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► **To cite this version:**

André Cartapanis, Marie-Hélène Gagnon, Céline Gimet. Financially sustainable optimal currency areas. Finance Research Letters, In press, pp.104059. 10.1016/j.frl.2023.104059 . hal-04165420

HAL Id: hal-04165420

<https://hal.science/hal-04165420>

Submitted on 19 Jul 2023

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FINANCIALLY SUSTAINABLE OPTIMAL CURRENCY AREAS¹

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This version: May 2023.

¹ The project leading to this publication has received funding from the French government under the “France 2030” investment plan managed by the French National Research Agency (reference: ANR-17-EURE-0020 and ANR-21-CE41-0010) and from Excellence Initiative of Aix-Marseille University - A*MIDEX.”

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ABSTRACT

In current economic conditions, financial stability is paramount to the proper functioning of open markets. Financial stability must be balanced with financial flexibility. This relationship is deeply affected by financial fragmentation. This is why Central Banks have focused on these issues in the last decade in particular. Both financial stability and financial fragmentation have unintended consequences on optimal currency areas. In this paper, we survey the original optimal currency areas literature and relate it with the new literature on financial stability and financial fragmentation. We highlight the importance of new macroprudential policies both at the national and regional levels.

Keywords: Optimal currency areas, Financial stability, Financial fragmentation

FINANCIALLY SUSTAINABLE OPTIMAL CURRENCY AREAS

In June 2022, the ECB Governing Council highlighted the importance of fragmentation in the European financial system at this current crucial point where monetary transmission is required to be as symmetric and straight forward as possible across all member states. Financial fragmentation remains prevalent, especially after the 2008 crisis (Coudert et al. 2020). European fragmentation decreases the efficiency of the common monetary policy. While the current events in the Eurozone underscore the importance of financial sustainability in optimal currency areas, the original literature did not emphasize this aspect of currency areas with the exception of Ingram (1969)'s criterion of free capital mobility. Therefore, this paper aims to reconcile the literature on optimal currency areas and the literature on financial stability and financial fragmentation.

In a regionally integrated financial system such as the Eurozone, financial stability implies a tradeoff with national economic policies. It follows that policies aiming at reducing financial instability in an optimal currency area will reduce individual states abilities to set their own prudential policies (De Grauwe and Ji, 2016). This paper underscores these relationships and highlights how the current problematic with financial fragmentation in a context of financial instability departs from the conventional optimal currency areas literature.

An optimal currency area is defined as a region with sufficient economic and political integration allowing the sharing of a single currency (Mundell, 1961). Optimality refers to the high degree of regional integration measured by the mobility of factors of production, price and wage flexibility, economic openness, diversification in production, similarity in inflation rates, and economic and political integration (Mongelli, 2002). In a context of low capital mobility, the theory of optimum currency areas (OCA) emphasizes the need to make *ex-ante* structural macroeconomic reforms (Kenen, 2000). However, recent experiences have shown that financial instability reduces a currency area's resiliency to a given shock and the effectiveness of its common monetary policy. Indeed, Aizenman (2018) argues fast-moving asymmetrical financial shocks interacting with real distortions pose a serious threat to the stability of currency areas and fixed exchange-rate regimes. In particular, recent crisis episodes highlighted the fixed exchange rate's vulnerability to international financial shocks

and the asymmetrical transmission of the crisis in regionally integrated areas (Reinhart and Rogoff, 2008).

Regional financial integration supposes common rules and equal access to financial services and instruments, and equal investment opportunities among comparable participants. This convergence results in an increase in cross-border financial links, in higher risk-sharing and symmetrical exposure to friction and common shocks (Baele et al., 2014). However, financial shocks are often inherently asymmetrical and financial vulnerabilities tend to build up over time (ECB Financial Stability Review, 2021). The ECB defines *financial stability* as a condition in which the financial system – which comprises financial intermediaries, markets, and market infrastructure – is capable of withstanding shocks and the unravelling of financial imbalances. Financial vulnerability is further exacerbated in the Eurozone by financial fragmentation created by the incomplete integration of the banking and financial systems.

1. THE CHOICE OF AN EXCHANGE RATE REGIME

1.1 Mundell's Trilemma

Mundell's trilemma (1961, 1963) states that only two out of three possibly desirable outcomes can be achieved: 1) fixed exchange rate, 2) independent monetary policy, 3) international mobility of capital. For example, monetary autonomy in a context of financial liberalization is not compatible with a fixed exchange rate because of the destabilizing effects of potential speculative attacks based on interest rate differentials. Alternatively, if the commitment to monetary autonomy is combined with a strong preference for a fixed exchange rate regime, then international capital mobility must be abandoned. Therefore, the choice of the exchange rate regime has generated a lot of debate (Obstfeld and Rogoff, 1995; Reinhart and Rogoff, 2004) and the range of possibilities has increased. Ilzetzki, Reinhart and Rogoff (2019, 2021) use the simplified typology (fixed, flexible and intermediate), even if each of them covers relatively different practices. Management of exchange rates is today the most widespread practice for more than 65% of countries, representing 40% of world GDP, i.e., with a hard peg or with a narrow fluctuation band. Only 3% of economies adopt pure float, but they are the largest economies, weighing 30% of global GDP. We are far from the dominance of corner solutions provided by Mundell's trilemma. Frankel (2017) offers comparable results. A very

large majority of countries are now adopting what he calls a *systematic managed floating*, giving them an intermediate degree of monetary autonomy coupled with an intermediate dose of exchange rate flexibility.

Mundell's incompatibility trilemma has been called into question. Rey (2013, 2019) underscores a new dilemma between monetary autonomy and capital mobility, regardless of the exchange rate regime. While some economists continue to defend the relevance of the trilemma (Obstfeld, 2017; Gopinath, 2019), others take a nuanced position by considering the *hybrid configurations* within the Mundell *triangle* itself, depending on the country (Aizenman, Chinn and Ito, 2010; Aizenman, 2018).

1.2 Monetary Union: The Case of the Eurozone

The Eurozone is a unique example of actual monetary union (see Table 1). The Delors Report or the Emerson Report (European Commission, 1989, 1990) put forward three objectives, for the future member countries of the European monetary union (Mongelli, 2010; Beetsma and Giuliodori, 2010):

- i) reduction of transaction and information costs caused by currency risk;
- ii) enhanced credibility of a single independent central bank, responsible for price stability;
- iii) increased autonomy of the Eurozone at the international level and less sensitivity to the dollar.

In such a context, asymmetrical shocks become problematic given that a single monetary policy does not accommodate differentiation of business cycles in member countries. As attractive as the European area currency seemed, experience has shown that a single currency induced heterogeneity within the suboptimal European area. The Euro area remains an incomplete monetary union. Moreover, a monetary union is a political project involving a deepening of the economic and institutional integration of member countries. Thus, further extensions of the scope of monetary integration to fiscal policies and financial stability policies remain on the agenda.

SECTION 2. THE CHALLENGES POSED BY FINANCIAL SHOCKS TO OPTIMAL CURRENCY AREAS

2.1 Conventional OCA Theory

Table 2 summarizes the nature of the criteria underscored by the literature in order to address the issue of asymmetrical shocks affecting a currency area both in terms of prevention and in terms of absorption of the shocks. The bulk of the literature on OCAs was written before the introduction of the Eurozone. At a regional level, Mundell (1961) underscores the importance of labor mobility for shock absorption. He argues that currency area can be optimal even in the presence of asymmetry. Flexible exchange rates as an adjustment variable for asymmetrical shocks are not a necessary condition. However, the common monetary policy then relies on prices and wages rigidities and low capital mobility. When there is an external deficit and unemployment associated with a negative demand shock in one country, labor movement from deficit to surplus countries corrects the imbalance and depreciation is not required. Again, at the regional level, Fleming (1971) stresses the importance of the convergence of monetary policy objectives in the long term, and thus, of their macroeconomic and social structures, in order to complete the labor mobility criteria underscored by Mundell (1961). At a national level, the diversification of production and exports criteria limits the total impact of shocks that concern a specific industry (Kenen, 1969). Moreover, economic openness, which enables external equilibrium by domestic absorption without affecting domestic stability, is considered as a shock absorption solution (McKinnon, 1963).

These original criteria for the success of an OCA were based solely on the real economy since capital mobility was limited in the 1960s. Nowadays, countries' financial openness supposes that the traditional real OCA criteria should be completed by considering new conditions in order to prevent the impact of international financial shocks.

2.2 External Shocks

New external shocks related to the international cycle of credit must be considered. In particular, the literature shows that recent sudden stops, characterized by an abrupt reversal of capital flows (Calvo et al., 2004), are associated with changes in US monetary policy. Indeed, Rey (2013, 2019) underscores the major role played by the US monetary policy in shaping a

global trend in financial markets, cyclicity of credit, and asset price movement. Countries with large current deficits relying on credit inflows are particularly vulnerable to the global financial cycle. International banks are instrumental in the credit booms and bursts, the impacts of which differ in magnitude and depend on the robustness of the country's fundamentals and its ability to curb massive capital flows.

Risk, risk measurement, and risk aversion play significant roles in accounting for the global cycle of credit. In the absence of an appropriate regulatory framework, agents fail to objectively measure the risks, giving the system endogenous fragility (Minsky, 1986). An increase in systemic risk leads vulnerability to sudden stops. This sudden loss of confidence among creditors drives countries into a "bad" equilibrium that confirms investors' expectations, generating a self-fulfilling liquidity crisis and a generalized fall in asset prices (Diamond and Dybvig, 1983; Chang and Velasco, 2000; Radelet and Sachs, 1999; Merler and Pisani-Ferry, 2012, De Grauwe et al., 2013). In theory, countries with floating exchange rates are less exposed to sudden stops given that their interest rates fluctuate less.

However, in practice, financial spillovers are similar for all types of exchange rate regimes (Canova, 2005; Rey, 2019). Rey (2016) argues that monetary policies are never truly independent regardless of the exchange rate regime due to the influence of the global financial cycle. Thus, the trilemma is in fact a dilemma given that capital flows must be controlled in order to ensure monetary policy independence. In the case of a monetary union, capital controls must be implemented regionally if the currency of reference floats. The existence of this global financial cycle is discussed in the literature but even if a certain autonomy of the monetary policy is preserved in flexible regimes (Obstfeld, 2017), the long-term interest rates are correlated at the international level, limiting the scope of monetary policies.

2.3 Internal Asymmetry

Another important issue is the external disequilibrium within the currency area with current deficits in some member countries, which are compensated by internal capital movements. Ingram (1969) shows that complete labor mobility between countries is not sufficient to counteract the effects of asymmetrical shocks in an integrated area and that free capital

movements are required to restore an equilibrium between deficit and surplus countries. Free capital movements imply a convergence in institutional structures allowing an efficient reallocation of funds to the countries affected by the shock. The deficit country offers new investment opportunities when these countries suffer from external and internal imbalances such as unemployment, capital inflows finance productive public expenditure and facilitate private investment.

However, the increase in cross-border lending can also create a credit boom, increasing systemic risk, asset prices, and financial vulnerability, especially in a context of information asymmetry and lacking macro-prudential supervision (Agénor et al., 2018). The lack of national macro-prudential measures creates a surge in non-performing loans in deficit countries, generating overinvestments and a widening of current account deficits. The increase in banks' debt renders countries more vulnerable to sudden stops (Corsetti, Pesenti and Roubini, 1998; Merler, 2015). In an OCA, the countries in surplus finance countries in deficits.

These loans may not generate productivity growth in deficit countries, but rather a growing current account deficit and an increasing financial vulnerability (Borio, 2013). Thus, the gap between surplus and deficit countries is widened and the financial cycles are disconnected across the members of the monetary union, creating financial fragmentation. Kaminsky and Reinhart (1999) state that *contagion*, based on real and financial interdependencies between countries (a term equivalent to the fundamental contagion term coined by Dornbusch, Park and Claessens, 2000), explains the regional profile of the crises. In a monetary union, banks are interconnected through the interbank market, which increases all banks' exposure to liquidity risk and creates a default chain (De Bandt and Hartmann, 2000).

On the financial markets, fundamental financial contagion is associated with variations in financial asset prices due to portfolio reallocations through international investors in countries with the similar macroeconomic profile as the originating country of the crisis (Calvo, 1999; Kaminsky and Reinhart, 1999; Kodres and Pritsker, 2002; Brunnermeier, 2009). These portfolio reallocations, called *wake-up calls* by Forbes (2013), are strengthened by the flight to quality behavior of investors in case of financial turmoil and by the major role played by global banks at a regional level (Chan-Lau and al., 2012). In the Eurozone crisis of 2011, the vicious circle between banking and sovereign risk exacerbated this risk of contagion.

The liquidity crisis can be compensated by an intervention of the common central bank (TARGET flows in the Eurozone) and by official public inflows (Fagan and McNelis, 2020). The spread on state long-term interest rates in countries with higher private capital outflows increases. The central bank liquidity assistance at a higher interest rate increases in these countries, which supplants flows on the interbank market (see the Emergency Liquidity Assistance (ELA) in the Eurozone, for example). Consequently, risk premia were increasing and the credit became costly in the financially stressed economies, which accentuated the financial fragmentation problem within the monetary union.

2.4 Optimal currency area 2.0

Several authors have investigated how to adjust the OCA conventional theory with respect to the recent events in Europe, in particular. On the theoretical side, the literature extends traditional Mundellian models to account for more than the enumeration of *noncommensurable criteria* (Santos Silva and Tenreyro, 2010). Significant contributions documents the nature of the shocks within the union and the monetary policy endogenous response. Aguiar et al. (2015) question the traditional conclusion of OCA literature that a country should join a union where members are similar to itself in the context of Keynesian macro-stabilization. In their framework, the composition of the union depends on the comparative level of country debt. Results show that high-debt country may be desirable in a currency union rather than having a common low debt level. Chari, Dorvis and Kehoe (2022) further extend the framework to account for temptation shocks and credibility. In this model, countries with dissimilar shocks should form unions, a result also different from traditional OCA prediction.

On the empirical side, much of the literature focuses on the level of business cycle synchronization (see Campos et al. (2019) for a review) and how to measure correlations (Bekiros et al. 2015). In particular, the question of synchronization had been addressed in the context of new potential members to the EU. Nanovsky (2022) finds that the business cycles of most new candidates are synchronised with the current EU members. Mika and Zymek (2018) use gravity models to conclude that recent Euro joiners should not expect significant trade boost from joining the Union.

Closer to our contribution, De Grauwe and Ji (2016) document the tradeoff between flexibility and stability. They question traditional OCA wisdom regarding permanent asymmetric shocks requiring structural reforms. They show that when shocks are temporary, providing more flexibility may be counterproductive. They find empirically that the biggest shocks in the Eurozone were the result of business-cycle movements and should be dealt with stabilisation efforts.

SECTION 3. NEW POLICIES FOR A FINANCIALLY SUSTAINABLE OPTIMAL CURRENCY AREA

Within an incomplete monetary zone plagued with financial fragmentation, shocks can be asymmetric and reinforce stress (widening bond spreads, specific tensions among bank balance sheets in each member country). For example, international investors assessed a higher risk of default during the Eurozone crisis (Cornand, Gandré, Gimet, 2016). These tensions spread to European banks, particularly in Germany where risk of illiquidity and insolvency became real (Meuleman, Vander Venet, 2022). This fueled a debt rush and a credit boom in some countries, but not in others. The favorable credit conditions created by monetary integration in the period 2000-2007 made possible rapid growth of bank assets in Ireland, the emergence of real estate bubbles in Spain and the accumulation of excessive sovereign debt in Greece. However, the virtuous scenario of the intra-European circulation of savings and liquidity came to a halt at the time of the subprime crisis (Merler, Pisani-Ferry, 2012; Fagan, McNelis, 2020). The sovereign crisis was therefore also a banking crisis and a balance of payments crisis. Indeed, Krugman (2013) argues that the asymmetry of the shocks implied a heavy trade off between the advantage of a single currency and the difficulties in losing national currency responses to local problems.

Facing such treats for financial stability in an OCA, traditional responses are 1) macro-Prudential policies and 2) external capital controls (see Table 3). Following the COVID crisis, the Eurozone has undertaken more subtle measures and has relied on macroprudential policy of the member countries, used in a *surgical manner* (IMF, 2023a).

3.1 Macro-Prudential Policy

Financial stability, which allows for both efficient resource allocation and protection against crisis, must be one of the primary objectives in the process towards a monetary union. It supposes the use of adequate economic policy instruments, in particular macro-prudential policy, to prevent and limit the impacts of a systemic crisis (Kaul et al., 2003; Galati and Moessner, 2013). Macro-prudential policies complete traditional fiscal policy dealing with aggregate demand. Both macro-prudential policies and fiscal policies must be coordinated with monetary policy, as they have complementary roles (Allen et al., 2011). Macro-prudential policies could be overviewed by the central bank (Blanchard et al., 2010) as, in a monetary union, regulations must be formulated at a regional level (Fernández and García Herrero, 2009). This point is crucial in light of the trilemma of financial stability (Schoenmaker, 2011), which emphasizes that, in a regionally integrated financial system, financial stability (defined as a low level of systemic risk) is incompatible with national financial policy.

Macro-prudential policies aim to ensure the stability of the banking sector in order to limit the amount of speculative borrowing and discourage non-productive investment (Furman and Stiglitz, 1998). They are based on a top-down approach and focus on the system as a whole, considering the endogeneity in risk-taking. Macro-prudential measures also aim at limiting financial stress and the macroeconomic costs of financial instability (Galati and Moessner, 2013). 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, 2000; Hellman et al., 2000). Moreover, measures to limit the pro-cyclicality of risk-taking are attractive (Borio, McCauley, and McGuire, 2011; Brunnermeier et al., 2012; Caruana, 2011). The macro-prudential policies must be borne by both lenders and borrowers. Credit risk, market risk, operational risk, and interest rate risk are considered as measures of banks' liquidity and solvency (Dees et al., 2017). Effective policies must monitor the banks' balance sheet composition and profitability (with emphasis on non-performing loans), capital adequacy, leverage and asset quality (CET 1 ratio, Tier 1 ratio, Total capital ratio, Leverage ratio), funding (Loan-to-deposit ratio), and liquidity (liquidity coverage ratio). On the lenders' side, it can take the form of capital requirements and leverage ratios (Merler, 2015).

In order to be effective, these measures should be flexible (Goodhart et al., 2013). While they are common to all countries in order to avoid financial fragmentation, they can be adapted to

the context and adjust to the cycle of each country. These measures can be completed by stress tests to evaluate the resilience of the banks to a major shock and to assess the level of the systemic risk in the financial system.

3.2 External Capital Controls

There is controversy in the literature regarding external capital controls. The dilemma presented by Rey (2013, 2019) questions the effectiveness of these measures, even with floating exchange rates (Borio and Zhu, 2012; Bruno and Shin, 2012; Rey, 2013). Several economists recommend a tax on short-term capital flows, as it causes a redefinition of the maturity of external debt in the long-term (Edwards and Rigobon, 2009). Moreover, control of the quality and amount of foreign currency assets through capital inflow restrictions may limit countries' vulnerability to sudden stops. An example of such control could be either an implicit tax on bank loans in foreign currency (McKinnon and Pill, 1998) or explicit tax on short-term debt in foreign currencies (Bianchi, 2011).

Recent theoretical welfare-based analysis emphasizes the gain of implementing temporary taxes on capital flows during the boom phase of the financial cycle in order to limit the negative externalities due to sudden stops (Korinek, 2011). The optimal tax depends on the country's profile and on its main vulnerabilities in dealing with the specific transmission channels of the external shocks (Ostry et al., 2010). Taxes should focus mainly on volatile short-term flows (Korinek, 2011) and can have a cyclical component to limit the negative influence of the global financial cycle (Ostry et al., 2010; Rey, 2019). These capital controls can be seen as a complement of the macro-prudential policy (Korinek and Sandri, 2016), but a common macro-prudential policy that prevents excessive external borrowing may also be sufficient by itself to limit credit boom even during domestic monetary policy tightening (Rey, 2019).

3.3 *Surgical* macroprudential policies in a financially sustainable optimal currency area

Since the COVID crisis in 2019, and again with interest rate hike, financial fragmentation in the Eurozone has justified the use of member countries' macroprudential policies, but in a surgical manner. In particular, the countercyclical capital buffer (CCyB) can act as a shock absorber. Banks can either absorb losses ex post in times of stress by reducing the ratio or contain the

risks of financial stress ex-ante by rising the ratio. This allows authorities to address differently between economies and over time systemic risks such as the heterogeneity of the zone and the risk of financial stress.

In terms of policy implications, this surgical policy could also be extended to other macroprudential measures: on the borrowers' side, with the modulation of ratios such as loan-to-value (LTV), loan-to-income (LTI), debt-service-to-income (DSTI); and on the lenders' side, of course, with the countercyclical capital buffer (CCyB), but also with the liquidity coverage ratio (LCR) and the net-stable funding ratio (NSFR).

Extending macroprudential policies to external sources of credit booms or asset market bubbles can be achieved by transposing certain prudential rules to international credits or to the cross-border activities of banks most involved in international intermediation. This means mobilizing macroprudential instruments ex-ante to better control the international pro-cyclicality of credit: 1) for example, by imposing higher capital requirements as part of a discretionary application of the countercyclical buffer in the presence of an international credit boom, in order to discourage international banking flows without changing policy rates; 2) by tightening the application of certain external or foreign currency debt ratios (loan-to-value, debt-to-income) on the debtor side; 3) by requiring exceptional provisioning on short-term external investments with domestic banks. These measures must however be calibrated to the situation of each member country of the monetary zone.

The early empirical literature suggests these policies are relevant. The resilience of financial systems and the soundness of banks have been strengthened and the effects of financial shocks on output are reduced (ESRB, 2022; IMF, 2023a, Fernandez-Gallardo and Paya, 2020). Extending these policies to shadow banking is desirable in terms of financial regulation (IMF, 2023b).

CONCLUSION

It is impossible to ignore the question of the ex-ante necessary conditions in order to ensure the sustainability of a monetary union from the origins of the recent financial crises. It is important to incorporate a positive approach into the normative dimension of the OCA theory

to derive a new set of financial policies that complete the real traditional ones. As underscored in this paper, the traditional criteria of the OCA theory are not sufficient today in a context of financial globalization. The sustainability of a monetary union does not solely depend on the solvability of the countries' long-term macroeconomic fundamentals. Structural imbalances in the banking and financial sectors and growing liquidity risk increase the vulnerability of countries with external deficits to sudden stops that can be followed by fundamental contagion and financial fragmentation. Common and national macro-prudential measures may be undertaken in order to limit the exposure of the area to financial shocks. At the European level, in the event of an external shock (global financial cycle, US monetary policy shock), the responses are mainly through the exchange rate or monetary policy. However, early evidence shows that since the COVID crisis and the rise in interest rates, it is macroprudential policies applied surgically that contribute to better financial stability. In terms of policies, the concept of surgical prudential policies warrants further developments to additional macroprudential metrics, external capital flows and traditionally harder to regulate sectors such as shadow banking. These efforts should be regionally coordinated.

Tables

Table 1. Models of Currency Areas among IMF Member Countries in 2020

Type of Currency Arrangements	Composition
Monetary Union: European Monetary Union	Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovak Republic, Slovenia, Spain.
Dollarization	Ecuador, El Salvador, Marshall Islands, Micronesia, Palau, Panama, Timor-Leste.
Euroization	Kosovo, Montenegro, San Marino.
Dollar Anchored Currency Board	Djibouti, Hong Kong SAR, ECCU (Eastern Caribbean Currency Union): Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines.
Euro Anchored Currency Board	Bosnia and Herzegovina, Bulgaria
Conventional US Dollar Peg	Aruba, The Bahamas, Bahrain, Barbados, Belize, Curaçao and Sint Maarten, Eritrea, Iraq, Jordan, Oman, Qatar, Saudi Arabia, Turkmenistan, United Arab Emirates.
Conventional Euro Peg	Cabo Verde, Comoros, Denmark, São Tomé and Príncipe, WAEMU (<i>West African Economic and Monetary Union</i> : Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo), CEMAC (<i>Communauté économique et monétaire de l'Afrique centrale</i> : Cameroon, Central African Rep., Chad, Rep. of Congo, Equatorial Guinea, Gabon).

Source: IMF, *Annual Report on Exchange Rate Arrangements and Exchange Restrictions*, IMF, Washington, 2020, p. 9.

Table 2. Traditional OCA Criteria

	Prevention	Absorption
National	Kenen (1969) : diversification of production and exports	McKinnon (1963) : economic openness
Regional	Fleming (1971) : convergence of monetary policy objectives	Mundell (1961) : labour mobility

Table 3. New Policies for Sustainable Optimal Currency Areas

	Prevention	Absorption
National	Stress tests	Facilitate internal capital flows from surplus to deficit countries
Regional	Temporary capital control Lenders and borrowers' macro-prudential measures Common system for deposit protection	Central bank liquidity supply Official public inflows

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