         |        |
| Current deficit (+)                 | X        | X       |         | X       | X       | X      | X       | X      | X       |        |         |        |         |        |
| Exportations (-)                    |          | X       | X       |         |         |        |         |        |         |        |         |        |         |        |
| External shock (+)                  | X        |         |         |         |         |        |         | X      | X       |        |         |        |         |        |

| Internal sector                     | CPR (98) | MR (98) | RS (99) | BM (99) | RV (99) | T (99) | GKR (00) | V (00) | KSS (01) | W (01) | BC (02) | BF (02) | CDM (02) | C (03) | E (03) |
|-------------------------------------|----------|---------|---------|---------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|
| Real interest rate (+)              |          |         |         |         |         |        |         |        |         |        |         |        |         |        |
| Credit growth (+)                   | X        |         |         |         |         |        |         |        |         |        |         |        |         |        |
| Excessive money supply (+)          |          |         |         |         |         |        |         |        |         |        |         |        |         |        |
| Budgetary deficit (+)               | X        |         |         |         |         |        |         |        |         |        |         |        |         |        |
| GDP (-)                             |          |         |         |         |         |        |         |        |         |        |         |        |         |        |
| Stock market index (+/-)            | X        |         |         |         |         |        |         |        |         |        |         |        |         |        |


The sign in brackets is the sign of the relationship between the indicator and the probability of crisis. A cross indicates that the variable is considered statistically significant.
These empirical findings are consistent with the theoretical idea that it is necessary to consider new banking and financial macro-prudential criteria to avoid the vulnerability of countries to external financial shocks. First, priority must be given to the consolidation of the banking system. On the other hand, it is important to control short-term capital inflows.

Stability of the banking sector is necessary to limit the amount of speculative borrowing and therefore discourage non-productive investment (Furman and Stiglitz, 1998). In particular, a certain amount of capital may be required to have a minimum level of available liquidity to discourage excessive risk taking (Krugman, 1999; Chang and Velasco, 1999; Hellman, Murdock and Stiglitz, 2000). Moreover, measures to limit the pro-cyclicality of risk taking must be envisaged (Borio, Furfine and Lowe, 2001; Borio, McCauley and McGuire, 2011; Brunnermeier et al., 2012; Caruana, 2011).

The solutions to the problem of short-term inflows are the subject of much controversy. Some economists recommend a tax on short-term capital flows, which may have positive effects because it redefines the maturity of external debt in the long term (Chumacero, Laban and Larain 1997; Montiel and Reinhart, 1999; Edwards and Rigobon, 2009).

Moreover, control of the quality and amount of foreign currency assets through capital inflow restrictions may be necessary to limit countries' exposure on international markets. This control can take the form of implicit taxes on bank loans in foreign currency through fixed amounts in foreign currency reserves (McKinnon and Pill, 1998).

The current discussion of the "new dilemma" instead of the traditional trilemma reopens the debate by focusing on the efficiency of capital controls even in the case of floating exchange rate regimes (Aizenman, 2010; Borio and Zhu, 2012; Bruno and Shin, 2012; Rey, 2013).

To conclude, the phenomena of contagion and regionalisation cannot be assimilated. It is not economic integration that is the main factor responsible for the spread of crises but the lack of convergence of banking and financial indicators between countries towards stable standards, which does not make the sustainability of the area possible.

3. The 2007 crisis episode and the validation of the new banking and financial criteria

The asymmetric impact of the US financial shock in 2007 that spread to the Eurozone and revealed the weaknesses of the banking and the financial sectors of member countries confirms the aforementioned suggestions. Indeed, the lack of macro-prudential supervision to prevent systemic risk (De Bandt and Hartmann, 2002) reinforced the area's heterogeneity and resulted in a direct and unequal impact of the US crisis on the Eurozone through the banking and finance channels, which then spread to the real economy in these countries. Some solutions that converge with the proposition made in the preceding section of this survey are suggested today, although they come rather late.

3.1. The incompleteness of the Maastricht regional criteria

The regional criteria used to ensure economic convergence before the adoption of the euro area are limited to the Maastricht criteria. Having reached the third stage of economic integration corresponding to the common market since the Treaty of Rome in 1957 and limited changes in
exchange rates between currencies to +/- 2.25% in the European Monetary System, in 1992 twelve European countries signed the Maastricht Treaty for the adoption of a common currency. The Treaty entails the five institutional criteria. First, it is essential that countries maintain their exchange rate in the European Monetary System over a period of at least two years. In addition, the inflation rate must not exceed 1.5% of the average of the three member countries with the lowest inflation rate. The long-term interest rates should remain below 2 points of the average rates of the three countries with the lowest inflation rate. Finally, the deficit is limited to 3% of GDP and the public debt to 60% of GDP.

From a theoretical economic point of view, these criteria are in some ways insufficient. First, they are not based on the traditional OCA theory. Only the Fleming (1971) criterion on the convergence of monetary policy objectives between countries can be observed in the requirement of a limit on the rate of inflation. However, similar to other traditional requirements that make it possible to ensure the stability of a monetary union, this criterion must be based on a structural convergence of the economies. Nevertheless, the only structural criteria provided in the Treaty are institutional and concern the independence of the European Central Bank.

Real criteria are not considered. The Treaty provides only a set of nominal criteria that do not solve the problem of asymmetries between the economies because of the persistence of deep disparities (De Grauwe, 1994). Moreover, the respect of arbitrary thresholds is largely influenced by political considerations, instead of economic concerns (De Grauwe, 1993).

It is clear that the formation of a monetary union presupposes in the countries an inflation convergence to a low rate to allow the establishment of an independent regional monetary policy. Overvalued real exchange can therefore no longer be used to control inflation because such an exchange would require a devaluation at the time of monetary unification incompatible with the exchange rate stability criterion and impose a costly adjustment of the economy. Moreover, long-term interest rate spreads should theoretically be reduced to comply with the abovementioned criteria. However, it is difficult to justify the fact that the stability of a future monetary union may depend on the respect of arbitrary quantitative limits on government deficit and debt to gross domestic product. The sustainability of a public debt depends on the solvency of the state and on its ability to repay its debt in the long term and to mobilise resources to refinance maturing debt. As the debate surrounding the Reinhart and Rogoff (2009) analysis has shown, the sustainability threshold of a debt depends on both a set of structural factors specific to the country (its ability to capture domestic and international savings, external position, potential growth, etc.) and on the current situation (crisis or normal period). Therefore, a deficit can be considered too high once it creates excess demand that generates an increase in the deficit. Thus, although it is necessary for budgetary deficits and public debt to converge to sustainable levels, constant and identical thresholds for all countries do not appear to be an appropriate solution.

Finally, a third remark concerns the insufficient consideration of the countries' banking and financial situation. The organisation and regulation of the banking and financial systems are not retained in the Maastricht Treaty. These factors inherent to the regionalisation process should have been considered theoretically in the transition from the third to the fourth stage of integration, which would have substantially consolidated the unification of financial markets and helped to limit financial risk taking. In addition, a preventive system is essential to guaranteeing the liquidity of these sectors and ensuring that the system can resist specific
shocks, as demonstrated in the previous section. The spread of the US crisis to euro area countries confirms the lack of this type of system (Chudik and Fratzscher, 2011). In fact, the systemic profile of the crisis in the summer of 2007, which originated in the US and spread to Europe through banking and financial relations between countries, revealed several weaknesses responsible for the increased vulnerability of the Eurozone to international financial shocks. The weaknesses are linked to the pro-cyclicality of risk taking as in the banking sector and financial markets. In the euphoria period preceding the crisis, during the Great Moderation period marked by strong global growth and inflation, risk taking was underestimated.

The endogenous fragility of these countries is caused by the behaviour of banks in particular, notably through the phenomenon of disaster myopia (Guttentag and Herring, 1986; Cornand and Gimet, 2012). This behaviour generated a credit boom and high indebtedness as well as an overreaction and bubbles in asset markets (Brunnermeier, 2009). Given the increased interdependence of financial markets, speculative shocks spread from one country to another, despite their geographical distance, through portfolio arbitrage. The situation was aggravated by the information asymmetry phenomenon. The European response to the US liquidity crisis was stronger because the Eurozone suffered from a significant concentration of risks in the banking system, responsible for the sector's low degree of resilience. This response was followed by a severe depressed phase responsible for the propagation of the shock to the real economy.

Hence, this crisis was all the more serious as the risks focused on banks. The liquidity risk was at the core of the financial crisis problem in Europe and highlighted the fact that decisions must be taken at a regional level to allow for better decoupling between international financial crises and the European response (Bordo, 2008; Brunnermeier, 2009; Acharya and Schnabl, 2010).

An appropriate set of regional banking and financial criteria in the Eurozone would have limited the vulnerability of European countries to this international financial shock. The real economy would not have been disturbed, and the European debt crisis would have been avoided.

Thus, today, new regional and global governance has been put in place. It is time to rethink regional financial and banking organisation in light of these lessons.

This action therefore means defending the introduction of a new macro-prudential policy of risk management in the banking sector, including the model of the US Dodd-Frank Act, taking into account the area's specificities.

### 3.2. Towards new global and regional governance

To limit the occurrence of these systemic crises, different types of solutions have been envisaged and economies' coordination on this question has been reinforced.

Following the recommendations of Basel III, a new set of measures is gradually being introduced to strengthen the regulation and supervision of the banking sector and to improve risk management at both the micro- and macroeconomic levels. In particular, to prevent liquidity risk, maturity transformation has been limited and short-term interbank financing, through liquidity ratios, has been controlled. The purpose is also to improve the volume and
quality of banks’ capital; to better take into account exposure to counterparty risks related to derivatives; to increase capital requirements weighted by risk, using a leverage ratio; and to implement countercyclical capital buffers (Basel Committee on Banking Supervision, 2011).

The European banking union project appears to be part of this path. Specific to Europe is the existence of a vicious circle between banks and sovereign risk caused by the ECB’s choice of the indirect monetisation of debt (Black et al., 2013; Beck, 2012). European banks are largely holders of European sovereign debt encouraged by the ECB’s unconventional policy from 2009 to 2015. Thus, beyond the priority objectives in the Eurozone, which consist in limiting the risk of abrupt reversals of private capital flows within the zone, by fighting against the fragmentation of capital markets at a time of crisis, and in reinforcing the independence of national regulators in the banking industry, it is important to solve the problem related to the interdependence between banks and sovereign risk.

Thus, three principles must be emphasised. The first is centralised supervision of the ECB. The second consists of common principles for bank restructuring, giving priority to private sector involvement (as opposed to bailout by the public sector) in the event of liquidity problems and potential access to a shared resource through a strengthened European Stability Mechanism. Finally, the last aim concerns deposit insurance (Beck, 2012; Pisani-Ferry et al., 2012).

The Dodd-Frank Act approved in the US in July 2010 pursues the same objective. It aims at preventing public bailouts of financial institutions and protecting consumers by tackling systemic risk with an advance warning system that ensures better transparency and accountability for exotic instruments. This effort can be considered a new attempt by regional governance to prevent systemic crisis from a macroeconomic point of view (Acharya and Schnabl, 2010; Hanson, Kashyap and Stein, 2011).

Table 2. New macro-prudential indicators in the literature: A summary

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>WARNING INDICATORS</th>
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<td>International debt securities</td>
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<td>Credit to GDP gaps</td>
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<td>Banking sector</td>
<td>Capital requirements (volume and asset quality)</td>
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<td>Liquidity level</td>
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<td>Maturity and currency mismatch</td>
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<td>Stress tests</td>
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<tr>
<td>Financial</td>
<td>Annual growth rate in real residential property prices: deviation from a long term trend</td>
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<tr>
<td>markets</td>
<td>Corporate bond, CDS spread, risk premia</td>
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<td></td>
<td>Short term capital flows</td>
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</table>

4. Conclusion and recommendations

In light of recent crises, monetary union projects are taking on a new dimension, raising the issue of the *ex ante* conditions necessary for establishing a monetary union that can resist international financial shocks. The purpose of this survey is therefore to propose a new set of *ex ante* sustainability criteria for monetary union, concentrating on the role of banking and financial criteria and the regional dimension. From the *third generation of crisis* literature and the empirical example offered by the reforms adopted by countries at a regional and international level, it appears important to consider the following: a low exposure in foreign currency and short-term capital; restrictions on banks’ foreign claims; a limited gap between the cost of mobilisation and the income of the assets in the banking system; a level of liquidity that covers the amount of credits; higher capital requirements as part of a countercyclical capital buffer; and a sustainable level of external debt, particularly a low amount of short-term debt covered by a sufficient amount of foreign exchange reserves at a regional level. Therefore, market volatility should be reduced and the confidence of international lenders should be preserved.

These new criteria must be incorporated at a regional level into the future monetary union project to limit the asymmetric impact of common shocks and ensure the area’s stability in the long term.

References


Radelet, S., Sachs, J. (1999), What Have We Learned, so far from the Asian Financial Crisis CAER II Discussion Paper 37.


Notes

1 Whereas supply shocks are assumed to have a permanent effect on output, demand shocks have a temporary one.

2 The author assumes that in the long run money supply and demand and IS shocks do not affect the gross domestic product. In the short term, supply shocks and money demand have no effect on production; production does not influence money supply, and money demand is homogeneous.

3 International variables are assumed to be exogenous.

4 According to Levy-Yeyati (1999), this fragility will be even more important in the case of asymmetries in guarantees. Indeed, the protection of foreign creditors may exacerbate capital inflows in emerging economies.