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THE EURO AS A RESERVE CURRENCY
COOPERATION BETWEEN P.R. CHINA AND EUROPE

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Abstract

The weight of the U.S. Dollar and the Euro on world reserves is unquestionable. Both these currencies are the most important currency-faces that represent world economy given their significance in terms of reserves. The U.S. Dollar is, in terms of world economy's assets transactions, economy funding and currency representativeness, the most important and dominant international currency. This dominion is real and will not change in the near future regardless of the efforts suggested in this thesis.

The Euro is looking forward to challenge the pre-eminence of the U.S. Dollar and has achieved a more solid position as an international currency but it is not enough. The Euro has potential and aptitude to become a reserve currency. However, the Euro has to improve its liquidity, gain visibility, attract foreign investment and fight the recently sharp widening of yield spreads of sovereign debt within the Eurozone first.

This thesis suggests a creation of a joint-partnership between Europe and P.R. China in order to allow the Euro to emerge as a reserve currency through the real conception of common Eurobonds. This cooperation would solve existing problems within the Eurozone, carry a more important role for P.R. China as a vital player in world economy and finance and, in the long-term, turn the Euro into a more serious reserve currency on par with the U.S. Dollar.

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Resumo

O elevado grau de importância do Dólar Americano e do Euro nas reservas mundiais é inquestionável. Estas duas moedas são as mais importantes faces cambiais que representam a economia mundial, dado o seu significado em termos de reservas. O Dólar Americano é, em termos de transacções de activos na economia mundial, financiamento económico e representatividade cambial, a mais importante e dominante moeda internacional. Este domínio é real e nada mudará num futuro próximo, independentemente dos esforços que esta tese sugere.

O Euro tem como objectivo desafiar a hegemonia do Dólar Americano e tem conseguido alcançar uma posição mais sólida enquanto moeda internacional, mas por si só não é suficiente. O Euro tem o potencial e a capacidade para se tornar numa moeda de reserva. No entanto, o Euro tem primeiro que conseguir melhorar a sua liquidez, ganhar visibilidade externa, atrair investimento externo e combater a recente disparidade de *yields* das dívidas soberanas dos países da zona Euro.

Esta tese sugere a criação de uma parceria conjunta entre a Europa e a R.P. da China com vista à ascensão do Euro como uma moeda de reserva através da concepção real de obrigações comuns Europeias. Esta cooperação resolveria os problemas existentes na zona Euro, daria um papel mais importante à R.P da China como uma nação vital na óptica económico-financeira mundial e, no longo prazo, tornaria o Euro como uma moeda de reserva mais séria, ao mesmo nível do Dólar Americano.

Acknowledgements

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List of Abbreviations

ABB	Asset-Backed Bond
bps	Basis points
BIS	Bank for International Settlements
COFER	Currency Composition of Official Foreign Exchange Reserves
CPIS	Coordinated Portfolio Investment Survey
EC	European Commission
ECB	European Central Bank
ECU	European Currency Unit
EIB	European Investment Bank
EMF	European Monetary Fund
EMI	European Monetary Institute
EMU	Economic and Monetary Union
ESCB	European System of Central Banks
ESF	European Stability Fund
EU	European Union
FRN	Floating Rate Notes
HICP	Harmonised Index of Consumer Prices
IFS	International Financial Statistics
ILB	International Locational Banking
IMF	International Monetary Fund
IMS	International Monetary System
NCBs	National Central Banks
OCA	Optimum Currency Area
OTC	Over-the-counter
SAR	Special Administrative Region
SDDS	Special Dissemination Data Standard
SEFER	Survey of Securities Held as Reserve Assets
SSIO	Survey of Securities Held by International Organizations
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union
TIC	United States' Treasury International Capital reporting system
UK	United Kingdom
USA	United States of America

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Sumário Executivo

O elevado grau de importância do Dólar Americano e do Euro nas reservas mundiais é inquestionável. Estas duas moedas são, de longe, as mais importantes faces cambiais que representam a economia mundial, dado o seu significado em termos de reservas. O Dólar Americano é a mais importante e dominante moeda internacional. Esta premissa assenta na consistência e solidez com que grande parte das transacções de activos na economia mundial, do financiamento económico e da representatividade cambial que o Dólar Americano exerce no mundo actual. Este domínio é real e nada mudará num futuro próximo, independentemente dos esforços que esta tese sugere.

No entanto, é de salientar a potencialidade do Euro como uma potencial futura moeda de reserva, tendo que, primeiramente, melhorar certos aspectos de natureza intrínseca e outros de natureza externa. Nesta medida, o Euro tem primeiro que conseguir melhorar a sua liquidez, ganhar visibilidade externa, atrair investimento externo e combater a recente disparidade de *yields* das dívidas soberanas dos países da zona Euro.

As reservas oficiais têm tido uma grande importância no que concerne à análise monetária e financeira mundial. Durante a última década estas mesmas participações oficiais têm sido cada vez mais diversificadas de forma a encarar a actual situação económica a nível mundial. O Dólar Americano, acostumado a uma elevada representatividade em termos de reservas, vê agora a sua diferença face ao mais directo concorrente diminuir para níveis mínimos históricos. Por outro lado, uma vez que a representatividade de ambas as moedas tem descido em termos globais, as reservas têm ficado cada vez mais dispersas e irreconhecíveis, principalmente por culpa de economias emergentes. Por conseguinte, o crescimento de reservas não alocadas registado na última década ultrapassa em três vezes mais o crescimento de reservas alocadas. Este crescimento é, em grande parte, devido ao enorme desejo das economias emergentes por reservas. Desde 2005, a quantidade total de reservas do grupo das economias emergentes supera o mesmo índice de reservas por parte de economias avançadas. Hoje em dia, 66% das reservas mundiais estão localizadas em economias emergentes o que representa uma enorme dispersão de reservas quando comparado com o passado recente. Esta reorganização demonstra a pro-actividade dos países emergentes em salvaguardarem-se dos mais variados contornos das possíveis e eminentes crises que possam estalar em economias como a Europeia e a Americana. Não obstante, dada a cada vez maior significância de reservas que não estão alocadas (44% do total mundial), sendo estas próprias quantitativamente mais significativas do que a totalidade das reservas em economias

avançadas, é essencial que estas tenham um maior controlo por parte das mais variadas instancias financeiras mundiais.

A forma como as reservas estão distribuídas pelos diferentes tipos de instrumentos de dívida depende invariavelmente do tipo de investidor. Entre as participações oficiais e privadas há diferentes aversões ao risco. Isto reflecte-se na disposição com que instâncias financeiras oficiais alocam mais facilmente obrigações do tesouro ao contrário de obrigações das empresas. A grande expansão de obrigações do tesouro entre autoridades oficiais é sustentada pelo crescente apetite de reservas por parte de economias como os BRIC e os países exportadores de petróleo. Estas mesmas obrigações estão concentradas em maturidades até 5 anos enquanto obrigações com maior grau de risco estão alocadas a maiores maturidades. Por conseguinte, tem existido uma maior facilidade em gerar liquidez para a economia.

A R.P. da China será, em tempo incerto, um país muito importante no que concerne a política financeira mundial. O seu poderio na economia e sustentabilidade mundial é incontestável, na medida em que é grande a dependência (de cariz produtivo, por exemplo) das maiores empresas mundiais neste país Asiático. Esta tese sugere a criação de uma parceria conjunta entre a Europa e a R.P. da China com vista ao progresso do Euro como uma moeda de reserva através da concepção real de obrigações comuns Europeias. Esta cooperação resolveria os problemas existentes na zona Euro, daria um papel mais importante à R.P da China como uma nação vital na óptica económico-financeira mundial e, no longo prazo, tornaria o Euro como uma moeda de reserva mais séria ao mesmo patamar do Dólar Americano. O sucesso desta parceria recai no desenvolvimento de obrigações comuns Europeias. Esta experiência ajudaria não só o financiamento dos países da zona Euro assim como a R.P. da China constituiria um investimento seguro, atractivo e monetariamente gratificante. No entanto, apesar dos países mais poderosos da zona Euro estarem protegidos de *yields* maiores (dada a estrutura das obrigações comuns Europeias proposta), estes países acabariam por se tornar de avalistas sobre os países com maiores dificuldades. A esta situação, Alemanha e França têm sido o grande entrave à criação deste instrumento de dívida.

O desenvolvimento do Euro como uma moeda de reserva está directamente ligado à R.P. da China assim como à real concepção de obrigações comuns Europeias.

1. Introduction

Born in 1999, the Euro became the single currency for more than 330 million Europeans regardless of its non-physical visibility. Euro cash was only introduced three years later. The European Union (EU) shapes both its functioning and general treaty to attend the newly currency to his citizens and worldwide partners. Here, the EU specified, among other provisions and principles, external and internal actions like internal market and free movement of goods, EU competence, competition, taxation and the economic and monetary policy. Grounded on the Maastricht Treaty, the Euro would benefit from monetary stability (Bergsten, 1997) and until some years ago, the stability already settled never had thought to get caught in such harsh economic environment and volatile expectations. Nevertheless, the European Central Bank (ECB) has been directly responsible for conducting monetary policy for the Euro area since then and has tried to achieve the highest level of credibility and reasonability. Therefore, the main goal of maintaining price stability over the Euro area leads to the development of a sustainable and reliable economy. Nonetheless, it has also assisted the EU establishing a sustained market that would work for Europe's development, competitiveness, progress and prosperity. Achieving these goals has not being an easy task. Nevertheless, the ECB is trying to surpass these worse times by cooperating with international and other European authorities like the International Monetary Fund (IMF) and European Commission (EC). It is time to look beyond borders and acknowledge the need to find new fellowships with new partners from G20 countries. This will infer the creation of a sound and respectful network relationship as to promote financial stability among countries.

The ECB must control and perform its monetary policy at weakened times. While conducting its monetary policy, the continuous exchange rate development has to be followed up in order to assess economic outlook projections, which will set price stability. On the other hand, the impact on economic growth and inflation must be also taken into account on their operational strategy preferences. The accuracy and effectiveness of ECB's performance is crucial for the existing system as the promotion of the European financial integration of the Eurosystem. The latter influences money market conditions as it manages market interest rates, defines and implements the monetary policy of the Euro area. Controlling very short-term money market interest rates[1] is acknowledged to be a practical way to implement monetary policy, as it is the first step in the transmission mechanism of monetary policy (European Monetary Institute

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[1] Euro OverNight Index Average – EONIA has been the effective overnight reference rate for the Euro. It is the weighted average of all overnight unsecured lending transactions undertaken in the interbank market.

(EMI), 1997). Overall, the Eurosystem has been conducting monetary policy and safeguarding stability over the financial system on Euro area. The Eurosystem wills to ensure the ECB's full liquidity to conduct its foreign exchange operations and its foreign reserves portfolio management activities. To do so, it tries to convincingly accommodate its goals of maintaining price stability on medium-long term avoiding inflation fluctuations to assets' real value and other exogenous shocks.

The ECB's monetary policy has been followed by three main characteristics. Those characteristics try to define and outlook price stability and complementary time perspective analysis. Applying a 2% goal to inflation, which is not as low as it may seem, the ECB is demanding a higher role to money and a continuous relative growth. Inflation has been commonly linked to economic growth. Achieving this 2% on a group basis (17 countries) sounds quite pacific. Nevertheless, there are some concerns about extreme Euro area inflations, on upper and lower cases. If certain countries spike their inflation to higher levels, the ECB will not be able to adjust greater gaps, as it cannot influence the spread of inflation in Euro area by its monetary policy. Then, the ECB organizes and crosschecks all relevant data in a systematic assessment of risk to price stability both in short-term (economic analysis) and in medium to long-term (monetary analysis). The ECB assesses current economic and financial developments that influence further price changes, and then, it links monetary growth and inflation over the years.

The Euro is looking forward to challenge the pre-eminence of the U.S. Dollar. Through the years, the Euro has tried to achieve a more solid position as an international currency. Firstly, the Euro has to develop their financial markets through a large supply of liquidity and consistency. Secondly, encourage monetary authorities to reassess the currency composition of their reserves national portfolio. However, the U.S. Dollar has dominated so far as the main international currencies supported by its hedge on financial markets in terms of size, credit quality, liquidity and notoriety. Nonetheless, Melkin and Nissim (2006) refer that "…with the creation of the Euro, the dollar has a potential rival for the role of the leading international currency".

The analysis of reserve currencies and their genesis has turned up in the literature on the theory of international money with Swoboda (1969) and since then other economic historians explored the rise and fall of international currencies like the Sterling Pound (Cohen, 1971), the U.S. Dollar (Krugman, 1984) and the Deutsche Mark (Tavlas, 1991).

As an international currency is one that is used by non-residents as a medium of exchange, store of value and unit of account (Truman, 1999), the Euro must fulfill entirely and efficiently these roles in order to reach the same stage of the U.S. Dollar or even surpass it. The emergence of the Euro will be influenced by its physical spread over other countries. Here, a great anchoring role of the Euro will imply a larger weight in official reserves. It will also be influenced by the macroeconomic stability over the Euro area countries. Thus, by maintaining price stability and managing the recently over-debt issue of some countries like Greece, Portugal, Spain and Italy, the ECB must spawn confidence to the markets and develop better conditions to accommodate the higher international role of the Euro. By increasing the Euro's liquidity through the development, promotion and improvement of financial markets, the Euro will be able to get used on intervention purposes (Eichengreen, 1998). The intervention in foreign exchange markets is crucial for monetary authorities on an official use and as a vehicle currency on a private use, and here, the Euro must level up its primacy status and allure. Notwithstanding, also on an official use, the Euro must become very liquid in order to help reserve managers on their reserve portfolio management and associated risk outlook. Then, the Euro will allow them to easily answer to any shocks in financial markets and then reflect the necessarily changes on theirs market expectations.

Still, there are particular political and physical constrains even after the recent suprime crisis that affected all world but more specifically the United States of America (USA). Since 2008, after the collapse of the subprime crisis in USA, global crisis resurrected concerns about the functioning of the International Monetary System (IMS) as large imbalances of the most important developed economic areas came out. Being the dominant reserve currency country-issuer, the USA runs fiscal and external deficits to meet growing world demand for reserve (Mateos y Lago *et al.* 2009). However, there are none mechanisms to adjust the demand for reserve currencies. Due to emerging and developing markets' hungry for reserves, which is reasonable from their party, they are self-insuring themselves against costly capital account crisis and future shocks over crucial commodities like oil, wheat and others. Nevertheless, key risks are deflationary bias if too few reserves are provided or accumulation of an unsustainable debt overhang if too many are.

The Euro is facing, on its own, a greater issue. The recently sharp widening of yield spreads of sovereign debt within the Eurozone in the course of the economic crisis that is striking not only the Euro area but whole developed countries. The Economic and Monetary Union (EMU) is concerned that maybe some of their members would encounter difficulties in rolling

their budgets. Therefore, it has invigorated the necessity for a common bond issuance that hypothetically will solve or, at least, help these countries getting rid off from their systemic problems. Kösters (2009) utter that common Eurobonds are projected to be a line of attack to fight back Eurozone debt crisis, as there is a growing demand for the issuing of common Eurobonds. Issuing common Eurobonds will then create a debt instrument where each Euro government would participate on its issue. Therefore, they would take an advantage of creating a more liquid Euro area bond market as the issuance mill allow each government to roll their existing debt and funding budgets. Thus, poorer countries will be able to mask their sovereign debt rating into a safer bond allowing them to get access to cheaper credit. As a union, richer countries will not gain as much as they possibly would but, given the chance to improve the welfare of some without reducing the welfare of others, it is likely to induce a further step towards greater integration of the EMU.

The Optimum Currency Area (OCA) through the Euro should be tuned and extended to emergent countries if the Euro is looking forward to increase its role as a reserve currency. However, before its extension, Eurozone countries have to focus on their own problems first. Its good functioning depends on how high the degree of synchronisation amongst the business cycles of the Union's members is (Gouveia and Correia, 2008). Thankfully, the degree of synchronisation of business cycles amongst the Euro countries is fairly high which is a good first sign to achieve short-term price stability and well-functioning of the monetary policy. Therefore, updating the cohesion among Euro countries, tuning financial market operations and aggregating critical statistics (that are wisely used to perform and build the ECB's monetary policy strategy) is an important path that the Euro must follow in order to represent an OCA that can be trusted by others and foreseen as a good investment and fellowship.

Embedding 17 countries, three of them from G7 (France, Germany and Italy), it is naturally that there are diverse and uneven economies inside the Eurozone economy. This is, somehow, reflected by the different nominal exchange rates[2] established from the beginning of the Euro journey. After these years, several countries have dealt with serious difficulties to accomplish Maastricht criteria[3] to join and even maintain his currency status. Even though their high indebtedness those countries have still managed to survive. Firstly Ireland (2004), then Greece and Portugal (2009 and 2010, respectively) have shown several constrains and

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[2] See Fixed Euro conversion rates: http://www.ecb.int/euro/intro/html/index.en.html
[3] The Maastricht criteria watch price stability, government debt and budget deficits, interest rates, and exchange rates. See Article 121.1 of the Treaty on European Union.

weaknesses to access primary and secondary markets. These countries have been exposed to unsustainable interest rate yields of their treasury bonds since financial markets do not believe in their solvability even after the guidance and management by *troika*[4]. Lately, countries like Spain and Italy are negatively following the prospects of indebtedness and have started to create reforms in order to avoid treasury downgrades and distrust from financial markets. Debt overhang has been dramatic for the second decade of the new millennium since not only European countries are being affected (except for Germany and United Kingdom (UK)) but also USA. The latter has dealt with it and perhaps more dangerously than the "old continent" debt overhang. The case of Euro area, since it is the ECB who is lending great part of the rescue plans for default countries, the risk has been kept inside borders. With the extreme case of Greece, European councilors are already thinking about debt forgiveness (part of) since they think that may be part of the "rapid" solution.

The Euro area must be aware of exchange rate fluctuations since its appreciation sure brings benefits in terms of product importation since importing products becomes cheaper, but more dependable from exterior economies. On the other hand, it also brings constrains. European firms tend to lose competitiveness ability as they get pricey products. Countries' current account has rising serious issues as they are importing more than exporting setting national economies at risk since they are consuming foreign products instead of creating (and then consuming) their own products. This is limiting economies from prosperity and somehow its existence because this tend to increase unemployment as this imbalance does not able micro and mini enterprises to produce and then increase national gross domestic product.

Euro's awareness is related to the economic risks that come from each Member State. Being 17 members, each country contributes with a fraction to the overall currency risk which means that even though a single risk may not alarming just by itself, the whole may be. Bypassing negative information from weaker countries to the world can be lethal to Euro's prosperity and notoriety. Among securities, reserves are somehow tied to exchange rates and then currency risk. Moreover, exchange risk is a powerful motive for international diversification of portfolios.

Euro area countries have to find an approach to bring foreign investment to them. The transference of capital and know-how to Euro countries will bring new employment and new opportunities for local development even though they possible have to demit control over

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[4] *Troika* is the name given to the group formed by IMF, ECB and EC.

operations. Apart from direct foreign investment, international borrowing and lending is a natural feature of the international economic landscape and the whole Europe should be prepared to deal with market conditions and political constrains.

In terms of risk sharing, the creation of macro markets would allow trading of enormous risks that have never been traded before. It is very important to allow trading of the biggest risks because this allows the most massive risk sharing, and such massive risk sharing can make possible all kinds of risk management products that help individuals.

Distributing risks for all parties as giving them an opportunity to act with a multi-currency reserve system will lead to an effective democratization of finance.

2. Literature Review

Swoboda (1969) made a first approach on international money analysis by studying the U.S. Dollar and the various vehicle currencies in the foreign exchange market. Since, the international role of most historical currencies was studied due to their potential as key currencies. At the time, Cohen (1971) studied the Sterling Pound as an international currency, Krugman (1984) analyzed the international role of the U.S. Dollar after the Bretton Woods system crash and Tavlas (1991) explored the international use of the Deutsche Mark.

An international currency is one that is used by non-residents as medium of exchange, store of value and unit of account (Truman, 1999). Even though these three roles can be fulfilled by different currencies, the international currency that has dominated as medium of exchange, historically has also served as the main store of value.

The currency used by the official sector to perform these functions is typically referred to as a reserve currency (Galati and Wooldridge, 2009). However, private sector participants make different uses of an international currency like for invoicing or trading. Within official sector, monetary authorities may hold an international currency to intervene in foreign exchange markets, to accumulate wealth and to act as a monetary anchor in order to support their use of the exchange rate on their monetary policy framework (Cohen, 1971). Within private sector, Kenen (1995) and Portes and Rey (1995) focused that an international currency is seen as a vehicle currency in foreign exchange markets in which the main determinant of use by the monetary authorities as an intervention currency is taken by. Concluding, banking is used in terms of store of value and finally invoicing for trade or financial transactions as unit of account (Cohen, 1971).

Galati and Wooldridge (2009: 10) refer that "…the most important role of a reserve currency is as medium of exchange", wherein the choice of the currency to intervene in foreign exchange markets is critical for monetary authorities. According to them, reserves management has been guided by preparations for contingencies and short-term subsequent potential necessity to intervene in financial markets. Therefore, reserve managers are due to hold most of their reserves in very liquid assets in order to be able to answer to any shock in financial markets with no lag. Nonetheless, as a store of value, a reserve currency "…will be a currency whose value is reliable in terms of future purchasing power (…) linked to the maintenance of sustainable macroeconomic policies" (Galati and Wooldridge, 2009: 16).

Despite the uncertain relationship between the official and private uses of a reserve currency, the emergence of a reserve currency is influenced by at least three factors. Firstly, macroeconomic stability is needed to ensure confidence in a currency's long-term purchasing power (Mateos y Lago *et al.,* 2009) where "policy-making institutions with credibility and a track record of maintaining price stability are a critical ingredient". Price stability is also stressed by Hartmann and Issing (2002) as an important pre-condition for the development, maintenance and sustainability of the international role of a currency. Eichengreen and Mathieson (2000) argue that "…confidence in a currency's value is critical for its roles as a unit of account and store of value". Secondly, country's financial markets development. The deeper and more liquid financial and foreign exchange markets are, the more likely that other countries will use its currency for intervention purposes (Eichengreen, 1998) and more resilient the currency will be during further crisis (Mateos y Lago *et al.*, 2009). Cooper (2000) and Frieden (2000) reinforce that the size and liquidity of foreign exchange markets are necessarily important and that "…a large financial sector can help to counterbalance the political influence of the trade sector in resisting political pressure in support of depreciating the currency to boost external trade". Thirdly, wide use of the currency in private sector transactions. The larger a country's share in world gross domestic product, trade and financial operations, the more likely it is that other countries will use either for trade as a monetary anchor or in support of external trade to conduct financial transactions (Eichengreen, 1998; Frankel, 2000; Mateos y Lago *et al.*, 2009). Regarding monetary anchoring, Galati and Wooldridge (2009: 3) refer that "…a greater anchoring role of a currency might imply a larger weight in official reserves for two related reasons (…) if the exchange rate of the domestic currency vis-à-vis a major currency plays an important role in the monetary policy framework, the central bank would typically hold the latter currency to be able to intervene on

short notice in the foreign exchange market. (…) if the country's liabilities are mainly in a particular currency, the central bank is likely to hold a significant portion of its assets in that currency". Throughout the wide use in private sector transactions, a greater currency attracts network externalities through a self-reinforcing cycle. "The more a currency is used as a medium of exchange, the lower its transaction costs and the higher its liquidity, and hence the more attractive it becomes for new users" (Mateos y Lago *et al*., 2009; Galati and Wooldridge, 2009). Notwithstanding these three factors, "a currency's status depends on others' use of it as a reserve currency" (Krugman, 1984; Rey, 2001) and it is the others' use that will ultimately determine a currency international status.

Galati and Wooldridge (2009) drew that well-developed financial markets are a necessary condition for an underlined currency play a role of reserve currency. The same authors suggest that the introduction of the Euro greatly improved the mechanism and functioning of Euro financial markets. According to Bernanke (2004) "…the development of euro financial markets is often seen as the most tangible benefit of European monetary union (EMU)".

Since Mundell (1961) first developed the concept of an OCA, research was drawn in order to understand the viability of Europe's monetary unification. Frankel and Rose (1998) and Issing (2001) pointed that this OCA approach "...balances the reduction in transaction costs from eliminating separate national currencies against the loss of monetary policy autonomy associated with the establishment of a common monetary policy". Gouveia and Correia (2008: 104) mention that the OCA theory "postulates that a high degree of synchronisation amongst the business cycles of the members of a monetary union is a necessary condition for its good functioning", because "…the common monetary policy is designed in view of the aggregate statistics and disregards asymmetric shocks and idiosyncratic business cycles". From an OCA point of view, Issing (2001: 443) refers that "…the incidence of disturbances across regions is a critical determinant of the design of a monetary union".

The OCA theory has been modeled into two different versions. The endogeneity OCA hypothesis has been assumed as a positive connection between trade integration and the symmetry of output fluctuations. This hypothesis emphasizes that a single currency itself forces in favour for synchronization of business cycles. An alternative hypothesis lies on the depth of integration within countries. Here, productivity specialty is linked to a deeper integration within countries. Hence, enhancing the vulnerability of individual countries to

idiosyncratic shocks and inducing non-synchronous business cycles (Gouveia and Correia, 2008).

There are four main inter-relationships between members in order to a potential OCA succeed. These inter-relationships are consensual and go from the extent of trade, similarity of the shock and cycles, degree of labor mobility to fiscal transfers' system. The greater the linkages between the countries using any of the four criteria, the more suitable a common currency becomes, especially in terms of international trade links wherein the potentially benefit greatly increases. In fact, the higher correlation between business cycles and member countries is, the more appropriate a common currency becomes (Mundell, 1961). Nevertheless, Frankel and Rose (1998: 4) refer that "…openness is one criterion for membership in an OCA since greater trade leads to greater savings in the transactions costs and risks associated with different currencies".

Synchronicity of business cycles is frequently regarded as an important prerequisite for a well-functioning and successful implementation of a common monetary policy (Azevedo, 2002; Gouveia and Correia, 2008; Weyerstrass *et al.,* 2011). Even though, the introduction of the Euro in 1999 did not apparently generated neither a positive or negative effect on business cycle synchronization within Eurozone countries, in present time, the degree of synchronization of business cycles among the Member States is in most cases relatively high (Weyerstrass *et al.,* 2011).

The degree of business cycle convergence in a monetary union is the result of a number of factors. The most important include the degree of symmetry of the underlying macroeconomic shocks in the Member States, the degree of symmetry in transmission channels in institutional features (including fiscal policy) between Member States, as well as the level of economic integration between the member countries. All these aspects play important roles in OCA theory. Moreover, it seeks to determine the costs and benefits from a common currency and which has received a great deal of attention in the discussion about the creation of the Euro.

Gouveia and Correia (2008) explored the existence of a degree of synchronization between national-level and aggregate Euro area business cycles. The latter authors found out a positive and statistically significant degree of synchronization on both subsets as the majority of the countries have a high degree of association with the Euro area cycle. Research by Azevedo and Koopman (2008) and more recently by Weyerstrass *et al.* (2011) has provided strong

evidence that the degree of synchronization of business cycles among almost the Member States of the Euro area is relatively high. Nevertheless, synchronization has a dynamic rather than a static feature. Beyond the Euro area, in terms of synchronization with global business cycle, coherence and dynamic correlation with major economies like UK, USA and Japan are also fairly high.

Niehans (1984) explored the balance of international indebtedness where firstly stated that countries are international debtors or creditors. Countries' position is determined if their investment opportunities exceed their wealth or if their wealth exceeds their investment opportunities, respectively. Secondly, the welfare effects of free capital movements concerning the effect of capital market integration on income. Niehans (1984: 114) mentions that "…real national income is higher with capital mobility than with isolation for both debtor country and the creditor country".

In terms of asset diversification and net international asset position, "…most countries are both gross creditors and gross debtors, with domestic residents holding assets abroad while domestic assets are owned by foreign residents" (Niehans, 1984: 132). Asset diversification stems from a largely amount of asset kinds into a least risk aggregate. Assets are heterogeneous whereas some consist of currency, others of interest-bearing debt, real capital goods or stocks. Even though assets are alike, they depend on what currency they are denominated, in which country the asset is located, who the debtor really is and the maturity of the same debt. Therefore, "net foreign assets are adjusted by capital flows; the composition of foreign asset is adjusted by arbitrage" (Niehans 1984: 132) no matter other externalities.

Deviations of the future expected exchange rate from interest parity are uncertain. If they were predictable, the transfer of all assets from one currency to another would avoid any losses. Implicitly, there would never be diversified portfolios with marginal adjustments to expected exchange-rate changes (Niehans, 1984).

Concerning both exchange rates and balance of payments, Krugman (1995) analyzed an adjustment in the world economy with respect to fiscal divergences and currency values stability. Krugman (1995: 3) refers that "…the debate over exchange rate policy stems in part from conflicts of interest and in part from legitimate disagreements over empirical parameters." Notwithstanding, the debate also stems to an important new level of pure and

simple mechanism in which the international adjustment should work. The standard view of the source of the current account imbalances takes as starting point the next identity:

$$S - I = Y - E = X - M,\qquad\qquad(1)$$

Where S and I are meant to national savings and investment, Y and E national income and expenditure, X and M national exports and imports of goods and services. National savings may be spread into government and private savings. A rise in the budget deficit boosted by government savings fall and a not-offset by private saving rise will be either reflected in a decline of direct investment or a rise in external deficit. Krugman (1995: 5) refers that "…it seems plausible to expect the external deficit to bear part of the burden, so a budget deficit can lead to a trade deficit". The importance of both interest rates and exchange rates is that their channel will be emphasized by the linkage between budget deficit and trade deficit.

The debt problem of developing countries suddenly evolved into a debt crisis and Krugman (1995) approached its aftermath. Here, Krugman refers to a debt overhang as a "presence of an existing inherited debt sufficiently large that creditors do not expect with confidence to be fully repaid". A country has a debt overhang issue when the expected present value of potential future resources is less that its debt, i.e. debt is not fulfilled by future entries of cash or resources.

Krugman analyses two debt overhang kinds. Firstly, in the absence of uncertainty, the problem about debt overhang is linear. The country will be allowed to pay by reaching a settlement with the initial creditors avoiding a liquidity problem. If not, the debt must be written down at the outset. Secondly, and more realistically too, a scenario that brings uncertainty into the problem either because the world economic environment is uncertain or because the country's own economic performance cannot easily be predicted. Thus, "unless the present value of resource transfer is less than the debt in both states, it is simply unknown whether the country can earn enough to repay its debt" (Krugman, 1995: 112). Moreover, the key question is whether the country will experience a liquidity crisis or not.

In a case of not debt forgiveness, Krugman (1995: 122) realizes that "…in a situation of defensive lending by existing creditors, the creditors do not expect to be fully repaid nor do the debtors expect to pay fully. Thus new money contains a concessional element". Hence, linking either eventual repayment to new money to measures of the state of nature is a good idea and debt can be postponed. Various schemes (buy-backs, securities, debt-equity swaps)

have emerged in effort to find a way out of the debt problem. New financial arrangements would be a great addiction to reduce the exposure of the country's banks and liabilities without the need for collectively bargained new money or debt forgiveness.

Shiller (2003) meant to develop a new financial order with respect to countries' risk management analysis. Focusing on the kind of economic risks, infrastructure and crisis preparation, Shiller pretended to reinforce that each individual incurs the combined effect of each kind of risk. Such risks go from country risks, occupational risks by staying on a specified country to individual career risks within an occupation. The idea was that a single risk might not be alarming just by itself, gathering them it could be. Despite the singleness, Shiller (2003) refers that "…each of them matters since it contributes to an overall pattern of individual risk, and these risks go far beyond the disability risks that are currently insurable". Moreover, though total risk to a nation could be considered as tolerable, Shiller (2003) emphasizes "…if borne equally by all people within a nation, the total risks that each individual faces are much larger."

Among securities, they are subjected to different laws and policies or even being denominated in a different currency all around the world. Those initial associated risks may be classified as country risks and the latter to currency risks. Nationalization risks, tax policies, government regulation and foreign trade policies are like to mix up into country risks (Niehans, 1984). On the other hand, exchange rates are the most important item related to currency risk. Nevertheless, exchange risk is not necessarily a barrier against asset diversification notwithstanding the increase of riskiness of foreign asset. Niehans (1984: 151) refers that "…exchange risk may be a potent motive for the international diversification of portfolios". Concerning floating exchange rates, interest differentials need to balance the expected changes in those rates but also on exchange risk itself. If by any chance this risk is not explicitly, "…there may be deviations of the expected exchange rate from interest parity even in equilibrium" (Niehans, 1984: 151). Finally, Niehans (1984: 151) refers that "…there may be a foreign demand for domestic even though foreign residents have no direct transactions demand for domestic", depending then on exchange risk and inflation risk.

Krugman and Obstfeld (2008) approached three international factor movements wherein they tend to raise even more political difficulties than international trade per-se. Firstly, the transference of capital via international borrowing and lending is "…a prominent feature of the international economic landscape" in respect to capital international movements.

Secondly, direct foreign investment and multinational firms where "international capital flows (…) a firm creates or expands a subsidiary in another country", and there is not only a transfer of capital but also the acquisition of control. Finally, labor migration is also considered as an international factor movement within human resources. In an open economy, macroeconomic policy has two main goals. The first goal deals with internal balance due to full employment with price stability and then external balance wherein avoid excessive imbalances in international payments takes part (Krugman and Obstfeld, 2008).

3. The Monetary Policy of the ECB

1 January 1999 – on this date a new currency was created, the Euro. Since then, the Euro is the official currency among 17 European countries with more than 330 million citizens, and an anchor of stability for Europe (Jean-Claude Trichet, 2011). Starting on this day, the ECB has been directly responsible for conducting monetary policy for the Euro area and accomplished a "high degree of credibility worldwide for its sound monetary policy geared to maintaining price stability in the euro area" (Jürgen Stark, 2011: 11). The ECB has also rapidly acquired a high degree of credibility for its monetary policy (Issing, 2000). Right from the beginning of the single monetary policy, the ECB's command influence in financial markets has been a fundamental pre-condition to ensure that price stability would be a permanent feature of the Euro area (Issing, 2001). The ECB is the central bank for Europe's single currency and was established as the core of the eurosystem and the European System of Central Banks (ESCB). While the ESCB comprises the ECB and all the National Central Banks (NCBs) of all EU Member States[5] whether they have adopted the euro or not, the Eurosystem ranges only those countries that have adopted the euro along with the ECB. As there are EU Member States outside the euro area, the eurosystem and the ESCB will co-exist.

As their principles, stated in Article 2 of the Treaty on European Union, the EU is looking for the establishment of an internal market that works for sustainable development of Europe based on balanced economic growth and price stability, social market economy competitiveness, employment and social progress. The Treaty[6] assigns the ESCB the primary objective of maintaining price stability. This reflects society's broad consensus that "the best contribution that monetary policy can make to economic growth, job creation and social

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[5] See Article 107.1 of the Treaty on European Union.
[6] See Article 127.1 of the Treaty – Unless specified, from now on the term Treaty is stated as the consolidated version of the Treaty on European Union and the Treaty of the Functioning of the European Union.

cohesion" is by maintaining prices stable (Jean-Claude Trichet, 2011: 7). Nevertheless, being unambiguously assigned overriding importance, also reflects a broad consensus in the economic discipline that the maintenance of price stability is the appropriate objective of monetary policy (Goodfriend and King, 2000; Issing, 2001; Gaspar *et al.*, 2001; Gaspar and Smets, 2002; Mateos y Lago *et al.,* 2009). Although the ESCB focus is on maintain price stability, and without prejudice of it, the ESCB shall support economic policies in the EU in order to achieve the latter principles.

The ECB's monetary policy framework builds its robustness on lessons and historical experiences over time by many central banks. The knowledge acquired by the institution let to slow inflation down to levels consistent with price stability objective. Its robustness is also granted by the ECB's credibility on price stability as their positive response to the financial crisis that stroke world economy on past 2008 and as their enhancement on economic and monetary analysis (Jürgen Stark, 2011).

3.1. Institutional framework of the single monetary policy

Since 1 January 1999 the ECB, a supranational institution congregating the responsibility of 17 countries, has been responsible for monetary policy decision-making in the Euro area. Joining the responsibility of the NCBs represented a milestone in a long, historical and complex process of integration among European countries.

The legal basis for the single monetary policy, on which written and then specified the tasks of the ESCB and the Eurosystem, is laid down in the Treaty establishing the European Union (TEU), the Treaty on the Functioning of the European Union (TFEU) and the Statute of the European System of Central Banks and of the European Central Bank. Since the design of the ECB and the Eurosystem, major responsibilities for a certain number of tasks are kept at a national level and combined with a centralized – supranational – decision-making related to monetary policy (Jung *et al.,* 2010).

According to the Treaty, there are four basic tasks to be carried out by the ESCB[7]. Firstly, define and implement the monetary policy for the euro area. Secondly, conduct the foreign exchange operations. Thirdly, hold and manage the official foreign reserves of the euro area countries. And as final basic task, promote the smooth operation of payment systems. Among other tasks, the ECB has the exclusive right to authorize the issuance of banknotes within the

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[7] The Treaty text refers to the ESCB instead of Eurosystem because it was drawn up on the premise that eventually all EU Member States will adopt the Euro in the future.

euro area. In order to fulfill their tasks, the ECB, in cooperation with the NCBs, collects statistical information either from national authorities or directly from economic agents. In terms of financial stability and supervision, the Eurosystem contributes positively to the smooth conduct of policies and the stability of the financial system. Cooperating worldwide, the ECB maintains working and respectful relations with both various and relevant international and European institutions to achieve the tasks entrusted to the Eurosystem.

Achieving price stability however has not been easy due to ultimate significant challenges. Jean-Claude Trichet (2011: 7) refers that "several adverse shocks have hit the Euro area economy and that the ECB has been confronted with periods of strong global commodity price movements, which are not under control of monetary policy". Like an open-market, commodities' prices float and strong movements bring uncertainty and vulnerability to them. On an economic environment highly uncertain, projecting and managing positions is hard and if the ECB cannot control it under a monetary policy, harder it is. Scheller (2006: 47) refers that "…by maintaining price stability, the ECB contributes to the proper operation of the price mechanism, which is an essential feature of a well-functioning market economy and which favours an efficient allocation of resources." Issing (2000: 200) belief that, "…is also appears possible that the experience of an extended period of price-stability will influence the behaviour and attitudes of economic agents and institutions". It is reasonable to think that the ECB, with the last thirteen years of experience, is leveling up in terms of stability acknowledge.

While conducting its monetary policy, the ECB takes into account the flexible exchange rate regime that has been adopted for the Euro, which affects the general economic outlook for price stability. Thus, the exchange rate is not a separate policy instrument even though monetary policy cannot be used to control the real exchange rate in a permanent way (Gaspar and Issing, 2002). The real exchange rate is defined as the relative price of the foreign output. The unique combination of one monetary policy and many fiscal policies in the euro area aims to ensure the smooth functioning of the EMU since the interactions between monetary and fiscal policies are better institutional set-up. The same fiscal policies have a significant impact on economic growth, macroeconomic stability and inflation. Together, with maintaining price stability, independence from political influence is other fundamental principle of the institutional framework for the single monetary policy.

3.2. Eurosystem

In the mean future, following the expectations and premises of the EU, the ESCB and the Eurosystem will become one. The latter gathers the ECB and all the NCBs of the EU Members that have adopted the euro performing a system instead of a single bank. Therefore, the Eurosystem is thus a sub-set of the ESCB. Since ECB's policy decisions, such as on monetary and fiscal policy, naturally apply only to the Euro area countries, it is the Eurosystem, which, as a team, carries out the central bank functions and tasks for the Euro area. Then, the ECB and the NCBs jointly contribute to attaining the common goals of the Eurosystem.

There are three main reasons for the existence of a system instead of a single central bank. First, the Eurosystem approach relies on the existing institutional setup and the built infrastructure of the NCBs across Europe. From these, the Eurosystem also gets theirs competencies, expertise and operational capabilities tuned on past years of exercise and regional presence. This regional presence helps the ECB getting its policy message out in many languages gathering specialized information in each regional economy (Jung *et al.,* 2010). Moreover, as a matter of accuracy and efficiency, several central banks perform additional tasks beside those of the Eurosystem in order to update and upgrade the existing system. Second, given the geographic dimension of the Euro area and the long-established relationships between all banking communities and respective NCBs, to credit institutions are given an access point to central banking in each participating Member State as a marginal lending facility and a deposit facility (Gaspar *et al.*, 2001). This could not be possible if only a single central bank would work since all banking communities would answer and interact to a single party, not taking advantage of the historical relations already set-up. Third, within the 17 countries that all gathered establish the Euro area, languages and cultures are diversified. Then, the NCBs are best located to serve and support as access points in each country of the Eurosystem.

The Eurosystem presents a decentralized structure implying a diffusion of power which makes it more difficult for outside pressures to be brought to bear on the ECB. This approach is also followed by the Eurosystem since it is practical and pragmatic when fulfilling several of its tasks (Jung *et al.,* 2010). Jung *et al.* (2010: 4) refer that "…decentralization can enhance competitive forces within the central bank system and can stimulate innovativeness".

Like the ESCB, the primary objective of the Eurosystem is to maintain price stability for the common good. Acting as a leading financial authority, it also aims to safeguard financial stability and promotion of the European financial integration. Once again, as stated in Article 127.2 of the Treaty, the Eurosystem and the ESBC share the same tasks but related to different areas wherein the Eurosystem refers to the Euro area.

The Eurosystem is responsible for defining and implementing the monetary policy of the euro area. This public policy function is implemented mainly by financial market operations where full control of the monetary base is essential to successfully fulfill the task. In matter of fact, the ECB and the NCBs are both the only institutions that are entitled to actually issue legal tender banknotes in the Euro area. As the banking system is dependent on base money, the Eurosystem is thus in a position to exert a dominant influence on money market conditions and money market interest rates leading to full control of the monetary base (Scheller, 2006).

The Eurosystem is also responsible for conduct foreign exchange operations. Those influence exchange rates and domestic liquidity conditions. Since central banks already have the required operational facilities ensuring operations consistency, the Eurosystem is able to manage these variables and, thus, perform the monetary policy.

Promoting the smooth operation of payment systems, which are means to transfer money between credit and other monetary institutions, the Eurosystem is looking for payment systems' efficiency and reliability. Thus, the Eurosystem is not only conducting the monetary policy itself but also the stability of the financial system, and foremost the economy as a whole.

Being able to manage the foreign reserves portfolio and proper reserve requirements, it ensures the Eurosystem that the ECB is going to have sufficient liquidity in order to conduct its foreign exchange operations needed to balance and re-structure portfolio (Gaspar *et al.*, 2001). Even though, the Eurozone NCBs manage their own foreign reserves independently. Above a certain limit, their operations on the foreign exchange market are subject to the approval of the ECB in order to ensure consistency with the exchange rate and monetary policy of the Eurosystem. Another instrument of the Eurosystem operational framework relates to open-market operations. These operations are mainly conducted through repurchase

agreements[8], within a payments and settlements infrastructure, through which the Eurosystem provides liquidity to the market in exchange for eligible collateral assets (Gaspar *et al.*, 2001).

Cross-border cooperation is expected, if needed, in order to promote financial stability. As stated in Article 127.5 of the Treaty, the Eurosystem ought to contribute to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system.

3.3. ECB's monetary policy strategy

The role of monetary policy undertaken by the ECB and how the latter designs to achieve its primary objective of maintaining euro's purchasing power and thus price stability in the Euro area is crucial. Upon this quest, the ECB realizes the extremely importance of price stability in order to develop a sustainable and reliable economy as the Euro one.

Price stability supports higher living standards by improving the transparency of relative prices. Here, it helps the market to guide and manage resources more efficiently increasing the welfare of households and thus the productive potential of the economy. Price stability also pretends to reduce inflation risk premium in interest rates giving credibility to the efficiency of capital markets and thus increasing the incentives to invest, namely foreign direct investment. Reducing distortions of tax system and social security systems by eliminating the real cost related when inflation exacerbates the distortionary impact on them is another feature of price stability. Finally, if monetary policy becomes credible and succeeds in maintaining price stability over time, inflationary and deflationary shocks to assets' real value can be avoided.

The transmission mechanism of monetary policy is characterized by long, variable and uncertain time lags since monetary action usually takes a considerable time to affect price expected developments. Economic developments are constantly influenced by commodities' prices shocks and administered prices which have a direct impact on inflation. Therefore, monetary policy has to monitor the transmission chain in order to avoid that exogenous shocks to the financial structure interfere with the transmission of monetary impulses. Setting official interest rates on its own operations, the ECB can exert a dominant influence on money market conditions and, thus, guide money market interest rates. The exchange rate channel

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[8] Trans-European Automated Real-Time gross Settlement Express Transfer (TARGET), is composed by the domestic Real-Time Gross Settlement Systems (RTGS) where each RTGS corresponds to each EU Member State and a network of links between them and the ECB payments node.

and relative changes in the exchange rate will usually affect inflation. This may affect the domestic price of imported goods, production and competitiveness. The price of imported goods tends to fall if the exchange rate appreciates, reducing inflation as far as those products are directly consumed. The same applies to production as imported products are used into the production process reducing final outcome price. However, by appreciating the exchange rate, it will constrain external demand as domestic produced goods become less competitive in terms of their price on global markets. Thus, by controlling very short-term money market interest rates, the ECB is able to execute their policy. This control has been recognized by the EMI since 1997 that very short-term interest rates were to be regarded as the first step in the transmission mechanism of monetary policy (Gaspar *et al.*, 2001).

The success of a monetary policy deals with key characteristics. First, monetary policy must preserve the smooth functioning of the transmission channel in order to properly transmit the ECB's policy rates. Dysfunctional money markets tend to weak the capability of monetary policy to influence the outlook of price stability only through interest rate adjustments. Second, monetary policy must be forward-looking and pre-emptive due to time lags and stochastic uncertainty in the transmission process. Thus, it designs a perspective what policy is required for present moment but focusing on medium-term. At last, anchoring systematic and consistent inflation expectations will turn the conducting monetary policy more efficient, credible and open.

The ECB's monetary policy has two main elements, a quantitative definition of price stability regarding Harmonised Index of Consumer Prices[9] (HICP) and a two-pillar approach for the analysis of the risks inherent to price stability. The HICP is the index that most closely approximates the changes over time in the price of representative basket of consumer expenses. Here, price stability is measured in terms of headline inflation, which corresponds to the representative basket. The governing council of the ECB has defined that price stability shall be defined as a year-on-year increase of HICP of below, but close, to 2% for the Euro. This will ensure price stability over medium-term with focus for inflation expectations assigning a higher role to money (Gaspar and Issing, 2002). This definition enhances the transparency of the ECB's monetary policy as it is easier to understand and provides a clear and measurable hurdle to forming expectations of future price developments. This overview

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[9] The HICP is the index that most closely approximates the changes over time in the price of representative basket of consumer expenses. Price stability is measured in terms of headline inflation, which corresponds to the representative basket.

allows the policy to appropriate play tight if prices rise too much or to play loose if prices rise too little. Even though, the use of policy to accelerate or decelerate the rate of inflation brings difficulty for the long-term desired inflation rate maintenance (Woodford, 2008). However, according to Issing (2001) the risk of structural inflation differentials among members is acknowledged to become a reason to concern. The reason is that the inflation rate of one country (within the Euro area) may, at some point, start diverging from the area average goal in a persistent mode. The real concern is that the single monetary policy cannot be expected to adjust the differential because the ECB is not in position to influence the spread of inflation within the euro area. The prominent role of money in the strategy is signaled by the announcement of a reference value for the growth of a broad monetary aggregate, M3 (Gaspar and Issing, 2002).

The two-pillar framework wherein each pillar represents a complementary perspective on the determinants of price stability, namely economic and monetary analysis, ensures that no relevant information is lost on the process. This is guaranteed by organizing, evaluating and crosschecking all relevant data in the systematic assessment of the risks to price stability (Jung *et al.,* 2010). The economic analysis is aimed at assessing current economic and financial developments and their implied action from short to medium-term determinants of price developments. Here, it focuses on real activity and cost factors driving prices over those horizons. The dynamics of real activity and further prices development are influenced largely by the interplay of supply and demand in goods, services and other factor markets at shorter horizons. Identifying the nature of shocks that strike the economy and their effects on cost and pricing short-term behaviour is another contribution of economic analysis. On the other hand, monetary analysis is aimed to the connection between monetary growth and inflation over the medium to longer-term horizon. The historical link between money growth and inflation is one of the most strong and durable empirical finding on economy literature. That is because prolonged periods of high inflation are associated with higher money growth and that inflation is ultimately a monetary phenomenon (Issing 2001). Thanks to its robustness relationship, a solid and reliable nominal anchor for the conduct of monetary policy is granted. Ensuring that money growth rate is consistent with price stability over long horizons by responding to economic developments, the ECB's strategy must be continuously reviewed. The final outlook for price stability and policy decisions include relevant wealth information and proper ECB's macroeconomic projections since those rely on structural macroeconomic models (Issing, 2001). Moreover, this perspective serves as a mean of crosschecking both

analyses in order to apply and support economic analysis. Overall, the two-pillar framework grants a setting of information from short-term to long-term ensuring that monetary policy does not neglect important information for assessing future price trends.

On their research, Gaspar and Issing (2002) also found out that the ECB's monetary policy strategy does not disregard the exchange rate of the Euro. The latest developments are taken into account when looking at the monetary policy's transmission mechanism and when assessing the current economic situation and projections for the Euro area.

As a final point, the monetary policy has, however, a very limited scope to exert a lifelong influence on real variables through other channels. On the long-term, real income will be essentially determined by supply-side factors as population growth, technology, markets' flexibility and the institutional economy's framework efficiency (Scheller, 2006). Thus, it is part of fiscal and structural policies post to improve the ultimate economy's growth potential.

3.4. Eurobonds

Since January 2002, the Euro gained physical visibility and has been used for both retail and capital market transactions in the EU. The creation of the single currency has eliminated currency risk, within the Euro area, and extended investors' instrument choice. Thus, it has improved liquidity and decreased transaction costs by reducing the issue costs of Euro denominated bonds compared to legacy currency bonds (Melkin and Nissim, 2006).

Despite its international currency status aspiration, the Euro has a bigger issue in hands and it has to deal with the debt crisis that is surrounding Member States. Spreads of sovereign debt within the Euro area countries, with the exception of Germany, have increased considerably during the last 3 years. Murphy (2003) analyzed the structure of credit risk premiums in the Eurobond market. Here, the latter author found that there was evidence of a rising term structure of credit risk premiums for higher-grade Eurobonds and a declining term structure for lower-grade. Due to the difference between interest rates among some governments and the German sovereign bond rate, De Grauwe and Moesen (2009: 132) refer that "…sovereign bonds with the same maturity but issued by different national governments are now perceived as imperfect substitutes". The same authors pointed out that as Eurobonds are expressed in the same currency, the diverse spreads reflect either a default risk or a liquidity risk. Empirical evidence has shown that the government bond markets in the Eurozone have become less liquid. Common Eurobonds are projected to be a line of attack to fight back Eurozone debt crisis, as there is a growing demand for the issuing of common Eurobonds and the settle up of

a European Stability Fund (ESF) (Kösters, 2009). This idea is proposed by the EC which would replace existing national bonds.

Technically, a Eurobond is a tradable debt contract, Euro denominated, which records the borrower's obligation to pay interest at a given rate and the principal amount of the bond on specified dates as general European bonds. There is no central register where issue holders are named and interests are paid upon presentation of detachable coupons. Moreover, the principal amount is overhauled on presentation of the Eurobond itself and free of taxation since they are largely free from government regulation per-se. The structure of a Eurobonds consists in its terms and conditions, which are printed on the actual bond. The face details the borrower, bond's maturity, interest base, rate and the promise to pay interest and principal. On its reverse, is described the terms and conditions of the issue and the details of the bank responsible for payment of interests and principal. Finally, the coupons are detachable components presented on interest payment dates as evidence of entitlement to payment. Among other categories, Eurobonds can be classified as Straight bond wherein rates and redemption are fixed, Floating Rate Notes (FRN) where the rate is variable and Asset-Backed Bonds (ABB) wherein the credit of the securities depends of segregated assets.

Throughout the bond issue process, there are specific costs associated to the bond issuance. Melkin and Nissim (2006) analyzed and compared the issue costs of Eurobonds before and after the achievement of the EMU in 2002. The latter authors examined the three components of issue costs as underwriter fee, underwriter spread and underpricing. Underwriter spread is stated as the difference between the offering price and the guaranteed price of the issuer and underpricing is stated as the difference between the market price after trading first-start and the offering price. Although the decrease of underwriter fee, underwriter compensation remained unchanged as there is an offset with an increase of underwriter spread. However, the reduction on overall issue cost is due to the riddance of underpricing wherein the discount to market bond prices is inferior. Therefore, Melkin and Nissim (2006: 158) refer that "…the EMU has also reduced the reliance of bond underwriters on local expertise and introduced opportunities for economies of scale in bond issuance", which lead to a stabilization of bond's cost as their costs reduced and became less drift.

Following De Grauwe and Moesen (2009) Eurobond issue format; first, each Euro government would participate in the issue on the basis of its equity shares in the European Investment Bank (EIB). Secondly, the given coupon rate would be a weighted average of the

yields observed in each government bond market at the moment. Thirdly, the proceeds of the bond issue would be channeled to each government using the same weights. Finally, each government would pay the yearly interest rate on its part of the bond, using the same national interest rate used to compute the average interest rate on the Euro. Moreover, "this proposal would be "Pareto optimal" since it allows the improvement of the welfare of some without reducing the welfare of others".

There are some theoretical drawbacks that have to be considered over common Eurobonds. As the most extreme high interest rate countries' spending is excessively expensive, the proponents of common Eurobonds fears that stabilization efforts will not be enough, which would lead to an aggravation of the present crisis (Kösters, 2009). The real concern is that if refinancing of outstanding debt becomes impossible as it is happening in Greece, a troubled country even could go bankrupt. Therefore, there is a serious fear of how much damage it would bring to the Euro and even let EMU fall apart. Another concern relates to the violation of no-bail-out clause. As stated in Article 103 of the Maastricht Treaty, neither the EU nor other member states are liable for the debt of a member state. The issuance of common Eurobonds would lead to disobedience and dilution of the European economic constitution as governments' public deficit that have already drifted to unsustainable positions would open a window to outsider financial help. Therefore, a common Eurobond issue in favour of a higher debtor country would mean that from now on every other EMU Member State could also count on such bailout if it could threaten bankruptcy (Kösters, 2009). Besides, a stern breaking of the Treaty as of the no-bail-out clause could do great damage to the further European integration process that is ongoing. The major question is how logical is to update the no-bail-out clause rather than just facing potential moral hazard and conflicts between Member States.

The European project has dealt with periods of crisis and tensions that have somehow postponed the development of European political and economic integration. However, Mayer (2009) refers that "…past experiences suggest that the present financial and economic crisis (…) is much more likely to induce a further step towards greater integration than the disintegration of EMU." Moving forward with this project, its success may depend, among financial markets uncertainty, from a better coordination of national fiscal policies between EMU member countries. Thus, reducing present public sector funding problems of the most problematical countries and looking forward to put future public debt issuance over a solid common issuance would be a good first approach. The idea is that despite funding of public

orientation, between countries, they must have a better coordination of pro-active fiscal policies with ECB's "surveillance" i.e. the coordination should bypass all monetary union.

Creating a more liquid Euro area bond market by its issuance will allow each government to roll their existing debt and funding budgets. Consequently, to understand how investors foreseen market expectations, they would have to exchange Eurobonds that have been already issued on the secondary market. The Eurobond secondary market is not a floor-trading type of market since transactions are conducted mainly over the phone by dealers, most of them in London. This type of trading is usually known as over-the-counter (OTC) trading. Both markets success are linked, as the success of the first will owe the success of the second and vice-versa. For the first market to operate efficiently, a very cost-effective and liquid secondary market is needed. In private placement markets, however, where a Eurobond is placed for long-term investment, this tends to lose significance as Eurobonds are kept for longer time periods.

The integration of sovereign bonds into international market, as other types of bonds, is connected and influenced by rating classifications. The rating assessment is viewed to establish the level of yields or spread rather than bond volatility (Cheney, 1983). Each bond carries two risk natures, default and credit risk. Moreover, credit ratings rank the risk of bonds according to credit spread volatility which represents only that part of the total yield volatility (Heinke, 2006). Likewise, credit spread volatility rises with market uncertainty and falls with liquidity. Therefore, the more common approach to work out the spread between two sovereigns is the difference in yields to maturity between a risk-free government bond, in this case Germany, and a bond subject to credit risk. This difference, usually in basis points (bps) between other Intel, is then figured by rating agencies that provide "useful" and practical value to world markets and investors. Nonetheless, they influence, somehow, both prices and volatility over bonds and stocks. Though, Heinke (2006) found that rating changes have a dynamic influence on spread volatilities and that credit watchlistings significantly reduce credit spread volatility which diminish investors' assessment risk. Thus, portfolio managers who work with credit-sensitive financial instruments tend to arrange and value their assets according to investor's risk aversion.

Mayer (2009) explored the establishment of a platform for emergency assistance and fiscal policy coordination. Similar to IMF, the creation of a European Monetary Fund (EMF) would coordinate national fiscal policies within monetary policy. The EMF would provide funding

to financial distressed countries and improving financial stability on the EMU in the long-term. As three main similarities with the IMF, Mayer (2009) emphasizes that the EMF would conduct professional surveillance of countries' economic policies and grant financial assistance in times of stress under strict policy conditionality. Finally, there would be also a parallels peer review of policies and peer control of financial assistance. On the other hand, the EMF would only act as a lender to EU countries. All EMU countries would have to commit to EMF's rules on economic policy and then the EMF would be a platform for fiscal policy coordination among EMU countries and the monetary policy itself. Thus, the EMF should permanently develop into an institution that looks forward to coordinate fiscal and monetary policing among EMU member countries. To do so, it will address not only problems related to the present economic and financial distress but also to acknowledge how this crisis could be used as a channel to power up European integration.

Pricing Eurobonds is not a straight-forward process, especially in the secondary market where investors tend to devise numerous calls before final quoting a target price. As there are zero-coupon bonds and other kinds of bonds, several pricing models may be applied since valuation can meet expectations and different risk aversion assessments. It is important then to observe and study how discounted Eurobonds can be at its issue and the relevant terms aggregated to each bond, looking forward to increase Euro reserves' position through advanced, emerging and developing economies. Analysis will be further developed.

The investment on Eurobonds is not restricted although it is quite difficult to regular small investors to operate with such instrument. Worldwide investors are able to buy Eurobonds as they are a good instrument to balance portfolios due to their safe and sound venture. This may be, somehow, one of the possible most efficient methods that P.R. China would contribute to EU funding. The Chinese government would be able to diversify their debt securities of various countries' portfolio in order to minimize their risk. Given German's resistance on common Eurobonds (logically, or not) and due to the inevitability situation over EMU members, one of the most reasonable scheme for P.R. China to invest would pass through the acquisition of debt securities from the ESF. This would help every country on a whole and not a single one and throughout this campaign it would be interesting in terms of politics as it could gather the two nations into a bigger companionship. Moreover, P.R. China would be mostly protected from debt forgiveness, as ESF's debt securities hardly would be subjected to a haircut.

Restoring confidence in the EMU sovereign bond market is now crucial and governments have to act on a fast pace since the sharp widening of yield spreads among EMU sovereign bonds is getting more extreme.

4. Composition of Official Reserves

Official reserves are extremely important in worlds' financial and monetary appraisal and within the last decade official reserve assets are swiftly being more diversified. Yet, the reserves' currency composition as maintained its configuration shares especially from the period 2009-12. The gap between the U.S. Dollar and the Euro (in terms of reserve allocation) was never as small as it is on present-day. Still, instrument composition has changed more significantly than currency composition. Reserve managers are keeping its program on reallocating their foreign exchange holdings' portfolio to riskier and more rewarding instruments.

Linking the gap shrunk between the two major currencies, the main responsibility for this circumstance is that, as emerging and developing economies gathered so many reserves over the last years, there was a significant shift out of U.S. Dollars. Those reserves became unknown (unallocated) while the Euro's reserves did not suffer from this pressure that intensively. Nevertheless, the Euro's share on world reserves it is still reasonably lower than U.S. Dollar's share.

4.1. Data Sources

Data research on the composition of foreign currency reserves is challenging since the latter is spread in several sources, each one significant and specific. Although stand-alone they are all incomplete, they all complete themselves.

Whilst data on total foreign currency reserves is easily obtainable from national sources and the IMF through its International Financial Statistics (IFS), there is a crumble of these reserves in terms of currency and instrument. Furthermore, its analysis becomes tricky to arise. Still, there are three main sources of data regarding the composition of reserves, namely national sources (World and National), surveys data and counterparty data. Their differences are outlined in Table 1 taken from Wooldridge (2006) and updated to today.

Table 1 – Selected sources of data on the composition of foreign currency reserves

	World total IMF IFS[a,b]	National data SDDS template[b]	Survey data IMF COFER[b]	IMF CPIS[c]	Counterparty data US TIC[d]	BIS ILB[b]
Identified holdings	4,347	2,832	2,911	2,145	1,938	1,079
Official institutions included						
Monetary authorities	✓	✓	✓	✓	✓	✓
Other national authorities[e]	✓	✓	✓	✓	✓	✗
Public investment funds	✗	✗	✗	✗	✓	✗
International organizations	✗	✗	✗	✓	BIS	BIS
Countries included	230	72	145	77[f]	230	230
Industrial countries	34	33	34	33	34	34
Japan	✓	✓	✓	✓	✓	✗
Developing countries	196	40	110	44	196+	196+
China	✓	✗	✗	✗	✓	✗
Taiwan, China	✓	✗	✗	✗	✓	✓
Hong Kong, China	✓	✓	✗	✓	✓	✓
Instruments included						
Cash in vault	✓	✓	✓	✗	✗	✗
Deposits	✓	✓	✓	✗	✗	✓
Including reverse repos	✗	✗	✗	✗	✗	✓
Debt securities	✓	✓	✓	✓	✓	✗
Equity securities	✓	✓	✓	✓	✓	✗
Other reserve assets	✓[g]	✓[g]	✓[g]	✗	✗	✗
Disclosed breakdowns						
By instrument	✗	✓	✗	✓	✓	✓
By currency	✗	✗	✓	✗	✓[h]	✓

[a]IMF's International Financial Statistics.

[b]At end-July 2012.

[c]Sum of SEFER and SSIO data; at end-December 2010.

[d]Annual survey of foreign portfolio holdings of US securities; at end-June 2011.

[e]National authorities, other than the monetary authority, which hold foreign currency reserves.

[f]Countries that participated in the 2010 CPIS.

[g]Includes financial derivatives and securities borrowed under reverse repos.

[h]Available only for total foreign portfolio holdings (private and official holdings combined).

Sources: BIS; IMF; national data; Wooldridge (2006).

The most detailed data is provided by national sources. However, in a world including numerous countries, their country coverage is rather limited since only around two-dozen central banks publish meticulously their currency composition of foreign currency reserves. Amongst the 72 publish details (including ECB representing the Euro zone) about their instrument composition, as part of the reserves template of the IMF's Special Data Dissemination Standard (SDDS), P.R. China and Taiwan are still missing. However, as an

addiction, the SAR of Hong Kong provides a template on their international reserves, which is as representative as Brazil. The country coverage of surveys is usually higher that national sources. These provide aggregate although data from individual central banks is unidentified. Apart from the IFS, the IMF holds two special kinds of surveys. First, the Currency Composition of Official Foreign Exchange Reserves (COFER) database is a record that keeps end-of-period quarterly data on the currency composition of official foreign exchange reserves. Presently, there are 145 countries that voluntarily report, consisting of member countries of the IMF, non-member countries/economies, and other foreign exchange reserves holding entities. Here, participating reserve managers report a breakdown of assets held in each of the five major currencies – U.S. Dollar, Euro, Yen, Sterling Pound and French Francs – plus a residual for all other currencies as allocated reserves. Until 1999, before the Euro introduction, the least important European currencies were identified separately in European Currency Unit (ECU), then Deutsche Mark, French Franc and Netherlands Guilder. Likewise allocated reserves, unallocated reserves are also recorded. The COFER database is not only by world total figures as advanced economies and emerging and developing economies figures also divide it. It is also split by allocated and unallocated reserves in each economy development-basis. The latter is that unallocated reserves line captures the difference between the total reserves data reported to IFS and to COFER. However, the IMF does not state the contributing countries in each subdivision and considering the size of the gap, P.R. China seems to be missing among those emerging and developing countries as it has a huge pile of foreign exchange reserves. Second, the Coordinated Portfolio Investment Survey (CPIS) captures the geographic distribution of year-end data on portfolio investment holdings of securities held as reserve assets in 77 countries. Here, this database gathers individual economies' – through the Survey of Securities Held as Reserve Assets (SEFER) – and international organizations' – through the Survey of Securities Held by International Organizations (SSIO) – combined holdings of reserve assets, equity and debt securities. Even though, these securities are aggregated in U.S. Dollars and there is no information concerning the currency in which these securities are denominated. Once again, P.R. China is missing as a whole but the SAR of Hong Kong reports an important stack of its assets' investment portfolio.

Counterparty data from liabilities to monetary authorities are a close proxy for reserve assets (Galati and Wooldridge, 2009). There are mainly two counterparty databases: United States' Treasury International Capital reporting system (TIC) and the Bank for International

Settlements (BIS) International Locational Banking statistics (ILB). The U.S. TIC reports the U.S. government's cross-border portfolio investment flows and reserve positions, excluding direct investment, and the resulting levels of cross-border claims and liabilities between U.S. residents (including U.S. based branches of firms headquartered in other countries) and foreign residents (including U.S. firms' offshore branches). The BIS ILB measures the international claims and liabilities of bank offices in the respective reporting countries, including inter-office positions broken down by instrument, currency, sector, country of residence of counterparty, and nationality of reporting banks. The reserves collected by the BIS are worked out within almost eight thousand commercial banks/securities brokers in form of deposits and loans, including reverse repos.

There are some final limitations concerning these sources of data. A regular limitation to both the ILB and COFER databases is that they report their reserves assets as a gross amount giving an incomplete picture of ultimate risk exposure. Moreover, its risk analysis becomes delicate as the specific currency and instrument of a single reserve asset turns out unfeasible to outcome. Another limitation on both counterparty databases is that the definition of liabilities to official institutions is frequently different from the conventional taxonomy of reserves. This may sum up into diverse figures interpretations.

4.2. Currency composition

Historically the U.S. Dollar has always been the dominant currency in terms of total amount of foreign exchange holdings among all other currencies in the financial world. Until 1999 the U.S. Dollar only had as more serious competitors (concerning reserves) the Yen and the Deutsche Mark but things were about to change (slightly) with the introduction of the Euro (Please see Figure 1).

Figure 1 - World Official Foreign Exchange Reserves Allocation
Currency decomposition of World Official Foreign Exchange Reserves from 1995 to 1999. Claims in Euros start in 1999 and replace French Francs and Deutsche Marks

Data Source: COFER
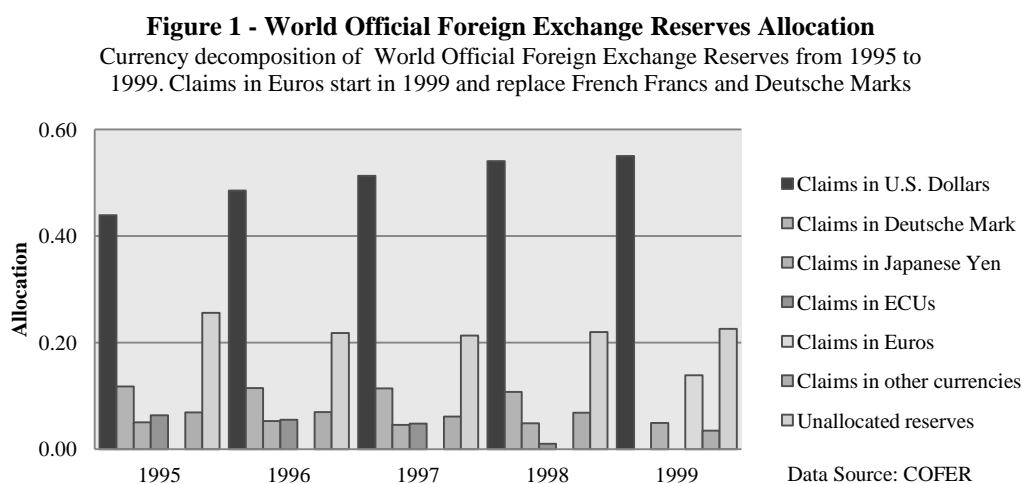
The IMF COFER data suggest that over the past decade (2002-11) there was a rough total growth of 323% on world total foreign exchange holdings with an astonishing growth on the period 2003-07 through a growth rate range of 27.63% (2007) to 15.26% (2005). Nevertheless, following a phase of small blaze over financial markets in 2008, reserves kept an important role on reserves' portfolio managers even though the world's reserves growth rate has slowed to a balanced 10% rounded pattern (with exception to 2010 with 13.49%) among economies with a tiny advantage for the non-advanced economies (Please see Figure 2).

Figure 2 - World Official Foreign Exchange Reserves Growth
Growth rate of World Official Foreign Exchange Reserves between 1996 and 2011 .

Data Source: COFER
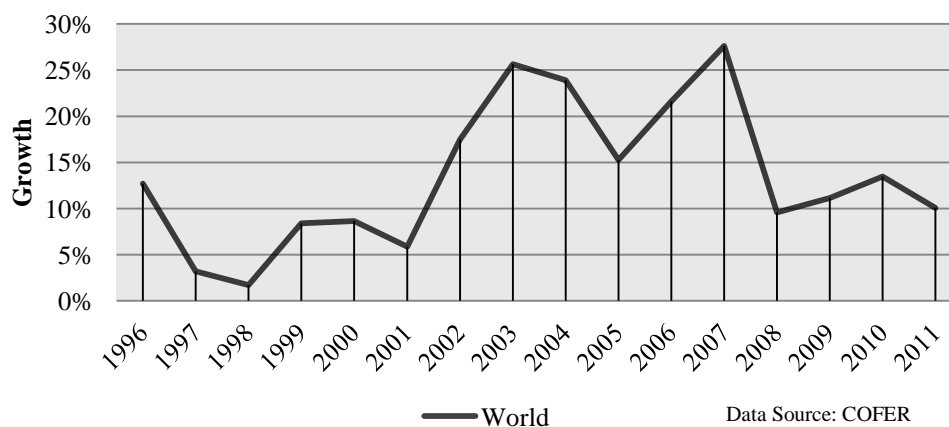
In addition, reserves' great development is due to a constantly higher growth rate over reserves non-allocation. Contrasting the growth rate of allocated reserves (214%) and unallocated reserves (643%) over the past decade, it is plain to agree on the importance of reserve allocation. Therefore, it is not surprising that, on present-day, unallocated reverses are still growing somehow faster than allocated-ones.

Emerging and developing economies' reserves evolution has become the energy that ultimately urges in reserves' financial mechanism. Moreover, these economies have worked intensively on their foreign exchange reserves portfolio positions since they were always behind (comparing to advanced economies) until 2005 (Please see Figure 3). Within the period 2003-07, its reserves increased in a tremendous pace (30.43% minimum in 2003 to 42.38% maximum in 2007) even though those reserves come out to be unallocated, i.e. without acknowledged currency distinction. On the other hand, advanced economies' reserves development turned out to be much slower particularly throughout the period 2005-08 (0.38%

minimum in 2005 and 8.37% maximum in 2006). Strangely (or not), these economies seem not to be cautious concerning the amount of foreign exchange holdings and, as a result, the growth rate of reserves on these outcome the non-urgency of urging for new reserves and stabilization of their portfolios. The same idea can be applied to emerging and developing economies, in the opposite way. Throughout those five years (2003-08), nations like P.R. China, Brazil and India (for example) got the opportunity to raise their positions on reserves in order to forearm possible resources' price, scarcity and volatility (Please see Figure 4).

Figure 3 - Economies Official Foreign Exchange Reserves
Advanced and Emerging and developing economies positions on Official Foreign
Exchange Reserves between 1995 and 2012* (*Quarter 2)
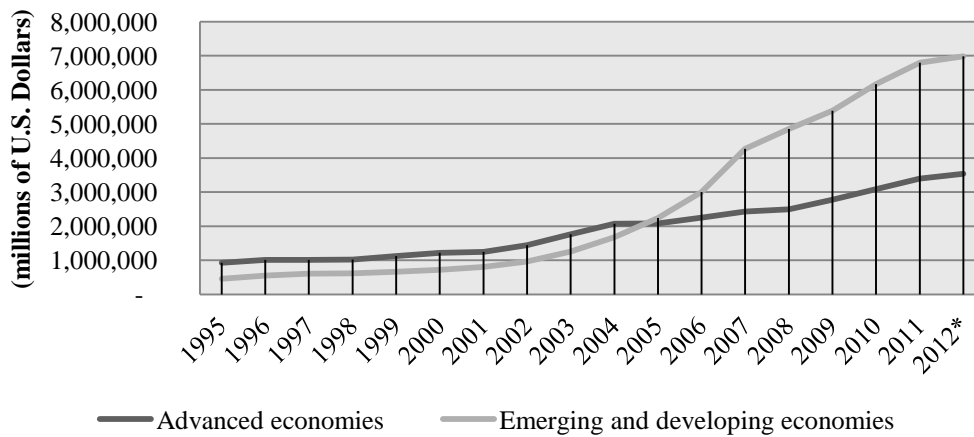
Data Source: COFER

Figure 4 - Economies Official Foreign Exchange Reserves Growth
Growth rate of Official Foreign Exchange Reserves on Advanced and Emerging and
developing economies between 1996 and 2012* (*Quarter 2)
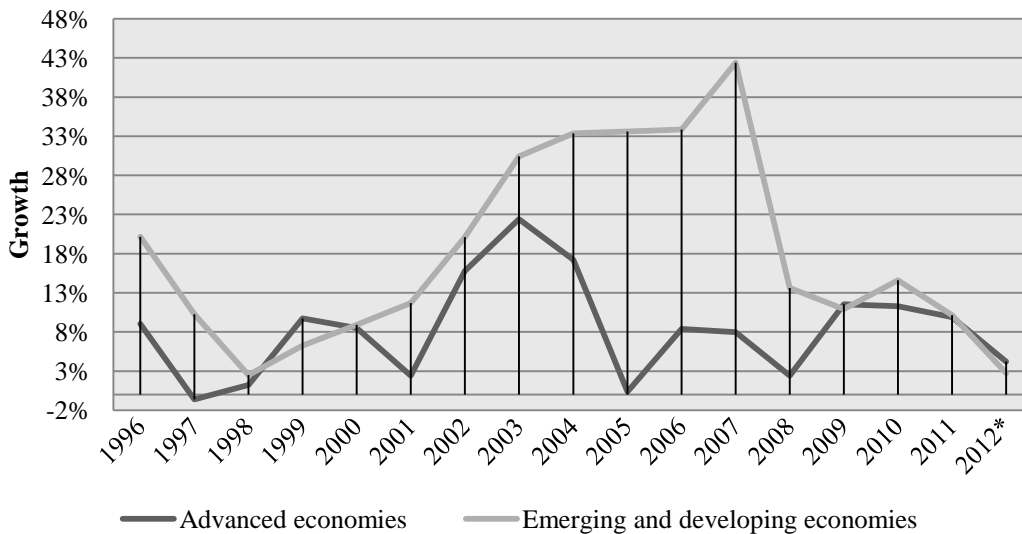
Data Source: COFER

During the last five years (2008-12), reserves' growth rate has been slower than previous years but stable nonetheless. The tiny advantage for the non-advanced economies is real. The reasoning behind this slowdown is possibly due to the exposure of the greatest economies to riskier assets that developed into toxic assets throughout the subprime crisis. Even though advanced economies had their financial systems more vulnerable to quick-drops on its assets' valuation, theirs seek for reserves accommodation did not decrease so abruptly comparing with emerging and developing economies reserves accommodation's behavior. The last available data concerning foreign exchange holdings from Q2 (2012) suggest that reserves' demand is decreasing even more as the total growth rate lies in 3.22%, 4.21% and 2.72% (only half year represented nevertheless) on world-basis, advanced economies-basis and emerging and developing economies-basis, respectively (Please see Table 6).

Moving forward to currencies' singleness, the world-basis growth rate of both claims in U.S. Dollars and Euros has followed a similar pattern (period-speaking) (Please see Figure 5). However, depending on the exact period, each currency was able to surpass the other rival.

Figure 5 - Currency Official Foreign Exchange Reserves World Growth
Growth rate of World Official Foreign Exchange Reserves in terms of U.S. Dollars and Euros between 2000 and 2012* (*Quarter 2)
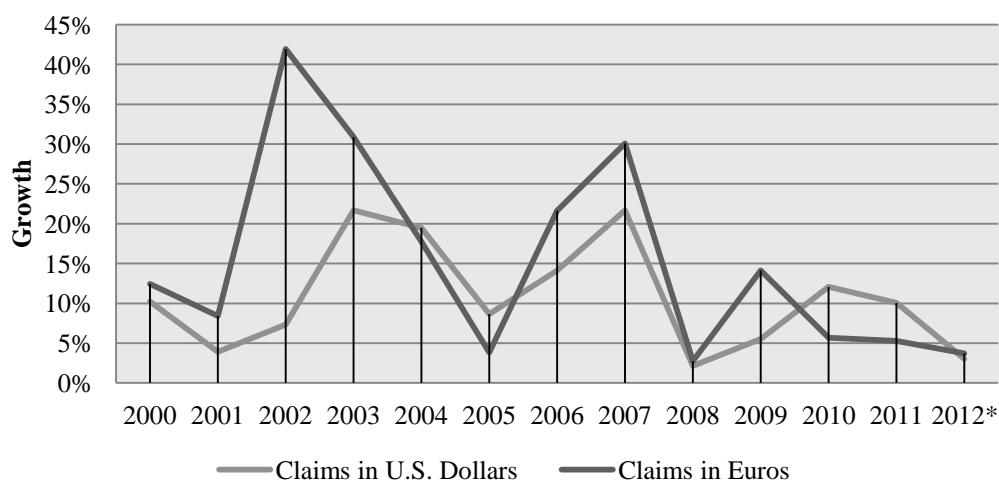
Data Source: COFER

As the Euro was born, allocated reserves claimed in Euros expanded quite quickly as it became a joint currency among Germany, France and other ECUs. Therefore, looking for reserves that were mainly known for Deutsche Marks was a must among reserves' portfolio managers to have with. This explains the sudden development in its early years of life (41.95%, 30.87% and 17.75% in 2002-04 respectively). The U.S. Dollar, a currency already

settled within world economy, merely followed this trend on a smaller scale. In 2005, both currencies fell into a 10% growth rate. However, until 2008 the U.S. Dollar and the Euro kept theirs high reserves' progress where thereafter they handled a huge drawback on its growth echoing worlds' low demand for reserves. Usually with the Euro upfront in the last years, foreign exchange holdings' growth rate decreased to 10.07% (U.S. Dollar) and 5.3% (Euro) in 2011 and 2012's figures suggests that the demand for reserves is likely to shrink even more in this year as by Q2 (2012) where reserves are only rising by 3.53% and 3.72%, U.S. Dollar and Euro respectively (Please see Figure 5).

As emerging and developing economies have been the main source for the huge advance in terms of reserves' quest, naturally these economies boosted the enhancement of the U.S. Dollar and the Euro in the world while its growth among advanced economies pushed down the total growth of reserves (relatively). In periods of less bright, namely 2005, the growth rate of those currencies stayed in rounded 22% (on non-advanced economies) while on advanced economies the growth rate was clearly negative with focus on Euro's one (-7.23%) and -0.23% on U.S. Dollar. Since 2009 (exclusive) until 2011, the Euro lost his realm as the U.S. Dollar has been growing faster on both economies-basis (Please see Figure 6 and Figure 7.

Figure 6 - Currency Official Foreign Exchange Reserves - Advanced Economies Growth

Growth rate of Official Foreign Exchange Reserves in terms of U.S. Dollars and Euros on Advanced economies between 2000 and 2012* (*Quarter 2)
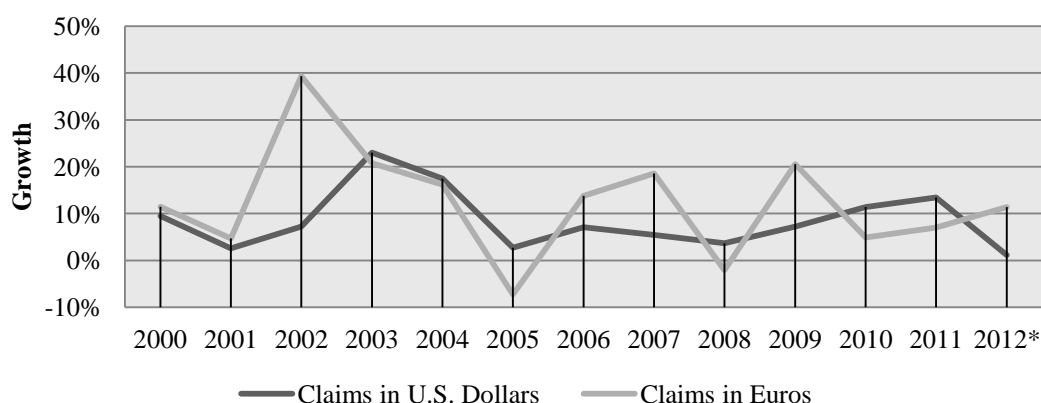
Data Source: COFER

Figure 7 - Currency Official Foreign Exchange Reserves - Emerging and Developing Economies Growth

Growth rate of Official Foreign Exchange Reserves in terms of U.S. Dollars and Euros on Emerging and developing economies between 2000 and 2012* (*Quarter 2)
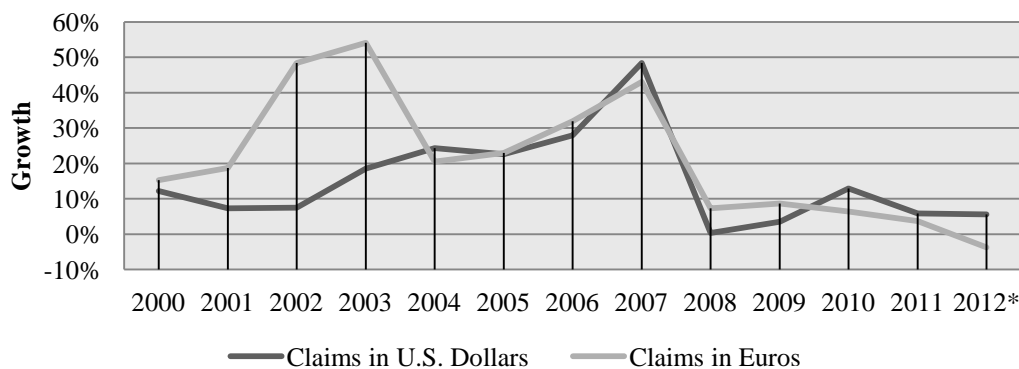
Data Source: COFER

Pulling up the latest 2012 figures, the Euro is leading in terms of reserves' growth as previously stated. Somehow, mostly from Q2, advanced economies are pushing up their Euro reserves' position with 11.41% growth while U.S. Dollars only 1.12% growth. On the other hand, and to balance the world-basis reserves growth by 3%, emerging economies are requesting more U.S. Dollars than Euros where the growth rate of the latter was indeed negative in Q2 (2012) by 3.67%.

Breaking up into reserves allocation, there is an unambiguous trend over this decade that reserves are spreading faster than usual as reserves are becoming less allocated than ever. Comparing side by side both growth rates in a world total basis on each allocation partition it is possible to assert that the fact of reserves are achieving an unquestionable importance level on world's financial attention (Please see Figure 8). However, if these reserves are flowing away to unknown sovereignty where they cannot be identified, it raises a new problem to worlds' most important monetary agencies given that reserves' control and fair analysis becomes impractical and unfeasible.

Figure 8 - World Official Foreign Exchange Reserves Allocation Growth
Growth rate of World Official Foreign Exchange Reserves in terms of allocation from
1996 to 2012* (*Quarter 2)

Data Source: COFER
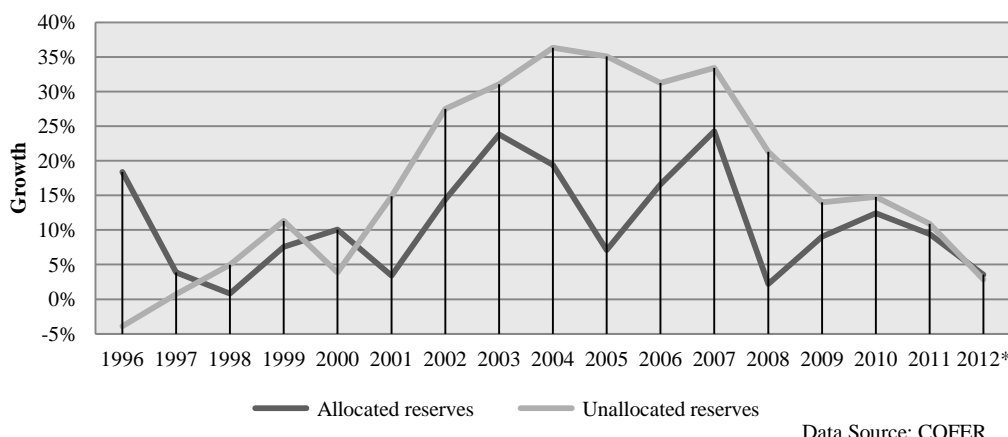
In 1995, the total foreign exchange holdings (world-basis) were esteemed to be 1,389,587MM of U.S. Dollars. Here, taking into account IMF COFER data, allocated reserves represented 74% while unallocated reserves were 26%. Throughout the period starting in 1995 to 2004, apart from a little oscillation (Δ5%), reserve allocation looked quite float. Starting from 2005, the allocation trend swiftly changes as reserves now become less definable. For instance, reserves increased more than ten times (10,523,847MM of U.S. Dollars) to present-day (2012-Q2) and yet only 56% of these reserves are allocated. Therefore, 44% of the worldwide total foreign exchange holdings (4,678,589MM of U.S. Dollars) are undisclosed, i.e. unallocated (Please see Figure 9).

Figure 9 - World Official Foreign Exchange Reserves Allocation
Allocation decomposition of World Official Foreign Exchange Reserves from 1995
to 2012* (*Quarter 2)

Data Source: COFER
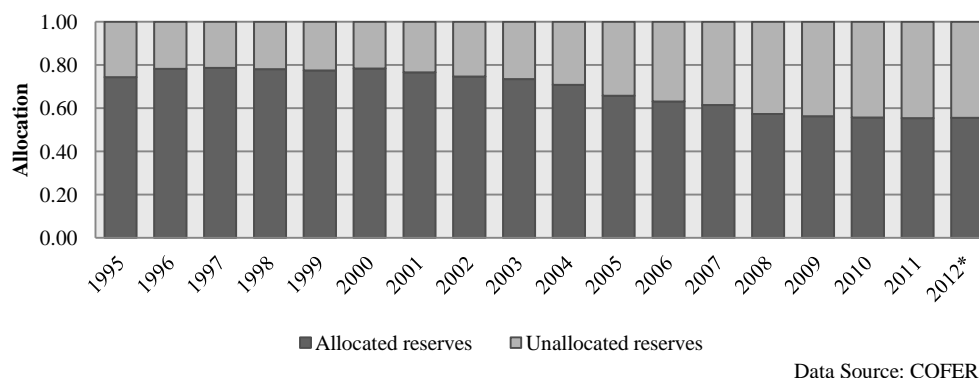
Among the last eighteen years the world has seen reserves changing their location, different economies' attitude and carefulness and, for instance, singular development strategies within Asia, America and Europe. In order to sustain reserves' present situation, some economies have been taking the lead in terms of reserves' recognition and accumulation.

Receding back to 1995, advanced economies had, on their own, 67% (932,158MM of U.S. Dollars) of world total reserves while emerging and developing economies only had 33%. However, as emerging and developing economies started to seek for reserves more intensively, it would become natural that one year those economies' reserves portfolio would surpass advanced economies' reserves position. In fact, between 1995 and 2011 there were only two years where non-advanced reserves' total growth rate was lower than advanced economies' one, 2001 and 2011. During the period 2003-07, whilst reserves were dealing with tremendous growth, reserves' positions changed drastically given that reserves in emerging and developing economies were 42% (2003) and suddenly in 2007 they were already 64%. On the last years, since both growth rates have been rather analogous, with exception to 2008 (13.63%), reserves' world distribution ratio developed into a stable pattern with 66% in emerging and developing economies and 36% on advanced economies (2012-Q2). The IMF COFER data implies that the main reason for this is that since 2005 reserves have not been allocated properly which leads to a drawback on reserve currencies' analysis especially among emerging and developing economies (Please see Figure 10).

Figure 10 - World Official Foreign Exchange Reserves Location
Location decomposition of World Official Foreign Exchange Reserves on Advanced and Emerging and developing economies from 1995 to 2012* (*Quarter 2)
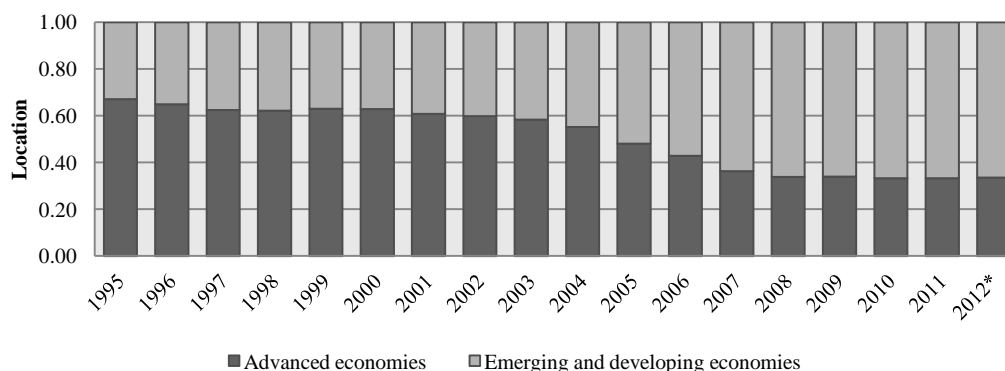
Data Source: COFER

There are two completely distinct settings between economies. While on advanced economies reserves are used to be allocated in a high grade rank, emerging and developing economies are evolving into the opposite situation wherein reserves are becoming less allocated. For instance, over the years (1995-2012) more than 89% (Δ2%) of advanced economies' reserves have been allocated and their currencies recognized while only 11% (Δ2%) have been unknown (Please see Table 7). If, for some reason, information on advanced economies' reserves identity is more flawless, sound and practical, it is because their financial system is better organized, built and controlled. Concerning emerging and developing economies, the

history reveals that back in 1995, 58% of its reserves were allocated while 42% were not allocated and until 2001 these reserves allocation did not vary too much. However, taking into account reserves' explosion in the period 2003-07, it is clear to denote that the reason why emerging and developing countries got their reserves accumulation so great is due to the overwhelming expansion of unallocated reserves. Within five years, non-advanced economies' total reserves went from 1,257,931MM U.S. Dollars (2003) to 4,272,127MM U.S. Dollars (2007) and unallocated reserves went by 47% (2003) to 54% (2007). As reserves have been growing very fast, reserves also became more unallocated and present figures suggest that. Through the last years to present-day (2012-Q2) unallocated reserves become 61% of total foreign exchange holdings while allocated reserves merely turn out to be 39%.

To highlight the greater importance of unallocated reserves spread around emerging and developing economies, since 2008 they are more quantitative significant (2,842,422MM U.S. Dollars) than whole advanced economies' reserves at that time (2,491,193MM U.S. Dollars) and this difference is getting even bigger at present time. Therefore, it becomes crucial for world's financial consciousness that emerging economies are keeping more reserves than ever, although grand fraction of them is unknown, unidentified and currency-faceless (Please see Figure 11)

Figure 11 - Economies Official Foreign Exchange Reserves Allocation
Comparision of World Official Foreign Exchange Reserves between Advanced economies and Emerging developing economies (different allocation) between 1995 and 2012* (*Quarter 2)
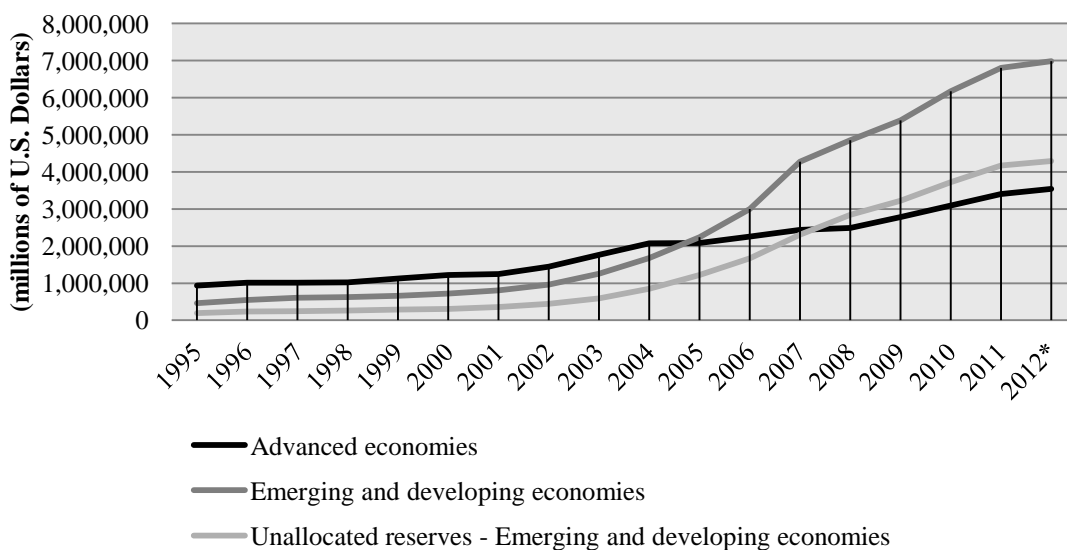
Data Source: COFER

In terms of diversification, the U.S. Dollar has lost some of its reserve hegemony over the past few years. Even though the Euro has stabilized his position as the second highest reserve currency with 14% (2012-Q2) on world total foreign exchange holdings (allocated reserves), the U.S. Dollar has been reduced to a long-time minimum of 34% (2012-Q1) (Please see Figure 12).

Figure 12 - Currency Official Foreign Exchange Reserves - World Diversification

Composition of Official Foreign Exchange Reserves in terms of U.S. Dollars, Euros and Unallocated reserves in the World between 1999 and 2012* (*Quarter 2)
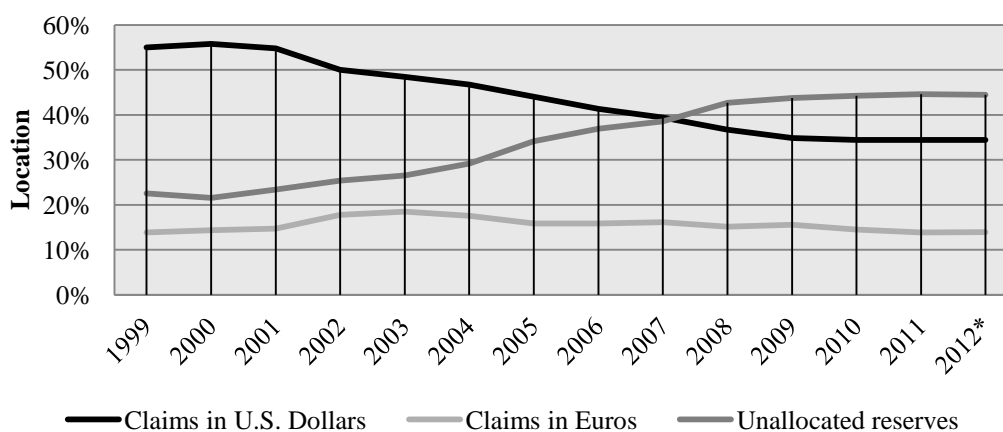
Data Source: COFER

The major impact is that U.S. Dollars that once lead world's reserves with large advantage over other currency players with a maximum proportion of 56% (2000), now, the same currency crashed more than 20% ever since. Although the Euro has still not threatened U.S. Dollar supremacy, the gap between both currencies was never as little as on present-day. This assortment is particularly interesting when the analysis gets deeper vis-à-vis economies. Although reserves blueprint on the most advanced economies has not distorted in the last decade (2002-11) following a solid trend, on the other hand, both currencies have lost some influence on emerging and developing economies' reserves. While advanced economies the U.S. Dollar is still completely dominant (and stable) with 57% (2012-Q2) on allocated reserves assessment, the same does not happen in emerging and developing economies holdings where it has constantly decreased from a 43% reserve allocation in 1995 to a diminutive 22% in 2011. On the other hand, the Euro has remained nearly unchanged with a 22% (2012-Q2) reserve position on advanced economies portfolio and a 10% (2012-Q2) on emerging and developing economies portfolio (Please see Figure 13 and Figure 14).

Figure 13 - Currency Official Foreign Exchange Reserves - Advanced Economies Diversification

Composition of Official Foreign Exchange Reserves in terms of U.S. Dollars, Euros and Unallocated reserves on Advanced economies between 1999 and 2012*
(*Quarter
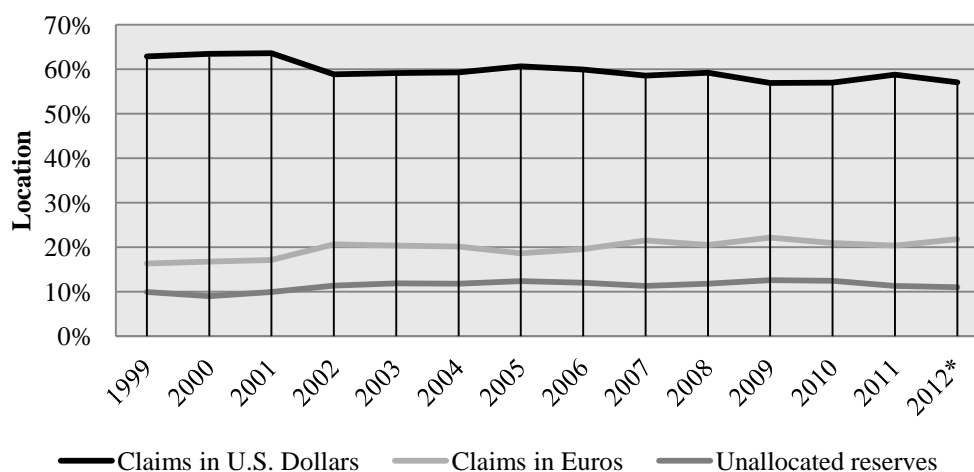
Data Source: COFER

Figure 14 - Currency Official Foreign Exchange Reserves - Emerging and Developing Economies Diversification

Composition of Official Foreign Exchange Reserves in terms of U.S. Dollars, Euros and Unallocated reserves on Emerging and developing economies betw
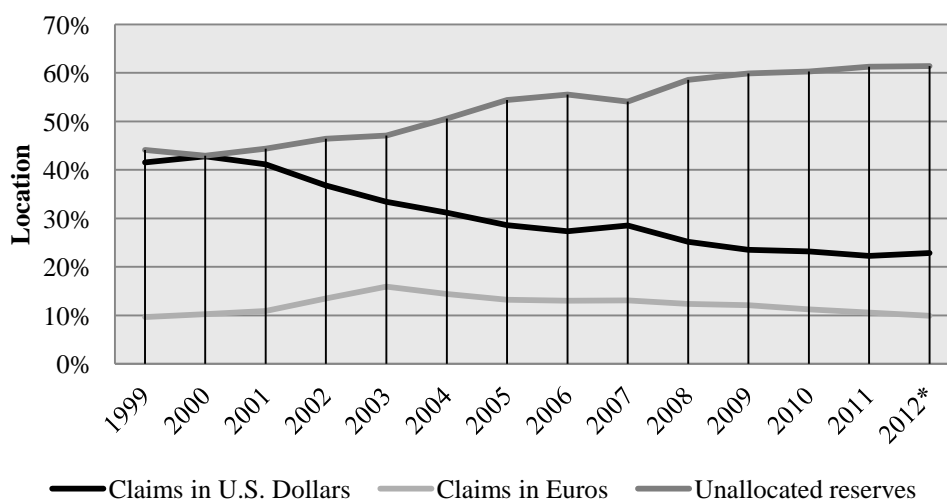
Data Source: COFER

Currency composition analysis mainly focuses in these two main currencies and evidence proofs that. Other worldwide currencies like Sterling Pound (2%), Japanese Yen (2%) and other currencies in general (3%) have a diminutive position on world reserves and, therefore, are nearly disregarded from quantitative analysis. Furthermore, the U.S. Dollar has been the most important currency in the World so far, especially among advanced economies with a large advantage over the Euro. Through emerging and developing economies, the scenario swifts in significance as both currencies have a total crash within their reserves' position where unallocated reserves become known not for the best reasons, i.e. almost 41%

(4,288,297MM U.S. Dollars – 2012-Q2) of world's total reserves are unallocated. Considering worldwide unallocated reserves this scenario gets worse as this portion reaches 44%. However, this exposes a very important outcome, how important reserves must be identified, worked and identified among not only emerging and developing economies as the international monetary agencies to prevent this trend from getting deeper and remote.

4.3. Instrument composition

The latest decades of financial history establishes that monetary authorities have gradually diversified theirs reserves into higher risk instruments and consequently higher expected rates of return. For instance, a mass volume of reserves were held in gold back in the 1980s because gold was, at that time, the representative "coinage" of world's financial system. However, great part of those reserves is, at the present time, being invested in foreign currency assets, mostly securities holdings. McCauley and Fung (2003) found out that reserve managers have extended the maturity of theirs foreign exchange holdings over the last decades. To do so, those reverse managers have been investing more in long-term securities, decreasing theirs positions in deposits.

Since the beginning of the new millennium, investors have been exposed with renewed kinds of securities. These securities, such as agency and corporate securities have become more popular within reserve managers' portfolios. Agency and corporate securities are widely known as more credit and liquidity riskier than governments' securities. On the other hand, until 2008 treasury securities had been losing their popularity as their portfolio's portion was decreasing year by year.

The U.S. TIC data suggest that latter trends on foreign holdings of U.S. long-term debt securities are solid. These trends are particularly sound on securities' maturities swift. It is possible to discern two pattern periods; prior to 2008 and past-2008. During the period 2000-08, official total bond holdings rose to 2,756 billion U.S. Dollars – total growth of 363%. Through this period, treasury securities declined from 83% to 61%, agency securities increased to 35% from 15% and corporate securities slightly grew to 4%. Since 2008, the latter securities positions trends have changed and the latest data proves that with 81%, 17% and 3%, respectively. Therefore, official institutions are investing more carefully as treasury securities recovered its greater portion on reserves' portfolio since it is the safest instrument to invest. Nevertheless, the same institutions are keeping an important part of their investment

on agency securities like straight bonds and on corporate securities as a manner of incentive (Please see Table 2).

Comparing private holdings on corporate securities with treasury securities on official holdings, non-official reserves' managers' position is similar. In 2011, 65% of the total private holdings were invested in corporate long-term debt securities. Although the latter securities followed the same trend as agency securities (relative to official holdings), the variation was not as violent as the last one.

Table 2 – Foreign holdings of U.S. long-term debt securities, by instrument[a]

	Official holdings				Private holdings
	Total bond holdings (USD bns)	Treasury securities (% of total)	Agency securities (% of total)	Corporate securities (% of total)	Corporate securities (% of total)
1989[b]	197	95	4	1	50
1994[b]	276	94	4	2	48
2000[c]	595	83	15	2	55
2002[d]	717	78	19	3	61
2003[d]	854	76	21	2	58
2004[d]	1,164	78	18	4	61
2005[d]	1,464	74	22	4	63
2006[d]	1,782	68	27	5	65
2007[d]	2,301	63	33	4	71
2008[d]	2,756	61	35	4	73
2009[d]	2,955	70	27	4	71
2010[d]	3,435	76	21	3	69
2011[d]	3,842	81	17	3	65

[a]Market value of securities holdings, excluding holdings of money market instruments; based on annual benchmark surveys.
[b]end-December
[c]end-March
[d]end-June
Source: U.S. Department of the Treasury *et al.* (2012); author calculations.

This great expansion of treasury securities within official holdings (after-2008) is sustained, especially, by the growing appetite of emerging and developing economies. Among these economies, focus on the BRIC economies like P.R. China (Taiwan as well), Russia and Brazil. Other group economies are also relevant for this grand expansion like Oil exporters and Caribbean banking centers. Nevertheless, developed economies like Japan and the UK take part on the major foreign holders of treasury securities. For instance, P.R. China increased their holdings on treasury securities from 477.6 billion U.S. Dollars (2007) to 1,151.9 billion U.S. Dollars (2011). Japan has also greatly increased their position to 1,058 billion U.S. Dollars (2011). Finally, the great development over Russia and Taiwan where in five years increased their position more than five times to 149.5 and 177.7 billion U.S. Dollars (2011) was impressive (Please see Figure 15 and Table 9)

Figure 15 – Major Foreign Official Holders Of Treasury Securities
These figures report the major foreign official holders of treasury securities.
Here, P.R. China and Japan stands out in term of their higher position
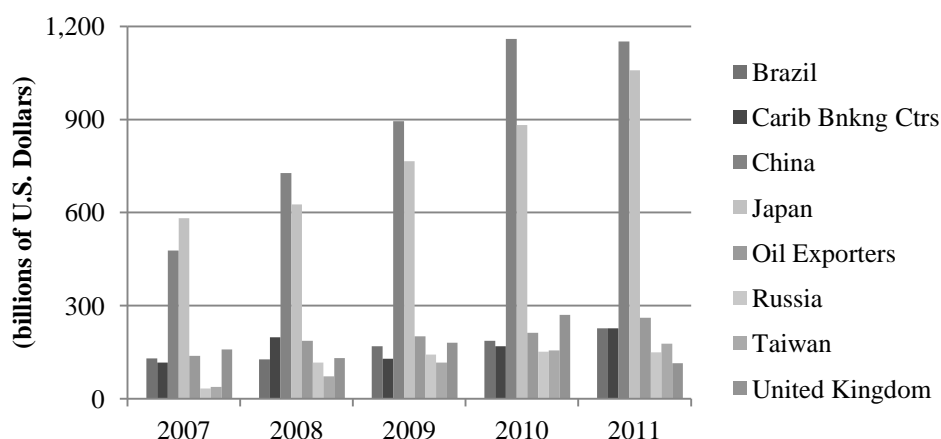
Data Source: U.S. TIC

The development of private foreign holdings of U.S. long-term debt securities has been softer when compared with official foreign holdings of the same debt securities. Private investors have their portfolios more diversified as they do not subject their entire portfolio to one security. During the period 2004-11, private total bond holdings rose to 3,889 billion U.S. Dollars – total growth of 66%. Agency securities have become less tempting since they only represent 10% (2011) of total private holdings while treasury securities regain importance being 24% (2011) of total private holdings. The significance is that within four years (2008-11), treasury securities rose by 71%. Corporate securities portion as remained as the major contributor to the holdings' portfolio with 65% (2011) after a maximum 73% back in 2008. (Please see Table 3)

Table 3 – Private Foreign holdings of U.S. long term-debt securities, by instrument[a]

	Private holdings			
	Total bond holdings (USD bns)	Treasury securities (% of total)	Agency securities (% of total)	Corporate securities (% of total)
2004[b]	2,336	22	17	61
2005[b]	2,655	20	18	63
2006[b]	2,950	17	17	65
2007[b]	3,706	14	15	71
2008[b]	3,739	14	13	73
2009[b]	3,285	17	12	71
2010[b]	3,487	21	10	69
2011[b]	3,889	24	10	65

[a]Market value of securities holdings, excluding holdings of money market instruments; based on annual benchmark surveys.
[b]end-June
Source: U.S. Department of the Treasury *et al.* (2012); author calculations.

Official institutions are known to be conservative investors. Their holdings of treasury securities are concentrated in maturities of 5 years of less (70.3%) while riskier securities are allocated in longer-term maturities. For instance, agency securities (63.5%) and corporate securities (57%) are concentrated in maturities of more than 10 years and more than 5 years, respectively. Since the majority of treasury securities are invested in shorter-term maturities, it exploits an increase of liquidity in the economy for the common good. (Please see Table 4)

Table 4 – Official Foreign holdings of U.S. long term-debt securities, by remaining maturity[a,b]

| | Official holdings | | | |
	Total bond holdings	Treasury securities	Agency securities	Corporate securities
0-1 years	10.9	12	5.4	11.3
1-2 years	18	19.5	12.6	7.6
2-5 years	34.2	38.8	13.5	24
5-10 years	23.6	22.9	5.1	25.7
> 10 years	13.3	6.7	63.3	31.3

[a]Market value of securities holdings, excluding holdings of money market instruments; based on annual benchmark surveys.
[b]As a percentage of all maturities for a given instrument.
Source: U.S. Department of the Treasury *et al.* (2012); author calculations.

While official institutions are more conformist, private institutions are more adventurous and risk disposed. The duration of their securities tend to be higher than official holdings, especially on treasury and agency securities. Their conduct in terms of corporate securities is alike official institutions' behavior. (Please see Table 5)

Table 5 – Private Foreign holdings of U.S. long term-debt securities, by remaining maturity[a,b]

| | Private Holdings | | | |
	Total bond holdings	Treasury securities	Agency securities	Corporate securities
0-1 years	10	12.7	4.4	9.9
1-2 years	10.4	14	6.4	9.8
2-5 years	24.5	27	6.2	26.4
5-10 years	24.6	31.7	5.8	25.1
> 10 years	30.4	14.5	77.2	28.9

[a]Market value of securities holdings, excluding holdings of money market instruments; based on annual benchmark surveys.
[b]As a percentage of all maturities for a given instrument
Source: U.S. Department of the Treasury *et al.* (2012); author calculations.

The composition of government debt in the Euro area in 2010 nearly approaches the upper research, now in terms of Euro. Here, it evidences that long-term securities (70%) are the most preferred financing instrument. The sector that contributes the most when issuing the instrument is the central government (82.7%). Therefore, it is the ECB that usually assists and lends money for the considered necessary countries. Non-residents (of a member country) are used to hold debt from Euro area governance. In fact, 52% of the Euro area government debt

structure is held by the latter party while the other 48% is held by residents of a member state. Here, monetary and non-monetary financial institutes hold 38.7% of the total debt. Therefore, concerning the debt sovereignty among Euro area countries, these countries are not entirely subjected to exterior dependence as European residents are large creditors as well. Lastly, the residual maturity of debt structure is rather diversified. Even though there is a slightly trend for higher durations, 40.3% of debt is within a maturity over 5 years, short-term debt (less than 1 year) has also an interesting share with 26.1%.

Figure 16 - Euro area Government Debt Structure in 2010[a] (percentage of total)

Composition of government debt in the Euro area in terms of instrument, sector contribution, debt holder and residual maturity
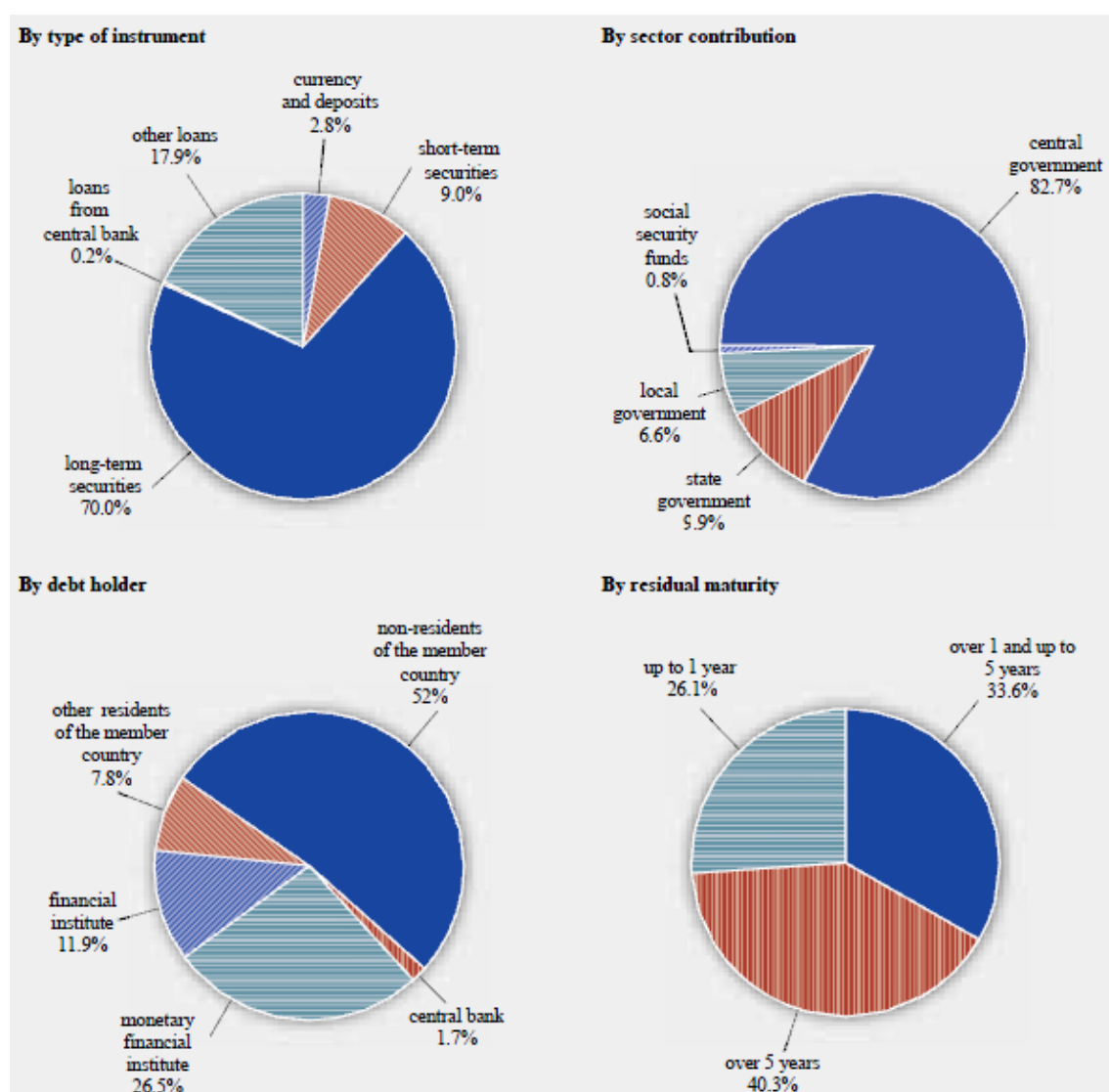
[a]Data refer to EDP debt. Gross general government debt at nominal value and consolidated between sub-sectors of government

Source: ESCB

5. P.R. China Cooperation

The development of the Euro as a reserve currency is not an easy mission. This quest has to be thought, designed, controlled and reasonably executed to achieve the highest degree of success. In order to understand how P.R. China could be useful in cooperation with Europe, it is crucial to comprehend where the assistance should be applied.

Sum up, in terms of assistance, the Euro must improve its liquidity, spread its physical appearance over other countries, become more interventive on markets, seize foreign investment to Euro countries and fight the recently sharp widening of yield spreads of sovereign debt within the Eurozone. These are the minimum subjects that the Euro must face in order to challenge the pre-eminence of the U.S. Dollar as the reserve currency, by excellence.

The creation of common Eurobonds would aid Eurozone countries in terms of liquidity and sovereign debt wide yields. Designing a solid common Eurobond maturity structure would go from very short-term to medium-long term "treasury" notes and bonds, respectively. The Euro has to become incredibly liquid in order to assist reserve managers and to provide turnover for short-term financial operations within the Euro economy. Besides, longer-term bonds would support a sustained and more efficient growth among deprived Eurozone countries. One of the most efficient methods that P.R. China would contribute to EU funding is by investing on latter's bonds. It would allow the Chinese government to diversify and even change their debt securities of various countries' portfolio. Thus, it would let portfolio managers to flow theirs various portfolios in function of different risk and expected return profiles. Therefore, one of the most reasonable schemes for P.R. China to invest would pass through the acquisition of debt securities from the ESF. Doing so, P.R. China helps every country on a whole and not a single one and throughout this campaign. Besides, P.R. China would be protected from debt forgiveness, as ESF's debt securities hardly would be subjected to a haircut. How each country would be affected would depend on the specific structure of the debt instrument.

For instance, the structure of a simple working common Eurobond model could be based on De Grauwe and Moesen (2009) format, turning them more attractive, suggestive and differentiated, specifically to P.R. China investors. Each instrument would be composed by the participating governments and the ECB, always. However, common Eurobonds' portfolio could me extensive as each Euro government would participate (or not) in the issue on the basis of its equity shares in the EIB. Therefore, not every Euro government has to take part on

common Eurobonds issue, depending on its necessity. Secondly, the given coupon rate would be a weighted average of the yields observed in participating government bond market at the moment, plus an attractive spread. Depending on the maturity of the Eurobond, the spread linked to the given coupon rate could be attached to EURIBOR[10], on the specific maturity. For example, quarterly coupon rates would be attached to EURIBOR3m, semester coupon rates would be attached to EURIBOR6m, and further time periods. Each participating government would pay the period interest rate on its part of the bond, and the responsibility for payment of the given EURIBOR spread would be ECB's liability. This debt instrument has to be tuned for the circumstances. For example, the payment of period interest cannot prejudice the safest countries. The reasoning is that as they are, in fact, helping inferior Eurozone countries, they are supporting higher risks that issuing a debt instrument on their own. Therefore, it would be necessary to create mechanisms to prevent these countries (Germany and France) and the proper ESF from paying more than its usual yield. Nevertheless, by joining the common Eurobond strategy, higher yielding Eurozone countries would be able to financing with less costs and safer credibility. The EURIBOR bonus for P.R. China investors, like a positive discrimination, would make part of the joint-partnership between P.R. China and Europe.

The emergence of the Euro will be influenced by its physical spread over other countries through the latter Eurobonds. Gaining visibility with P.R. China with a clear increase of Euro exchange holdings would transmit a greater anchoring role of the Euro as it reaches further and emerging economies. A larger weight of Euro reserves in P.R. China's official reserves could be grand opportunity to develop the responsibility of the Euro among Asian economies.

The creation of a sound and respectful network partnership between P.R. China and Europe would diminish present-time political constrains and mix market conditions. P.R. China has kept huge piles of currency holdings in their portfolios. Every person who lives in this country feels and experiences that, despite poverty extremes (that there are), the Chinese governance and its investors have lots of money. This way, bringing foreign investment to Europe will bring new employment, new opportunities to local development and capital. Through more wealth, larger companies would be able to invest more in a safer and secure economy like the Eurozone's one.

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[10] The Euro Interbank Offered Rate (**EURIBOR**) is an interest rate based on the average interest rates at which a panel of European banks lends money to one another.

The Euro has to become more interventive. The Euro will be able to get used on intervention purposes if the Euro economy develops and improves within financial markets. If the ECB manages to control price stability and the recently over-debt issue among substandard Eurozone countries, the ECB will seed confidence to world markets and will develop better conditions to accommodate the higher international role of the Euro.

Moving forward, in terms of reserves' management, the development of the Euro as a reserve currency will be attached with P.R. China reserves' behavior. The fact is that emerging and developing economies hold great part of world's foreign exchange reserves and evidence proofs that. Therefore, since grand part of P.R. China's foreign exchange holdings are in U.S. Dollars, which is logical, P.R. China will be a dominant player concerning the international role of the Euro. Following the common Eurobond methodology, Chinese investors will start getting in touch with the Euro more than ever. This might by the first approach to an increase of the Euro in reserves' position. On the other hand, evidence also shows that more than 40% of world total foreign exchange holdings are unallocated. In general, giving that P.R. China financial system is underdeveloped, essentially in terms of loans and mortgages, the latter country has to give enormous effort solving their own problems first.

The development of the Euro as a reserve currency is not an easy mission. If Europe and P.R. China create a strong and solid fellowship in world economy, this quest might get easier to overcome. In order to be successful, for both parties, the creation of common Eurobonds is a must. The idea is that, through this debt instrument, the Euro will be acknowledged as a secure and rock-hard currency. Therefore, the Eurozone will ensure that its problems (liquidity, intervention, foreign investment, over-debt sovereign countries) will foresee a brighter future ending.

6. Conclusions

The importance degree of the U.S. Dollar and the Euro on world reserves is incontestable. Both these currencies are, by far, the most important coinage-faces that represent world economy given its significance in terms of reserves. However, taking into account world economy's assets transactions, economy funding and currency representativeness, the U.S. Dollar is still dominant. This domain is real and will not change in the near future regardless of the efforts suggested in this thesis. Even so, the same domain has slightly reduced.

Do not rush it. The Euro, as an international currency, has enormous potential. Comparing both currencies, there are years, decades, centuries of history, experience, data and knowledge

separating them. However, as the Euro has potential and dexterity, it also has its serious problems to be care of. For instance, the Euro has to improve its liquidity, visibility, attract foreign investment and fight the recently sharp widening of yield spreads of sovereign debt within the Eurozone.

The Euro is looking forward to challenge the pre-eminence of the U.S. Dollar and has achieved a more solid position as an international currency but it is not enough. The idea is that it is too soon to aspire for that. Thus, the Eurozone has to get prepared for this ambition (real or not) that will put both currencies at par in an uncertain future.

Official reserves have been extremely important in worlds' financial and monetary assessment and, within the last decade, official foreign exchange holdings are swiftly being more diversified. In fact, the difference between the U.S. Dollar and the Euro was never as modest as it is in this moment. Thus, assuming that reserves do not disappear, they are getting more unallocated and disperse in the world. Evidence proofs this. Over the past decade (2002-11) the growth rate of allocated reserves (214%) and unallocated reserves (643%) exploits that reserves are becoming less "handy", less allocated. Moreover, 66% of total foreign exchange holdings are located within emerging and developing countries. This represents huge reserves dispersion when compared to 2005 when both economies kinds were on even reserves' position. According to the least recent data, this tends to maintain since both growth rates are almost equal in 2012. In fact, the year of 2005 marks the overturn in terms of reserves' position. Since here, emerging and developing economies have worked intensively on their foreign exchange reserves portfolio positions. Now, in 2012, they are safeguarding any possible outcome from economies like the European and American where may outburst an eminent crisis. To underline the significance of unallocated reserves (on emerging and developing economies), since 2008 they have been more quantitative significant than whole advanced economies' reserves. Thus, it is crucial for world's financial consciousness that emerging economies are keeping more reserves than ever, although grand fraction of them is unknown and unidentified.

The significance among currencies depends on their presence on specific markets and explicit markets. Despite their regional importance, the Sterling Pound and the Japanese Yen are currencies that have a diminutive position on world reserves. Both these currencies only represent 5% of world total reserves. Thus, only the U.S. Dollar and the Euro gain international currency status. However, different economies perceive the U.S. Dollar and the

Euro in different "size" perspectives. While on advanced economies, the U.S. Dollar has a large advantage over the Euro (55% gap), on emerging and developing economies, the same gap decreases to 20%. The conclusion is that advanced economies support theirs (advanced) financial systems on an acknowledged, recognized, mature and experienced currency with a low share of unallocated reserves (10%). On the other hand, emerging and developing economies do not organize so well their portfolios and they do not rely (so much) their reserves on the U.S. Dollar (23%) and the Euro (10%) with a huge size of unallocated reserves (61%).

Considering the amount of worldwide unallocated reserves (44%) its exposes a very important result. The fact is, reserves must be recognized and extended among not only emerging and developing economies as international monetary agencies to prevent this trend from getting deeper and inaccessible.

P.R. China will be, at an uncertain time, a very important country in terms of world finance. Its might on world economy and sustainability is already unquestionable. This is due the overall dependence of the greatest companies on P.R. China, for example. The information relative to financial statistics in P.R. China is limited. This information is public nonetheless, but, it is not well organized. Although the statistics on P.R. China's all-system financing aggregates come from a largely group of institutions like the People's Bank of China and commissions as National Development, Reform and China Securities Regulatory, the information comes confused, puzzled and there is a lack of communication sense. The composition of official reserves assessment is also too tricky to be analyzed. For instance, only the IMF and the U.S. TIC have reserves' information on P.R. China as a whole. In addition, Hong Kong SAR, Taiwan and Macau SAR (more residual) are special regions that belong to P.R. China. Here, there is more available information as they are covered in more data sources. Thus, P.R. China total foreign exchange holdings are not easy to come by and this brought difficulty to composition of official reserves analysis.

The significance among debt instruments depends on how reserves are distributed within official and private holdings. Both kinds of investors have distinct risk aversions. Official financial institutions are usually more risk averse as 81% of their foreign holdings of U.S. long-term debt securities are treasury securities. Thus, the inverse happens for corporate securities where the latter investors' portfolio only gathers 3% in riskier securities. Agency securities are not very popular among official and private investors. But they used to be.

Private investors also decreased their portfolio risk as they decreased their holdings on corporate (65%) and agency securities and increased on treasury securities (24%). This mentality change goes to present-time insecurity, uncertainty and lack of confidence on world finance. The great expansion of treasury securities within official holdings since 2008 is sustained by the appetite of economies like the BRIC and other economies like Oil exporters. These are, however, known holdings. As emerging and developing economies reserves have emerged significantly since 2005, the huge pile of unallocated reserves is still unknown. In terms of maturities, treasury securities are concentrated in maturities of 5 years of less, while riskier securities are allocated in longer-term maturities. Since most of long-term debt securities are invested in short-term maturities, especially official holdings, it has developed liquidity for the economy.

The domain of the U.S. Dollar will not be broken in the near future. The Euro is not ready. Since the Euro has to improve in several factors and subjects and given the role that P.R. China might represent in the future on the financial world, P.R. China could be handy on the progression of the Euro as a reserve currency. Thus, the Eurozone has to get prepared for this dream.

The creation of a partnership between Europe and P.R. China concerning the creation/acquisition of common Eurobonds would aid Eurozone countries in terms of liquidity and sovereign debt wide yields. This is a real fact. Through short-term treasury securities, the Euro would gain incredibly liquidity and provide great elasticity not only for Eurozone countries as for P.R. China monetary institutions as they would diversify their portfolio. For longer maturities, these common Eurobonds would be a great approach for both EU funding and P.R. China. Given that the investment would be very safe, attractive and rewarding, it is a in favor of the creation of common Eurobonds. Common Eurobonds solves five things: First, liquidity gets increased. Second, Eurozone countries that had their sovereign bond yield rocket high will be able to fund themselves on lower interests. Third, the Eurozone would get more united. Fourth, this would increase tremendously the taste for Euros on emerging and developing economies given that P.R. China is clearly investing on a sound Euro financial structure. Finally, it would shrink the gap of Euros for U.S. Dollars in terms of reserves allocation.

The common Eurobond structure suggested in this thesis would be hardly accepted as it is from richer Eurozone countries and it sounds quite obvious (or not). Even though countries

like Germany and France would be protected from higher yields (given the proposed instrument structure) they would be used as guarantors for over-debt countries. The fact is that the Eurozone has to become more unite but those G7 countries will not give up from their might in Europe. This is not a union. It is true that south European countries always had their problems regarding their financial miss-operations and mal-functions. Nevertheless, since the Euro was born, great part of monetary policy' decisions within the Euro area have been made from the German-French axis. Germany (especially) is getting a lot from the despair of over-debt countries.

The development of the Euro as a reserve currency is, then, attached to P.R. China will and to their reserves' behavior. At first P.R. China will be able to assist Europe solving their problems first. This is going to be vital for the development of the Eurozone economy and for the management of over-debt Eurozone countries through common Eurobonds. In fact, common Eurobonds seems to be the most obvious debt instrument to be created and tuned over the years. Secondly, P.R. China is a very powerful, persuasive and influent country which will assist (on its risk) and expand their influence and weight in the world economy and finance. Therefore, the creation of a strong fellowship between Europe and P.R. China would diminish present-time political constrains, and the Euro would be recognized as a secure, solid and safe international currency.

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Tables

Table 6 – Currency Composition of Official Foreign Exchange Reserves (COFER)

(In millions of U.S. dollars)

	1995	1996*	1997*	1998	1999
World					
Total foreign exchange holdings	1,389,587	1,566,054	1,616,034	1,643,589	1,781,733
Allocated reserves 1/	1,034,175	1,224,464	1,271,982	1,282,406	1,379,705
Claims in U.S. dollars	610,337	760,071	828,887	888,724	979,783
Claims in pounds sterling	21,874	32,883	32,856	34,142	39,827
Claims in Deutsche mark	163,088	179,916	184,349	176,951	…
Claims in French francs	24,361	22,638	18,314	20,814	…
Claims in Japanese yen	70,071	82,307	73,487	80,029	87,939
Claims in Swiss francs	3,464	3,705	4,435	4,237	3,172
Claims in Netherlands guilder	3,306	2,935	4,461	3,489	…
Claims in ECUs	88,288	86,837	77,322	16,637	…
Claims in Euros	…	…	…	…	246,950
Claims in other currencies	49,387	53,172	47,871	57,383	22,034
Unallocated reserves 2/	355,412	341,591	344,052	361,183	402,028
Advanced economies					
Total foreign exchange holdings	932,158	1,016,385	1,010,008	1,022,435	1,121,786
Allocated reserves 1/	767,037	911,511	912,265	925,177	1,010,771
Claims in U.S. Dollars	413,192	525,243	556,595	618,689	705,693
Claims in pounds sterling	15,978	25,905	24,562	26,033	30,429
Claims in Deutsche mark	130,260	142,212	139,767	130,279	…
Claims in French francs	17,313	14,975	10,666	12,898	…
Claims in Japanese yen	54,073	64,890	57,103	65,943	73,413
Claims in Swiss francs	1,428	1,451	2,259	2,212	1,338
Claims in Netherlands guilder	2,402	2,473	3,245	2,989	…
Claims in ECUs	88,116	86,655	76,931	16,541	…
Claims in Euros	…	…	…	…	182,960
Claims in other currencies	44,277	47,708	41,135	49,593	16,939
Unallocated reserves 2/	165,120	104,874	97,743	97,258	111,015
Emerging and developing economies					
Total foreign exchange holdings	457,429	549,669	606,026	621,153	659,947
Allocated reserves 1/	267,138	312,952	359,717	357,229	368,934
Claims in U.S. Dollars	197,145	234,828	272,292	270,035	274,090
Claims in pounds sterling	5,897	6,978	8,294	8,110	9,398
Claims in Deutsche mark	32,828	37,703	44,582	46,672	…
Claims in French francs	7,048	7,663	7,648	7,916	…
Claims in Japanese yen	15,998	17,418	16,384	14,086	14,526
Claims in Swiss francs	2,036	2,254	2,175	2,024	1,834
Claims in Netherlands guilder	904	461	1,216	500	…
Claims in ECUs	172	182	391	96	…
Claims in Euros	…	…	…	…	63,991
Claims in other currencies	5,110	5,464	6,735	7,790	5,095
Unallocated reserves 2/	190,292	236,717	246,308	263,924	291,013
Memorandum Items					
Exchange Rates					
Pound sterling per U.S. Dollar	0.65	0.59	0.61	0.60	0.62
Japanese yen per U.S. Dollar	102.83	116.00	129.95	115.60	102.20
Swiss franc per U.S. Dollar	1.151	1.346	1.455	1.377	1.600
Euro per U.S. Dollar	…	…	…	…	1.00

Source: IMF Statistics Department COFER database and International Financial Statistics

* Countries with sizable reserves either joined (began reporting) the sample or left (stopped reporting) the sample.

(…) Not applicable / Not available

1/ This line shows reserves data whose currency composition has been identified.

2/ This line is the difference between total foreign exchange reserves and the allocated reserves.

Table 6 – Currency Composition of Official Foreign Exchange Reserves (COFER) (continued)

(In millions of U.S. Dollars)

	2000	2001	2002	2003	2004
World					
Total foreign exchange holdings	1,935,859	2,049,241	2,407,575	3,024,664	3,747,956
Allocated reserves 1/	1,518,244	1,569,552	1,795,997	2,223,206	2,655,173
Claims in U.S. Dollars	1,079,916	1,122,431	1,204,676	1,465,754	1,751,012
Claims in pounds sterling	41,798	42,401	50,537	61,655	89,457
Claims in Deutsche mark	…	…	…	…	…
Claims in French francs	…	…	…	…	…
Claims in Japanese yen	92,078	79,190	78,145	87,608	101,787
Claims in Swiss francs	4,087	4,372	7,314	5,016	4,419
Claims in Netherlands guilder	…	…	…	…	…
Claims in ECUs	…	…	…	…	…
Claims in Euros	277,693	301,089	427,406	559,340	658,634
Claims in other currencies	22,672	20,069	27,919	43,833	49,865
Unallocated reserves 2/	417,615	479,690	611,578	801,458	1,092,783
Advanced economies					
Total foreign exchange holdings	1,217,025	1,246,356	1,443,148	1,766,733	2,070,549
Allocated reserves 1/	1,107,883	1,123,120	1,279,176	1,557,148	1,825,781
Claims in U.S. Dollars	772,465	792,352	849,700	1,045,038	1,227,839
Claims in pounds sterling	31,010	30,034	36,088	36,338	48,421
Claims in Deutsche mark	…	…	…	…	…
Claims in French francs	…	…	…	…	…
Claims in Japanese yen	80,784	68,356	69,329	80,512	90,764
Claims in Swiss francs	3,185	3,391	6,616	4,158	3,247
Claims in Netherlands guilder	…	…	…	…	…
Claims in ECUs	…	…	…	…	…
Claims in Euros	203,910	213,489	297,428	359,079	417,198
Claims in other currencies	16,529	15,498	20,014	32,023	38,311
Unallocated reserves 2/	109,142	123,236	163,972	209,585	244,769
Emerging and developing economies					
Total foreign exchange holdings	718,834	802,885	964,427	1,257,931	1,677,407
Allocated reserves 1/	410,361	446,431	516,821	666,058	829,393
Claims in U.S. Dollars	307,452	330,079	354,975	420,717	523,172
Claims in pounds sterling	10,788	12,367	14,448	25,317	41,036
Claims in Deutsche mark	…	…	…	…	…
Claims in French francs	…	…	…	…	…
Claims in Japanese yen	11,294	10,834	8,817	7,095	11,023
Claims in Swiss francs	901	981	698	858	1,172
Claims in Netherlands guilder	…	…	…	…	…
Claims in ECUs	…	…	…	…	…
Claims in Euros	73,783	87,600	129,978	200,261	241,436
Claims in other currencies	6,143	4,571	7,905	11,810	11,554
Unallocated reserves 2/	308,473	356,454	447,606	591,873	848,015
Memorandum Items					
Exchange Rates					
Pound sterling per U.S. Dollar	0.67	0.69	0.62	0.56	0.52
Japanese yen per U.S. Dollar	114.90	131.80	119.90	107.10	104.12
Swiss franc per U.S. Dollar	1.637	1.677	1.387	1.237	1.132
Euro per U.S. Dollar	1.08	1.14	0.95	0.79	0.73

Source: IMF Statistics Department COFER database and International Financial Statistics

* Countries with sizable reserves either joined (began reporting) the sample or left (stopped reporting) the sample.

(…) Not applicable / Not available

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2/ This line is the difference between total foreign exchange reserves and the allocated reserves.

Table 6 – Currency Composition of Official Foreign Exchange Reserves (COFER) (continued)
(In millions of U.S. Dollars)

	2005	2006	2007	2008	2009
World					
Total foreign exchange holdings	4,319,960	5,253,007	6,704,335	7,345,798	8,164,214
Allocated reserves 1/	2,843,626	3,315,575	4,119,399	4,209,861	4,590,036
Claims in U.S. Dollars	1,902,535	2,171,075	2,641,672	2,698,211	2,847,437
Claims in pounds sterling	102,243	145,205	192,675	168,793	194,904
Claims in Deutsche mark	…	…	…	…	…
Claims in French francs	…	…	…	…	…
Claims in Japanese yen	101,769	102,051	120,480	131,901	132,994
Claims in Swiss francs	4,143	5,685	6,395	5,799	5,300
Claims in Netherlands guilder	…	…	…	…	…
Claims in ECUs	…	…	…	…	…
Claims in Euros	683,893	832,039	1,082,399	1,112,317	1,269,625
Claims in other currencies	49,041	59,520	75,778	92,839	139,777
Unallocated reserves 2/	1,476,334	1,937,433	2,584,935	3,135,937	3,574,177
Advanced economies					
Total foreign exchange holdings	2,078,490	2,252,532	2,432,208	2,491,193	2,778,625
Allocated reserves 1/	1,821,599	1,982,264	2,157,080	2,197,678	2,429,109
Claims in U.S. Dollars	1,261,105	1,350,325	1,423,433	1,475,598	1,581,750
Claims in pounds sterling	49,831	64,719	76,021	59,055	67,739
Claims in Deutsche mark	…	…	…	…	…
Claims in French francs	…	…	…	…	…
Claims in Japanese yen	86,263	84,197	85,215	93,545	94,922
Claims in Swiss francs	3,428	4,579	4,721	3,955	4,511
Claims in Netherlands guilder	…	…	…	…	…
Claims in ECUs	…	…	…	…	…
Claims in Euros	387,038	440,455	522,190	511,245	616,432
Claims in other currencies	33,935	37,990	45,501	54,281	63,755
Unallocated reserves 2/	256,891	270,268	275,127	293,515	349,516
Emerging and developing economies					
Total foreign exchange holdings	2,241,470	3,000,476	4,272,127	4,854,605	5,385,588
Allocated reserves 1/	1,022,027	1,333,311	1,962,319	2,012,182	2,160,927
Claims in U.S. Dollars	641,431	820,750	1,218,239	1,222,612	1,265,687
Claims in pounds sterling	52,413	80,487	116,654	109,738	127,164
Claims in Deutsche mark	…	…	…	…	…
Claims in French francs	…	…	…	…	…
Claims in Japanese yen	15,506	17,854	35,265	38,356	38,072
Claims in Swiss francs	715	1,106	1,675	1,845	789
Claims in Netherlands guilder	…	…	…	…	…
Claims in ECUs	…	…	…	…	…
Claims in Euros	296,855	391,584	560,209	601,072	653,193
Claims in other currencies	15,106	21,530	30,277	38,558	76,022
Unallocated reserves 2/	1,219,443	1,667,165	2,309,808	2,842,422	3,224,661
Memorandum Items					
Exchange Rates					
Pound sterling per U.S. Dollar	0.58	0.51	0.50	0.69	0.62
Japanese yen per U.S. Dollar	117.97	118.95	114.00	90.75	92.06
Swiss franc per U.S. Dollar	1.314	1.220	1.126	1.064	1.031
Euro per U.S. Dollar	0.85	0.76	0.68	0.72	0.69

Source: IMF Statistics Department COFER database and International Financial Statistics

* Countries with sizable reserves either joined (began reporting) the sample or left (stopped reporting) the sample.

(…) Not applicable / Not available

1/ This line shows reserves data whose currency composition has been identified.

2/ This line is the difference between total foreign exchange reserves and the allocated reserves.

Table 6 – Currency Composition of Official Foreign Exchange Reserves (COFER) (continued)
(In millions of U.S. Dollars)

	2010	2011	2012 - Q1	2012 - Q2
World				
Total foreign exchange holdings	9,263,130	10,195,610	10,421,672	10,523,847
Allocated reserves 1/	5,160,998	5,646,016	5,704,094	5,845,258
Claims in U.S. Dollars	3,191,467	3,512,714	3,548,200	3,619,481
Claims in pounds sterling	203,015	216,209	228,439	223,398
Claims in Deutsche mark	…	…	…	…
Claims in French francs	…	…	…	…
Claims in Japanese yen	188,770	199,052	202,725	220,158
Claims in Swiss francs	6,629	6,475	6,889	6,529
Claims in Netherlands guilder	…	…	…	…
Claims in ECUs	…	…	…	…
Claims in Euros	1,342,012	1,413,079	1,422,927	1,465,581
Claims in other currencies	229,105	298,488	294,914	310,110
Unallocated reserves 2/	4,102,132	4,549,593	4,717,579	4,678,589
Advanced economies				
Total foreign exchange holdings	3,092,204	3,398,772	3,437,819	3,541,980
Allocated reserves 1/	2,708,457	3,015,361	3,043,925	3,151,687
Claims in U.S. Dollars	1,761,725	1,998,456	1,999,828	2,020,880
Claims in pounds sterling	68,152	76,534	84,100	78,202
Claims in Deutsche mark	…	…	…	…
Claims in French francs	…	…	…	…
Claims in Japanese yen	120,656	127,265	131,319	140,689
Claims in Swiss francs	5,198	4,732	4,419	4,341
Claims in Netherlands guilder	…	…	…	…
Claims in ECUs	…	…	…	…
Claims in Euros	646,720	692,012	697,487	770,985
Claims in other currencies	106,005	116,363	126,772	136,591
Unallocated reserves 2/	383,747	383,411	393,894	390,293
Emerging and developing economies				
Total foreign exchange holdings	6,170,926	6,796,837	6,983,854	6,981,867
Allocated reserves 1/	2,452,541	2,630,655	2,660,169	2,693,571
Claims in U.S. Dollars	1,429,742	1,514,258	1,548,372	1,598,602
Claims in pounds sterling	134,862	139,675	144,339	145,196
Claims in Deutsche mark	…	…	…	…
Claims in French francs	…	…	…	…
Claims in Japanese yen	68,113	71,788	71,406	79,469
Claims in Swiss francs	1,431	1,742	2,471	2,188
Claims in Netherlands guilder	…	…	…	…
Claims in ECUs	…	…	…	…
Claims in Euros	695,292	721,068	725,440	694,596
Claims in other currencies	123,101	182,124	168,142	173,519
Unallocated reserves 2/	3,718,385	4,166,182	4,323,685	4,288,297
Memorandum Items				
Exchange Rates				
Pound sterling per U.S. Dollar	0.64	0.65	0.63	0.64
Japanese yen per U.S. Dollar	81.45	77.72	82.15	79.30
Swiss franc per U.S. Dollar	0.940	0.941	0.903	0.955
Euro per U.S. Dollar	0.75	0.77	0.75	0.79

Source: IMF Statistics Department COFER database and International Financial Statistics
* Countries with sizable reserves either joined (began reporting) the sample or left (stopped reporting) the sample.
(…) Not applicable / Not available
1/ This line shows reserves data whose currency composition has been identified.
2/ This line is the difference between total foreign exchange reserves and the allocated reserves.

Table 7 – Currency Composition of Official Foreign Exchange Reserves (COFER) Decomposition
(In units)

	1995	1996*	1997*	1998	1999	2000	2001	2002	2003
World									
Total foreign exchange holdings									
Allocated reserves 1/	0.74	0.78	0.79	0.78	0.77	0.78	0.77	0.75	0.74
Claims in U.S. Dollars	0.44	0.49	0.51	0.54	0.55	0.56	0.55	0.50	0.48
Claims in pounds sterling	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Claims in Deutsche mark	0.12	0.11	0.11	0.11	…	…	…	…	…
Claims in French francs	0.02	0.01	0.01	0.01	…	…	…	…	…
Claims in Japanese yen	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.03	0.03
Claims in Swiss francs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Claims in Netherlands guilder	0.00	0.00	0.00	0.00	…	…	…	…	…
Claims in ECUs	0.06	0.06	0.05	0.01	…	…	…	…	…
Claims in Euros	…	…	…	…	0.14	0.14	0.15	0.18	0.18
Claims in other currencies	0.04	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.01
Unallocated reserves 2/	0.26	0.22	0.21	0.22	0.23	0.22	0.23	0.25	0.26
Advanced economies									
Total foreign exchange holdings									
Allocated reserves 1/	0.82	0.90	0.90	0.90	0.90	0.91	0.90	0.89	0.88
Claims in U.S. Dollars	0.44	0.52	0.55	0.61	0.63	0.63	0.64	0.59	0.59
Claims in pounds sterling	0.02	0.03	0.02	0.03	0.03	0.03	0.02	0.03	0.02
Claims in Deutsche mark	0.14	0.14	0.14	0.13	…	…	…	…	…
Claims in French francs	0.02	0.01	0.01	0.01	…	…	…	…	…
Claims in Japanese yen	0.06	0.06	0.06	0.06	0.07	0.07	0.05	0.05	0.05
Claims in Swiss francs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Claims in Netherlands guilder	0.00	0.00	0.00	0.00	…	…	…	…	…
Claims in ECUs	0.09	0.09	0.08	0.02	…	…	…	…	…
Claims in Euros	…	…	…	…	0.16	0.17	0.17	0.21	0.20
Claims in other currencies	0.05	0.05	0.04	0.05	0.02	0.01	0.01	0.01	0.02
Unallocated reserves 2/	0.18	0.10	0.10	0.10	0.10	0.09	0.10	0.11	0.12
Emerging and developing economies									
Total foreign exchange holdings									
Allocated reserves 1/	0.58	0.57	0.59	0.58	0.56	0.57	0.56	0.54	0.53
Claims in U.S. Dollars	0.43	0.43	0.45	0.43	0.42	0.43	0.41	0.37	0.33
Claims in pounds sterling	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.02
Claims in Deutsche mark	0.07	0.07	0.07	0.08	…	…	…	…	…
Claims in French francs	0.02	0.01	0.01	0.01	…	…	…	…	…
Claims in Japanese yen	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01
Claims in Swiss francs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Claims in Netherlands guilder	0.00	0.00	0.00	0.00	…	…	…	…	…
Claims in ECUs	0.00	0.00	0.00	0.00	…	…	…	…	…
Claims in Euros	…	…	…	…	0.10	0.10	0.11	0.13	0.16
Claims in other currencies	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Unallocated reserves 2/	0.42	0.43	0.41	0.42	0.44	0.43	0.44	0.46	0.47
Memorandum Items									
Exchange Rates									
Pound sterling per U.S. Dollar	0.65	0.59	0.61	0.60	0.62	0.67	0.69	0.62	0.56
Japanese yen per U.S. Dollar	102.83	116.00	129.95	115.60	102.20	114.90	131.80	119.90	107.10
Swiss franc per U.S. Dollar	1.151	1.346	1.455	1.377	1.600	1.637	1.677	1.387	1.237
Euro per U.S. Dollar	…	…	…	…	1.00	1.08	1.14	0.95	0.79

Source: IMF Statistics Department COFER database and International Financial Statistics; author calculations
* Countries with sizable reserves either joined (began reporting) the sample or left (stopped reporting) the sample.
(…) Not applicable / Not available
1/ This line shows reserves data whose currency composition has been identified.
2/ This line is the difference between total foreign exchange reserves and the allocated reserves.

Table 7 – Currency Composition of Official Foreign Exchange Reserves (COFER) - Decomposition (continued)
(In units)

	2004	2005	2006	2007	2008	2009	2010	2011	2012 - Q2
World									
Total foreign exchange holdings									
Allocated reserves 1/	0.71	0.66	0.63	0.61	0.57	0.56	0.56	0.55	0.55
Claims in U.S. Dollars	0.47	0.44	0.41	0.39	0.37	0.35	0.34	0.34	0.34
Claims in pounds sterling	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Claims in Deutsche mark	…	…	…	…	…	…	…	…	…
Claims in French francs	…	…	…	…	…	…	…	…	…
Claims in Japanese yen	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Claims in Swiss francs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Claims in Netherlands guilder	…	…	…	…	…	…	…	…	…
Claims in ECUs	…	…	…	…	…	…	…	…	…
Claims in Euros	0.18	0.16	0.16	0.16	0.15	0.16	0.14	0.14	0.14
Claims in other currencies	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03
Unallocated reserves 2/	0.29	0.34	0.37	0.39	0.43	0.44	0.44	0.45	0.45
Advanced economies									
Total foreign exchange holdings									
Allocated reserves 1/	0.88	0.88	0.88	0.89	0.88	0.87	0.88	0.89	0.89
Claims in U.S. Dollars	0.59	0.61	0.60	0.59	0.59	0.57	0.57	0.59	0.58
Claims in pounds sterling	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Claims in Deutsche mark	…	…	…	…	…	…	…	…	…
Claims in French francs	…	…	…	…	…	…	…	…	…
Claims in Japanese yen	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.04
Claims in Swiss francs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Claims in Netherlands guilder	…	…	…	…	…	…	…	…	…
Claims in ECUs	…	…	…	…	…	…	…	…	…
Claims in Euros	0.20	0.19	0.20	0.21	0.21	0.22	0.21	0.20	0.20
Claims in other currencies	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.04
Unallocated reserves 2/	0.12	0.12	0.12	0.11	0.12	0.13	0.12	0.11	0.11
Emerging and developing economies									
Total foreign exchange holdings									
Allocated reserves 1/	0.49	0.46	0.44	0.46	0.41	0.40	0.40	0.39	0.38
Claims in U.S. Dollars	0.31	0.29	0.27	0.29	0.25	0.24	0.23	0.22	0.22
Claims in pounds sterling	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Claims in Deutsche mark	…	…	…	…	…	…	…	…	…
Claims in French francs	…	…	…	…	…	…	…	…	…
Claims in Japanese yen	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Claims in Swiss francs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Claims in Netherlands guilder	…	…	…	…	…	…	…	…	…
Claims in ECUs	…	…	…	…	…	…	…	…	…
Claims in Euros	0.14	0.13	0.13	0.13	0.12	0.12	0.11	0.11	0.10
Claims in other currencies	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.02
Unallocated reserves 2/	0.51	0.54	0.56	0.54	0.59	0.60	0.60	0.61	0.62
Memorandum Items									
Exchange Rates									
Pound sterling per U.S. Dollar	0.52	0.58	0.51	0.50	0.69	0.62	0.64	0.65	0.64
Japanese yen per U.S. Dollar	104.12	117.97	118.95	114.00	90.75	92.06	81.45	77.72	79.30
Swiss franc per U.S. Dollar	1.132	1.314	1.220	1.126	1.064	1.031	0.940	0.941	0.955
Euro per U.S. Dollar	0.73	0.85	0.76	0.68	0.72	0.69	0.75	0.77	0.79

Source: IMF Statistics Department COFER database and International Financial Statistics; author calculations
() Not applicable / Not available
1/ This line shows reserves data whose currency composition has been identified.
2/ This line is the difference between total foreign exchange reserves and the allocated reserves.

Table 8 – Currency Composition of Official Foreign Exchange Reserves (COFER) Growth
(In Percentage)

	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
World									
Total foreign exchange holdings	12.70%	3.19%	1.71%	8.41%	8.65%	5.86%	17.49%	25.63%	23.91%
Allocated reserves 1/	18.40%	3.88%	0.82%	7.59%	10.04%	3.38%	14.43%	23.79%	19.43%
Claims in U.S. Dollars	24.53%	9.05%	7.22%	10.25%	10.22%	3.94%	7.33%	21.67%	19.46%
Claims in pounds sterling	50.33%	-0.08%	3.91%	16.65%	4.95%	1.44%	19.19%	22.00%	45.09%
Claims in Deutsche mark	10.32%	2.46%	-4.01%	…	…	…	…	…	…
Claims in French francs	-7.07%	-19.10%	13.65%	…	…	…	…	…	…
Claims in Japanese yen	17.46%	-10.72%	8.90%	9.88%	4.71%	-14.00%	-1.32%	12.11%	16.18%
Claims in Swiss francs	6.96%	19.70%	-4.46%	-25.14%	28.85%	6.97%	67.29%	-31.42%	-11.90%
Claims in Netherlands guilder	-11.22%	51.99%	-21.79%	…	…	…	…	…	…
Claims in ECUs	-1.64%	-10.96%	-78.48%	…	…	…	…	…	…
Claims in Euros	…	…	…	…	12.45%	8.43%	41.95%	30.87%	17.75%
Claims in other currencies	7.66%	-9.97%	19.87%	-61.60%	2.90%	-11.48%	39.12%	57.00%	13.76%
Unallocated reserves 2/	-3.89%	0.72%	4.98%	11.31%	3.88%	14.86%	27.49%	31.05%	36.35%
Advanced economies									
Total foreign exchange holdings	9.04%	-0.63%	1.23%	9.72%	8.49%	2.41%	15.79%	22.42%	17.20%
Allocated reserves 1/	18.84%	0.08%	1.42%	9.25%	9.61%	1.38%	13.89%	21.73%	17.25%
Claims in U.S. Dollars	27.12%	5.97%	11.16%	14.06%	9.46%	2.57%	7.24%	22.99%	17.49%
Claims in pounds sterling	62.13%	-5.18%	5.99%	16.89%	1.91%	-3.15%	20.16%	0.69%	33.25%
Claims in Deutsche mark	9.18%	-1.72%	-6.79%	…	…	…	…	…	…
Claims in French francs	-13.50%	-28.77%	20.93%	…	…	…	…	…	…
Claims in Japanese yen	20.00%	-12.00%	15.48%	11.33%	10.04%	-15.38%	1.42%	16.13%	12.73%
Claims in Swiss francs	1.61%	55.69%	-2.08%	-39.51%	138.04%	6.47%	95.10%	-37.15%	-21.91%
Claims in Netherlands guilder	2.96%	31.22%	-7.89%	…	…	…	…	…	…
Claims in ECUs	-1.66%	-11.22%	-78.50%	…	…	…	…	…	…
Claims in Euros	…	…	…	…	11.45%	4.70%	39.32%	20.73%	16.19%
Claims in other currencies	7.75%	-13.78%	20.56%	-65.84%	-2.42%	-6.24%	29.14%	60.00%	19.64%
Unallocated reserves 2/	-36.49%	-6.80%	-0.50%	14.14%	-1.69%	12.91%	33.06%	27.82%	16.79%
Emerging and developing economies									
Total foreign exchange holdings	20.16%	10.25%	2.50%	6.25%	8.92%	11.69%	20.12%	30.43%	33.35%
Allocated reserves 1/	17.15%	14.94%	-0.69%	3.28%	11.23%	8.79%	15.77%	28.88%	24.52%
Claims in U.S. Dollars	19.11%	15.95%	-0.83%	1.50%	12.17%	7.36%	7.54%	18.52%	24.35%
Claims in pounds sterling	18.33%	18.86%	-2.22%	15.88%	14.79%	14.64%	16.83%	75.23%	62.09%
Claims in Deutsche mark	14.85%	18.25%	4.69%	…	…	…	…	…	…
Claims in French francs	8.73%	-0.20%	3.50%	…	…	…	…	…	…
Claims in Japanese yen	8.88%	-5.94%	-14.03%	3.12%	-22.25%	-4.07%	-18.62%	-19.53%	55.36%
Claims in Swiss francs	10.71%	-3.50%	-6.94%	-9.39%	-50.87%	8.88%	-28.85%	22.92%	36.60%
Claims in Netherlands guilder	-49.00%	163.77%	-58.88%	…	…	…	…	…	…
Claims in ECUs	5.81%	114.84%	-75.45%	…	…	…	…	…	…
Claims in Euros	…	…	…	…	15.30%	18.73%	48.38%	54.07%	20.56%
Claims in other currencies	6.93%	23.26%	15.66%	-34.60%	20.57%	-25.59%	72.94%	49.40%	-2.17%
Unallocated reserves 2/	24.40%	4.05%	7.15%	10.26%	6.00%	15.55%	25.57%	32.23%	43.28%
Memorandum Items									
Exchange Rates									
Pound sterling per U.S. Dollar	0.65	0.59	0.61	0.60	0.62	0.67	0.69	0.62	0.56
Japanese yen per U.S. dollar	102.83	116.00	129.95	115.60	102.20	114.90	131.80	119.90	107.10
Swiss franc per U.S. dollar	1.15	1.35	1.46	1.38	1.60	1.64	1.68	1.39	1.24
Euro per U.S. dollar	…	…	…	…	1.00	1.08	1.14	0.95	0.79

Source: IMF Statistics Department COFER database and International Financial Statistics; author calculations
(...) Not applicable / Not available
1/ This line shows reserves data
2/ This line is the difference between total foreign exchange reserves and the allocated reserves.

Table 8 – Currency Composition of Official Foreign Exchange Reserves (COFER) Growth (continued)
(In Percentage)

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12-Q2
World								
Total foreign exchange holdings	15.26%	21.60%	27.63%	9.57%	11.14%	13.46%	10.07%	3.22%
Allocated reserves 1/	7.10%	16.60%	24.24%	2.20%	9.03%	12.44%	9.40%	3.53%
Claims in U.S. Dollars	8.65%	14.11%	21.68%	2.14%	5.53%	12.08%	10.07%	3.04%
Claims in pounds sterling	14.29%	42.02%	32.69%	-12.39%	15.47%	4.16%	6.50%	3.33%
Claims in Deutsche mark	…	…	…	…	…	…	…	…
Claims in French francs	…	…	…	…	…	…	…	…
Claims in Japanese yen	-0.02%	0.28%	18.06%	9.48%	0.83%	41.94%	5.45%	10.60%
Claims in Swiss francs	-6.25%	37.22%	12.49%	-9.32%	-8.60%	25.08%	-2.32%	0.83%
Claims in Netherlands guilder	…	…	…	…	…	…	…	…
Claims in ECUs	…	…	…	…	…	…	…	…
Claims in Euros	3.84%	21.66%	30.09%	2.76%	14.14%	5.70%	5.30%	3.72%
Claims in other currencies	-1.65%	21.37%	27.32%	22.51%	50.56%	63.91%	30.28%	3.89%
Unallocated reserves 2/	35.10%	31.23%	33.42%	21.32%	13.97%	14.77%	10.91%	2.84%
Advanced economies								
Total foreign exchange holdings	0.38%	8.37%	7.98%	2.43%	11.54%	11.29%	9.91%	4.21%
Allocated reserves 1/	-0.23%	8.82%	8.82%	1.88%	10.53%	11.50%	11.33%	4.52%
Claims in U.S. Dollars	2.71%	7.07%	5.41%	3.66%	7.19%	11.38%	13.44%	1.12%
Claims in pounds sterling	2.91%	29.88%	17.46%	-22.32%	14.70%	0.61%	12.30%	2.18%
Claims in Deutsche mark	…	…	…	…	…	…	…	…
Claims in French francs	…	…	…	…	…	…	…	…
Claims in Japanese yen	-4.96%	-2.40%	1.21%	9.78%	1.47%	27.11%	5.48%	10.55%
Claims in Swiss francs	5.57%	33.58%	3.10%	-16.23%	14.06%	15.23%	-8.96%	-8.26%
Claims in Netherlands guilder	…	…	…	…	…	…	…	…
Claims in ECUs	…	…	…	…	…	…	…	…
Claims in Euros	-7.23%	13.80%	18.56%	-2.10%	20.57%	4.91%	7.00%	11.41%
Claims in other currencies	-11.42%	11.95%	19.77%	19.30%	17.45%	66.27%	9.77%	17.38%
Unallocated reserves 2/	4.95%	5.21%	1.80%	6.68%	19.08%	9.79%	-0.09%	1.79%
Emerging and developing economies								
Total foreign exchange holdings	33.63%	33.86%	42.38%	13.63%	10.94%	14.58%	10.14%	2.72%
Allocated reserves 1/	23.23%	30.46%	47.18%	2.54%	7.39%	13.49%	7.26%	2.39%
Claims in U.S. Dollars	22.60%	27.96%	48.43%	0.36%	3.52%	12.96%	5.91%	5.57%
Claims in pounds sterling	27.72%	53.56%	44.94%	-5.93%	15.88%	6.05%	3.57%	3.95%
Claims in Deutsche mark	…	…	…	…	…	…	…	…
Claims in French francs	…	…	…	…	…	…	…	…
Claims in Japanese yen	40.67%	15.14%	97.52%	8.77%	-0.74%	78.91%	5.40%	10.70%
Claims in Swiss francs	-38.99%	54.69%	51.45%	10.15%	-57.24%	81.37%	21.73%	25.60%
Claims in Netherlands guilder	…	…	…	…	…	…	…	…
Claims in ECUs	…	…	…	…	…	…	…	…
Claims in Euros	22.95%	31.91%	43.06%	7.29%	8.67%	6.45%	3.71%	-3.67%
Claims in other currencies	30.74%	42.53%	40.63%	27.35%	97.16%	61.93%	47.95%	-4.72%
Unallocated reserves 2/	43.80%	36.72%	38.55%	23.06%	13.45%	15.31%	12.04%	2.93%
Memorandum Items								
Exchange Rates								
Pound sterling per U.S. Dollar	0.52	0.58	0.51	0.50	0.69	0.62	0.64	0.64
Japanese yen per U.S. dollar	104.12	117.97	118.95	114.00	90.75	92.06	81.45	79.30
Swiss franc per U.S. dollar	1.13	1.31	1.22	1.13	1.06	1.03	0.94	0.955
Euro per U.S. dollar	0.73	0.85	0.76	0.68	0.72	0.69	0.75	0.79

Source: IMF Statistics Department COFER database and International Financial Statistics; author calculations
* Countries with sizable reserves either joined (began reporting) the sample or left (stopped reporting) the sample.
(...) Not applicable / Not available
1/ This line shows reserves data
2/ This line is the difference between total foreign exchange reserves and the allocated reserves.

Table 9 – Major Foreign Official Holders Of Treasury Securities
(In billions of U.S. Dollars)

	2007	2008	2009	2010	2011
Country/Group					
Brazil	129.9	127.0	169.2	186.1	226.9
Caribbean Banking Centers	116.4	197.9	128.2	168.4	226.2
China	477.6	727.4	894.8	1160.1	1151.9
Japan	581.2	626.0	765.7	882.3	1058.0
Oil Exporters	137.9	186.2	201.1	211.9	261.1
Russia	32.7	116.4	141.8	151.0	149.5
Taiwan	38.2	71.8	116.5	155.1	177.3
United Kingdom	158.1	131.1	180.3	270.4	113.7

Source: U.S. Department of the Treasury et al. (2012)

Table 10 – Value of long-term securities held by foreign official institutions
(In billions of U.S. Dollars)

	2004	2005	2006	2007	2008	2009	2010	2011
Type of Security								
Total foreign holdings, all long-term securities	5,431	6,262	7,162	9,136	9,463	8,492	9,736	11,561
of which: foreign official holdings	1,297	164	1,997	2,567	3,119	3,266	3,862	4,409
Percent foreign official	23.9	2.6	27.9	28.1	33.0	38.5	39.7	38.1
Total foreign holdings, U.S. Equity[1]	1,930	2,144	2,430	3,130	2,969	2,252	2,814	3,830
of which: foreign official holdings	132	177	215	266	363	311	426	567
Percent foreign official	6.8	8.3	8.8	8.5	12.2	13.8	15.1	14.8
Total foreign holdings, U.S. Treasury Debt	1,426	1,599	1,727	1,965	2,211	2,604	3,343	4,049
of which: foreign official holdings	912	1,079	1,213	1,452	1,684	2,054	2,617	3,103
Percent foreign official	64.0	67.5	70.2	73.9	76.2	78.9	78.3	76.6
Total foreign holdings, U.S. Agency Debt	619	791	984	1,304	1,464	1,196	1,086	1,031
of which: foreign official holdings	211	324	473	750	966	794	721	635
Percent foreign official	34.1	41.0	48.1	57.5	66.0	66.4	66.4	61.6
Total foreign holdings, U.S. Corporate Debt	1,455	1,729	2,021	2,738	2,820	2,440	2,493	2,651
of which: foreign official holdings	41	61	96	99	106	107	97	104
Percent foreign official	2.8	3.5	4.8	3.6	3.8	4.4	3.9	3.9

1. Total equity includes common stock, all mutual funds shares (regardless of the types of securities the fund invests in, including money market mutual funds), as well as other forms of ownership interests, such as preferred stock.
Source: U.S. Department of the Treasury *et al.* (2012); author calculations.

Table 11 – Value of long-term securities held by foreign private institutions
(In billions of U.S. Dollars)

	2004	2005	2006	2007	2008	2009	2010	2011
Type of Security								
Total foreign holdings, all long-term securities	5,431	6,262	7,162	9,136	9,463	8,492	9,736	11,561
of which: foreign private holdings	4,134	6,098	5,165	6,569	6,344	5,226	5,874	7,152
Percent foreign official	76.1	97.4	72.1	71.9	67.0	61.5	60.3	61.9
Total foreign holdings, U.S. Equity[1]	1,930	2,144	2,430	3,130	2,969	2,252	2,814	3,830
of which: foreign private holdings	1,798	1,967	2,215	2,864	2,606	1,941	2,388	3,263
Percent foreign official	93.2	91.7	91.2	91.5	87.8	86.2	84.9	85.2
Total foreign holdings, U.S. Treasury Debt	1,426	1,599	1,727	1,965	2,211	2,604	3,343	4,049
of which: foreign private holdings	514	520	514	513	527	550	726	946
Percent foreign official	36.0	32.5	29.8	26.1	23.8	21.1	21.7	23.4
Total foreign holdings, U.S. Agency Debt	619	791	984	1,304	1,464	1,196	1,086	1,031
of which: foreign private holdings	408	467	511	554	498	402	365	396
Percent foreign official	65.9	59.0	51.9	42.5	34.0	33.6	33.6	38.4
Total foreign holdings, U.S. Corporate Debt	1,455	1,729	2,021	2,738	2,820	2,440	2,493	2,651
of which: foreign private holdings	1,414	1,668	1,925	2,639	2,714	2,333	2,396	2,547
Percent foreign official	97.2	96.5	95.2	96.4	96.2	95.6	96.1	96.1

1. Total equity includes common stock, all mutual funds shares (regardless of the types of securities the fund invests in, including money market mutual funds), as well as other forms of ownership interests, such as preferred stock.

Source: U.S. Department of the Treasury *et al.* (2012); author calculations.