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INTRODUCTION

In the recent past, the Target 2 balances have received a lot of attention "particularly in surplus countries such as Germany, as their potential losses in case of exit of a single euro country or a complete euro break up are huge" (Schuiling, 2017).

Due to the crisis that has especially influenced banks in peripheral countries, such as Italy, Spain, Portugal and Ireland, Target balances have increased. To ward off a banking crisis, the ECB has started issuing three-year LTROs with full allotment and reducing collateral requirements in the ECB's normal open market operations. The lack of private flows to the periphery was offset by central bank money "which led the respective NCBs to increase, in cumulative terms, the Target liabilities" (Sinn, 2012). In parallel with the increase in Target balances, there has been an increase in spreads on sovereign bond yields of peripheral countries in Germany.

The first chapter analyses the history of the European Union and the adoption of the single currency. It starts from the Bretton Woods Treaties, passes through the Treaty of Maastricht and the Lex Monetae up to the manoeuvres implemented by the ECB to safeguard the single currency. This chapter highlights how the Eurozone is both a homogeneous but at the same time heterogeneous area. Jacques Delors underlined that the euro creation was marked by a "fault in execution" of his plan by the political leaders, who decided to turn a blind eye to the fundamental weaknesses and imbalances of some countries which entered the single currency (Delors, 2011).

Then there will be a short excursus through the history of payment systems, speaking of the RGTS. Such system is the continuous process of settling interbank payments on an individual order basis across the books of a central bank. The system does not require any physical exchange of money and in this way minimize the credit risk.

In the next chapter, we deal with the European payment system: Target 2. We analyse its history, properties and evolution over the years. In summary, the Target 2 system acts in the following way. If a German bank has to settle a credit with an Italian bank, "it can access an infra-daily liquidity account with the Bundesbank and get the amount advanced, while the Italian bank will settle its balance with the Bank of Italy" (Minenna, 2012).

After the years of the crisis, the analysis of the path of the target balances shows how these have been characterized by a decrease, in parallel with the decrease in financial stress. However, since the beginning of 2015 they have started to grow again. The triggers of this new growth have to be found in the cross-border liquidity flows deriving from the purchase regulation under the ECB's Quantitative Easing program (APP) as stated by Schuiling in her article.

Therefore, in chapter three, it is highlighted that the explosion of the Target 2 balances is nothing more than a debt crisis.

Even before the target system was implemented in 1998, Peter Garber wrote that Target system and the structure of the ECB would create a "perfect mechanism to make an explosive attack on the system" (Pisani-Ferry, 2012). The chapter focuses on the measures introduced by the ECB. The ECB program is characterized by the purchase of securities from a large variety of counterparties by central banks. If these purchases generate a cross-border flow, this transaction affects the target balances of the sending and receiving NCB. In fact, if the Italian NCB buys a national bond from a foreign agent and it maintains the liquidity in his country of origin, the Bank of Italy accumulates a liability towards the euro system. The problem that arises from the adoption of the single currency is that individual nations had become responsible for their own banking systems. There was no hope that they would be able to bail them out without sinking their governments.

If until a decade ago it was impossible to consider the breakdown of the euro as a possible event, now this perspective has been shaken up.

To hypothesize what could happen in the future it is necessary to make a distinction in the event of the exit from the euro of a single country or the complete exit from the single currency. In the event of a complete breakdown, each country would regain control of its monetary policy with its own currency. As regards the liquidation of the Target balances, it would be very complicated due to the possible broken financial ties and the lack of connection between the balances and the economic reality of the financing needs.

According to the former head of the German Ifo Institute Hans-Werner Sinn "if the euro area breaks down and Target debtors fail, there may be no clear legal basis for Target credits, as surplus countries would contend for a system that no longer exists" (Sinn, 2012). To conclude, following the study conducted by Minenna (2016) this work will try to give an hypothetic solution to reduce public debt. The ECB should review its goals and aim for the zero-spread target. In this way, it would also give a signal that any exit from the euro would be an impractical choice. Is leaving the euro a "folly" as Spaventa says or is it the only way to go because "the [European] construction is lopsided and incomplete?" (Balassone, Visco, 2018).

CHAPTER 1 THE ORIGINAL SIN

1.1 Background: is Europe an integrated area?

After the collapse of the Bretton Woods system in 1973 in Europe, two different ways emerged. Some countries decided to adopt the "inflation regime" for their economies with the aim to promote economic growth using inflations as an extra stimulus. On the other hand, some European countries decide to undertake the way of "stability regime" with the purpose to stable price.

Strong labour unions and weak governments characterized the first regime. In this context, labour unions put pressure on public and private firms by wage demands: governments were forced to meet the wage and job demands by running a budget deficit. Public debts increased in order to ensure subsidies to guarantee the survival of the companies. To avoid the increase in the interest rate caused by the increasing of the public debt, NCBs were forced under the influence of the Government "to expand the money supply and purchase government bonds" (Blankart, 2012). Consequently, prices rose while hand in hand imports and international competitiveness declined thus causing current account moved into deficit.

"In the inflation regime of a nation state there is a succession of inflation and devaluation because the government cannot state credibly that it will withstand the demands of the unions" (Blankart, 2012).

In the second regime "the unions like any other interest group are part of a constitutional framework", as stated Blankart, and they did not use strike to obtain better work conditions or better wages. The central bank is independent. Hence, there was a liner relationship between wages and labour productivity. In the case of an increase in wage, prices remained stable.

Germany and the Benelux countries opted for the second regime while governments of France and the Mediterranean countries of Spain, Italy, Greece and Portugal decided to undertake the first regime.

"The result was that the former lagged in growth behind the latter, inducing the inflation regimes to exert a permanent political pressure towards fiscal equalization." (Blankart, 2012).

After that on the 1st November 1993 the Maastricht Treaty was established, as an instrument that wanted to guide the path towards the adoption of the single currency.

Contrary to what one might think, the Maastricht criteria were not conceived as an austerity driven framework, neither in terms of deficit nor with reference to debt. The 60% ratio was predicated by reference to the weighted ratio of countries recorded in those years.

The "Maastricht parameters" imposed that the countries that wanted to join the single currency met four convergence requirements. The first concerned inflation; national inflation had to be within a range that had as its upper limit a number that could not be more than 1.5% distant from the average of the three most virtuous countries. The second requirement looked at the debt ratio: according to the convergence parameters, the deficit / GDP ratio had to be contained in the margins of 3%, while the debt / GDP ratio could not exceed the limit of 60%. Subsequently, countries that wanted to become part of the monetary union had to have the exchange rate not subject to voluntary devaluation for at least two years. To conclude, the last condition imposed that the long-term interest rate should not exceed 2% compared to the average of the three most virtuous countries.

The "ratio" underlying the imposition of these convergence parameters can be identified in two fundamental reasons. The first reason has its foundations in the balance of public finances. In fact, once the single currency was adopted, the country lost the autonomous management of monetary policy instruments, while fiscal policy remained firmly in the hands of the national government: therefore, the public finances had to be transparent and under control. The other reason, however, aims to achieve "balance of financial and commercial flows" (Minenna, 2016). In fact, "the financial flows with other currency areas are automatically kept in balance through adjustments of the exchange rate between the different currencies" (Minenna, 2016). Therefore, the logic underlying these parameters imposed before joining the single currency is the desire to "reduce the possible problems due to the adoption of a fixed exchange rate regime by reducing phenomena that could have led to systematic imbalances in financial flows and business" (Minenna, 2016).

According to Cesaratto and Pivetti (2012), the advantage of monetary unification emerges where the economic systems involved are not homogeneous and there are no forces that tend to converge them, so exchange rates are relatively uncertain or divergent. In other words, "monetary unification is necessary only where it is harmful, that is, only where it implies the renunciation of an element of flexibility (that of the exchange rate) useful for absorbing shocks or compensating for structural divergences" (Cesarotto, Pivetti, 2012).

The biggest advantage of adopting the single currency is the elimination of the risk of currency risk. Thanks to the elimination of currency risk, the EMU reduces the transaction costs and it

eliminates location disadvantages. Furthermore, via common capital market, countries can receive more favourable conditions for financing investment. In addition, political arguments should be listed. As stated by Sinn (2012), "enable a real political union with a strong European government and an influential parliamentary." Furthermore, the dominant position of the Bundesbank on monetary policy is replaced by a common central bank in which all countries have equal influence. We know from economic history that all monetary unions between equal partners have failed because the centrifugal forces in the emergence of very different economic developments in sub-regions and the institutional disincentives were not gotten under control. The biggest disadvantage for EMU is the loss of "competency in the area of monetary policy": for this reason, the flexibility of prices and wages has remained the responsibility of individual nations. Furthermore, all debts with the single currency can be considered foreign and "participating countries have lost the right to create their own money" (Sinn, 2012). The elimination of exchange rate risk is offset by the increase in the risk of insolvency for sovereign debt.

Measures taken to stabilize monetary union have also exposed to "significant political risk" (Sinn, 2012): individual countries can delegitimize their mistakes by taking "Europe as a scapegoat".

However, Minenna has a different view than Cesaratto and Pivetti. According to the author of the "The incomplete currency" adoption of a single currency is preparatory in a geographical area already highly economically integrated and which shows uniformity in terms of interest rates and inflation. According to the author, the European situation has overturned the extremes of the equation. Minenna stated that European authorities thought "the presence of a single currency was sufficient to encourage the integration of economies belonging to the same area that were structurally not adequately integrated with each other" (Minenna, 2016 pag.115).

To define an optimal currency area, that is, with an interest in carrying out one's own commercial and financial transactions through a single exchange instrument, are necessary three basic requirements. The first of these is undoubtedly the presence of high flexibility in prices and wages; the second prerogative consists in the high mobility of labour and capital factors. While the third prerequisite requires the need of a high degree of openness of the economy. These requirements measure the degree of integration of a certain geographical area economy. Taking as an example two different economies such as the United States and the European one, the importance of these requirements emerges. For these two economies there is an exchange rate fixed irrevocably. If in the USA the interest rates are equal to 10%, while in Europe is equal to 5% and the exchange rate is fixed at dollars / euro = 1: 1, it is much more convenient for the investors make their capital profit in the USA rather than in Europe, ceteribus

paribus the level of inflation. In fact, the real interest rate, given by the difference between the nominal interest rate and the inflation rate, is lower in America. The fact that it is more profitable to invest in America has the consequence that investors will shift their capital to American investments and this will lead to an increase in demand for dollars. At this point, since the exchange rate is fixed, and therefore cannot be used as a tool to rebalance the economic process, the European economy is less competitive than the foreign one. However, taking into account the requirements listed above, a possible solution to the scenario envisaged may be to decrease the prices of the European geographical area through a decrease in wages; this policy would lead to an increase in demand until reaching a point of equilibrium.

Although in theory this seems a logical and easily implemented solution, the data show that trade unions play a fundamental role in Europe and "it is not possible to achieve a downward levelling of wages (if not temporarily) since wages are set in bargaining collective" (Minenna,2016). Furthermore, as Minenna states, "due to the diversity of language and culture, labour mobility in Europe is naturally lower than in the American area, which enjoys widespread uniformity". These are characteristics inherent within a geographical area and therefore difficult to modify or eliminate and which do not allow defining Europe "as an optimal currency area" (Minenna, 2016).

The requirements listed help to understand the rationale underlying the labour market reforms implemented by the Monti government (from the 16th November 2011 to the 28th April 2013) or by the Rajoy government in Spain: these policies tended to rebalance economic flows through a tightening of wages and employment to support the irrevocable exchange rate.

To analyse in greater depth the degree of integration and openness of European economies, some macroeconomic indicators come to our aid. The first indicator is the degree of correlation between the economic cycles of Germany and other European countries: the value varies within the range [-1;+1].

If the indicator is equal to one, it follows that Germany and the country in question experience in unison the phases of recession or expansion of the economy. Conversely, the more the value is close to '0' or with a negative trend, it follows that the economies are not integrated and that they experience phases of the economy that are not simultaneous. To underline the fact that a high degree of correlation does not imply the satisfaction of optimality requirements. Therefore, for two economies having a high degree of correlation is a necessary but not sufficient condition for satisfying the requirements listed above.

The figure below shows that the Italian economic cycle is proceeding almost in unison with the German one, given the fact that there are numerous and large commercial links between the two countries. For example, if German employment slows down, consumers in that

geographical area buy fewer Italian products and this has an impact on Italian exports, causing a slowdown in the Italian economy. Furthermore, it is noted that France, Belgium and Holland also have a degree of integration similar to that just mentioned. Instead, the economic cycles of Ireland, Spain and Portugal are less coordinated with the German cycle as evidenced by the observation of the indicator, which stands at values very close to zero indicating little integration between countries. On the other hand, Greece shows practically no correlation with all European economic cycles: in fact, its economy is very small and based mainly on tourism.



Figure 1: Correlation of the economic cycles of the Eurozone countries with the economic cycle of Germany, Minenna, 2016

A second useful indicator to study is the one that measures the relationship between the total exports and imports of a given geographical area and the gross domestic product of the same. This indicator is the most appropriate for measuring the "degree of openness of a country to foreign trade. A value greater than 100% indicates that the country in question moves more than it produces (high opening); while a value that is below 50% indicates that the movement of goods to and from abroad does not count half of the national production (low opening). From the proposed graph it emerges that small countries are more likely to trade openness because they have limited production and are forced to import what they need from abroad. Two exceptions are Greece and Portugal, which, despite the reduced economies, show low levels of openness that "reconciles less with the need to have a single currency" (Minenna, 2012).

The graph shows that the value of the indicator in question is high, demonstrating a marked opening in the economies of most of the Eurozone. In fact, if we compare the ratios between total exports and imports and GDP of the USA, Japan and the EU, the "average level of the indicator for large world economies stands at 30%, a low value, and that the economies

Eurozone are mainly open to the Eurozone itself and later to the rest of the world. This indicator leads to the conclusion that a monetary union was desirable.



Figure 2: % of exports + imports compared to GDP for large world economies (2013 data), Minenna, 2016

In 1988, Delors drafted a document affirming that a strong economic and fiscal convergence of all the countries that wanted to join the single currency was a necessary condition for the successful completion of the project.

However, contrary to the Maastricht criteria, it is decided to be less intransigent and those countries that do not meet the requirements were allowed to join the single currency. In fact, even in 1999 Greece had not been allowed to join the monetary union for not having fulfilled the imposed criteria, two years later it was allowed to join the single currency. "Official comments on the date of entering the Eurosystem were: this is a historic date that places Greece firmly at the heart of Europe" (Masera, 2019).

Delors declares that this choice implicated that the euro was born with a "fault in the execution". Blanchard and Giavazzi (2002) stated that when European imbalances began to show themselves, these did not create problems, as the European periphery would use that capital for investment and growth. However, experience has taught that this does not happen: in general, capital flows feed not productive investments such as to increase exports and the possibility of repaying the debts contracted, but consumption, and in particular, real estate bubbles. This, as happened in Spain and Ireland, can also generate growth: construction is, however, a flywheel. In fact it is able to increase direct and induced employment (materials used, furniture etc.), but does not increase the export capacity. Due to this positive trend, families could have access to mortgages at affordable rates and durations. In this way, families get into debt. This growth translates into two other "unfortunate events": inflation increases, competitiveness is lost in international trade, and income growth generates increased imports from central countries. In addition, debt generates interest, relatively low at least as long as confidence lasts, as happened in the euro area where, moreover, the ECB itself has practiced low rates.

Beyond the preventive measures of the Maastricht Treaty, the euro area does not have mechanisms capable of adjusting and balancing trade and financial flows should the imbalances reach a very high critical point. In 1997 the "Stability and Growth Pact" was signed which established penalties in monetary terms for countries that did not comply with the Maastricht parameters. Despite repeated violations of the parameters by most of the acceding countries, no sanction was ever imposed. All this has resulted in the discrediting of the agreement and the loss of credibility of the Union Authorities regarding the need to adhere in a strict manner to the dictates imposed (Minenna, 2012).

After the introduction of the single currency, the first phenomenon that stands out is a boom in the budget deficits of most Eurozone countries. It can be concluded that this pattern was triggered by the fact that countries that came "from a past of high interest rates, such as Greece, Spain, Italy, Ireland have found themselves experiencing an extraordinarily low single curve that has automatically become for some governments an incentive to get into debt" (Minenna, 2016). As an aggravating factor, even before the introduction of the single currency, the policy of the peripheral countries was directed towards an expansionary policy, which combined with the absence of an enforcement on compliance with the Maastricht parameters has further accentuated the result. During the two-year period, from 2006 to 2008, the real estate bubble that had been created and magnified began to deflate, with the decline in the prices of real estate assets, which had a strong impact mainly on the balance sheets of banks through the reduction of mortgage guarantees, and an increase in bad debts on mortgages. Subsequently, the owners of the properties without any notice have to pay a mortgage decidedly higher than the value of the property without having the opportunity to face this change. In this context, the key point was the uncontrolled spread of derivative instruments to which no one gave the necessary importance (Minenna, 2016). These structured instruments were reissued on the market and sold to retail savers. Therefore, the decline in the value of real estate not only had the effect of hitting the main players in the real estate market, but it hit the financial system violently with a tail stroke. The collapse of Lehman Brothers, combined with the complete lack of transparency of risks in the sale of structured products, shook the world markets to the foundations and gave rise to a truth that was hidden at the time. The fact that the "market did not bet and considered the risk of default of important economic entities did not imply the absence of risk" (Minenna, 2016). The collapse of the American bank took the crisis to a subsequent step: if before the crisis was limited to the countries that had experienced the bursting of the real estate bubble and to the holders of toxic securities, now the crisis had taken the shape of a global crisis, hitting the bases of the economic system. The main victim was the interest rate curve. "The curve was unique only in substantial terms, given that each country formally maintained its own risk-free interest rate curve, consisting of government bonds. Convergence was guaranteed by the assumption of absence of default risk of all Eurozone countries for which the securities were superimposable on the very solid German Bund" (Minenna, 2016). From this moment on, there is a phenomenon of structural divergence between the various economies.

What emerges is that the economies belonging to the Eurozone have continued to operate following their own particular characteristics. Furthermore, the divergence phenomenon is a self-reinforcing phenomenon. In fact, the increase in nominal interest rates had the consequence of the increase in the cost of servicing public debt for governments, which was followed by an increase in financing costs for the production systems of the countries. In turn, the fall in GDP has meant that tax revenues for governments have decreased and there has been a parallel increase in public spending due to unemployment benefits, layoffs ect.

In this context, it is highlighted fiscal policy lack an adequate degree of integration.

The operations conducted by the ECB through asset purchases have injected liquidity into the economy but which has not flow into the real economy; indeed this has generated a greater excess of liquidity especially in the core countries. On the other hand, peripheral economies have used money from the ECB to buy euro assets in core countries. This cross-border flow highlights the preferences of investors who prefer to buy assets in core countries, reducing their exposure to the periphery. "This has to do with the fact that financial integration in the euro area is still fragmented" (Macchiarelli, Koutroumpis, 2016). According to ECB (2017), the current build-up of Target imbalances shows that risk perceptions and fragmentation have not yet disappeared, mainly with regard to specific euro area countries. "The [European] construction is lopsided and incomplete; its very sustainability requires that the missing elements be incorporated soon" (Balassone, Visco, 2018). The EMU was and continues to be a "politically driven process" (Mayer, Mobert, Weistroffer, 2012): for the EMU survival it is necessary that the missing elements will be incorporated as soon as possible.

1.2 History of system of payment and the RTGS

In 1999, with the idea of introducing the single currency, there was the need that the funds could be moved freely and without risks between the central bank accounts and the euro-area

countries in order to implement a single monetary policy and the integration functioning of the area-wide money market. At the time, "the majority of Member States already had their own RTGS systems, but only for the settlement of domestic transactions" (Kokkola, 2010).

Up to 1999 there were six large value payment systems operating in euro in the euro area, divisible into two categories: the first was composed of the Target and the EURO1 that operated on an area-wide basis, while the remaining four payment systems were more localized. In the German country there was EAF, beyond the Pyrenees there was PSN, the SPI in Spain and finally in Finland there was POPS. Within this second category of payment systems, the one that moved the most transactions was the German system EAF. This was followed by the PNS, which recorded an average daily turnover of 20,000 transactions, with an average daily transaction value of 90 billion euros. Now three of these systems have stopped operating (EAF, SPI, PNS) while the average of the value of the transactions that the POPS recorded has decreased so much that it is reclassified as a retail payment system and no longer a large-value payment system.



Figure 3: Monthly Bulletin, ECB, 2006

Before the advent of the single currency in 1999, the most used method to operate cross border payments within the European Union was via correspondent banking. Once the euro was introduced, there was a disruption of payment services within the euro area. The introduction of the euro meant that cross-border payments became like payments within the same country. Monetary policy also required a single money market for all euro countries. As a result, there was an urgent need to develop a payment service supporting the safe and efficient movement of funds between central bank accounts on an area-wide basis"(Kokkola, 2010). The money

market had significant help "from the Eurosystem's creation of an area-wide RTGS system – TARGET – for the settlement in central bank money of urgent large-value payments in euro" (Kokkola, 2010).

When the monetary union was born one of the greatest difficulties to be solved was that of "merge the legal currencies money markets into a single and integrated money market" (Cesaratto, Pivetti, 2012). To make this integration possible it was necessary to uniform infrastructure for settling large value transaction between member states banks and financial institutions.



Figure 4: Turnover in selected large-value payments systems, Kokkola, 2010

RTGS is a settlement system in which the fund transfer instructions and the final regulation take place for each individual transaction (i.e. without compensation) in real time on the same day of input.

The operating mechanism of the RTGS system requires that each transaction has to be settled individually "as soon as the transfer order is submitted and accepted for settlement, provided that the payer has sufficient funds available on its account" (Kokkola, 2010). RTGS systems typically process credit transfers. An operation is considered definitive when there is a debit on the payer's account and the credit on the beneficiary's account. The biggest advantage of the system is that the payment "becomes final immediately at the time of settlement (i.e. in the course of the day), so there is no intraday exposure to credit risk" (Kokkola, 2010).

The difference with deferred-time gross settlement systems and deferred net settlement is that the RTGS processes payments immediately, while in the other two systems, payments are settled at a set deadline.

Over the years, there has been an explosion in the number of RTGS systems to such a degree that today most of the economies have this system. The way the system works implies that participants have large intraday liquidity needs. Some systems may include limits to control the outflow of settlement funds, imposed on bilateral or multilateral basis. If the payer's funds are insufficient, the transaction order is queued.



Figure 5: The settlement process with a central queue, Kokkola, 2010

"RTGS systems are typically used by financial institutions for the settlement of large-value and / or time-critical payments" (Kokkola, 2010). Normally it is believed that if an RTGS system is adopted the risk of a systematic crisis is lower compared to a net settlement system. The explanation is because "there is no risk of unexpected payment obligations arising during the settlement process if another participant fails to fulfill its obligations" (Kokkola, 2010).

CHAPTER 2 THE OPERATING ARM OF THE EUROPEAN FINANCIAL SYSTEM

2.1 Target 2: origin and accounting

Target 2 was launched in 2007 and became operational in May 2008 when it definitively replaced the old system still in force.

The acronym Target stands for 'Trans-European Automated Real-time Gross Settlement Express Transfer'. Target 2 represents "the second generation of this Eurozone settlement system, controlled by the ECB, in which central banks as well as private institutions participate" (Homburg, 2012).

As Kokkola (2010) argues in his paper "despite its technical centralization, Target 2 remains a decentralized system in legal terms, with each central bank retaining full responsibility for its contractual and business relationships with its own participants."

The advantages of using this system are multiple. First, payments are made to the NCBs' accounts, which makes them particularly safe. Secondly, there are no upper limits on the obligations transferred for domestic or cross-border transactions. Furthermore, payments are "carried out immediately and irrevocably" (Cesarotto, Pivetti, 2012).

Target 2 wants to pursuit three main objectives. The first one is to allow the smooth implementation of the single monetary policy. The second goal is to provide a tool for the settlement of payments on an RTGS basis in central bank money; and at the end, it wants to allow efficiently the payments in euro. In other words, the purpose of this tool is to promote the smooth operations of payment systems and the stability of the euro market money.

At the beginning, this instrument had a "decentralized structure" (Kokkola, 2010): it was built by the national RTGS system, the ECB Payment Mechanism and the Interlinking system. The national RTGS systems impose access criteria, operating times and days, the provision of intraday credit and cross border pricing. Due to its decentralized structure, the system was not suitable for the new needs of the market and the progressive geographical enlargement of the euro area. So, it has been decided to adopt a new Single Shared Platform to replace this system: the power and duty to create the SSP on behalf of the Eurosystem was given to the Bank of Italy, the Banque de France and the Deutsche Bundesbank. This tool is the operational arm of the European financial system for efficiently regulating interbank credit. Target 2 allows the rapid transfer of financial flows between the various countries of the Eurozone. Target 2 is one of the most important instruments for the Eurosystem because through it the monetary authority can implement monetary policy and support the functioning of the euro area's money and capital markets. This tool permits to quickly and in a safe manner exchange payments throughout the euro area in money market and other operations. Individual NCBs data are netted figures: in fact, they represent Target claims netted against total Target Liabilities.

The Target 2 balance is an accounting record of the net debt/credit flows regulated by financial operators of a given country vis-à-vis the rest of the Euro system. These balances produce minimal effects in terms of interest rate and in any case, they are never collected but are accumulated and offset in the overall balance sheet of the ECB under Monetary Income. Banks in countries that do not belong to the euro area, on the other hand, receive interest from the ECB in relation to the size of their net balance.

The most important feature of this tool is the fact that is not available only for the euro area: in fact, the payment services of the Target 2 in euro is usable across a geographical area that is larger than the euro area. Countries such as Bulgaria, Romania, Denmark, Poland and Lithuania that do not belong to the Euro area also join the system. The Council of the European Monetary Institute (EMI) established this feature in 1995, when it was not already known whether the 15 NCBs would be part of the euro area but they had the necessity to invest in Target 2. However, it was indicated that "those countries which would not adopt the euro from the outset, the connection to Target would be subject to conditions to be decided by the Governing Council of the ECB". (Kokkola, 2010)

This instrument makes possible to implement the limits with regard to liquidity outflows from an account. These limits are imposed on the sender rather than credit limits. These constraints are imposed to avoid episodes of free riding on the liquidity of the participants. These are not mandatory but optional constraints and there is always the possibility of modifying them.

The banking groups belonging to the euro area are granted the option of using a liquidity pooling function in all the accounts belonging to the various entities in the group. The Target 2 system grants two options for this functionality: the first is aggregated liquidity while the second one is consolidated information. As far as the first option is concerned, it is envisaged that a payment order presented by a bank belonging to a banking group is liquidated if the payment amount is smaller or equal than the sum of the liquidity available on all of the accounts in the group. If this condition does not occur, the payment is treated as a last arrived.

The second option instead provides that the participant have in any moment all the information with respect to the liquidity positions of its entities in the group. As regards the legal and commercial rules, this option is granted by itself for the accounts of the banks belonging to the euro area.

These different procedures that aim at optimizing are at the basis of the regularity of payments in the queue. This procedure focus on the code to discover pairs of payments that can be settled on an "offsetting" basis given the amounts of liquidity available in the accounts of the relevant participants." (Kokkola, 2010). If from an economic point of view there are no differences between "offsetting" and "netting", the same cannot be said from a legal point of view; in fact, in this case offsetting payment are settled "by one on a gross basis in a logical block" (Kokkola, 2010).

As said, the aim of the Target 2 is to provide, guarantee and oversee the operation of payment and settlement system in the euro area. This purpose is very important for the success of the monetary union. In fact, "operation of payment and settlement systems is key for the success of the monetary union, because an efficient and well-functioning payment system is essential for maintaining the stability of the financial system, needed to preserve the confidence in the common currency, and a necessary condition for the implementation of the single monetary policy" (Bindseil, Konig, 2011).

Target 2 is the tool to provide payment and settlement services but its mechanism do not impose any upper bound on the amount that can be processed during the day. The authorities decide that intra-day credit needs to be collateralized and the collaters are subject the same eligible requirements and risk control measures as applied in Eurosystem liquidity-providing monetary policy operations, as said Bindseily and Konig.

Nowadays the number of financial transactions is almost impossible to calculate: a necessary condition for the correct development of the economy is that these transactions be "settled smoothly and securely" (Jobst, Handig, Holzfeind, 2013).

Each Target 2 operation involves two banks and gives rise to Target 2 claims for the receiving banks and respectively to Target 2 liabilities for the sending bank. If an Italian bank transfers money to a German bank via Target 2, the following movements would be recorded: firstly, the Italian NCB debits the current account of the Italian bank. Subsequently, it records liabilities with the receiving German NCB. Finally, it records a claim against the NCB that transferred the amount to the German bank. "At the end of the day, the transfer gives rise to a net asset or liability position of each NCB against the other NCBs. Each NCB offset all of its bilateral claims or liabilities into a single net asset or liabilities position vis-à-vis the ECB, which assume the role of a central clearing house" (Cesarotto S., Pivetti , 2012).

The sum of all the balances of the Euro system CB is zero.

What appears in the German accounting books will be a credit to the Italian bank, while in the balance sheet of the Italian bank there is recorded a debit to the German one. To compensate for this credit there will never be a direct transfer of flows between the two central institutions because it is not collectable and does not have a real maturity.

The regulation of the American Reserve Banks within the US Federal Reserve Interdistrict Settlement Accounts, the instrument used in America to guarantee the operation of the American banking system, does not work in the same way. In fact, in the USA there is a procedure according to which in April of each year the Reserve banks perform a nettlement of their positions through an exchange of gold certificates: this netting prevents the creation of persistent surpluses or deficits towards each Reserve banks. However, the Fed at its discretion may allow the suspension of this procedure as happened in 2009 when it came to accumulate a positive balance of 300 billion dollars. Furthermore, in the federal reserve system, daily imbalances between districts Feds are cleared by increasing the claims of districts Feds with net payment inflow against the Interdistrict Settlement Account.

The principle that governs and controls the Euro system payment transactions and monetary policy operations is the decentralization. In fact, although the Governing Council of the ECB establishes the standards and conditions, the actual operations are carried out by the NCBs. This is the reason why credits and liabilities arise between the NCBs and the ECB.

This statement can be explained by illustrating the differences that emerge between the comparison of Balance Sheet of a single central bank and a decentralized system of central bank as does Jobst and all in its studies (2013). In the first case, the liquidity is produced by the bank by printing banknotes. To put banknotes in circulation the central bank buys assets as gold or issues collateralized loans. "In the central bank's balance sheet these assets are offset by matching liabilities" (Jobst, Handig, Holzfeind, 2013).

Moreover, from the analysis proposed springs the accounting difference between the two realities. In fact, in this second case "the difference between activity and liability will manifest itself as claims or liabilities within the Eurosystem" (ECB, 2013).

As written above, the goal of the smooth functioning attribute to the ECB is to ensure the stability of financial system and "maintains confidence in the common currency" (Bindseil, Konig, Cour-Thiman, 2012). Finally, the objective of the ECB is to promote a common monetary policy, as it is prescribe by the Bank for International Settlements 2003. For this reason, Eurosystem developed Target 2 payments system. In fact, "Target 2 permits the business partners of the Eurosystem to conduct payments in unlimited volume as well as to raise intraday credit against eligible collateral" (Bindseil, Konig, 2011).

Assuming that a Greek customer buys a good from a German supplier for the value of 5000 euros, the buyer needs to have a loan for the same amount of money from his bank. The Greek bank debits the customer account and at the same time requests the NCB where it holds its account to transfer the amount established via the ECB and the Bundesbank to the bank where the supplier holds the account. At this point, the NCB of Greece records liabilities towards the ECB for the amount transferred; the ECB transfers the amount to the German NCB, which in turn transfers it to the bank where the supplier has access to the account.

Assume that German NCB lends this sum to the Greek ban the payment flows among the central banks reverse and their balances with the ECB equilibrate. The German NCB now holds a claim against the Greek bank, which in turn records a claim against its client.

On the other hand, assume that the German NCB refuses to re-cycle this sum to finance Greece. The German bank now holds the money, and there is an imbalance in the balances of the two NCB with the ECB. The wealth held by the German bank can be used to purchase financial assets or increase credit in its home markets.

The peculiarity of the system is that it guarantees that the institution that receives the payment is not exposed to credit or liquidity risk "since the account of the receiving institution is never credited before the account of the sending institution has been debited" (Kokkola, 2010). The instrument has no lower or higher limits for the value of payments. If the system prior to Target 2 was a decentralized tool, built by connecting the national RTGS systems of the countries that belonged to the euro area, Target 2 instead offer efficiency and a harmonized service.

2.2 Target 2's properties

In order to offer a harmonized state of the art of payment the same high quality services, functionalities and interfaces and a single price structure are offered to all participants.

The system has a long daily operation hour: it opens at 7 a.m. CET and it closes at 6 p.m. CET. Furthermore, "to better manage their end-of-day liquidity, customer payments are subject to a cut-off time of 5 p.m. CET. Target 2 starts the new business day on the evening of the previous day, a "night-time window" being available from 7.30 p.m. to 6.45 a.m. CET, with a three-hour technical maintenance period between 10 p.m. and 1 a.m." (Kokkola, 2010). Target 2 guarantees this night window to facilitate night-time settlement of various ancillary systems in central bank money with finality. Target 2 is open every working day, with some exceptions such as Christmas Day, Easter Monday and New Year's Day. Target 2 offers a range of features allowing efficient liquidity management, including payment priorities, timed transactions, liquidity reservation facilities, limits, liquidity pooling and optimization procedures.

Three-priority level can be assigned to a payment: "normal" (if the payment has no urgency), "urgent" or "highly urgent". If the system receives a payment called "highly urgent" the first two categories are not settled. The only case in which a payment with less urgency can be resolved before one with greater urgency, is the case in which this allows an offsetting transaction to be settled and results, overall, in increased liquidity for the sending participant (Kokkola, 2010).

It can be set sender limit in order to prevent the "unbalanced dissipation of liquidity and to avoid free riding on the liquidity of the participants" (Kokkola, 2010).

The direct participants are guarantors for all payments, both received and sent, which are made from their accounts even if operated by indirect participants. Indirect participation implies that the transaction is always carried out from the system via a direct participant. Only the direct participant has a legal relationship with the Eurosystem.

Once the switch between the centralized instruments to the Target 2 system took place, which operates in a decentralized manner, there was a decrease in the number of participants at the end of 2009. This event may have been due to various factors. For example, it could be because banks operating in multiple countries have managed to decrease access points; or because some participants have decided to become indirect participants to minimize the costs of using the new system.

Prices are determined on "on a non-profit-making cost recovery principle" (Kokkola, 2010). Fees are determined in order to attract the largest number of operators to the system: in fact, for banks that generate large volumes of trades, which are essential for using economies of scale, digressive transactions fees are provided.

Participants can choice between two price options based on the volume of traffic involved. Normally, operators who move low traffic volumes opt for the option with a monthly 100 euros fees and 0.80 euros fixed transaction fees. On the other hand, large-volume operators choose a 1.25 euros monthly fees combined with a transaction fee that varies according to the volume.

Most of the members of this instrument choose the first option (85%) while the remaining part relies on the option of the decreasing rate. "Ancillary systems settling in Target 2 are subject to some additional fees, the size of which is dependent on the average daily gross value of the underlying business" (Kokkola, 2010).

A separate price is provided in order to use the liquidity pooling service, which costs \in 1,200 per account per year for consolidated information and \in 2,400 per account per year for the aggregate liquidity option. Authorities paid specific attention to operational risk management in the system development and design phase: in fact, a risk management framework was built for Target 2 system based on the internationally recognized ISO / IEC 27002 standard.

The structure is divided into three hierarchical levels: at the first level there is the high-level policy, while at the base of the pyramid there are the operating procedures.



Figure 6: Structure of the Target 2 risk management framework, Kokkola, 2010

Given that a failure of Target 2 would entail the risk of contagion between the financial markets and system to minimize the risk and ensure an adequate level of resilience "Target 2 was established on the basis of a" two regions - four sites "principles" (Kokkola, 2010).



Figure 7: Resilience based on the "two regions – four sites" principles, Kokkola, 2010

This tool has operating structures in two different European countries and two operating centres are located in each region characterized by different levels of risk. The staff within these structures is permanent and "responsibility for live operations is periodically rotated between the regions" (Kokkola, 2010). If the resilience procedures were not sufficient, the Eurosystem has developed an emergency plan to ensure continuity for those operations of systematic importance in the case of a Target 2 entity suffered an operational problem.

The objective that the Eurosystem has set for Target 2 is to process very critical payments within 30 minutes, while all other payments must be processed by the end of the day.

In 2009, Target 2 instrument processed 88.5 million of payments, for a total value of 551.174 billion euros with a daily average of approximately 345.768 of payments and an average daily value of \notin 2.153 billion. Most of the transactions are interbank transitions (92%) while the remaining 8% is represented by transactions with customers. In addition, 65% of the total volume of transactions handle values equal to or less than 50,000 euros (ECB bulletin).

Although Target 2 closes at 18.00 CET, the deadline for customer payments is 17.00 CET, so that participants can "manage their end-of-day liquidity position without interference by third parties" (Kokkola, 2010). The hour before closing is characterized by very large treasury operations. However, during the day the average value of the interbank payment fluctuates in the range between 3 million euros and 15 million euros.

Analysing the total number and value of the transactions regulated by Target 2, there is a continuous increase during the period from 1999 to 2008, while there is a decrease in 2009. There are multiple explanations for this fact. On one hand, there was a decrease in transactions on the markets due to the crisis and consequently a reduction in the turnover of the system. On the other hand, to counter the crisis ECB introduced new tools that have increased the average duration of the operations.



2.3 Explosion of target 2 imbalances

Figure 8: Target 2 balances in the euro area, Merler and Pisani-Ferry, 2012

From a purely accounting point of view, Minenna (2016) in his book stated that Target 2 balance is given by the difference between assets and liabilities recorded under "Other Investments" of the balance of payments financial account. By definition, this balance must add to zero whereby a negative balance under this item must have a positive response in other items of the financial account.

It is clear that since there has been parity between European currencies, European economies have been characterized by current account imbalance and a persistent delta between imports and exports. In fact, if on one hand the exchange rate had been frozen to keep current accounts in balance, on the other hand the economies of the various countries continued to evolve following their "structural trends" (Minenna, 2016).



Figure 9: Trend of the trade balance of the main Eurozone countries (Eurostat data 2002-2013), Minenna, 2016

From the figure emerges how the peripheral countries belonging to the euro area have shown high trade deficits: there is an important growth in imports followed in parallel by a reduction in exports. In this context, only Germany appears as a rare bird. As shown in the graph, Germany has always shown a trade balance surplus exceeding 6% of GDP.

It is useful to explain what the "converge trades" phenomenon is. Similarly to arbitrage, it is a long-term buying or selling strategy of assets that are considered similar. For example, the market bet that if two countries become part of the Eurozone, then the bonds are comparable "and therefore can be priced in an identical way" (Minenna, 2016). This phenomenon explains how it is possible that the interest rates already converged in 2001, although two years earlier diverged by more than 8%. However, this path does not necessarily mean that convergence occurs near the equilibrium point.

A constant current account deficit is associated with an increase in Target 2 liabilities and negative net balance values. In a symmetrical way a current account surplus is associated with an increase in Target2 assets and a positive net balance value. In fact, in this case "the payment system records an increase in credits settled by operators in the reference country vis-à-vis the rest of the Euro system" (Minenna, 2016).

An example of what has just been said is the figure below that shows the cumulated progress of the current accounts of Germany compared to the other countries and the related Target 2 balance. Negative Target 2 net balance that many peripheral countries of the euro area have recorded is due "as the underlying trend of the current account deficit. However, the evolution



of the trade deficit of Italy, Spain and the other peripheral countries or the surplus as in the case of Germany does not fully explain the explosion of the Target 2 balances " (Minenna, 2016).

Figure 10: Trend of Target 2 from 2001 to 2019, Westermann (2018), Euro Crisis Monitor

The figure shows the trend of the balances for the countries participating in the Target 2 system. An increasing accumulation of "non-collectible loans" can be found in the NCBs balance sheets of the core countries since 2006. Following the crisis in 2008 there is an explosion of the Target 2 balances caused by the European debt crisis. "These loans correspond to financial transactions regulated by the financial sector, therefore the growth in absolute value of Target 2 balances represents a deleveraging of the private financial sector which has dismantled a huge amount of transactions in the acute phase of the financial crisis" (Minenna, 2016).

This balance has close connections with the trend of the balance of payments and with the liquidity flows introduced within the ECB's Euro system through the LTRO.

2.4 Evolution of Target 2 imbalances in Germany

Until the years before the financial crisis, the Bundesbank's net claims against the ECB were close to zero, hence "private sector capital flows financed the current account imbalances within EMU" (Sinn, 2012). Subsequently, due to the increase in private sector flows caused by the increasing of risk aversion in the interbank money market, t Bundesbank's net claims risen. As stated Sinn, "when Germany's surplus savings were no longer re-cycled by the private sector, the Eurosystem took over". This is due to the "increasing reliance of banks in the peripheral countries on the Eurosystem for the funding of their assets" (Sinn, 2012).

The figure below shows the main and log-term refinancing operations conducted by ECB and the share of the five peripheral countries (GIIPS). In the year before the outbreak of the financial crisis, the five European peripheral countries absorb funds provided by ECB on average with the countries belonging to the Eurozone. However, with the occurrence of cut offs of banks from these countries, their share in the ECB's refinancing operations rose to around 75 %.



Figure 11: ECB refinancing operations (main and log-term refis), Mayer et all, 2012

Another cause of the imbalances within the Eurozone are the capital movements alone. If an Italian agent moves his deposits to a foreign country like Germany, this operation triggers two events: the first is a debt in the account held with the ECB for the Italian NCB and a surplus in

the account of the Bundesbank. Instead, if German investors bought Italian securities, there would be a reduction in liabilities for the Italian NCB and a Bundesbank claim.

The figure proposed below depicts Bundesbank's claim against the ECB and Germany's current account. "The fact that the Bundesbank's net claims against the Eurosystem rose faster than Germany's current account surplus suggests that there were also capital movements into Germany" (Sinn, 2012).



Figure 12: The Bundesbank's claim against the ECB and Germany's current account surplus, Mayer et all, 2012

Instead, the table shows the net position of the NCB belonging to Euro area against the ECB at the end of 2010. The table underlines that the main creditors are Germany, Luxembourg, Netherlands, and Finland while the main debtors are the peripheral countries of the Euro area.

					Change
	End-				since
	2010				end-2010
	billion	2011		2011	billion
	euros	billion euros		% of GDP	euros
Germany	325.6	449.6	Sept	18%	+124.0
Luxembourg	67.9	72.4	Aug	163%	+4.5
Netherlands	40.5	64.8	Sept	11%	+ 24.3
Finland	19.7	43.4	Sept	23%	+ 23.7
Italy	3.4	- 103.5	Sept	- 7%	- 106.9
Malta	- 1.2	- 0.5	Aug	- 8%	+ 0.7
Slovenia	-2.1	-2.4	Aug	- 6%	- 0.3
Cyprus	- 6.4	- 7.9	Sept	- 43%	- 1.5
Slovakia	- 13.3				
Belgium	- 13.9	-24.1	Sept	- 6%	- 10.2
ECB	- 21.2				
Austria	- 27.5	-35.5	June	- 12%	- 8.0
France	- 28.3	-33.5	Aug	- 2%	- 5.2
Spain	- 50.9	- 82.8	Sept	- 8%	- 31.9
Portugal	- 59.9	- 59.4	Aug	- 35%	+0.5
Greece	- 87.1	-97.5	Aug	- 44%	- 10.4
Ireland	- 145.2	- 140.6	Aug	- 0.9	+ 4.6

Table 1: Net position of Eurosystem central banks against the ECB (Target 2) Mayer et all,2012

Looking at the last column, it turns out that the greatest deterioration occurred in Italy, where a small surplus turned into liabilities equal to 103.5 billion of euros. To stop the bleeding that these imbalances have triggered, the ECB exposed itself "to the risk of sovereign and bank defaults" (Sinn, 2012). However, temporary measures are likely to further increase opponents against the EMU in the paying countries; it is necessary "to correct the balance of payment deficits by reducing the deficits in the current account and the private capital account" (Mayer, Mobert, Weistroffer, 2012).

Since the balance of payments must always be zero, it follows that a negative balance recorded by Target 2 instrument, i.e. a growth in liabilities, must have as a counterpart a decrease in investments from abroad. Therefore, it follows that an increase in Target 2 balances of Italy and Spain is associated with a flight of private sector capital. The graph proves what has just been said. From the second half of 2011 there was a decrease in private investments. This outbound capital outflow is almost entirely offset by ECB inflow through three-year LTROs. This sale of securities on the secondary market by foreign banks contributes to the outward movement of private investments and involves negative changes in Target 2 balances. There is a connection between the sale of securities by foreign banks and changes in the Target 2 balance. If a foreign agent sells a national business that have purchased from national agent, this entails financial movement from the national banks. The result is a debt with the national central banks towards the central bank of the agent who buys the assets, and therefore the registration of a negative sign operation in the balance sheets.

On the other hand, Germany has always recorded a structural current account surplus and a constantly negative financial account. While Italy and Spain saw private sector funding flee

abroad, Germany recorded a slowdown in private sector investment offset by an increase in financial flows to the monetary authorities. German banks accumulated excess liquidity with the ECB. Since a positive Target 2 balance must be offset by a corresponding increase in outward cash flows, it should be expected that Germany has experienced a downward movement in the financial account. However, this is not the case. Therefore, the large and sudden growth of the Target 2 balance must be sought "in the race to buy German government bonds from the Eurozone banks and the massive sale of government bonds from the periphery by the German banks" (Minenna, 2016). The triggering of these changes in the Target 2 balance has two main factors: the former has a financial nature while the latter is to be found in the long-term trend of financing current account deficits that has caused the accumulation of unregulated loans to surplus countries (mainly Germany).

"According to the ECB, financial innovation and the EMU have weakened the link between a country's Target balance and the economic reality of banks' financing needs in individual countries" (Schuiling, 2017). This disconnection is caused by the possibility of multinational companies to raise funds in a decentralized way and then centralize liquidity management. In fact, the parent company can refinance itself through a subsidiary with an NCB in another Eurozone country (generating a Target credit in the country of the parent bank and a Target liability for the NCB of the country of the subsidiary). In addition, there are cross-border payment flows that cannot be accounted for in Target balances because they are not settled in money by the central bank. Finally, whenever a flow involves non-euro area banks "they can still be settled in this payment system through accounts with banks that hold Target accounts in different euro area NCBs (example: Bundesbank and DNB) thus affecting the target balances of the respective euro area NCBs " (Schuiling, 2017).



Figure 13: Italy, Target 2 balance and sovereign yield spread with respect to Germany, Bloomberg
CHAPTER 3 IMPLICATION OF ECB OPERATIONS ON TARGET IMBALANCES

3.1 A Debt crisis

In 2006 in its Official Bulletin ECB states that the QE (Quantitative Easing) is one of the most important player that drives the divergent of Target 2 balances among the euro area countries. In this Bulletin, it was shown the linear relationship between "the liquidity injected into European financial systems through the purchase of government bonds and the corresponding increasing of Target 2 balances, negative for the peripheral central banks, and positive for Germany and satellite core countries" (Minenna, 2019). According to the QE rules, NCB can acquire government securities from both domestic and foreign entities. The data reported in ECB Bulletin shows that 80 % of all purchases were made through cross-border operations on NCB with foreign entities; moreover, 50 % of securities purchases within the QE involved residents outside the euro area.

In order to study Target 2, "the operating arm of the European financial system" (Minenna, 2016) and its consequences, it can be useful to decompose this technical tool through the analysis of the financial accounts of the Balance of Payment as made by Minenna in his studies. The starting point is that since "the value of net payment made by the residents of one of Euro area country to another jurisdiction is fully offset by an equivalent amount of fund via the interbank markets, the NCB's intra-Eurosystem Target" (Terzi, 2019) must be equal to zero. Therefore, Target 2 balance vary in response to a variety of cross-border financial transactions carried out by banks, governments and non-financial private sectors. In first analysis, Minenna starts to decompose the Target net balances of Southern countries such as Italy and Spain. By studying the case of Italy emerges that in 2011 "core banks have sold a significant amount of Italian government bonds on the secondary market due to the augmented perception of credit risk" (Minenna, Dosi, Roventini, 2018). The sale of these bonds are registered as a minus in the Target 2 balance as long as this sale represents capital outflow for the country. Successively, Italian Banks repurchased these bonds at low prices: this operation was possible thanks to the

huge injections of liquidity made by the ECB via LTROs. In this way, the sovereign credit risk was internalizing within the Italian financial system. In 2013, when started the repayment of LTROs the ECB's balance sheet together with the Target 2 balance gradually decreased until June 2014. In this year, it was created the T-LTRO programme aimed to increase corporate credit. After that, the divergence process in Target 2 balance continued to increase due to the launch of the QE and the PSPP (Public Sector Purchase Program). In this way the main factors that dived the deterioration of Italian Target 2 balance was "the reallocation of non-financial private-sector wealth from government bonds to foreign bonds, mutual funds, and shares" (Minenna, Dosi, Roventini, 2018). In only two years (2015-2017), non-financial Italian firms invested over 220 billion of euro in vehicles with legal residence in Luxemburg, Germany and Netherlands: only 20 % of these can be attributable to Italian entities.

Spain's Target 2 balance followed a similar patter with respect to the Italian ones. In fact, after the launch of the QE programme, the balance registered a deterioration. There are three factors that can be responsible of this dynamic. First the increasing of the non-financial sector foreign investment, second the sale of government assets by foreign investors to Banco de Espana. The last factor is the reduction in the quantity of interbank loans obtain by Spanish Banks.

3.2. Target (im)balance and ECB instruments

"Target 2 imbalances are closely correlated to countries' recourse to Eurosystem refinancing operations through the NCB balance sheets; however, they are not caused by these operations" (Cecioni, Ferrero, 2012). ECB provides central bank money through three instruments. The first are MROs (Main Refinancing Operations), liquidity-providing operations that are conducted regularly on a weekly basis and executed through standard tenders. In addition to the weekly MROs, the ECB also executes regular monthly LTROs with a 3-month maturity aimed at providing longer-term liquidity to the banking system. LTROs are conducted as standard tenders in a decentralised manner, and all counterparties fulfilling general eligibility criteria may participate. The last operation is the Marginal Lending Facility. The national central banks either may provide liquidity under the marginal lending facility in the form of overnight repurchase agreements (i.e. the ownership of the asset is transferred to the creditor, while the parties agree to reverse the transaction through a re-transfer of the asset to the debtor on the next business day) or as overnight collateralised loans. During the economic crisis, ECB decided to increase the field of eligibility criteria for collaterals and relied on new tools to preserve the functioning of the monetary policy transmission mechanism. All these measures had repercussions on the balance sheet of the ECB, which recorded a strong deterioration.

These measures were undertaken to fulfill the task that the EU Treaty assigns to the ECB of promoting the smooth operation of payment systems which implies" facilitating the circulation of money in a country or currency area". Without these policies, it would not have been possible to fulfill that task.

"Unconventional policies have also limited the asymmetric effects of the crisis within the euro area" (Cecioni, Ferrero, 2012). The large amount of cash provided through the LTROs operations and the followed increase in Target 2 balance has entailed considerable easing of the strains in the interbank, as claims by Cecioni and Ferrero (2012). In fact "the spread between the 3-month interest rate on unsecured loans (Euribor) and that on the corresponding interest rate swaps (Eonia swap), which provides a measure of the risk premium, diminished by 60 basis points. The spreads between the overnight rates paid by banks located in countries under stress and EONIA, which in some cases had risen to above one percentage point, fell to zero" (Cecioni, Ferrero, 2012).

The VLTRO operations launched in 2011 balance the loss of liquidity in the peripheral countries belonging to the euro area thanks to the repatriation via Target 2 of the loans previously obtained from the core countries. However, peripheral banks used the liquidity created to buy Government bonds that were no longer attractive to investors in core countries. "The liquidity created in favour of the banks of the peripheral countries thus flowed to the core countries ending up deposited in the reserve accounts with the ECB of the commercial banks of those countries" (ECB, 2017).



Figure 14: Relationship of banks with the Eurosystem percentage of the total of the euro area, IESEG, 2019

However, agents' confidence in the sustainability of the public debt of the peripheral countries was not rebuilt, so much so that in 2012 both Italy and Spain were one-step away from the exit from the single currency. To take cover, ECB acted as lender of last resorts via OMT, operations that guaranteed the sustainability of the sovereign debt of the two aforementioned countries. "The OMT did not directly affect the ECB's balance sheet, as a threat of intervention never actually implemented remained" (Cesaratto, 2015). This operation had indirect effects: at the end of 2012 peripheral countries recorded capital flows to sovereign securities. This allowed the commercial banks of these countries to improve the position of these securities and the possibility of returning LTRO funds. All this led to the easing of the ECB's balance sheet and a reduction in the Target 2 balances.

On 22th January 2015, the program now known as Quantitative Easing was launched; before the operation was called "Expanded Asset Purchase Program (APP)", and subsequently "Public Sector Purchase Program" (PSPP). This program provides for both the purchase of ABS (ABSPP) and "covered bonds" the possibility to purchase on the secondary market of securities with a maturity between 2 and 30 years denominated in euro issued by sovereign states, agencies Eurozone and European institutions. The eligibility criteria require that the securities that can be purchased must have a positive rating. Securities from States that adhere to recovery and financial assistance programs are also eligible even if they have not positive rating. 80 % of the risk on these securities is held by the country while the remaining 20% is distributed according to the shares of the ECB's share capital among European countries.

The ECB has self-imposed an upper purchase limit of 25% for each purchase tranche in order not to block any procedures for restructuring the public debts subject to the CAC. In fact, for all issues exceeding one year, any event that changes the terms of debt must be approved by at least 75% of investors. The purpose of QE is to increase the liquidity in the system through the purchase of long-term securities, mainly public, and reducing the long-term real interest rate. In this way, the ECB decides to intervene actively (unlike what happened with the LTROs operations) by introducing liquidity through the increase in its portfolio of securities. However, with the other type of transaction the system was free to decide how much liquidity was to be absorbed. The ultimate goal of Quantitative Easing is to "support aggregate demand" (Cesaratto, 2015). In the short term, this operation tends to increase the value of the securities purchased while in the long term it leads to a decrease in the interest rate. The increase in the value of securities is also caused by the "portfolio effect" (Cesaratto, 2015). In fact, operators selling securities to the ECB have an excess of liquidity, which leads to buy other securities, not only domestic but also foreign. This implies that "greater demand for foreign currency needed to purchase those securities will result in a depreciation of the national currency" (Cesaratto, 2015).

Another effect of QE is to arm the balance sheets of credit institutions thanks to the possibility of selling government bonds at a higher price than the purchase price. In fact, according to Quantitative Easing programme the profits made on the purchases of the securities are paid to the individual States.

Nevertheless, not only. Quantitative Easing also acts on the expectations of economic agents, both public and private. In fact, Quantitative Easing is "functional to transmit to families and businesses the message that the ECB is absolutely determined to fight the recession thus determining inflation expectations" (Cesaratto, 2015).



Figure 15: Change in liquidity accounts in October 2019 and net flows from the market, Minenna, 2019

The Quantitative Easing operation needs to be accompanied by an expansive fiscal policy. If the two operations do not travel on parallel tracks, and the fiscal tightening continues, the interest rates of the debt for the most peripheral countries of the euro area continue to be relatively low, but this is accompanied by a very high level of unemployment.

A simplified representation of the balance of the Eurosystem has on the left side essentially three components: autonomous factors (gold, net foreign assets, domestic assets), monetary policy instruments, and foreign currency liquidity providing operations. On the liability side is registered banknotes in circulation, deposits, capitals and reserves.

In the NCBs' balance sheets there are two additional items, that do not appear in the Eurosystem consolidated balance sheet because they sum up to zero: "liabilities or claims on Target 2 and other liabilities towards or claims on the Eurosystem (in large part related to the banknotes that an NCB puts into circulation)" (Cecioni, Ferrero, 2012). Since the beginning of the global financial crisis, the size and composition of the NCBs' balance sheets changed significantly. Figure shows the balance sheet decomposition and two different types of countries can be identified. The first group experienced a large increase in the appeal to OMOs and consequently an increase in the Target 2 liabilities. The first group is composed by peripheral countries of the euro area such as Spain, Italy, and Portugal. On the other hand, there are countries that have less recourse to the OMOs and have increased their Target 2 claims.



Figure 16: NCBs balance sheets (in billions of euros), Cecioni and Ferrero, 2012



Figure 17: Balance of Payments, Cecioni and Ferrero, 2012

The substantive difference between the balance of payments and the Target 2 system consists in the fact that the first instrument keeps track of all the transactions between a country and the rest of the world, while the Target 2 is a payment system in the central bank money only for banks operating in the euro area. The Balance of Payment accounting identity is:

Current account + Financial account + Capital account + Errors & omissions = 0

Apparently, looking at the identity just proposed there seems to be no connection between the Balance of Payment and Target 2. However, the "Capital Account" component is composed of "Other Investments" which includes trade credits, loans, deposits and other accounts receivable and payable. This last item has in turn a breakdown by (resident) sectors: *i*) "Monetary authority", which includes all transactions of the central bank with foreign counterparts and which, in the euro area, are in large part related to NCBs Target 2 position with the ECB; *ii*) "General Government", which records cross-border financial transactions that have the general

government. The composition of the Balance of Payment changed in a significant manner during the financial crisis. During the crisis Balance of Payment was "largely influenced by financial support from international and European institutions to the domestic government" (Cecioni, Ferrero, 2012).

The transactions that affected Target 2 and registered in the Balance of Payment are crossborder sales/purchases of goods/services or securities/interbank loans. If an Italian resident purchases a good from a foreign agent, Italian trade deficit increases. This operation is balanced by an "increase in the liability side of the "other investment – monetary authority" item in the financial account of the Balance of Payments as the payment between the two banks is settled in Target 2 and generates a debit position of the NCB towards the ECB.

At the height of the crisis, the current account deficit has increased and then stabilized. In this period, the factor that contributed most to the change in the composition of the Balance of Payment was the financial accounts. There was no connection between the decrease in foreign investment in domestic securities and a corresponding increase in disinvestment of domestic capital previously invested abroad. "Financial account net outflows are counterbalanced by a considerable increase in NCBs' Target 2 liabilities with the ECB and by loans from international and European institutions to the Greek and Portuguese governments" (Cecioni, Ferrero, 2012).

The evolution of Target 2 balances is caused both by the outflows of loans to banks and by the refinancing of banks, as shown in the figure below. The figure highlights how the creation of liquidity by the Eurosystem has an evolution similar to that of Target 2 liabilities. The right side of the figure shows how the trend of liquidity has allowed the repatriation of capital ending up in the current accounts of the banks of the core countries with the Eurosystem.



Figure 18: Evolution of Target 2 in relationship with the liquidity absorption in the Eurosystem, Cesaratto, 2015

3.3 Determinants of Target 2

Following the studies conducted by Cecioni and Ferrero (2012), let us analyse three possible explanations for the large increase in Target 2 liabilities:

- (*i*) large current account and trade balance deficits;
- *(ii)* flight of private capital from the country at risk in terms of portfolio investment and interbank loans and deposits
- (*iii*) deposit run by resident households and non-financial firms.

According to Cecioni and Ferrero (2012), let us consider three periods: from 2001 to 2007 (before the financial crisis), from August 2007 to April 2010 and the period characterized by the sovereign debt crisis (May 2010 - February 2012). Testing hypothesis number *(i)*, the deficits before the crisis are financed by other liabilities in the financial accounts. The correlation takes significance only for the second period analyzed and only for a single country: Greece. So "balance deficits per se are neither a necessary nor a sufficient condition for observing large Target 2 liabilities" (Cecioni, Ferrero, 2012).

Different evidences emerge instead testing the second explanation. Considering private capital flight, it emerges that there is a significant and negative correlation for the peripheral countries adhering to the euro already in the first period and this correlation stabilizes after May 2010. This fact suggests "the reduced inflows in portfolio investments are substituted with Target 2 inflows" (Cecioni, Ferrero, 2012).

The relationship between Target 2 flows with MFIs' other investments is negative and significant both in the second period under review (during the financial crisis) and in the third (sovereign debt crisis).

Finally, according to Cecioni and Ferrero studies (2012) a correlation between Target 2 flows and the asset side of the other investment sectors emerges only in the case of Greece, while for the other peripheral countries of euro area there is no significant relation.

To conclude, the first explanation proposed seems suitable and confirmed by data only for Greece while movements in the current account's deficit does not show correlation for the other European countries. Instead, "for all countries the large increase in Target 2 liabilities appears to be mostly related to capital flight, concerning both portfolio investments and cross-border interbank activity" (Cecioni, Ferrero, 2012).



Note: Solid bars denote significance at least at 10% level (p-values smaller than 0.1); FA = financial account; CA = current account.

Figure 19: Correlations with flows of Target 2 liabilities- Italy, Cecioni and Ferrero, 2012

"The single currency was expected to make balance of payments irrelevant between the euroarea member states" (Cecioni and Ferrero, 2012).

In the graph below it is represented the situation of two different groups of countries. In the left table, it is shown the evolution of current account balances in three countries that do not belong to Euro Area. In the right side it is recorded the evolution of current account balances for Greece, Spain and Italy, three euro area countries with the highest deficits in 2007.



Figure 20: Current account outside and within the Euro area, Marler and Pisani-Ferry, 2012

It seems clear that the evolutions for the two different groups of countries have undergone a remarkably different path: as regards the first group of countries, the deficit that is accumulating close to values of 25% of GDP in a few years has been transformed into surplus. On the other hand, the weights belonging to the euro area have seen these adjustments much more slowly. But looking only at the user of the current account does not give a correct view of the phenomenon of capital flows. The financial identity for the financial account includes the capital flow and is as follows:

$$CAB+PCI+T2F+PGM+SMP=0$$

Current Account Balance + Private Capital Inflows + Eurosystem Financing through Target2 +Securities Market Programme for ECB + financing through IMF and European Assistance = 0

Following the studies carried out by Ferry-Pisani (2012), we analyse the capital flows taken from the original balance of payments subtracting the official inflows deriving from the changes in the Target 2 balances. The countries examined are the peripheral countries of the euro area: Spain, Italy, Greece, Portugal and Ireland. Pisani-Ferry "plots for all countries accumulated capital inflows in proportion to their 2007 GDPs" (Marler, Pisani-Ferry, 2012). Focus on inflows and inversions, not on short-term fluctuations emerges significant capital inflows for the period before the financial crisis which was followed by sudden outflows. In the graph, the blue line represents the total cumulated flows while the red line traces the cumulative private flows. The picture shows Bruegel calculations with national and Eurostat data. From the graph emerges the cumulative and capital inflows relative to the international investment position debt in 2011.



Figure 21: total and private capital inflows, selected southern euro-area countries, 2002-11 (%2007 GDP), Marler and Pisani-Ferry, 2012

In Greece, there is a total outflows and inflows equal to 40% of the 2007 GDP. "Capital stopped flying into Greece even before the announcement in October 2009 by the Papandreou government that public finance data has misreported deficit and debts" (Marler, Pisani-Ferry, 2012). In Portugal, instead there is an outflow in the spring of 2010 near the Greek program. Subsequently there is a second outflow in early 2011. In Spain, there is a brief outflow in 2010 and one in 2011 in conjunction with that experienced in Italy.

Pisani-Ferry uses the Calvo methodology to find episodes of sudden stop and find three characteristic periods. Suddenly stopped are episodes in "which there is at least one observation with year to year inflows two standard deviations below the mean" (Marler, Pisani-Ferry, 2012).

1. Global financial crisis: this period is characterized by an increase in the risk aversion and by the market tightening especially in Ireland and Greece. Before public finance data were wrongly declared and even before the collapse in the United States of Lehman Brother, in Greece capital flowed out from the country in early 2008. In the same period, private capital begins to leave Ireland.

2. Spring 2010: it occurs an episode of contagion. This period is characterized by the announcement of the agreement of the EU program. Immediately, Portugal experiences a brief sudden stop event.

3. End 2011: the third period of sudden stops affects both Spain, Italy and Portugal.

Therefore, the analysis shows that these countries have experienced sudden stop events. "This was no evident from the official balance of payment statistics, because the private capital outflows were compensated for by an equally sizeable increase in public capital inflows. These flows have prevented the official financial account from shrinking." (Merler, Pisani-Ferry, 2012).

The following graph shows the decomposition obtained by cumulating separately changes in Target 2 liabilities, programme flows, and our measure of private capital inflows over the same period for all countries. The sum of these three component had been plotted against the total cumulated total inflows.



Figure 22: Decomposition of cumulative capital inflows (% of 2007 GDP), Merler and Pisani-Ferry, 2012

From the breakdown of cumulative capital inflows, it is clear that for Greece the component with the greatest impact is the Target liabilities, which affects 56%. On the other hand, for the other examined countries this component is not the one with the greatest impact.

"Large current account balances per se are neither a necessary nor a sufficient condition for incurring significant Target 2 liabilities" (Merler, Pisani-Ferry, 2012). What most impacts is how current account balances were composed and funded before the advent of the financial crisis. The countries with the large current-account deficits are mostly financed by portfolio debt and bank loans. Therefore, direct investment is low. This financing structure makes these

indebted countries really exposed to the "unwinding of capital inflows" (Merler, Pisani-Ferry, 2012).

During the pre-crisis years, ECB pointed an accusing finger at states that did not apply strict fiscal policies, but were not concerned about external current account imbalances within the currency union. After all, they looked at the USA and found no reason to worry when even overseas they did not worried.

"When excessive private and public borrowing from abroad lead to an unsustainable current account deficit, an EMU country is at risk of being suddenly cut off from funding this deficit" (Sinn, 2012).

Even in the 1990s, there was a similar risk for the economies of emerging countries, which had acquired a lot of foreign currency. A cut-off from the international capital markets was then called in the economic literature a 'sudden stop". However, numerous differences emerge between the 'sudden stops' that occurred during the 90s and those that occurred in many economies of countries belonging to the euro area. In fact in the first case, the 'sudden stop' event was cause by a depreciation of the currency, which in some cases led to "to default on the foreign currency liabilities". Instead, for Eurozone countries a depreciation of the currency is not possible, but bridging financing was required from the central system and from the banks. This has led to significant financial imbalances within the euro area.

One factor that played a key role in the growth of current account imbalances was the "easy credit that allowed some countries to fund private and public saving-investment deficits" (Mayer, Mobert, Weistroffer, 2012). GIIP countries have been able to use very low interest rates until ran up a GDP weighted deficit of about 7 percent of GDP at the height of the credit bubble" (Mayer, Mobert and Weistroffer, 2012). On the other hand, Germany has not experienced this drop in the interest rate; it has pursued a path of cost reduction aimed at regaining the international competitiveness that distinguished it during the 90s.



Figure 23: Current Account balances in EMU, Mayer, Mobert and Weistroffer, 2012

According to Sinn, both private and public sector savings-investment deficits contributed to the current account deficits in the GIIPS countries. Figure 24 shows the decomposition of cumulated net borrowing for GIIP countries for the time interval between 1999 and 2007, the year before the outbreak of the financial crisis. It is noted as for all countries the current account deficit are composed by both private and private sector net borrowing. For Spain, it is immediately evident that the factor that has the greatest impact on the deficit is private sector borrowing. Ireland and Italy experienced a surplus, although in very different measures: the first thanks to private sector net lending, while for Italy "due to government borrowing that exceeded somewhat private sector lending" (Mayer, Mobert and Weistroffer, 2012).



Figure 24: Cumulated net borrowing by the public and private sector, 1999–2007, Mayer, Mobert and Weistroffer, 2012

Eurosystem plays an important role "in temporarily reducing the risk of a 'sudden stop' by filling the funding gap created by investors' refusal to roll outstanding debt" (Sinn, 2012). As long as sovereign default risk was considered almost impossible, investors preferred "higher yielding debt of EMU countries with weaker government finances"; when the financial crisis broke out, there was a turnaround. Risk aversion has increased and there has been a collapse in investments in euro area securities. To counter this investor flight, the Eurosystem has sought to finance weaker governments: NCB bought government bonds thanks to the money lent by the ECB. As a result, the government bonds held by the banks recorded a significant increase and at the same time, there was a decrease in interest from other investors. In addition, another contribution from the ECB was to buy government bonds in difficulty directly from secondary

market. The chart below shows how in May 2011 the number of bonds held by the ECB underwent a significant increase due to the Securities Market Program.

There are two reasons for ECB intervention. First, the markets had reacted irrationally which had led to a liquidity crisis. Secondly, "no other body available for crisis management" (Mayer, Mobert and Weistroffer, 2012).



Figure 25: Holding of bonds under the ECB's Securities Market Programme (SMP), Mayer, Mobert and Weistroffer, 2012

CHAPTER 4 IS THE EUREXIT THE ONLY POSSIBLE WAY?

4.1 From past to future

In November 2010, in an interview to "L'Espresso" Spaventa stressed the impossibility of a return to the lira: "Going back to the lira: a folly". The argument was because now due to the great public debt and the speculation against Italy would be the cause of default for the State. He summed up the situation with the following phrase in Latin: "nec tecum nec sine te vivere possum" (Martial, Epigram XII, 46: "I can live neither with you, nor without you") (Masera, 2019).

In order to prevent redemption of public debt in national currencies, Lex Monetae was introduced. This principle states that "in the EU legal framework, the euro is the currency of the member countries of the Euro area (EA), which "irrevocably" replaced national currencies" (Masera, 2019).

The official position of the ECB had been traditionally that the euro was irrevocable and enshrined in the Treaties (Draghi, 2012).

From a purely economic point of view, the introduction of the single currency remains a "simple fixed exchange rate agreement between a group of heterogeneous nations, assessable in the same way as the old Gold Standard or the currency agreements of Bretton Woods". (Minenna, 2016). It should be emphasized that both agreements had a limited life before the structural balances made them break.

It must be remembered that in the Gold Standard currencies were anchored in a fixed conversion ratio with gold, so that the exchange rate remained stable and independent of changes in the demand and supply of the currency. The fact that the exchange rate was fixed guaranteed that the trade imbalances were only adjusted through changes in prices and wages. A deficit in the trade balance was necessarily regulated in gold leading to a decrease in gold reserves and in parallel to a reduction of money in circulation, leading to recessive effects. The cost of the adjustment always weighed on the debtor country, while the surplus country was not affected by any adjustment. All of this encouraged the nations adhering to this system to a fiercely mercantilist policy aimed at seeking a permanent surplus in the balance of payments. Subsequently, the Bretton Woods agreements were adopted, in which the acceding countries anchored their currency to the US dollar. The dollar in turn had full convertibility with gold at a predetermined ratio. These agreements made it possible to guarantee the stability of exchange rates between the various currencies without detaching them from fluctuations in supply and demand. On the other hand, they avoided the regulation of trade balance imbalances through movements of gold. This system relied on the fact that the gold reserves of the American Treasury were so large that they could meet any possible need for convertibility into gold. However, with the post-war reconstruction in Europe and the great economic growth of Japan these conditions were transformed: American competitiveness was questioned by the increase in wages and price levels compared to Japanese, German and Italian industry, which could enjoy a very low labour cost. During the 1960s, the USA entered a phase of trade deficit accompanied by "high public deficits due to the war in Vietnam, the costs of the nuclear escalation of the cold war, nationally prestigious programs such as the race to the Moon (5% of the budget Federal) and the explosion of expenses related to the welfare state" (Minenna, 2016). The deficits were settled in dollars but were not covered by an adequate gold reserve. Conversely, Japan and Europe accumulated large dollar currency reserves convertible into dollar in every moment; on the international market, therefore, it took place a disconnection between the official dollar gold price charged by the Federal Reserve and that observed on the international markets. All this made possible arbitrage mechanisms such that a nation had an incentive to convert dollars into gold and then sell that gold on international markets and make a profit. The slowdown in the global economy that occurred during the 1970s brought into question the convertibility of reserves to gold. To face the challenge of the European states to verify the will to support the convertibility rate, the USA would have had to increase its gold reserves through heavy deflation and recessionary policies, but had no intention of do that. When the speculative waves put the Bretton Woods system in serious difficulty America decided to suspend the convertibility of the dollar into gold in order to protect its gold reserves. Prices became a floating quantity dependent on the movements of the demand and the offer. The Bretton Woods agreements ceased.

This excursus is useful to underline some peculiarities that Euro shares with the previous experiences just described. Firstly, our single currency shares with the first agreements of the Gold Standard the "property of downloading the structural adjustment costs of financial flows exclusively on debtor countries, through depressive and deflationary measures" (Minenna, 2016). Secondly, as Minenna (2016) states, "by construction, the functioning mechanisms of the Euro are exposed to self-reinforcing divergence phenomena such as those that characterized the Bretton Woods system". Therefore, limiting to a single historical vision "fixed exchange

rate agreements generally have a limited life and tend to explode sooner or later" (Minenna, 2012).

4.2 Probability of euro breaking

The official position of the ECB had been traditionally that the euro was irrevocable and enshrined in the Treaties (Draghi, 2012). For Draghi euro is "irreversible".

However, as shown in the figure below, during the summer of 2011 the credit default swaps of the four main European economies undergo a sudden increase, which marks a new upward trend. Each CDS listed on the market corresponds to a precise probability of default by the issuer.



Figure 26: Evolution of the CDS spread for Spain, Germany, Italy and France, Minenna,

2016



Figure 27: One-year probability of default implicit in the CDS for some Eurozone countries, Minenna, 2016 (data: 2011)

There is a close relationship between the default event of a country belonging to the euro area, the exit of that country from the single currency and the event of termination of the euro. Investors with securities from euro area countries purchase CDS in a different currency than the euro to hedge against "convertibility risks" (Draghi, 2012), the risk of renaming the debt in a new national currency. This lead to an increase in the premium required on these contracts compared to the same contracts in euros. This difference is known as the "quanto spread" (Minenna, 2016). Quanto spread highlights market assessments on the relationship between a Euro area country default and the event of the euro breaking. The period characterized by high financial tensions registered widening of the quantum spread. In the years characterized by economic uncertainty, in Italy and Spain were recorded the highest peaks of this indicator.

The quantum spread can be interpreted as a "proxy for the marginal contribution that the default of that country would give to the breaking of the euro" (Minenna, 2016). Adding the probabilities implied in the quantum spreads for the major European economies, we obtain the figure below which shows the evolution of the 5-year euro breaking probability implied in the quantum spreads.



Figure 28: 5-year probability of the euro breaking up for Spain, Germany, Italy, France (2009-2014), Minenna, 2016

It has become impossible to consider the exit of a country from the Euro-area "as events characterised by a negligible probability. They have been admitted and examined by the official political, economic and monetary authorities of the Euro area" (Masera, 2019).



Figure 29: Premium for default and redenomination risks on Italian government bonds (credit default swaps; basis points; daily data; 5-day moving averages), Masera, 2019

4.3 Condition to exit the euro

If a member country exits the euro it would legally imply exit from the European Union. However, according to Dor (2011) the country in question could appeal to 44 and 46 articles of the Vienna Convention on the Law of Treaties, as not all the countries belonging to the Union adhere to the single currency, motivating that a change has occurred compared to the circumstances that existed when the treaty was signed. Article 50 of the Lisbon Treaty provides for an agreed exit of a country. If this decision is not agreed, this option remains valid after two years from the communication to the European Council of the desire to leave. In any case, as Cesaratto and Pivetti (2012) state the prolongation of the time to exit the Monetary Union would upset the financial system of the outgoing country so much that it would no longer be possible for the country to issue new currency and introduce controls on capital movements and on people according to the provisions of the European Treaties. From this observation, emerges the first necessary condition to minimize the costs of an exit from the single currency and at the same time also the biggest obstacle to face: a country's decision to leave the European Union must be "as quick as possible, and be taken in the most secret way possible" (Cesaratto and Pivetti , 2012).

There are further economic obstacles. In these cases, history can come in handy to some extent. From the Argentine financial crisis, the disappearance of the USSR or the division of Czechoslovakia only examples can be drawn, as "the degree of financial integration in the case of the euro is much greater, and therefore the macroeconomic effects of a country's exit from the euros are much more disruptive" (Schuiling, 2017). Furthermore, according to the country that should leave the European Union, the scenarios would change significantly. If it were Greece, it would have the public debt that can no longer be renamed in the new currency because it was not issued under its own legislation. The state should declare default. In the case of Italy's exit, however, due to the high public debt renamed in the old currency, the depreciation of the new currency on the value of these securities held by foreign investors would have significant wealth effects, and in this way probably heavy repercussions on the activity levels (Cesaratto and Pivetti, 2012).

Countries that register a surplus in the event of a breakdown of the single currency run the risk of losing their total balances. Those who would experience the biggest loss would be Germany and Holland: the loss for the former could increase to around 1000 billion euros while for the latter countries it could be around 20% of GDP, around 130 billion euros. (Schuiling, 2017) Different is the case in which a single country exits the euro. The country that leaves the agreements should pay the liabilities towards the ECB in euros, while the new currency they

use could suffer a strong depreciation. The bank of the outgoing country to fulfill the obligations would be forced to print a large quantity of money with the consequent devaluation of its own currency and the risk of default. If the outgoing country were unable to comply with its obligations towards the ECB, the remaining countries in the euro area would have no choice to "share their losses, in proportion to their share in the capital of the ECB" (Schuiling, 2017).

Cesaratto and Pivetti (2012) have analysed the measures that a state should carry out in order to minimize the costs of leaving the European Union. According to the economists, a country that decides to take this way must decree the payment of all operations in the new currency, allowing the use of the old currency in the transition phase in which it waits to print the new currency. Before the definitive printing of the new currency, it is useful to insert a limited number of tickets denominated in euro-new currency, and then allowing the conversion of the various currencies into the new one. In this transition period, logistical problems are faced such as machinery, parking spaces still operating with the old currency. Subsequently, "all reserves of the national banking system at the Central Bank are frozen and renamed to the new currency with a 1 to 1 exchange rate" (Cesaratto, Pivetti, 2012). At the same time, the loans granted by the ECB and the euro deposits of the country's residents with national banks are converted at the same exchange rate. To avoid the bank run and the spread of panic, the country must freeze the savings accounts of private individuals held in national banks. In order to avoid the default of the national banking system it is necessary to nationalize it. The NCB's capital and reserves held by the ECB are bought by the NCBs of the other countries in order to pay off the accumulated debts. Remaining payables denominated in euros must be repurchased and settled in other forms. The introduction of controls on capital movements will be necessary in order not to decrease too much the value of the currency. The country will have to grant NCB the ability to purchase government bonds on primary markets and direct state financing.

The advantages that derive from a possible exit from the single currency are mainly two. On the one hand, the outgoing country regains monetary sovereignty. It follows that the government regains possession of the coordination tools for fiscal and monetary policies. On the other hand, thanks to the depreciation of the exchange rate, the government can recover competitiveness vis-à-vis other countries while simultaneously reducing the trade deficit. However, this depreciation should not be excessive. Taking for example the case of Italy, the depreciation should not be less than that which occurred in 1992, equal to 40% of the lira compared to the German mark. The evidence for these claims is twofold. The first lies in the fact that the foreign trade deficit is such as to require a strong depreciation of the exchange rate but can be addressed by using import and industrial substitution policies. The second reason, on the other hand, lies in the need to limit excessive imported inflation "which leads to either a run-up in wage prices or, in its absence, a sharp drop in real wages, which is difficult to sustain" (Cesaratto, Pivetti, 2012).

4.4 Benefits and costs

The immediate benefit that a country would derive from the exit from the single currency would be the recovery of "monetary sovereignty" (Minenna, 2016). Thanks to the printing of money, inflation is created which decreases the debt / GDP ratio.

The figure below "deforms the geographical dimension of each country in proportion to the government debt / GDP ratio" (Minenna, 2016). The larger a country is represented the higher is the debt / GDP ratio of that country in 2014.



Figure 30: Amount of government debt in relation to GDP (data 2014), Minenna, 2016

Since public debt is for the most part subject to the national law of the issuing country, there is the possibility of renaming and consequently devaluing a greater part of debt. It follows that the countries with the greatest incentive to exit the single currency are Italy and Spain. Following it is reported the portion of debt that does not fall under national jurisdiction and therefore unable to be renamed and not subject to devaluation. Indeed, "the debtor would suffer an increase in the weight of the debt because he was forced to repay a currency stronger than that of his country" (Minenna, 2016).

The figure below shows the breakdown of public debt for European countries (date 2017). It is reported the percentage of debt that falls under a foreign jurisdiction in relation to the total debt. The higher this percentage is the lower the benefits of a possible exit from the single currency.



Figure 31: General government gross debt by sector of debt holder, Eurostat, 2017

The other advantages deriving from exit the single currency are anchored by the adoption of Collective Action Clauses (CAC). The CACs are "clauses included in the underwriting contracts for bonds that allow the issuer to restructure the debt with the consent of a qualified majority of bondholders" (Minenna, 2016). The implications of the clauses are that in the event of a country exit the single currency "this country does not have the possibility of independently converting public debt into a new currency" (Minenna, 2016) and to benefit from a possible devaluation. Since 2013, there has been a progressive decrease in the possibility of issuing public debt without the presence of common CACs for Eurozone countries. In 2013, there was the possibility of issuing 45% of the public debt without the presence of the clauses. To date, only 25% of the public debt may not have the clauses, while from 2023 onwards it will be possible only for 5% of the debt not to have entered these conditions. The result is the cancellation of the benefits deriving from the renaming of the debt for a member state of the European Union to abandon the single currency.

According to ISDA (International Swaps and Derivates Association) regulations, the renaming of debt in a new currency represents a technical default and this would lead to limitations on access to capital markets. Therefore, the country that is least dependent on the need for funding is the one that has the greatest incentives for a possible abandonment of the single currency. Greece, Spain and Portugal would find difficulty to access the capital markets having to tackle the monetization of the deficit with the consequent strong inflation.

As mentioned, a possible exit from the single currency would implies a devaluation of the new currency adopted by the outgoing country with respect to the single currency. The consequences of a devaluation, in addition to the renaming of debts, are also the increase in exports due to the reduction of their relative price. So "the more export-oriented an economy is the more it will benefit from a devaluation" (Minenna, 2016). Conversely, imports are more expensive in the event of a devaluation because their relative price increases. So the more an economy tends to be dependent on imports the lower is the convenience of a devaluation due to the release of the single currency.



Figure 32: import / GDP ratio for European countries, 2017

In general for the peripheral countries of the euro area, imports weigh more than exports. The case of Italy is a bit to the limit: the country has always been oriented towards export and would absorb the blow deriving from the reduction in export costs. However, Italy is at the mercy of rising raw material prices, especially oil.

4.5 A possible solution

The spread that manifests the divergence in government bond yields has created an ever-wider gap in the conditions of public finances of the various states belonging to the Eurozone. Since the crisis arose, core countries have been able to "refinance their debt under increasingly advantageous conditions" (Minenna, 2016) by reducing public debt. Peripheral euro area countries have always had to fight the spread. Since the crisis began in 2009 until 2014, there has been a reduction of around \in 15 billion in annual interest expenditure on Germany's debt. At the same time, the differential between Italy and Germany increased almost 5 times.



Figure 33: Public debt and interest charges: comparison between Italy and Germany, Minenna, 2016

The high financialisation degree of the economy resulted in the economic crisis spreading like a fire, both because of the alteration in the conditions of relative competitiveness of the various countries and because of the severe fiscal policies focused on austerities that have depressed domestic demand. Recently there has been a normalization of spreads in peripheral countries due to the numerous extraordinary operations implemented by the ECB. The last operations was Quantitative Easing that had the purpose to act as a "caps" (Minenna, 2016) on spread. The ECB must therefore monitor the economic and financial conditions that could lead to an explosion in the spread, to the disintegration of the single curve of interest rates, to the misalignment of the economic cycles of the various countries belonging to the euro area. According to Minenna (2016), a change of objectives pursued by the ECB is urgently needed. If ECB haS so far pursued the goal of keeping inflation under control it should now focus on "zeroing spreads on a systematic basis" (Minenna, 2016). A reform of the ECB that aims at the zero-spread target would give a strong signal to the markets that "for the Eurozone countries the dissolution of the single currency is absolutely inadmissible and the common intent is to achieve for the euro the paradigm typical of each single currency area: a currency, a single interest rate curve " (Minenna, 2016).

According to the Minenna, in order to pursue the zeroing of the spreads ECB should cancel the interest on government securities purchased by the same central body. A second step would be to conduct an operation such as Quantitative Easing characterized by "full risk sharing. The goal of the operation is to decisively outline the European public debt maturities" (Minenna, 2016) and reduce interest expenditure. This program should provide for the purchase of government securities guaranteeing "the refinancing of its public debt through the replacement of short-term bonds on their maturity with long-term bonds that are not interest-bearing" (Minenna, 2016). To convince even the most averse countries to mutualize sovereign risks, each country would benefit from the program by using GDP as a measuring meter for the public debt. In this way the stronger countries would benefit more than the peripheral ones.



Figure 34: Subdivision of the Program among EU member countries, Minenna, 2016

The duration of the program should be around four years depending on "the size of GDP and the long-term structure of public debt" (Minenna, 2016).



Figure 35: Duration and extension of the Program for the main Eurozone countries, Minenna, 2016

The main advantage of this program lies in the "reduction of spread pressures from the secondary market" (Minenna, 2016). The program does not change the size of the debt but proposes a re-profiling of the maturities, so each country could finance its debt with long-term bonds purchased by the ECB.

Consequently, a significant percentage of the public debt would be entered in the ECB balance sheet for a long period without requiring interest payments. To encourage the adoption of a single interest rate curve, the ECB could intervene in a very pervasive way by carrying out a "partial monetization, cancelling part of the securities in its possession" (Minenna, 2016). This would lead to a decrease in government debt. An advantage that would result from this action would be the permanent increase in the monetary base, which would lead to a recovery in production, in public and private investments. In addition, given that the debt purchased by the ECB does not produce interest, this would implicate a reduction in interest expenditure for countries belonging to the single currency. As required by Article 105 of the Treaty establishing the European Community and Article 3 of the Statute of the European System of Central Banks and of the European Central Bank, the task of the ECB is to provide, guarantee and oversee the operation of payment and settlement systems in the euro area. All of this was possible thanks to the Target 2 system. The growth of the Bundesbank's balance sheet with persistent claims under Target 2 highlights a double aspect. On the one hand, emerge "the technical features of the euro area financial structure and the APP implementation" (ECB, 2017). On the other hand, it is highlighted the reluctance of the German private sector to direct funds the periphery. The intent of the program put in place by the ECB was that national banks would relaunch the weight of government bonds in their assets and thereby breaking the pathological link that had formed between banks and governments. However, the money injected into the system through the extraordinary operations conducted by the ECB was absorbed and deposited in the accounts of the countries enjoying the highest rate. The creation of Target 2 imbalances are currently reflecting an uneven distribution of liquidity created by Quantitative Easing across the euro area.

Core countries do not consider tolerable ECB support to peripheral countries that are not implementing austerity measures. "In a viable monetary union including sizeable fiscal transfer mechanisms, external trade imbalances could find a financial compensation and, therefore, a Balance of Payment crisis avoided" (Febrero, Uxò, Bermejo, 2018). However, this thought remains impossible to implement as Germany "fully rejects the abandonment of her neo mercantilist model and the public opinion in the core countries does not welcome solidarity measures for the periphery" (Febrero, Uxò, Bermejo, 2018).

CONCLUSION HOW TARGET IMBALANCES REVEAL QE AND EUROSYSTEM FRAGMENTATION

The project for the creation of the single currency was based on a strong political motivation, which can be summarized in the need to complete integration through the creation of a European state. At the time, however, there were not yet all the economically conditions to give way to a complete monetary union. Alongside the component of monetary policies managed by an independent central bank it was necessary the fiscal component to make stable and irreversible the choice of a monetary union. Especially it was necessary a centralized balance sheet capable of sharing risks at a European level and ensure a gradual convergence between the income conditions between central and peripheral Eurozone countries.

Global crisis spreading from the USA infected Europe as a debt crisis and it was tackled with austerity policies by the countries of the Euro group. These policies have translated into an increase in the differences between creditor and debtor countries of the Eurozone. Once the recession caused by this debt crisis has been overcome, thanks in particular to the extraordinary operations conducted by the ECB, the remedies put in place in the meantime to strengthen the Eurozone's structures are still not sufficient to guarantee its survival.

The EMU appears today an unsustainable equilibrium. Mosler (2001) warned from the beginning that individual EMU nations would not be able to deal with a financial crisis because of the setup of the currency union.

By accepting junk bonds as collateral, the Eurosystem anticipated the establishment of the ESM creating a "gigantic liability union, and violated the principle of good central bank policy, according to which monetary policy should not have redistributive effects and is to be sharply separated from fiscal policy" (Homburg, 2012).

The growth and evolution of the spread proves that competition in the Eurozone is "insane": "how can you compete on equal terms if the cost of money is different and the exchange rate is fixed?" (Minenna, 2019). Walters predicted that euro would be vulnerable to large gaps between member countries and pro-cyclical deflationary dynamics at national level. The introduction of the single currency which, however, proceeds economically and physically at different speeds, amplifies the original imbalances between the core and peripheral countries. Instead of favouring a true union tends to create an even more fragmented area.

The same Quantitative Easing mechanism adopted by the ECB as a monetary stimulus to defeat deflation "reiterated that the euro area members still have to do their part as if they were still in their own currencies. In fact, NCBs are called to take on risks to the extent of 80%" (Rinaldi,

2015). Formally, we have the same currency but then we have witnessed a coexistence of interest rates that range in such a wide range that each member country in the euro area has been catalogued differently. In short, the whole system on which the euro is based has proved to be a masked fixed exchange rate agreement. Rinaldi (2015) says that the euro is not a currency but only a fixed exchange rate agreement. Therefore, the problem of the single currency is that it is a partial monetary and institutional unification based on wrong lines: "building a stateless currency union was certainly the euro's original sin" (Cesaratto, 2015). This paper analyses the implications of a continued divergence of Target 2 balances in the euro area. The accumulation of Target 2 claims (liabilities) would make the ECB's liquidity management asymmetric once the Target 2 claims in core countries have crowded out central bank credit in those regions.

A stylized NCB balance sheet shows how monetary policy items characterize the left side of the balance sheet. On the other hand, autonomous factors unrelated to monetary policy, required reserves and excess liquidity are recorded on the liabilities side. The first and second elements of the right side of the balance sheet represent the liquidity needs of domestic banking system. Reserves are indispensable to allow banks to cover their aggregate liquidity needs. The result is a close link between monetary policy operations, the financial needs of the banking system and the Target 2 balances. A claim arise on the left side of the balance sheet when a monetary policy operation is implemented and remain registered until their maturity. On the other hand, the reserves created by one NCB can flow to another via cross-border payments in Target 2. In in this case there is no correspondence between the reserves held by an NCB and the reserves created by this NCB, so an element is needed to balance this imbalance. Although initially credit operations do not affect Target balance, they then have an impact on this, if and when the corresponding reserves are used to make cross-border payments in Target 2 by the borrowing bank.

In order to combat the crisis triggered by the collapse of the Lehman Brothers, Eurosystem has loosened control over the quantity in its regular provision through the introduction of fixed rate full allotment tender. Initially the operations undertaken did not include cross border payment and therefore had no impact on the Target. However, demand for Eurosystem refinancing was fully accommodated subject to collateral availability which allowed significant growth in excess liquidity. As a result, excess liquidity started to emerge as banks' aggregate demand for reserves exceeded the liquidity needs of the system. In the past, the absence of large amounts of excess liquidity excluded the possibility of significant growth in Target balances.

The current main driver of the expansion in the Eurosystem balance sheet and consequently in the level of excess liquidity (which underlies the increase in Target balances) is the APP.

The execution of the APP had a direct impact on the Target balances as it gives rise to substantial cross-border flows of reserves during the settlement process, when securities are exchanged for payment.

The financial structure on which the euro is built has had an impact on the evolution of the Target imbalances: cross-border payments are an inherent feature of decentralised APP implementation in an integrated market. The operations may outlaw the national borders with the consequence that the assets bought by the NCBs are located in other jurisdictions. It follows that if the central banks purchase from non-domestic counterparties, regardless of whether they are located in the euro area or not, it gives rise cross border payment during APP implementation. According to ECB data, almost 80 % of APP purchases by volume have been from non-domestic counterparties while around 50% of APP purchases by volume have been from counterparties that are resident outside the euro area, especially concentrated in the United Kingdom. The banks located in the Eurozone countries participate in Target 2 through their local NCB, while the banks positioned outside the euro area access Target 2 via a branch or subsidiary in the euro area or via a correspondent bank. In particular, England has always had access to Target 2 especially through the Deutsche Bundesbank or through the NCBs of the Netherlands. Both countries have always been seen "as less vulnerable". Target balances increased as this liquidity subsequently flowed from vulnerable to less-vulnerable countries in the context of severe market stress.

Without the operations conducted by the ECB, the total Target balance would be at a much lower level. There is a parallel trend in the rise of total Target and the upward path implied by cross-border payments for APP transactions. This shows that other financial flows did not further increase the balance after the implementation of the operations conducted by ECB.

Total purchases exceeded 1300 billion and this had a reflection on its balance sheet, which exploded. However, this liquidity was used by the NCBs to repay their debt exposures with Germany and core countries for around 120 billion. If there had not been the possibility to lean on Target 2 the peripheral countries banks would have had a strong liquidity crisis that could have culminated in a crisis of solvency.

However, the banking system cannot forever count on central bank money as the main funding source. The lack of inflows of foreign private funds cannot forever be replaced with Target 2 liabilities by peripheral countries belonging to the euro area. These countries must implement policies to return to private markets and restore the attractiveness of their funds. To do this, it

is necessary to rebuild investor confidence in both the banking sector and in the sustainability of public finance.

Particularly, to the extent that Target 2 imbalances reflect investors' mistrust, the implementation of monetary measures where the ECB would be directly involved could lead banks to reinvest in the periphery. A reflow of foreign funds into the government bond markets, particularly in the periphery, would help reduce Target 2 imbalances. The instability of the Target 2 balance is strongly due to the large accumulation of German current account balances. Hope is that Target 2 balances do not infinitely diverge. To achieve this goal the euro area interbank money market would need to be fully restored to improve the liquidity allocation process. With the stabilization policies that are in place it is not easy to achieve this goal. It is necessary that policy makers speed up the restructuring process in many European banking sectors to meet the fiscal consolidation targets and regain the trust of financial markets.

The extraordinary actions carried out by the ECB did not and could not have the purpose of adjust external imbalances. The goal was to gain time so economic policy could find a solution for these imbalances. However, economic policy has acted in the unilateral direction consisting in the imposition of restrictive measures on peripheral countries" (Cesaratto, 2015).

"A fully fledged federal union, which would likely please peripheral Europe, is impracticable since it implies a degree of fiscal solidarity that does not exist" (Cesaratto, 2016). The debt crisis that hit the euro area could have been the vehicle and the impetus to achieve unity that at the time of the introduction of the single currency was missing. However, as Friedman said "a monetary unit imposed under unfavourable conditions will prove to be a barrier to achieving political unity". To conclude, the solution to the recession phase that hits various peripheral countries is not leaving the single currency. One thing is to get out of a national currency to enter a supranational currency. Another thing is to step out of a supranational currency into a national currency. "Whoever does it lose the future without regaining its past" (Tremonti, 2019). The solution is to take up the challenges that the economy is launching to create a true integrated area in which all member countries together seek to reform the gaps that characterize the euro area and that the single currency is not just a facade. Europe cannot be built on the fear of a breakup, but instead on the prospects for a mutually beneficial cooperation.
Bibliography

ABAD J., LOFFLER A., ZEMANEK H., 2011. Target 2: monetary policy implications of asymmetric liquidity management within the euro area. MPRA paper no. 31937

BINDSEIL U., KONIG P.J., 2011. The economics of TARGET2 BALANCES. SFB 649 discussion paper 2011-035, pp.1-28

BINDSEIL U., KONIG P., COUR-THIMANN P., 2012. Target 2 and cross-border interbank payments during the financial crisis, CESifo Forum, ISSN 2190-717X, ifo Institut - Leibniz-Institut für Wirtschaftsforschung an der Universität München, München, Vol. 13, Iss. Special Issue, pp. 83-92

BLANKART C.B., 2012. The Euro in 2084, CESifo Forum, ISSN 2190-717X, ifo Institut - Leibniz-Institut für Wirtschaftsforschung an der Universität München, München, Vol. 13, Iss. Special Issue, pp. 23-28.

BUITER W.H., MICHELS J., RAHBARI E., 2011. The implications of intra-euro area imbalances in credit flows. POLICY INSIGHT No.57, CEPR, pp.1-14

CECIONI M., FERRERO G., 2012. Determinants of TARGET2 imbalances. Questioni di Economia e Finanza, no.136 Banca d'Italia, September pp. 5-24

CESARATTO S., 2016. "Alternative interpretations of a stateless currency crisis," Department of Economics University of Siena 736, Department of Economics, University of Siena

CESARATTO S., L'organetto di Draghi. Terza Lezione: LTRO, Target 2, OMT (2011-2012). Economia e Politica.

CESARATTO S., L'organetto di Draghi. Quarta Lezione: forward guidance e quantitative easing (2013-2015). Economia e Politica

CESARATTO S., PIVETTI M., 2012. Oltre l'austerità [www.micromega.net]

ECB, 2013. Target balances and monetary policy operations, Monthly Bulletin, May

FEBRERO E., UXO' J., BERMEJO F., 2018. The financial crisis in the Eurozone: a balanceof-payments crisis with a single currency? Review of Keynesian Economics, Vol. 6, pp. 221-239

GIAVAZZI F., SPAVENTA L., 2010. Why the current account may matter in a monetary union: lessons from the financial crisis in the euro area. Working Papers 426, IGIER (Innocenzo Gasparini Institute for Economic Research), Bocconi University.

HOMBURG S., 2012. Note on Target 2 dispute. CESifo Forum, ifo Institute - Leibniz Institute for Economic Research at the University of Munich, vol. 13(1), pages 50-54

JOBST C., HANDIG M., HOLZFEIND R., 2013. Understanding TARGET2: The Eurosystem's Euro Payment System from an Economic and Balance Sheet

Perspective. Monetary Policy & the Economy, Oesterreichische Nationalbank (Austrian Central Bank), issue 1, pages 81-91.

KOKKOLA T., 2010. The payment system, European Central Bank (Chapter 8 e 11)

MACCHIARELLI C., KOUTROUMPIS P., 2016. The current state of financial (dis)integration in the euro area: in-depth analysis. IP/A/ECON/2016-03, PE 587.314. European Parliament, Policy Department A: Economic and Scientific Policy, Brussels, Belgium MAYER T, MOBERT J., WEISTROFFER C., 2012. Macroeconomic imbalances in EMU and the Eurosystem. CESifo Forum, ISSN 2190-717X, ifo Institut - Leibniz-Institut für Wirtschaftsforschung an der Universität München, München, Vol. 13, Iss. Special Issue, pp. 35-42

MASERA R., 2019. EMU: An Italian perspective. PSL Quarterly Review, 72 (288): 27-40 MERLER S., PISANI-FERRY J., 2012. Sudden stops in the euro area. Bruegel policy contribution, vol.3

MINENNA M., 2019. Sovereign spreads and the frailty of the Eurozone. Social Europe MINENNA M., 17/11/2019. Le banche e quel Boom di liquidità. Il sole 24 ore

MINENNA M., BOI M., VERZELLA P., 2016. "La moneta incompiuta: il futuro dell'euro e le sue soluzioni", Ediesse, Roma (RO)

MINENNA M., DOSI G., ROVENTINI A., 2018. ECB monetary expansion and euro area Target 2 imbalances: a balance-of-payment-based decomposition. European Journal of Economics and Economic Policies; Interventions, Vol. 15, pp.147-159

SCHUILING A., 2017 Eurozone Watch – Target2 balances a ticking time bomb?, Eurozone Watch Insights, 2017/05

SINN H.W., 2012. 'The European balance-of-payment crisis'. ISSN 2190-717X, ifo Institut -Leibniz-Institut für Wirtschaftsforschung an der Universität München, München, Vol. 13, Iss. Special Issue

TERZI A., 2019. The rise of national central bank's Target balances in the euro area: a comment. European Journal of Economics and Economic Policies; Interventions, Vol. 16, pp.161-168