

**Valerio Zoccante**

# Analysis on the trade imbalances within the European Union

**Master's Thesis**

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# **ANALYSIS ON THE TRADE IMBALANCES WITHIN THE EUROPEAN UNION**

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Master thesis at the University of Southern Denmark

## SUMMARY

The aim of this work is to assess the factors that have been affecting the imbalances of trade within countries of the European Union. The analysis takes into consideration the elements that could affect the balance of trade, thus saving or investment. The variables that are included in the panel data framework are related to productivity, inflation, consumption, wage level, capital movements, demography of the population, economic growth, public and private debt levels. A panel data, that leaves out countries from East Europe, is created, and takes values that go from 2002 to 2013.

The panel data shows that technology gaps and capital movements have been the main factors that affected the balance of trade of the peripheral countries. Peripheral countries did not invest enough in projects that could enhance the productivity, leading to a competitiveness loss that was not followed by a correction of the wage levels. Moreover, capital movements have been financing consumption surges in Greece and Portugal, whereas in Spain and Ireland those capitals have fueled credit booms and house bubbles. Therefore, those countries have been experiencing a worsening of their balance of trade, and investors have not been willed anymore to finance additional debt. Indeed, Members of the euroarea could not guarantee that the central bank could play the role of lender of last resort. Knowing that, in a currency union, the external position of a country represents its capacity of producing goods and services that could serve the debt in a troubled time, in the eyes of the investors the balances of trade of the peripheral eurozone countries became relevant during the European sovereign debt crisis.

In relation to the Maastricht treaty, there is not a surveillance system, in the euro area, of the factors that could still affect deeply the balance of trade, e.g. productivity, credit boom, asset prices, inflation and wage levels. In the euro area, it is important that countries coordinate their policies in order to decrease the cost of implementing a currency union. Economic policies that could be not aimed to affect the balance of trade but other economic variables, when they affect the level of saving or investment, they are, however, going to affect the external trade position. Moreover, not only the country that is implementing a new economic policy is going to be affected, but also

the balances of trade of the partner countries are going to be influenced, since the sum of all the balances of trade in the world must be equal to zero.

In the European framework, in order to decrease the imbalances of trade within the Members, fiscal transfers to peripheral countries could be beneficial for decreasing the cost that peripheral countries need to undergo during the adjustment period, whereas reforms that aim to enhance productivity in the peripheral countries and increase the mobility and the flexibility of the product and labor markets could be highly helpful. The following work highlights all those elements in a empirical framework, relating, however, the results to the literature that has been developed around the European case and the optimum currency area.

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# 1 INTRODUCTION

In 2009, the GDP of the European Union decreased, in percentage terms, 4,4%, while the young unemployment rate increased from 14,1% to 18,3%, and nowadays it is around 20,2% (Eurostat<sup>1</sup>). On the other hand, the respondents to the Eurobarometer<sup>2</sup> survey that believe that the European Union is an useful institution decreased, on average, from 48% to 40% in 2009, and it reached the lowest level in 2012, when it was established around 30%. The European election in 2014 has confirmed this trend, indeed political parties disapproving the European Union have increased their participation in the European parliament.

This data clearly shows how the economic crisis in 2009 had a negative impact overall in all the European Union. The crisis reduced not only the employment rate, but dramatically increased the difficulties for young people to enter in the labor market. The public opinion reacted badly to the inability of the European policy makers of implementing policies that would have boosted the growth, and peripheral countries, like Greece, Spain, Portugal, Italy, Ireland suffered the highest cost of the crisis. Overall, the economic crisis have been raising contrasts between the Member States, disturbing the peace and integration process started in Europe in the 1952.

The public debate about the economic crisis was based on cultural and financial aspects. For instance, some observers pointed out how prodigals are the Greek citizen, and how German citizen are hard working and money savers. This kind of cultural debate totally misses the economic factors in role during the European unification, and it exacerbates the tensions between the European Members. About the financial aspects, criticism hinges on the creation of the common currency, the over liberalization of the banking system, and other related observations.

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<sup>1</sup> The Eurostat is the statistical office of the European Union. Its task is to provide the European Union with statistics at European level that enable comparisons between countries and regions (<http://ec.europa.eu/eurostat/data/database>)

<sup>2</sup> The Eurobarometer is a survey that measures, annually, the evolution of the public opinion about the European Union in the Member countries. The survey is run by the European Commission, and it helps to develop better policies in favor of the European citizen ([http://ec.europa.eu/public\\_opinion/index\\_en.htm](http://ec.europa.eu/public_opinion/index_en.htm))

Once the sharp financial reaction occurs, institutional deficiencies will be evident. Thus, after a crisis, it will be always be possible to construct plausible arguments – by emphasizing the trigger events or institutional flaws – that accidents, mistakes, or easily correctible shortcomings were responsible for the disaster. (Minsky, 1982)

Therefore, it is important to analyze the European crisis in a deeper level, without referring to cultural arguments or populist propaganda. At a first glance, an observer could argue that the crisis occurred because the peripheral countries of Europe continuously increased their public debt over the GDP, and, at certain point, the financial agents could not be confident anymore about the solvency of those countries. Hence, as a classic sovereign debt crisis, the cost for refinancing the public debt increased to unsustainable levels, various governments tried to raise the level of taxes in order to decrease the external deficit, consumption and investments lowered, leading to a recession that made even worse the weight of the public debt over the GDP. This is the typical succession of events during a sovereign debt crisis, and that occurred also in Europe, where countries as Greece had to renegotiate their debt with the creditors, and other Members from European Union, the International Monetary Fund and the European Central Bank had to try, through loans and other instruments, to rescue Greece from bankruptcy.

Triggered by the downgrading of rating agencies, risk premium demanded by holders of public debt have increased. The ten-year sovereign yield spread for bonds issued by surplus and deficit countries widened up to 250 base points. Costs of risk insurance have risen from 3 to 10 percent for Greek government bonds over the course of 2010, as measured by credit default swaps. The euro area members as well as the IMF stepped in as a lender of last resort to ensure further access to credit, conditional on the implementation of austerity reforms to consolidate the public budget. To avoid contagion to other countries and additional distortions in the transmission of the common monetary policy, the ECB started to purchase government bonds of the debtor countries. (Belke and Dreger, 2011)

Two main questions arise from the European economic crisis, that are going to be the main topics of this essay. First, an observer could argue that governments of the peripheral countries have guiltily increased their debt over reasonable levels, taking advantage of the over confidence of the financial investors after the creation of the common currency. Those countries could not, after the introduction of the euro, devalue their own currencies against the German currency for correcting structural unbalances, therefore a sovereign debt crisis was unavoidable. Is this one the only reason for the European financial crisis? The aim of this essay is to try to show that the economic crisis was developed not only by prodigal attitudes of Southern European governments, but there could be other reasons about the spreading of the financial crisis in Europe. In the Europe Union there have been in place persistent pair to pair trade imbalances between peripheral European countries and Germany. Overall Germany experienced extremely positive balance of trade versus negative balances of trade in co respective countries as Greece, Spain, Italy and Portugal. Intuitively, a negative balance of trade means that a country is importing capital, however those movements of capital could be a natural consequence of under consumption policies implemented in Germany aiming to increase saving in order to have a positive balance of trade and low unemployment. If Southern European countries had to absorb excessive saving from Germany, the deficit of those countries, the house bubble in Spain and the over consumption in Greece can also be a natural consequence of excessive saving in Germany that decreased the interest rates paid by peripheral countries, and not only a prodigal attitude of Southern European governments. Symmetrically, the importing of foreigner demand of goods can explain the extreme low unemployment rate in Germany (Pettis, 2014). Moreover, capital movements and related imbalances could have been caused by private market dynamics, and not prodigals attitudes of governments, for instance a surge in the credit delivered to the housing sector, as it happened in Spain and Ireland.

A second question could arise about the management of the financial crisis in Europe. It can be argued that the European Union has not implemented the best policies in order to reverse the economic growth from negative to positive. The Maastricht treaty did not work in the way policy makers were expecting, structural imbalances have

been persistent in the euroarea before the European sovereign debt crisis. Thereby, after a careful analysis of the imbalances of trade, new policy suggestions can be arisen.

Therefore this essay tries to explore these claims, and it develops as follow. The next section introduces the trend of the balance of trade within the European Members, together with some policy implications. After that, the third section describes the relevant literature to this topic. The fourth section develops some theoretical implications that are tested in an empirical framework. The fifth section describes some policy suggestions and the sixth concludes.

## **2 THE BALANCE OF TRADE BETWEEN MEMBERS OF THE EUROPEAN UNION**

### **2.1 PROBLEMS WITH THE MANAGEMENT OF THE EUROPEAN INTEGRATION**

The European integration has forced the participating countries to open completely their market to other members of the European Union (EU). In other words, it has been established free movement of people, capital and goods. Strict regulations have been applied in order to create a common market of goods. For instance, a common regulatory technical framework has been imposed for the production of goods in Europe, and every country has to follow those rules. In other words, every product needs to be manufactured following the guideline imposed by the European regulations. Therefore, at the border the authorities cannot stop anymore goods that come from another Member of the EU in order to check if those products have been manufactured following the right norms on safety. This imposition has been increasing considerably the speed of trade exchanges between countries in the EU. On the other hand, strict regulations have been introduced in order to avoid that firms could be subsidized or protected, directly or indirectly, by governments. Thus, every firm in the EU is competing against each other on the same level, without taking advantage of any kind of external help or “soft regulation”. The creation of a common currency for several countries participating in the EU has further boosted the integration process, removing the risk of exchange rate movements for firms that export abroad.

However, the integration process has introduced many challenges to the management of the European integration. First of all, an integrated market of capital could boost expectations, that maybe cannot be realized, about the potential economic growth of Members of the EU. For instance, a country that has a low GDP per capita, or with a lower endowment of capital, could attract a lot of resources, since investors could expect that this country will catch up with the richest countries of EU (Blanchard and Giavazzi, 2002). Therefore, an expectation of a greater return on investments in a peripheral country of Europe could simply be fueled by an over estimation of its future prospects. Without any kind of protection or regulation about the movements of

capital, those expectations could be harmful for a poorer or prodigal country (Siena, 2014).

Those movements of capital could, therefore, fuel structural unbalances for a long period of time. For instance, if a country like Greece has a chronic negative balance of trade, and a competitiveness gap with countries as Austria, Germany or Netherland, those speculative transfers of resources could finance for a long period of time a negative balance of trade or external deficits. Thereby, the cost for rebalancing could be much higher afterwards, when suddenly the crisis occurs, and capital flies away. Indeed, it is not possible anymore, after the introduction of the euro, for countries as Greece, Portugal or Spain to devaluate their own currency against the countries that have a positive balance of trade.

The creation of a common currency generated another problem that is important to highlight. Before the sovereign debt crisis, peripheral countries necessitated a different interest rate from the one established by the European Central Bank, in particular much higher. Nechio (2011) shows that applying the Taylor rule for monetary policy, the European Central Bank was trying to apply an interest rate that fits the EU as a whole. However, an independent monetary policy for every country of EU could have slowed down the worsening of structural unbalances between European Members<sup>3</sup>. After the crisis occurred, the same problem is proposed again, but in the opposite direction.

Peripheral countries, for gaining again competitiveness, they need an inflation level that is lower than the German growth of consumer prices. Their products would, therefore, become cheaper every year compared to the German ones, and a little bit of competitiveness would be recovered. However, the inflation in countries as Germany is already low, because of prudential macroeconomics policies, with restraints on consumption and wages growth, in order to maintain a positive balance of trade and low unemployment (Zemanek, Belke and Schnabl, 2010). Without a reversal of the balance of trade between peripheral and central countries, and with those policies in place that highlight a lack of coordination within European Members, the crisis can be prolonged and achieve a new negative equilibrium, where all countries implement

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<sup>3</sup> For instance, an higher interest rate in Spain would have reduced the credit boom that fueled the consumption and the house bubble.

recessive policies on consumption and investments in order to achieve a positive balance of trade within each other (Pettis, 2013).

In order to reverse the balance of trade, the peripheral countries could, in correlation with competitiveness gains, implement policies for wage austerity, however it is well known that workers are not willing to decrease their salaries, at least the ones that already have a job. Those labor market rigidities have a double bad effect: an increase of the unemployment rate, especially among people that do not have a job yet, therefore a relevant increase in the rate of unemployment among young people, and the prolongation of the structural trade imbalances between Members of the EU. On the other hand, a labor market that is not flexible could slow down the speed which workers can be reallocated from sectors that are suffering the international competition to sectors that are at the top of the competitiveness in the international market. Higher social protections for unemployed could also reduce the level of labor mobility across sectors. Those rigidities can increase the unemployment level in one country, but can also make more onerous the adjustment of the balance of trade in countries that suffer a gap of competitiveness.

Another feature that has been usually underestimated about the creation of the common market in the EU is the effect that this one had on firms that are based outside the EU. Intuitively, a firm that is based outside EU should afford every time the custom duty to EU. However, after the establishment of a common market, foreigner firms typically located a subsidiary in one Member of the EU, and from there they can serve all the European market without paying any kind of custom duty. Those firms usually have been locating in one country where is very cheap to invest, for instance where the taxes on earnings are low, or where the labor is cheap, or where the labor is high qualified. From this country they usually export in all over the EU, therefore this feature could worsen the imbalances of trade between European Members, especially when countries implement specific policies for attracting foreign direct investment.

Another relevant problem is the mobility of labor among European countries. Since European countries speak different languages, there is not a mobile labor market, therefore workers from poorer countries with high level of unemployment don't move sufficiently to the richer countries with higher level of employment. Thus, the

readjustment of the imbalances of trade is slowed down, and, more importantly, the factor price equalization process is delayed, or even interrupted, and unemployment persists in peripheral countries. A desirable solution, that cannot be applied in Europe, since EU is not a political union, would be the implementation of fiscal transfers to countries that suffer, simultaneously, high level of unemployment, fiscal deficit and negative balances of trade, from the ones that don't face an economic crisis.

## **2.2 TRADE IMBALANCES**

The main problem, however, in the European framework is the persistent combination of imbalances of trade between European Members. A continuous combination of imbalance of trade can affect, negatively, the unemployment rate and the debt level. First of all, in a currency union where the labor mobility is very low, therefore workers don't move in countries where the employment rate is higher, a country that is always importing more than exporting could suffer of high unemployment rates. This is a natural consequence because the rate of the internal demand of that specific country that is requesting foreigner products is too high. This could be related to price decisions, or quality decisions, if products from abroad have higher contents of technology. Buying from abroad means that local firms have not enough orders, in the case exports are not adequate, therefore they are forced to employ fewer local workers<sup>4</sup>.

On the other hand, a persistent negative balance of trade means that the country is importing capital from abroad, leading to a massive accumulation of foreign debt, thereby raising concerns into its creditworthiness. Those capitals could fuel the debt level, however, for repaying them, the governments need to reverse the balance of trade, or they necessitate to use those capitals in investments that will give higher returns than the cost for refinancing the debt. Overall, if those investments give higher returns, it follows that the GDP will grow<sup>5</sup>, reducing the real debt. Nevertheless, the main focus is about the balance of trade, indeed when the income of the residents is increasing, it also follows that a part of the additional income will be saved. On the

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<sup>4</sup> However, that has not to be always the case, especially when the domestic demand is already adequate, and the trade deficit is just temporary and it is used for borrowing resources that are going to increase the productivity, therefore improving the balance of trade of that country.

<sup>5</sup> Assuming, however, that other components of the GDP, as consumption, remain constant or don't decrease.

other hand, if the consumption is remaining constant, it follows that the additional production is being exported abroad. Overall, every of those effects increases the level of saving, and if investments don't continuously increase more than savings, it means that a certain point the balance of trade has to improve<sup>6</sup>. From a competitiveness approach, higher returns could be a consequence of an increase in productivity that improves the international competitiveness of local firms, for instance they can produce the same goods at a lower cost, thus improving the balance of trade.

However, in the peripheral countries, those capitals have mainly boost the consumption, therefore they have not been using for projects with higher returns. Peripheral countries did not improve their productivity or increase the return on investments. There has been some growth of the GDP, but that was only a consequence of higher consumption levels pulled by the net import of capitals (Greece and Portugal) or house bubbles (Spain and Ireland). Therefore, without improvements on the returns of the investments, there cannot be a reversal of the trade imbalances, hence it is problematic to repay the debt. Moreover, there has not been, in the EU, the so called "cold shower" effect when the common market has been established (Pelkmans, 2006). Observers indeed expected that countries with a productivity gap, after the removal of the custom duty, would have improved their productivities and converged to the richest countries. This should have been the case because firms that were still competitive in the internal market against foreigner firms due to the custom duty, after its removal they would have been crowded out from the market. A more competitive market, therefore, would have forced less productive firms to leave the market<sup>7</sup>, or to improve their productivities for being still competitive against foreigner firms (cold shower effect). This mechanism has not properly worked in Europe, and poorer countries have delayed the structural reforms as well, and no process of convergence in competitiveness has been observed. Moreover, peripheral countries export products with high content of labor, instead of technology, therefore over the

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<sup>6</sup> It is important to remind, at this point, that the balance of trade is simply the difference between saving and investment. Therefore, every factor that affects saving and/or investment is also automatically affecting the balance of trade.

<sup>7</sup> In order to increase the productivity of one country, it is already a sufficient condition that the last productive firms leave the market, since the average of the productivities of the remaining firms is going to be higher.

time they lost competitiveness against countries that export products to EU and have a cheaper labor market, for instance China.

Most likely the over confidence of the investors, that believed that this process would have taken place, has delayed the need for those countries of catching up with the richest countries of the EU. Reforms and investments on innovation that could have boosted productivity have been delayed and nowadays the adjustments are even more costly. It is not even possible for the peripheral countries, in order to decrease the costs of those adjustments, to devaluate. Moreover, since the political and geographical configuration of the European integration, there is not enough mobility of labor or fiscal transfers between European Members,. It could be desirable, but it is unlikely to happen in Europe because of prudential and export led policies in Germany, that an increase in the consumption in Germany would improve the bilateral trade of peripheral countries against Germany. In this case, it would automatically worsen the balance of trade of Germany, that has a positive balance, and improve the one of peripheral countries that have a negative balance (Pettis, 2014). What is left, in this projection, is the implementation in the peripheral countries of the EU of recessive macroeconomic policies. For instance, by lowering the consumption level, the saving need automatically to increase, because fewer production is consumed domestically, however that would lead to a worsening of the unemployment rate<sup>8</sup>.

Therefore, as described above, the management of the imbalances of trade within Members of the EU is a complex matter that need a careful analysis. Before describing in the next section the main literature related to the imbalances of trade in the European context, it is however useful to observe the evolution of the imbalances of trade within the European Members before the sovereign debt crisis. Observer point out that countries have systematically diverged from 1995-1996, with peripheral countries worsening their balance of trade against countries as Germany and Austria (Zemanek, Belke and Schnabl, 2010) (Berger and Nitsch, 2010). However, the data confirm that Germany is the country that had the best bilateral trades versus peripheral country. For instance Italy increased its trade deficit with Germany by a factor of 5

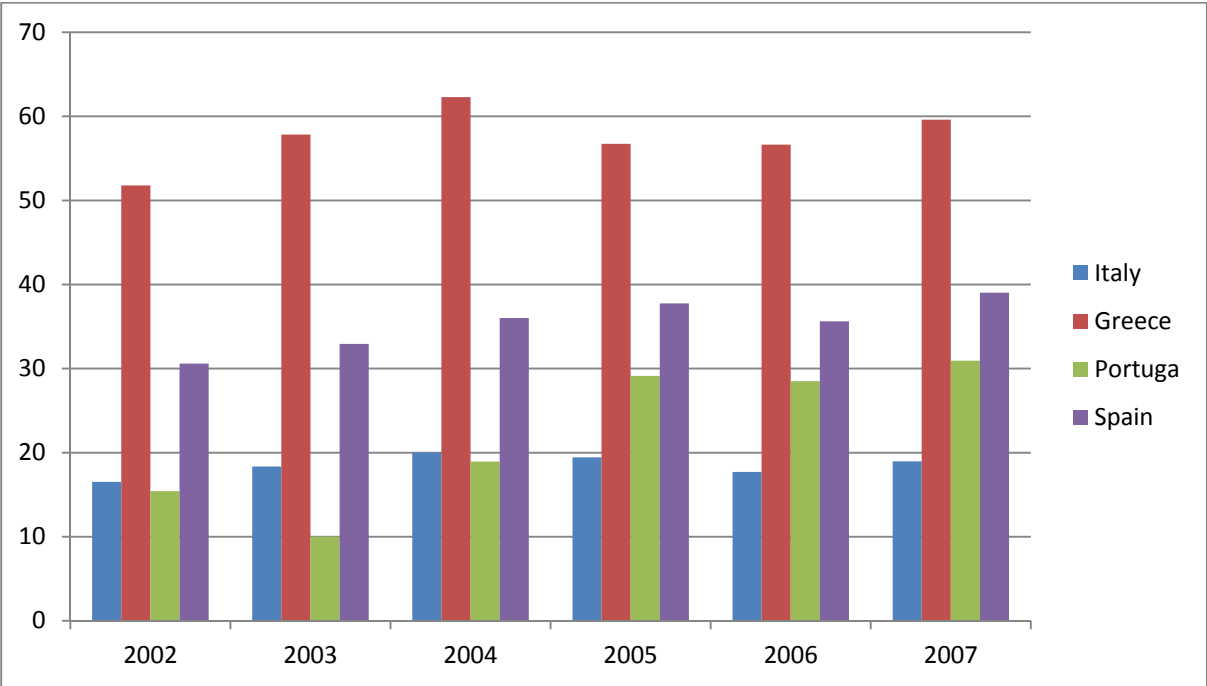
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<sup>8</sup> As mentioned before, if every peripheral country will perform recessive policies, automatically also the balance of trade of Germany will suffer, because of a lower foreigner demand, worsening the employment rate. It is indeed desirable that European Members coordinate for a first best solution, without implementing all together recessive policies .

within a decade, exceeding a few times its overall deficit in external trade (Canale and Marani, 2014).

The data proposed in the empirical section of this work is a panel data from 2002 to 2013. In the following table (Figure 1) are displayed the net exports of Germany from 2002 to 2007 versus countries as Italy, Greece, Spain and Portugal<sup>9</sup>. It is straightforward to notice that the net exports of Germany increased, and, reversely, that the balance of trade of peripheral countries got worse over the time.

**Figure 1. Evolution of the net exports of Germany versus selected countries<sup>10</sup>**



<sup>9</sup> The data is taken from the dataset of United Nation Com Trade, and it is described in detail in the empirical section.

<sup>10</sup> The index is constructed as follows:  $(\text{Export}-\text{Import})/(\text{Export}+\text{Import}) * 100$

### **3 LITERATURE REVIEW**

#### **3.1 THE FINANCIAL MARKETS INTEGRATION AND THE INTERTEMPORAL APPROACH**

The first signal of concern about structural trade imbalances is provided by Blanchard and Giavazzi (2002). In their work, they observe that Portugal and Greece were, in 2000-2001, respectively, recording a current account deficit<sup>11</sup> of 10 and 7 percent of their GDP. They argue that, since Portugal and Greece were, in 2002, the two poorest members of the European Union, what was occurring was a natural consequence of the greater integration of goods and financial markets in the EU. Since Portugal and Greece were the poorest countries of the EU, they were the countries with higher expected rates of return, therefore they would have registered an increase in investment. Moreover, since they were the countries with better growth prospects, they would have also recorded a decrease in saving, because households would have been expecting an increase in their permanent income, thereby starting to consume more. Thus, poorer countries are expected to run larger current account deficits, however, symmetrically, richer countries are expected to run larger current account surpluses, since they would not invest saving domestically, but abroad where the returns are expected to be higher.

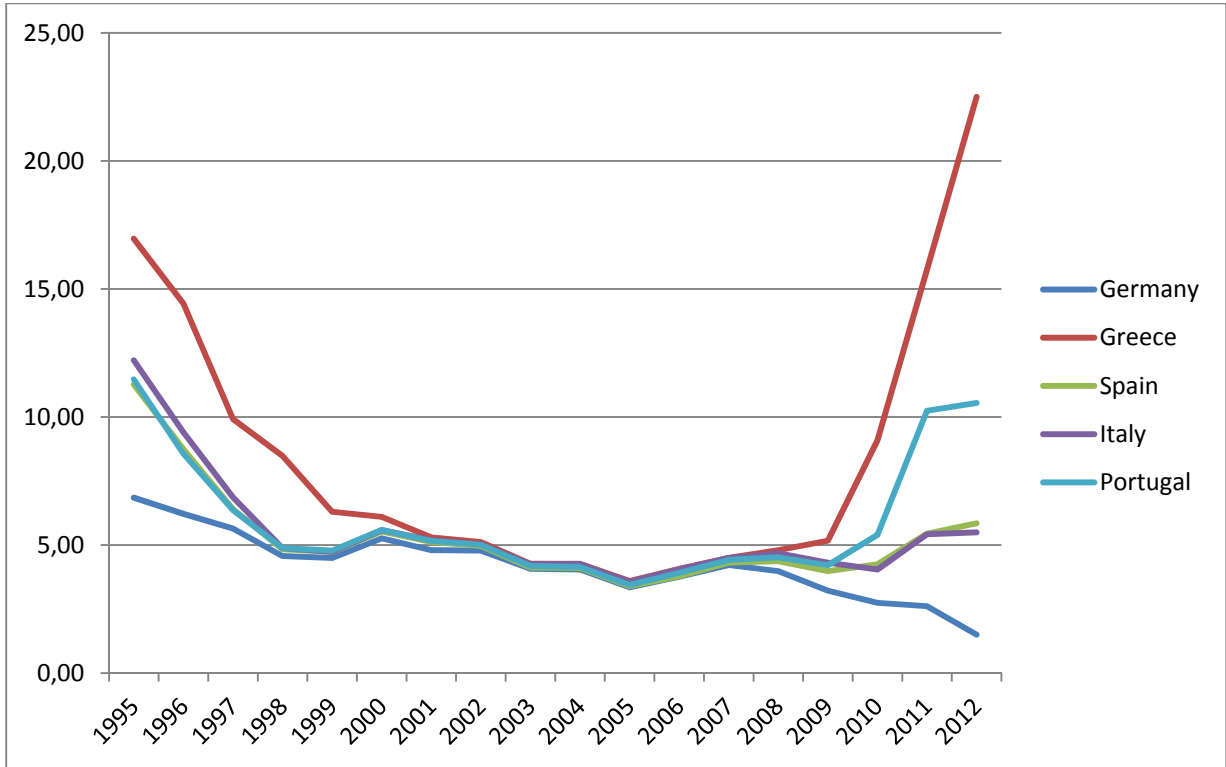
Blanchard and Giavazzi demonstrate, through a panel data from countries participating in the Organization for Economic Cooperation and Development (OECD) that saving rather than investment is the main channel through which integration affects current account balances. They conclude that, in Portugal and Greece, lower private saving, due to both internal and external financial market liberalization but also to better future growth prospects, and, to a lesser extent, higher investment, appear to be the main drivers of the larger current account deficits. Thereby, they suggest that countries such as Portugal and Greece should not take measures to reduce their deficits.

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<sup>11</sup> In this work is assumed that the value of the current account and balance of trade is approximately the same, since the bulk of the current account is the balance of trade, especially for similar countries. Therefore, in the empirical section, the balance of trade is the dependant variable, and it is not taken into account any kind of net amount received for domestically-owned factors of production used abroad. Hence, the GDP, and not the GNP, is the relevant measure used in the essay.

The idea of Blanchard and Giavazzi, and what also investors expected, was based on the assumption that countries as Greece and Portugal would have, within a couple of years, increased their GDP, thus automatically their saving<sup>12</sup>, thereby improving their balance of trade, assuming that investments are constant. This optimistic view, in the beginning of the 2000', as shown in Figure 2, lowered the interest rates in the peripheral countries, fueling what was likely not a natural process, but a structural imbalance in the euro area.

**Figure 2: 10-years governments bonds interest rate of selected countries**



Source: Eurostat

The previous view is in line with the intertemporal approach to the current account. The intertemporal approach implies that countries with lower per capita income may attract foreign capital due to higher growth perspectives. They should consume more and save less in anticipation of higher permanent income. Investments are expected to exceed savings, implying external deficits in the catching up period. Similarly, richer

<sup>12</sup> This conclusion relates on the fact that an additional income would not totally be spent, but a part of it would be saved, therefore is assumed that the marginal rate of saving is different from zero. However, the catching up did not take place, therefore what seemed to be not harmful but natural, a temporary imbalance, it is thereby evaluated in a different way nowadays.

countries tend to run current account surpluses (Gourinchas and Rey, 2007). Ca'Zorzi and Rubaszek (2012) confirm that the intertemporal current account model can describe quite well the pre-financial crisis dispersion of the current account and saving rates. They argue that consumption smoothing, based on expectations of economic convergence and free access to capital markets, was the main force driving the current account of the euro area countries, while capital accumulation played a less pronounced role.

However, different per capita incomes do not imply that the extent of borrowing that actually took place has been optimal, actually it could have been the opposite (Jaumotte and Sodsriwibon, 2010). In the long run higher net foreign debt positions need to be serviced by future net exports or a reduction of the debt. Growth must be driven by an adequate increase of the country's production capacity of traded goods and services. Giavazzi and Spaventa (2010), by examining the composition of output and demand, find that has not been the case in the peripheral countries under consideration and argue that the monetary union has helped to relax the necessary discipline. The common monetary policy moreover did nothing to prevent an extraordinary growth of credit that fed the imbalances in peripheral countries. The intertemporal mechanism might also not work at all when countries borrow capital to finance the production of non-tradables goods. Indeed, borrowing implies that resources are used in a way that the intertemporal budget constraint is satisfied, with future positive net exports matching today's incurred liabilities. For this to happen, the country must use at least some of the resources it borrows to enhance its potential in the production of goods that can be exported. However, if foreign borrowing is invested to increase the production of goods that cannot be exported (non-tradables), these goods are automatically consumed domestically, therefore the foreign financing of their production is equivalent to a borrowing from abroad for consumption purposes. The increase of the construction sector in countries as Spain and Ireland, fueled by an excessive credit expansion derived from net import of capital from abroad, provides evidence that the latter effect may have dominated (Giavazzi and Spaventa, 2010).

The link between capital flows within EU members and trade balances is further analyzed by Siena (2014). First of all, Siena claims that significant flows of capital and diverging current account balances have characterized the countries that are part of the common currency since the formation of the European Monetary Union. Starting in the 1990's, especially during the second part, peripheral countries, such as Ireland, Portugal, Spain and Italy accumulated increasing current account deficits. Other countries, instead, such as Germany, Austria and Netherlands started to run surpluses. Siena, however, does not focus only on the current account imbalances, but he tries to understand which factors, before the sovereign debt crisis, have established in the peripheral countries, simultaneously, negative trade imbalances, real exchange rate appreciation and output growth. In particular, he claims that expectations are crucial drivers of the international trade, especially anticipated shocks. Indeed, international trade is affected by intertemporal decisions about saving, investment and expected future income that influences the consumption. Siena proves that anticipated international yield spread shocks are the main drivers of the euro area periphery current account imbalances. Thus, after the creation of the common currency, the financial agents were expecting a shock on the yield spread, and this could have had a huge effect on the peripheral countries. Siena claims that international yield spread drops are the only sources that can generate the simultaneous observed dynamics of current account, real exchange rate appreciation and output growth in the peripheral countries. In contrast, anticipated productivity shocks fail to generate an appreciation of the real exchange rate.

The role played by the financial market integration in the EU is further explored by another paper of Schmitz and Von Hagen (2011). They first highlight the role that the monetary union could have had on deepening the financial market integration. They argue that after the introduction of the EMU and the common currency, financial markets became more transparent and transaction costs diminished. Moreover, permanent restrictions on domestic monetary policy, followed after the introduction of the ECB, can increase sovereign borrower's credibility in international financial markets and consequently increase a country's international financial integration (Arellano and Heathcote, 2010). Schmitz and Von Hagen prove that the introduction

of the euro has, therefore, led to a significant increase in cross border asset holdings, hence leading to larger current account balances. They argue that capital flows in Europe are influenced by the different capital endowments of the European economies. After the start of the monetary union this tendency has become stronger for flows within the euroarea. The monetary union has, indeed, facilitated the allocation of capitals by promoting financial integration and reducing costs after the removal of the exchange rate risk. Some countries experienced lower real interest rates, and the decline might have fostered investment booms and saving busts. However, this can increase the persistence of deficits as lower income countries have improved access to external financing. Schmitz and Von Hagen interpret those signals as a sign of the proper functioning of the integration process, highlighted by a more efficient financial market that allocates better the resources, and not as an indication of an improper macroeconomic management.

On the other hand, a lot of observers believe the opposite. The euro generated problems difficult to manage, especially regarding the balances of trade within the EU.

The lack of an adjustable nominal exchange rate supposedly poses a problem within a currency union that also operates a single and unrestricted market for goods and services, such as the euro area. In this case, the permanently fixed nominal exchange rate forces real exchange rate adjustment through relative price levels alone, which can be difficult in the presence of rigidities in national goods and labor markets. (Berger and Nitsch, 2010)

### **3.2 THE COMPETITIVENESS APPROACH**

The main debate on the imbalances of trade within countries of the European Union does not include only considerations about the financial integration or the introduction of the common currency, but it also explores other reasons that could have influenced the development, along the years, of those unbalances. An imbalance of trade represents, on the same time, two aspects that are equally important. First of all, a balance of trade is equal to the net transfer of capital, or, in other words, to the

difference between investment and saving, therefore an analysis of this aspect includes an evaluation of financial and intertemporal aspects like income differences. However, on the other hand, a balance of trade is also equal to the difference between exports and imports, therefore this aspect include an assessment on competitiveness of countries and firms, that is thereby related to price, productivity and labor fundamentals. Hence, in this section, are proposed a sequence of observations that are more related to a competitiveness approach analysis<sup>13</sup>.

In a monetary union with a common currency, the real exchange rate depends only on changes in relative prices between countries. A country with low competitiveness needs to undergo a real devaluation, hence, to deflate its general price level to regain competitiveness, or at least registering an inflation that is lower than the countries with a positive external position. Domestic products have to become cheaper as compared to foreign goods. If this is the case, exports increase, imports decrease and the current account deficit is eliminated. Conversely, a country with a competitive economy could reduce its current account surplus by a real appreciation, for instance by increasing wages. This would accelerate national inflation via higher costs and prices. Competitiveness in the euro area would be rebalanced via flexible prices and wages, however, it is already straightforward to notice that wages are not flexible, especially they are downward rigid because of labor unions.

The competitiveness approach is, therefore, an analysis on the prices of products, cost of labor and other elements that can influence the international position of a country. In the case of Europe, deficit countries may have become less competitive because domestic prices increased more than foreign prices. A possible explanation can be derived in terms of a catching up effect (Belke and Dreger, 2011). According to the Balassa-Samuelson hypothesis, increases in the overall price level and an appreciation of the real exchange rate should be expected when a poorer economy is catching up with a richer one, for instance a peripheral country that is increasing its productivity

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<sup>13</sup> An example of competitiveness approach is proposed by Blanchard (2007), analyzing the economic situation of Portugal. Blanchard argue that Portugal, in the late 1990s experienced, as the other peripheral countries, a sharp drop in the interest rates, derived by the introduction of the euro, and an excessive rosy expectation for convergence due to the euro area membership, especially in productivity levels. This led to wage increases exceeding productivity growth. Blanchard claims that in this case the labor costs more, therefore local goods became more expensive in the international market and export growth weakened, hence external deficits widened to unsustainable levels.

level<sup>14</sup>. Another possible explanation about inflation differentials, knowing that the monetary policy is common, could be related to heterogeneous national policies of fiscal policy, taxation, or wage determination. This might contribute to the emergence of different country-specific developments of income, consumption, investment and saving. Moreover, as countries are exposed differently to extra euro area trade, changes in the external value of the euro should have a country-specific impact on imported inflation (Honohan and Lane 2003). For example, since Ireland trades more with the UK than with Germany, a depreciation of the euro against the pound should raise import prices in Ireland more than in Germany. Furthermore, countries are asymmetrically exposed to common temporary shocks, such as the surge of raw material and oil prices (Hofmann and Remsperger 2005). More technology intensive economies such Germany tend to use relatively less oil than Southern European countries, which therefore have been hit more severely by an increase in raw material prices. Structural differences among national euro area inflation rates might also be driven by business cycles (Honohan and Lane 2003). For instance, after the turn of the millennium Spain and Ireland experienced a period of sustained growth while German growth remained weak. Therefore, the implementation of the common monetary contributed to asymmetric economic developments. Decreasing interest rates and persistent inflation rates reduced real interest rates and could have boosted demand in former high inflation countries such as Spain or Ireland. In contrast, relatively high real interest rates in Germany reduced investment demand and kept inflation low (Zemanek et al., 2010). That's the typical problem of a currency area where only one interest rate can be established<sup>15</sup>.

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<sup>14</sup> The underlying logic to the Balassa Samuelson (BS) effect can be summarized as follows. Let's assume that the law of one price (LOOP) holds for all internationally traded goods. In growing economies, it is plausible to consider that productivity growth is concentrated precisely in the production of these goods. This leads to an increase in wages that is not necessarily accompanied by an increase in prices. In the non-tradable sector, instead, the demand for higher wages leads to higher prices and consequently to a rise in the CPI. Since the LOOP will continue to be respected and the nominal exchange rate remains constant, the joint work of these forces results in an appreciation of the real exchange rate. This effect could lead, however, to a loss of competitiveness in the international market, since non tradable-goods, like services, that are more expensive after the BS effect, are used for the production of tradable goods. On the other hand, when wages influence directly the prices of tradable goods, also this direct effect can erode competitiveness.

<sup>15</sup> A huge line of research is available on the optimal area currency. The main idea is that Members of a currency area can deal better with an external shock if there is high mobility of labor between Members, flexible labor and product markets, and fiscal transfers (Mundell, 1961)

The deterioration of the competitiveness of peripheral countries could also have been driven by other factors, such as excessive nominal wage growth. Zemanek et al. (2010) believe that the current disequilibrium within the euro-zone countries has emerged gradually via persistent asymmetric wage growth rates in the peripheral countries. Indeed, in those countries wages increased more than Germany, implying a real appreciation and a huge loss in competitiveness. On the same line, Pettis (2014) believe that Germany implemented policies from the 1990's, when it had a very high unemployment rate after the reunification, to slacken the wage growth in order to gain competitiveness and attract foreign demand. Therefore, productivity in Germany increased more than wages, making available saving that needed to be absorbed abroad<sup>16</sup>. Hence, Germany employed a under-consumption policy, where the disposable income of household increased less than the production growth or GDP, in other words wages increased less than productivity gains, financing indirectly the export sector through lower wages, that decreased the production costs for exporting firms, thus importing foreign demand<sup>17</sup>. Figure 3 displays the development of unit labor costs in the euro area from 1999 to 2007. While Germany almost kept the level of 1998, in Portugal, Spain, Greece and Italy the unit labor costs have increased significantly up to 30% compared to 1999<sup>18</sup>.

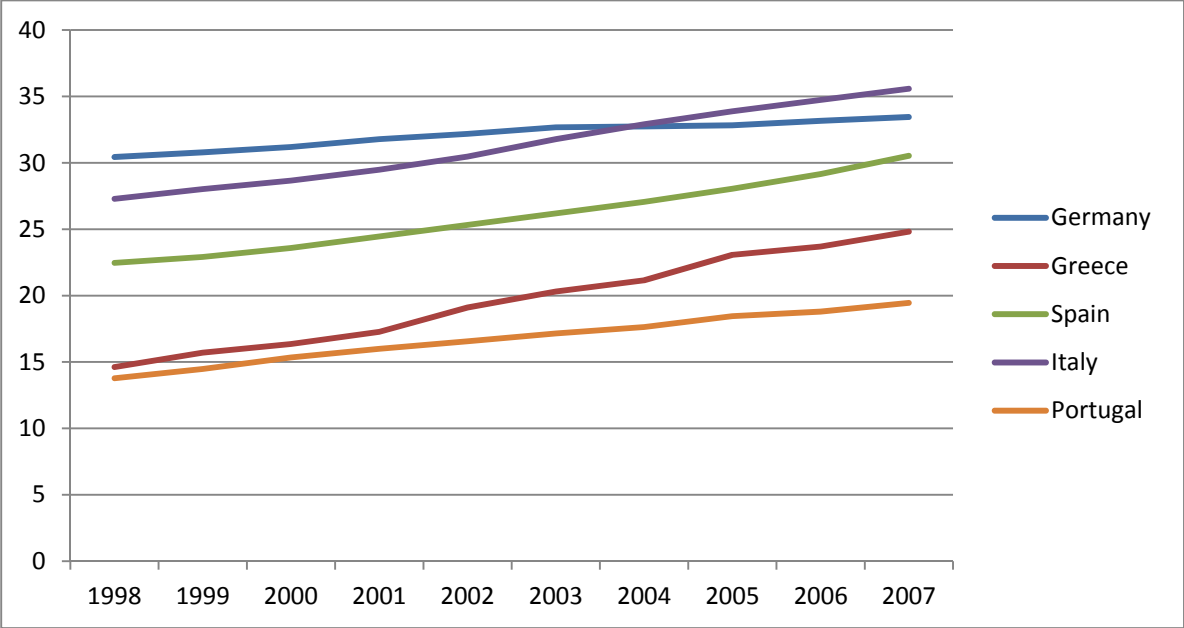
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<sup>16</sup> It is important to understand that a policy, that could also not be direct to change the current account position of one country, when it affects saving or investment, it is going however to affect the current account. On the other hand, a change abroad must be absorbed by another country, therefore, even if a country does not implement new economic policies, the current account could still change as a consequence of foreigner policies, since the sum of the current account of all the countries in the world is equal to zero. The interest rate drop in Southern European countries could also be a natural consequence of the huge savings not invested in Germany. For example, the house bubble in Spain could be a natural consequence of German policies, if the government did not intervene for reversing the current account (Pettis, 2014).

<sup>17</sup> It can be argued that those capital fueled consumption and inflation of peripheral countries, making the German export sector even more competitive.

<sup>18</sup> Wage increases, moreover, have not been followed by adequate productivity surges.

**Figure 3: Nominal compensation per employee of selected countries**



Source: Ameco database (European Commission)

On the other hand, assuming that the wage growth in Germany was adequate, a natural question would be to understand why peripheral countries increased so much their wages. Apparently, relative wages have not adjusted to diverging competitiveness to a sufficient extent and have thus ultimately failed to correct the rising current account imbalances. According to Altissimo et al. (2006) this is due to the fact that structural rigidities and in particular downward rigid prices and wages in the euro area have prevented any significant adjustment of real exchange rates in many euro area countries.

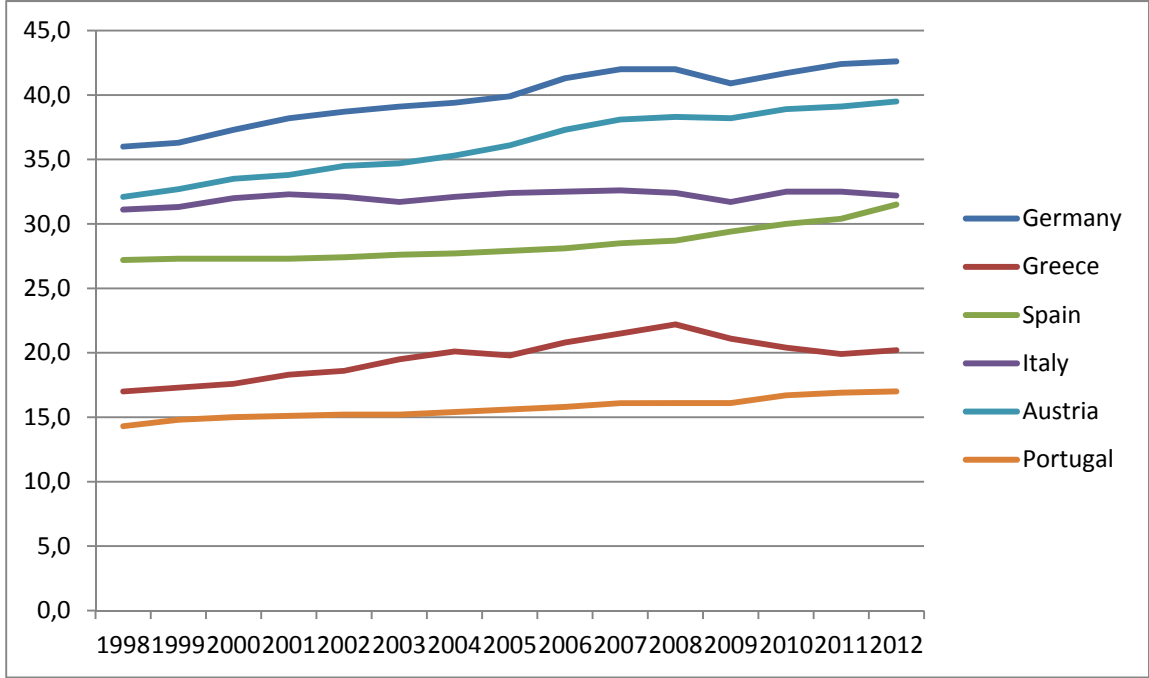
It is also important to consider, at this point, in which factor of production the peripheral countries are specialized. Southern European countries are typically specialized in the production of labor intensive goods, hence the power to pass prices to international markets is low and international market shares are lost in response to higher wages. Indeed, the cost of employing workers take a big share of the final cost of the product, if those are labor intensive. In the latter case, excessive wage growth is more harmful because of competition with low labor cost countries<sup>19</sup>, such as the new EU members or the East Asian emerging markets, is getting more aggressive. Hence, German consumers are indifferent to buy a product with low content of technology

<sup>19</sup> Countries, as Germany, that produce goods with high content of technology, can pass higher prices more easily on consumers, because the demand is more inelastic.

from South Europe, China or East Europe. Thus, wage growth in countries with more labor-intensive production such as Italy, Greece, Spain or Portugal might accelerate the loss of market shares relative to countries with capital-intensive production such as Germany (Zemanek et al., 2010). Intuitively, it is not always harmful a wage growth, especially when is accompanied by a productivity growth gains, but that is not the case for Greece, Italy, Spain and Portugal (figure 4).

It is also important to consider in the competitiveness analysis not only the tradable sector, but also the non-tradable sector, mainly for two reasons. First, non-tradable goods such as logistics, IT, construction, personnel and financial services are used as inputs for the production of tradable goods. Rising prices in the non-tradable sector push up the costs in the tradable sector. Second, price increases in the non-tradable sector tend to fuel inflation which reduces the purchasing power of wages in the tradable sector. In turn, the trade unions in the tradable sector claim a higher inflation compensation. Thus, the production costs of tradable goods increase and the competitiveness of the tradable sector shrinks (Zemanek et al., 2010).

**Figure 4: Real labour productivity per hour worked of selected countries**



Source: Eurostat

### 3.3 LABOR AND PRODUCT MARKET FLEXIBILITY

Other observers have pointed out that the variance of the current account is positively associated with the degree of domestic labor market rigidity across countries. It is indeed important, for countries that suffer a trade deficit, to have flexible labor and product markets. If wages are flexible, especially if they can decrease, a country could easily regain competitiveness, and unemployment would be reduced. On the other hand, when workers are flexible to change employment between sectors, a reallocation of workers from industries that are internationally non competitive to industries that are internationally competitive can faster adjust the current account. Therefore, less social protection to unemployed could be beneficial for giving an incentive to people to change their job or to find a new one<sup>20</sup>. A flexible product market can assure that prices are not sticky and the composition of goods is flexible, thereby adapting to contingent international markets competition.

Berger and Nitsch (2010) establish that countries that display relatively higher fiscal deficits and less flexible labor and product markets usually exhibit lower trade surpluses than other countries. Ju and Wei (2007) report evidence that an economy's frequency in the adjustment of the goods trade composition is linked to its labor market rigidity. They also suggest that economies with a more rigid labor market have a larger current account response to the same set of underlying shocks. They also show that even if a large country has a completely flexible labor market, but the rest of the world does not, part of its response to a shock has to take place through a change in its current account. This is a natural consequence, already mentioned before, that derive from the fact that a change in the current account abroad, or a implementation of economic policies abroad that affect investment or saving, must affect the reporter country current account, since the net sum of current account in the world is equal to zero.

Also Biroli et al. (2010) shows evidence that regulations that affect the nominal flexibility of prices, wages or employment generally hamper the adjustment to shocks and increase the passivity of the prices. They find that cross-country differences in

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<sup>20</sup> In order to increase the mobility between sectors, trainings that decrease the learning cost of the workers that move to a new sectors could be highly helpful.

regulations and institutions, regarding product markets, minimum wages and unions play a role for the extent to which common shocks could have country specific effects. As mentioned before, the real appreciation due to wage austerity in Germany and rising wages in Southern Europe distorted the international competitiveness of Spain, Greece, and Portugal (Blanchard 2007). In the long run, as unemployment increases, the pressure for adjustment in the less competitive country increases. This adjustment might call for a period of sustained high unemployment, leading to lower nominal wage growth until relative unit labor costs have decreased respect to surplus countries, and competitiveness has improved<sup>21</sup>. Both the speed of this adjustment process and the level of unemployment depend on the degree of nominal wage rigidity and the degree of price stickiness<sup>22</sup>.

In case of the euro-zone, the low inflation policy of the ECB is intuitively slowing down the speed for a competitiveness recovery in the peripheral countries. Assuming that nominal wage cuts are unlikely, since labor market are not completely flexible, the lower the inflation is, the smaller will be the real wage cuts and the competitiveness gains of peripheral countries against other euro-area countries, and the more the re-balancing process is postponed. Downward wage flexibility is, given similar levels of productivity increases, crucial for rebalancing current account imbalances in the euro area via the competitiveness channel. The process of globalization and the rising competition from China and the Eastern European Countries have further enhanced the pressure on competitive as well as on less competitive euro area countries<sup>23</sup>.

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<sup>21</sup> Such a period of competitive disinflation has often been argued to have taken place in Germany, where real wages have remained widely constant since the turn of the millennium after the unemployment rate had increased to historical levels in the 1990' (Pettis, 2014).

<sup>22</sup> Absent labor market flexibility, a main mechanism to adjust competitiveness in a currency union (Mundell 1961), can be one of the main reason for such large and persistent current account deficits and surpluses in the euro area.

<sup>23</sup> Other determinants of current account positions could be related to population growth and old-age dependency ratios. Those elements are expected to lower the current account due to their adverse impact on saving. A more restrictive course of fiscal policy tends to raise national savings and, therefore, the current account balance, if it is not fully offset by a decrease in private saving or a rise in private investment. A expansive fiscal policy could increase the level of prices, eroding competitiveness and saving. Indeed, it is important to remind that public expenditure (government budget) can be accounted in the current account, if we define a part of the public expenditure as public investment. Governments, indeed, can also intervene to affect the current account in this way. Moreover, higher social spending and intensified employment protection might reduce the saving rate, worsening the current account. Greater business cycle volatility is associated with higher precautionary household savings, which, by extension, should lead to higher trade balance surpluses or lower trade balance deficits (Belke and Dreger, 2011).

## 4 THE EMPIRICAL INVESTIGATION

### 4.1 ASSESSING THE MAIN DETERMINANTS

In the previous section different features related to the European capital and trade integration have been analyzed. In relationship with the European sovereign debt crisis, different critical aspects have been pointed out. However, the aim of this section is to propose an empirical framework that could confirm or suggest a new insight to the determinants of the European trade imbalances.

First of all, it is important to select the variables that could be relevant in the European study case. The focus is on the divergences between countries from South and Central-North Europe. Therefore, countries from East Europe that joined the EU in 2004 or afterwards are excluded, since they are on a different stage of development and they did not take part of the sovereign debt crisis. Hence, the countries considered are Germany, France, Italy, Belgium, Netherlands, Denmark, Ireland, United Kingdom, Greece, Portugal, Spain, Austria, Finland and Sweden.

The dependant variable, that is the focus of this work, it is the bilateral trade between all the couples of countries listed before. Hence, 91 different combinations are proposed every year. A panel data is constructed from 2002 to 2013, with a total amount of 1092 observations. In order to be able to evaluate how much significant is the difference between export and import, the value of the net export is normalized through a denominator that sum export and import, and then is multiplied by a factor of 100.

In the same way, the independent variables are constructed by calculating the pairwise difference in values between the reporter and the partner country. Thanks to the panel data it is possible to assess how changes along the years in the values of the independent variables have influenced the evolution of the balances of trade between the countries in the sample. Doing so will make clear which are the most important variables in the analysis of the trade imbalances in the European Union. Therefore the empirical test will assess which are the significant variables in the European context, however, before doing that, it is important to highlight which are the reasons behind

the choice of the variables used the regression, and which value, negative or positive, are the estimator expected to take.

The first indicator used is the difference between the labor productivity in the reporter and the partner country. This variable proxies the technology level of a country. The more a country is improving its productivity level, the more its firms are competitive. In particular, firms that displays higher productivity levels can produce at a lower cost, hence being more competitive in the international markets. Moreover, those firms are usually manufacturing products with high content of technology, where the demand, abroad and at home, is less sensitive to mark ups. Higher level of productivity could also derive from national markets that are more competitive and transparent, or where the institutional and political framework is more business friendly. For all the reasons listed above, an increase in the difference of the productivity level between two countries is expected to be followed by an improvement of the balance of trade, or, referring to the results of the regression, it is expected that the coefficient will exhibit a positive sign. However, if the increase in the productivity levels are a consequence of a massive increase of the investments direct to the improvement of the production system, the coefficient could also take a negative sign, given a constant level of saving.

Another variable to consider is the consumption level, that could be different between two countries. Intuitively, the consumption is related to the amount of income that is spent by the households. The more the households consume, the fewer are the savings. Hence, a country that consume more than another displays fewer saving. For similar level of investment, it follows that the country has on average a more negative balance of trade than the other. In the same way, if the ratio of consumption on GDP is higher, it follows that the production of one country is sold mainly at home, and a fewer part of the national production is left to the exporting markets. Reciprocally, for similar ratios of domestic demand that requests foreigner products, higher levels of consumption imply an increase in the import levels. Therefore, it follows that an increase in the difference level of consumption will be followed by a negative sign.

The third independent variable that is proposed is the inequality of income distribution. It is established in the economic mainstream, but also proved by empirical

researches, that richer people are saving more than poorer people. In order to understand why, it is straightforward to introduce the two extreme cases. On one hand, when a family is really poor, and the income is close to the survival threshold, all the income is spent. On the other hand, when a person is really rich, not all the income can be spent, and a part is saved for precautionary uses or for supporting relatives in the future, or for smoothing the consumption in case the income will be not available for all the expected years of living. The income can also be invested for gaining an interest rate that will increase the future consumption rate, indeed the future income. The range between a poor household and a rich household is a situation where the household tries gradually to reach the desired level of saving, but when the income is too low it is not possible, however the more the income it increases, the more saving will be accumulated by the household, until the opposite case is met. Therefore, in a society where the income is mainly allocated to a small amount of people, it is reasonable to expect that saving would be higher, hence on average the country would display better levels of the balance of trade. The sign of the coefficient is thereby expected to be positive, the more the inequality difference between two countries is increasing, the more is expected to be the surplus, or fewer the deficit, of the balance of trade in the reporter country against the partner country.

The fourth variable taken into consideration is the amount of investments on education and training. This variable helps to approximate the level of investment in one country, hence it is expected a negative sign. The more a country invests on education and training, the worse gets the balance of trade, given a constant level of saving. However, an opposite effect can be expected since fewer investment on education could worsen the competitiveness of one country, deteriorating the skills of entrepreneurs and researchers. Hence, it is not desirable, in a long run perspective, that a country decreases its investment on education during a recession. It is important to check if this is the case in the EU. Moreover, another indication can be established. When a State is closer to a welfare State model, and this could be the case also for other variables related to welfare protection, hence the education makes use of more resources, households are less worried to save money for training in the future the

young generation, since the state will spend money for that, therefore the saving will decrease, confirming the negative effect on the balance of trade.

The next three variables account for the amount of taxes charged on consumption, capital and labor. Those three kind of variables display how policy makers can affect the balance of trade through economic policies that change the level of saving or investment<sup>24</sup>. Moreover, it is important to remember that a policy implemented at home will also affect the balance of trade of other countries, even if those countries do not implement any kind of economic policies, since the sum of balances of trade in the world must be zero. A higher tax on consumption reduces the real household income because households are able to buy fewer goods and services after the consumption tax is imposed. This causes a reduction in the total amount of their consumption. Assuming that the total production of goods and services is unchanged, and investment are kept constant, the increase in the consumption tax reduces the domestic consumption, and automatically increase the domestic saving. Therefore, we assume that the estimator will take a positive sign, in other words an increase in the consumption rate in the reporter country will improve its balance of trade against the partner country. When the taxes on capitals are increased, assuming that the investment of the firms are not responsive to changes in the profits and are planned years before, it is arguable that the state would increase investment or consumption after the new earnings are collected, especially in recessive economies. Therefore investment could increase, however, saving would decrease, since profits of firms and other kind of saving would be eroded by the new rise of the tax. In the case the state would redistribute the resources from the people that owns the profits to the poorest people through the welfare protection, knowing that the saving rate are different between the two individuals, it is still expected a overall decrease in the amount of saving of the country. Both observations imply that the estimator should take a negative sign. In the same way, when taxes on labor are increased, the bilateral trade worsen, so we would expect a negative sign. Increasing the tax on labor reduces the

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<sup>24</sup> It is important to remind that, every kind of economic policy, even if it is not aimed to influence the balance of trade, when it affects the level of saving or investment rate in the country, it automatically affects its balance of trade.

profits of a firm. That happens because, knowing that wages are kept constant in the short run, a firm faces higher costs, therefore its saving or profits decrease.

Another variable tested in the empirical framework is the inflation level. In a competitiveness approach, if prices in the reporter country are increasing more than in the partner country, it follows that it is losing competitiveness and its balance of trade is getting worse, therefore the sign is expected to be negative. On the other hand, growing inflation could be followed by rising wages, since workers might request higher compensations, thereby increasing the cost of production. Hence, same conclusion, firms would afford higher costs and would lose competitiveness in the international market.

As mentioned in the previous section, in the European framework the government bonds have played an important role in the sovereign debt crisis, since peripheral countries experienced accentuated decreases in the cost of borrowing money at the introduction of the millennium. This phenomenon could be the consequence of the over confidence of the investors on the future prospects of growth of peripheral countries after the introduction of the euro. However, during the sovereign debt crisis, the yields on the 10 years bonds increased dramatically in the Southern European countries, signaling that investors could not believe anymore in the creditworthiness of those countries. Testing the hypothesis that the yields on the bonds are significant would confirm that capital movements have played an important role in the European sovereign crisis. The expected sign of the estimator should be positive, since an increase in the cost of borrowing decreases consumption and investment in a country, improving the balance of trade against another country. On the same way, a decrease in the cost of borrowing is expected to be followed by a worsening of the balance of trade.

Another variable that is included in the empirical section is the old age dependency ratio. A country that has an older population than another country might display a minor rate of saving, since old people are typically saving less than young people because they are at the end of their life and they don't earn a wage.

The GDP growth rate is also included in the regression. The GDP growth rate can indicate the stage of growth of a country and proxies the investment level in the

following years. If a country is growing more than another, a simple explanation could be that it is catching up with a richer country. On the other hand, higher growth, if not pulled by consumption, it could approximate the level of investment in one country. When an economy is growing, a firm expects higher demand in the future, therefore investment are necessary in order to satisfy a greater demand and to capture new opportunities of profits. Moreover, the saving rate is expected to decrease since households could start to spend more in the current time, expecting that the permanent income will be higher. Therefore, higher growth rate should be followed by a negative sign that indicates a worsening of the balance of trade against another country.

An index that proxies the evolution of the estate market is another variable that could affect the balance of trade. Intuitively, higher house prices could be perceived by households as an increase in their wealth. Thereby, this phenomenon is called the wealth effect. When families feel that are richer, they could start to consume more, saving less, hence the balance of trade would get worse. A negative sign of the coefficient should therefore be expected. Moreover, since not all the countries in the sample are part of the eurozone, a control on the exchange rate is added in order to check if changes in the balance of trade could be simply a consequence of exchange rate movements.

As already mentioned, the balance of trade is the difference between investment and saving. Any change in value of those variables will automatically change the balance of trade. A decrease in the cost of borrowing, as it happened with the introduction of the euro in the peripheral countries, could have relaxed the financial constraint of governments and households. Hence, it is important to check for both. In the case of the governments, the deficit over GDP is introduced in the regression. An increase in the spending of the government involves an increase in consumption or investment, and automatically, a decrease in saving. It is therefore expected that an increase in the deficit will be followed by a worsening of the balance of trade, hence a negative sign is expected. An important conclusion could be formulated when the empirical results are showed. If the deficit is significant in the regression, it could be argued that peripheral countries, after the relaxation of their financial constraints, have been implementing prodigal behaviors that have worsened their capacity to repay the debt.

On the other hand, when the deficit is not significant in the regression, it follows that governments, on average, have not played a major role, and other reasons need to be introduced. For instance, when major movements of capital have been in place in the eurozone, the private market, e.g. firms and households, could have reacted by increasing consumption and investment, and decreasing automatically the saving rate. In this latter case, an increase in the private debt could have been the cause of increased unbalances of trade within countries of the EU. If this is the case, the governments have fewer control on the private market, since, after the introduction of the euro, the monetary policy is common in the eurozone. Losing the power of imposing an interest rate that suits the needs of the economy, policy makers could have less instruments available for correcting the imbalances of trade. Indeed, this is the typical problem described in advance with the creation of the currency area, when the countries' fundamentals are not converging. Introducing in the regression the percentage of the private debt to GDP, it is possible to verify if this is the case. Whether or not it is significant, the sign of the private debt estimator should be negative, following the case of the government deficit.

Finally, a last check is imposed on the labor market. As mentioned in the previous section, countries with labor markets that are more flexible should display on average better balances of trade. An index is introduced in order to control for differences in the sample. Another variable, instead, controls the evolution of the cost of the labor in the panel data. Countries with relatively rising wages have been losing competitiveness in the international market, since firms afford higher costs in the production process. A relative growth in the wages in a country should be followed by a worsening of its balance of trade, therefore a negative sign of the coefficient is expected. If the labor and product markets are not flexible, one country could adapt less easily to growing wage rates and register persistent trade deficit, since the composition of the goods traded in the international market could change more slowly towards products that display less labor content and more capital content, that became relatively cheaper. A simultaneous check on the evolution of wages and the flexibility of the labor market is therefore important.

## 4.2 DATA GATHERING

Before the analysis of the main regression, it is important to describe how the data has been obtained and which sources have been using. First of all, the data of the bilateral trade is obtained from the United Nations Comtrade database. The UN Comtrade contains trade data about all the countries in the world. The interesting feature of the dataset is the possibility to build the bilateral trade between any given countries in any recent given year. For the purpose of the analysis, it is straightforward to obtain the data of the bilateral trade between any couple of countries in the EU.

However, with some exceptions, almost of the relevant data has been obtained from the Eurostat database. The statistical office of the European Commission offers a wide range of data that is available for every country of the EU. Moreover, and mostly importantly, this data is comparable between different countries of the EU, since it has been collecting using the same criteria in every country. This is very important for the purpose of the analysis, since the independent variables in the regression are simply the pair-wise difference in values of the parameters measured in two different countries. If the data would be collected with different criteria in every country, the values of the parameters could not be compared, and all the results would be biased.

The first variable proposed from the Eurostat database is the labor productivity. The labor productivity is approximated by the labor productivity per hour worked. The labor productivity per hour worked is calculated as real output per unit of labor input (measured by the total number of hours worked). The advantage of using this index is that measuring labor productivity per hour worked provides a better picture of productivity developments in the economy than labor productivity per person employed, as it eliminates differences in the full time or part time composition of the workforce across countries and years. Another variable obtained by the Eurostat database is the household final consumption expenditure on GDP. The index is constructed by calculating the percentage of the household final consumption expenditure on the GDP. The inequality index of income distribution, instead, is the ratio of total income received by the 20% of the population with the highest income (top quintile) to that received by the 20% of the population with the lowest income (lowest quintile). From the Eurostat is also obtained the data relative to the

investments on education and training. This data is then divided by the GDP and multiplied by a factor of one hundred, in order to extract the percentage on the GDP. The Eurostat proposes also comparable data on the level of taxation on consumption, capital and labor. The implicit taxes on those three groups are computed as the ratio of the total tax revenues of the category (consumption, labor and capital) to a proxy of the potential tax base defined using the national accounts. Those three indexes approximate the tax burden, on the overall taxation system, that is extracted from the consumption, capital and labor earnings. Other values that are obtained from the Eurostat are the inflation levels, the ten years government bond yields<sup>25</sup>, the old age dependency ratio<sup>26</sup>, the real GDP growth rate, the index of house prices<sup>27</sup>, the evolution of exchange rates between countries that use different currencies. The data on government deficit or surplus and the private debt of non-financial firms and households is also obtained from the Eurostat.

Two other variables are obtained from two other different datasets. The first one, the compensation per employee, approximates the level of wages in a country, and is obtained from the AMECO database<sup>28</sup>. The labor freedom, instead, approximate how much flexible is the labor market of a country. It is obtained from the Heritage Foundation database<sup>29</sup>. The labor freedom indicator is a quantitative measure that considers various aspects of the legal and regulatory framework of a country's labor market, including regulations concerning minimum wages, laws inhibiting layoffs, severance requirements, and measurable regulatory restraints on hiring and hours worked.

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<sup>25</sup> The interest rates are based on the central government bond yields on the secondary market, gross of tax, with a residual maturity of around 10 years. The bond or the bonds of the basket are replaced regularly to avoid any maturity drift.

<sup>26</sup> The indicator is the ratio between the number of elderly persons of an age when they are generally economically inactive (aged 65 and over) and the number of persons of working age (from 15 to 64).

<sup>27</sup> The House Price Index measures inflation in the residential property market. It captures price changes of all kinds of residential property purchased by households, both new and existing. The land component of the residential property is also included.

<sup>28</sup> AMECO is the annual macro-economic database of the European Commission's Directorate General for Economic and Financial Affairs. It contains a wide range of economic measurements.

<sup>29</sup> Founded in 1973, the Heritage Foundation is a research and educational institution whose mission is to formulate and promote conservative public policies based on the principles of free enterprise, limited government, individual freedom. The index is available from <http://www.heritage.org/index/labor-freedom>.

### 4.3 RESULTS

First of all, it is important to describe the equation that is going to be estimated, and which articles uses a similar approach. As mentioned before, the bilateral trade between two countries is regressed on different parameters, in a panel data that takes values from 2002 to 2013. The main equation (1), therefore, is the following:

$$\begin{aligned} \frac{NX}{EX + IM} * 100_{a-b,t} = & \beta_{0,t} + \beta_{1,t} \Delta lp_{a-b} + \beta_{2,t} \Delta ch_{a-b} + \beta_{3,t} \Delta id_{a-b} + \beta_{4,t} \Delta ie_{a-b} + \\ & \beta_{5,t} \Delta tco_{a-b} + \beta_{6,t} \Delta tca_{a-b} + \beta_{7,t} \Delta tla_{a-b} + \beta_{8,t} \Delta in_{a-b} + \beta_{9,t} \Delta bo_{a-b} + \beta_{10,t} \Delta old_{a-b} \\ & + \beta_{11,t} \Delta gdp_{a-b} + \beta_{12,t} \Delta hp_{a-b} + \beta_{13,t} \Delta ex_{a-b} + \beta_{14,t} \Delta lf_{a-b} + \beta_{15,t} \Delta ce_{a-b} + \beta_{16,t} \Delta pd_{a-b} \\ & + \beta_{17,t} \Delta gd_{a-b} + \varepsilon_t \end{aligned}$$

where  $t$  indicates the year, from 2002 to 2013,  $a-b$  indicates a couple of two countries, and  $\Delta$  is the pair-wise difference in values of the parameter between the countries  $a$  and  $b$ . In the following table the abbreviations of the parameters are explained.

**Table 1: List of abbreviations**

nx	Net export	in	Inflation
ex	Export	bo	Bond yields 10 years
im	Import	old	Old age dependency ratio
lp	Labor productivity per hour	gdp	Real GDP growth rate
ch	Final consumption of households	hp	House price index
id	Inequality of income distribution	ex	Exchange rate
ie	Investment on education and training	lf	Labor freedom
tco	Implicit tax on consumption	ce	Compensation per employee
tca	Implicit tax on capital	pd	Private sector debt
tla	Implicit tax on labor	gd	Government deficit/surplus

It is possible to rewrite the previous equation (1) in a more compact way (2):

$$\frac{NX}{EX + IM} * 100_{a-b,t} = \beta_0 + \beta_{n,t} \Delta \lambda_{n,a-b} + \varepsilon_t$$

where  $\lambda$  represents the parameter and  $n$  indicates the numerical sequence of the parameters from 1 to 17.

This approach follows the empirical method proposed in two different articles. The first one is from Berger and Nitsch (2010). In order to give an idea of the magnitude of the surplus/deficit of the bilateral trade between two countries, they normalize the net export by computing the ratio to the sum of the export and import between countries  $a$  and  $b$ . This gives an idea of how large are the imbalances of trade between countries  $a$  and  $b$ . However, they use different independent variables, though some are the same proposed in this work. Moreover, the focus of their research is different, since they introduce a dummy variable in order to check how the introduction of the euro has influenced the bilateral trade within countries in the EU. The other independent variables, hence, are used as controls, in order to isolate the euro effect from other influences, e.g. institutional and market changes. An interaction term is also introduced, in order to check if the introduction of the euro could have influenced the evolution of the institutional and market benchmarks. In their empirical framework they simply use OLS estimators, without robustness checks.

A second article uses a similar approach. Zemanek, Belke and Schnabl (2010) investigate which are the factors, private or public sector reforms, that could affect the bilateral trade balances in the EU. They use, in part, similar independent variables that are, however, regressed taking the pair-wise difference value between country  $a$  and  $b$ . However, in their estimation they use a dynamic panel model technique.

In the following table the regression results of equation (1) are proposed, in particular, as robustness check, RE and FE are both reported.

**Table 2: Regression results**

Dependent variable: bilateral trade	1	2
Labor productivity	.828 (.161)***	.842 (.163)***
Consumption expenditure	-.906 (.346)***	-.896 (.351)**
Inequality of income distribution	-.788 (1.365)	-.837 (1.395)
Investment on education and training	-4.597 (1.755)***	-4.395 (1.794)**
Implicit tax rate on consumption	1.542 (.388)***	1.49 (.394)***
Implicit tax on capital	-.583 (.140)***	-.605 (.143)***
Implicit tax on labor	-.871 (.318)***	-.955 (.327)***
Inflation	-.698 (.973)	-.541 (.997)
Bond yields 10 years	3.073 (.687)***	3.199 (.698)***
Old age dependency ratio	.596 (.578)	.746 (.595)
Real GDP growth rate	-1.173 (.510)**	-1.217 (.529)**
House price index deflated	.028 (.156)	.070 (.163)
Exchange rate	-.202 (.303)	-.278 (.341)
Labor freedom	-.083 (.076)	-.084 (.076)
Compensation per employee	.266 (.283)	.325 (.289)

Private sector debt	-0.060 (.022)***	-0.059 (.023)**
Government deficit/surplus	-.369 (.289)	-.397 (.292)
Constant	1.328 (1.174)	1.107 (1.191)
R square <sup>30</sup>	0.65	0.65

Standard errors are reported in parentheses. \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% level. Column 1 computes GLS RE and column 2 FE.

A lot of observations can be proposed from these results. First of all, the labor productivity has a positive sign and is significant. Hence, when a country in the sample increases its productivity levels, on average it improves its bilateral trade against another country. Therefore, for improving its balance a trade, a government could invest in projects that pull innovation in the private sector, e.g. financing firms that improve their production process, or increasing the degree of competition between firms, for instance by liberalizing the market or removing every kind of cartel or monopoly. The empirical results, indeed, show that the productivity is a significant variable. It follows that European countries compete not only on wages or cost levels between each other, but mainly on the technology content of their products. This can be a natural consequence of the competition from Asia and cheaper labor countries, that European countries cannot sustain. Therefore, since European countries are in similar stage of development, where the qualification of the labor and the technology are important factors for the production, the competition is mainly in the quality and the technology content of the products, and not on the cost of the goods. Hence, countries that are not enough productive face more difficulties to pursue a positive balance of trade than countries that experience increases in the productivity levels. On the other hand, the results show that countries that display low levels of productivity, as typically southern European countries, cannot regain easily competitiveness in the European market through lower wages or costs, because of the competition with

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<sup>30</sup> R square is computed relating to the following prediction equation:  $\hat{y}_{it} = \alpha + x_{it}\beta$

Eastern European and Asian countries. This is an important point that policy makers have to keep in mind and will be discussed in the next section.

The second result, because of the negative sign, shows that the more the household consumption increases in a country, the more, on average, is going to worsen the bilateral trade against another country. The household consumption is also significant, implying that, in the EU, there have been persistent differences in the consumption levels. At a first glance, it is possible to observe how, countries as Greece<sup>31</sup>, have had consumption levels 15% higher than in Germany. Since policy makers cannot intervene through monetary policies after the introduction of the euro, fiscal policies are required for smoothing the consumption levels, e.g. higher taxes on consumption in countries where is too high, and lower in countries where is too low. The implicit tax on consumption, as showed in the empirical result, is significant in the sample and of positive sign. Therefore, if a country increases, related to another country, taxes on consumption, it follows that its bilateral trade, against the partner country, is going to improve, in other words, its deficit will reduce or its surplus will increase<sup>32</sup>. It is important to notice that coordination between European countries is needed, since an over or under consumption case in one country is going to affect the balance of trade in another country. It is not necessary that consumption is the same in different countries, since different economic growth prospects or investment levels can be temporary different, but a rebalance process has to be met in the medium term.

The third variable took into account is the inequality of income distribution. It is not significant in the sample size, therefore in the EU there are not consistent differences in the distribution of the wealth among the population that could affect saving and therefore the balance of trade. The variable in investment on education and training has, instead a negative sign and it is significant. That means that countries, especially

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<sup>31</sup> Greece, for instance, has displayed levels of consumption to GDP more or less 15% higher than in Germany. Moreover, southern European countries have also displayed on average higher levels of consumption than Germany. That could be a natural consequence of expectations of better prospects of economic growth, or different business cycles, with different level of investment or expected economic growth. However, that could also display misaligned consumption levels, indeed, over consumption levels in the south of Europe, or under consumption in Germany. However, it is important that consumption levels realign in the sample, at least to close levels.

<sup>32</sup> A higher tax on consumption reduces the real household income because households are able to buy fewer goods and services after the consumption tax is imposed. This causes a reduction in the total amount of their consumption. Assuming that the total production of goods and services is unchanged, and investment are kept constant, the increase in the consumption tax reduces the domestic consumption, and automatically increase the domestic saving.

during a recession, have deployed policies that cut the expenses in the education. Intuitively, the negative sign shows that the more a country invests, the worse its balance of trade becomes. However, it is possible to state also the opposite, the less a country invest in education, the more improves its balance of trade. Observing that the parameter is significant implies that countries, especially the ones that faced an economic crisis, have lowered their investment in education and training. On a short term it can have a positive effect, however, knowing that education and training affect the level of productivity in the long run, it is straightforward to assess that those kind of policies can have a harmful effect in the economy, even if they are beneficial in the short run. Indeed, the productivity of an economy, as showed before, is an important indicator of competitiveness in the EU, therefore, cutting the expenditure on education can be one of the worst decision, because it increases the technology gap with more advance economies, even if could be beneficial in the short run. This is another important point that policy makers need to keep in mind.

Further observations are needed when the other variables are analyzed. First of all, the inflation is not significant in the sample. This is a first validation that countries in the sample compete internationally more on the technology content of their products than on the costs. Moreover, the ECB has pursue, in the recent years, monetary policies of tight inflation. Therefore, peripheral countries, if they would like to recovery competitiveness through the price channel, assuming that wage cuts are unlikely, they need to keep wages and prices constant for a long period of time trough high unemployment, since inflation in other countries is very low. This is what Blanchard (2007) denominates *competitive disinflation*. Tight inflation in Germany and ECB monetary policies leaves fewer space for a competitive disinflation in the peripheral countries, as the data shows.

Another variable that affects the bilateral trade is the yields of the 10 years government bonds. Intuitively, the more is the cost for the government to borrow money, the fewer are the investment, therefore the bilateral trade improves. However, the data proves that capital movements after the introduction of the euro have had an influence on the imbalances in Europe, since they lowered the yields in the peripheral countries, as showed in figure 2. Besides the fact that those movements of capital could be the result

of over estimations of future growth prospects, or over saving in Germany, the data shows that they had a negative effect on the bilateral trade of peripheral countries. Indeed, the positive sign indicates that when the cost of borrowing increases, the bilateral trade improves, however also the opposite is true, if the cost of borrowing decreases, the bilateral trade gets worse. The data confirms that, especially when those capitals have not been used for increasing the productivity in the medium term, the bilateral trade gets worse. The previous statement is, at a first glance, not confirmed by the implicit tax on capital, since the sign is negative. Indeed, when taxes on the capital are increased in a country, its bilateral trade gets worse. However, taxes are related to the profits and earnings, and not to the cost of borrowing. When taxes on profits increase, it follows that resources are taken from agents that have availability of capital. Those resources are mainly saved, however, if the state increases its revenue from this source, it means that those additional revenues will be instead consume or invested, worsening the balance of trade. In the case those resources would be redistributed to poorer economic agents, those resources would still be spent, at least partly, since the rate of marginal saving is typically lower when the income shrinks. This case shows that policy makers have to be aware of which taxes are implementing, and their effects. A tax on consumption would improve the balance of trade, but one on capital would have the opposite effect. Thereby, if the government would like to affect the balance of trade, it is important that an evaluation of the effects is employed. The implicit tax on labor confirms this idea, indeed, the estimator takes a negative value. When taxes on labor are increased, the bilateral trade worsen. Increasing the tax on labor reduces the profits of a firm. That happens because, knowing that wages are kept constant in the short run, a firm faces higher costs, therefore its saving decrease, assuming that investment are kept fixed <sup>33</sup>. On the other hand, higher costs imply a loss of competitiveness in the international market.

Demographic differences do not affect the imbalances of trade within countries of the EU. The old dependency ratio is not significant, implying that demographic conditions in the EU are close enough to not determine relevant changes in the saving levels. A variable that instead, is significant, is the real GDP growth. As explained before, due

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<sup>33</sup> When the government uses the additional revenue for increasing consumption or investment, as it is predictable in recessive economies, the effect on the balance of trade is reinforced.

to the Balassa-Samuelson effect, due to profit prospects that increase investments and due to permanent income increases that pull consumption, when the reporter country is growing more than the partner country, its bilateral trade against the partner country is getting worse. In the European sample those differences are consistent with the data, especially before the crisis southern European growth was faster than central Europe. However, after the recessive dynamics took place during the economic crisis, peripheral countries had temporary improved their balance of trade, a feature that is confirmed by the data as well.

The exchange rate has not be relevant in the sample. In the same way, it has not been depicted any kind of wealth effect, since the house price index does not enter significantly in the regression. The labor freedom index is not significant in the regression as well. This does not imply that more labor flexibility is not useful for improving the balance of trade in a country. As discussed previously, less unemployment protection and more labor flexibility across sectors can be beneficial for improving the balance of trade of a country. Indeed, the not significance of the indicator could simply be the consequence of labor reforms that have not been implemented in the peripheral countries. Countries as Greece have implemented lately reforms on labor market, even if they were in the middle of an economic crisis. Labor union struggles and less popularity of political parties before elections could be ones of the reasons that can be listed. Only huge economic pressures from abroad had forced peripheral countries as Greece, Spain, Italy and others to implement labor reforms, however, their effects cannot be depicted by the data, since they have been put in place very late, and their effectiveness can be observed only in the medium term, and not in the short run.

The level of wages, approximates by the compensation per employee, is also not significant. This result confirms the previous observations on the inflation and the downward rigidity of wages. Moreover, competition between countries in the sample is more intense in the technology sector, and low price products are mainly imported from East Europe or Asia. The higher increase in the wage levels in the peripheral countries, before the crisis, has probably lowered the exports of some firms. However, it is important to remember that prices are partly rigid, indeed firms, instead of losing

market quotas in the international market, when they face wages increases they prefer to keep prices constant, reducing therefore the profits. Moreover, knowing that the capital, in the pre crisis scenario, became cheaper in peripheral countries, and wages higher, it is straightforward to predict that in those countries firms tried to substitute, at least partly, labor with capital<sup>34</sup>. It is arguable, also, that if it is assumed that products are differentiated, and international European firms compete in a monopolistic competition framework, the demand should be less sensitive to price changes. Besides the previous considerations, another observation can be proposed. Since wages cuts are unlikely in the peripheral countries<sup>35</sup>, and labor compensations that are almost constant in Germany because of policies that aim to pull export and keep unemployment low (Pettis, 2013), many years are needed before peripheral countries can recovery competitiveness through lower levels of wage growth. In a post crisis scenario, a slow wage growth in Germany leaves less space for peripheral countries to regain competitiveness through wage growth differentials. As the data confirms, until recently the wages have therefore not influenced the bilateral trade.

The last two variable in the regression refer to the private sector debt and the annual deficit or surplus government budget. The results show that the government budget has not been so influential as it could be thought at a first glance. Besides to Greece, that broke the Maastricht pact, other governments have maintained good financial policies. However, capital movements and growth prospects could have fueled the private debt, that enters significantly in the regression. The case of Spain is an example. The more the private debt increases, the more the bilateral trade gets worse. The private debt indicates cases in which households overconsume, or firms are investing in new projects. Those two events worsen the balance of trade, however, for the governments of the countries adopting the euro, is more difficult to manage those situations, since they have no power on the interest rate applied by the central bank. Therefore, a better coordination is needed in the European countries, in order to avoid that capital movements over-pull private debt. It is important that countries applies fiscal transfers

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<sup>34</sup> Before the crisis, unemployment has likely remained low in peripheral countries because consumption has increased. Moreover, with cheaper capital in the peripheral countries, the demand has increased.

<sup>35</sup> The downward rigidity of wages can be a reason of the big increase in the unemployment levels in the peripheral countries. Moreover, since reforms of the labor market has been implemented slowly, wages have maintained sticky.

and align consumption, investment and saving on similar level. The theory related to the optimum currency area, indeed, highlights the importance to reach a convergence of macroeconomic fundamentals in the EU, together with higher mobility and flexibility of the labor market and a better institutional framework that coordinates the economic policies of the Members of the euroarea.

## **5 POLICY IMPLICATIONS IN THE EUROPEAN FRAMEWORK**

### **5.1 INTERPRETATION OF THE RESULTS**

The results previously proposed leave space to some interpretations. First of all, the main channels through trade imbalances have developed are capital movements and technology gaps. The introduction of the euro has deepened the integration of the financial markets, leading, before the economic crisis, to a convergence of the interest rates of the sovereign bonds. Many reasons can be listed for this phenomenon. First of all, better integrated financial markets imply that, for the interest rate parity, at least a process of convergence has to be observed, if risk premium remain constant. Without risk on the exchange rate, capitals move to countries where yields are higher, thereby decreasing the interest rate in those countries, and increasing the interest rate in countries where is lower. In the EU, since the abundance of capitals, it has been possible to observe only a decrease in the interest rate of peripheral sovereign bonds. However, an over saving theory can be also proposed. German export-led policies could have pulled capitals to leave Germany towards peripheral countries, leading to an over availability of capitals in peripheral countries. However, capitals could have also flown to peripheral countries for higher expected growth prospects. Investors could have thought that the deeper integration would have led to higher growth in countries that are poorer in the EU. As explained before, higher competition from abroad and technology improvements, pulled by cheaper capitals available for innovation and research, might have pulled growth in the medium term in the peripheral countries of the EU. Besides the factors that have influenced the capital movements observed in the EU, the results confirm that they have been harmful for the European integration. A relaxation on the Maastricht pact and the private sector reaction have worsened the imbalances in the EU. The yields of the sovereign bond have been showed to be significant in the empirical section, confirming that countries that experienced a relaxation of their financial constraints, have also worsened their balance of trade. For instance, in Greece the level of the public debt got too high, and no labor market reforms or tax modifications have been introduced. Moreover, the

government has also cheated on its annual deficit. In Spain and other countries, a relaxation of the cost of borrowing pulled the private market, creating the conditions for the house bubble in Spain and other structural unbalances, e.g. consumption surges. The previous observations highlight the need, for European countries, to implement different monetary policies simultaneously. For instance, Spain would have needed a higher interest rate than the one established by the ECB before the sovereign debt crisis. Since European countries have different factors endowments, different wage levels, and different growth prospects, fiscal transfers are very important for smoothing temporary structural divergences. One element that policy makers need to evaluate is when structural divergences are part of a convergence process, that is in harmony with the optimum currency area theory. For instance, European policy makers should have evaluated if trade imbalances in Greece and other peripheral countries were part of a catching-up process – economic growth differentials, productivity surges – to richer countries, or were merely the consequence of unrealistic expectations. When imbalances are just temporary, and are part of a catching-up process led by the convergence of the macroeconomic fundamentals, fiscal transfers need to be realized between European countries. When the case is the opposite, governments need to intervene and reduce imbalances that are not the consequence of a convergence process. There are, however, cases where, for governments, to intervene is difficult, especially when it is the private sector that is fueling structural imbalances. If investors or households, after the introduction of the euro, have surged the private debt of peripheral countries, mitigating policies are needed. By mitigating policies it is meant that loans from other European countries to peripheral countries need to be targeted on a medium term prospects, and with goals to reach a gradual rebalance. Indeed, private capitals can fly away in a very short time during a financial crisis, but economic imbalances and fundamentals need years before they adjust. Therefore, first of all, countries in need of a financial help need an external help from other Members of the custom union, especially Members of the currency union, in the form of fiscal transfers. Second of all, reforms need to be gradual, otherwise the cost of the reforms, in terms of unemployment and economic growth could be too high. For instance, before rebalancing the balance of trade, a country needs years of adjustments in order

to regain competitiveness. The loans from the EFSF, IMF and ECB to the banking sectors have been good instruments, but on a too short deadline. More realistic goals could be established by the European Commission, IMF and ECB to Greece<sup>36</sup>, in order to smooth the costs that the population has to afford.

Fiscal coordination is hence important in the European framework, however, combined with fiscal transfers, the payoff can be higher. Tight impositions on the fiscal policies, in the form of the Maastricht pact and the Fiscal Compact, can be beneficial in order to avoid the moral hazard problem, but need to be well supported by medium term loans from other countries. Coordination is also needed in the field of taxes, consumption and labor market. As showed in the empirical section, taxes can have different consequences on the balance of trade, and governments need to be aware of that, knowing that every policy could not only influence the balance of trade of the country adopting the measure, but also the balance of trade of other countries. Moreover, country as Germany need to leave space for wages increases, and accept higher inflation levels, in order to permit peripheral countries to gain competitiveness more quickly (Pettis, 2014). It is not affordable, for peripheral countries, to sustain such high levels of imports. However, consumption needs to decrease in countries as Greece, and labor market reforms aimed to increase the flexibility are needed. The coordination between European countries can lead to an higher payoff (Blanchard, 2007). If, every country, tries to follow its own benefit, and an agreement and coordinative policies are not met in the European negotiations, the payoff can be negative. Indeed, if every country implements recessive policies in order to have a positive balance of trade, the payoff is negative for every Member. The policy makers, therefore, need to be aware of the importance of coordinate policies, especially in a currency union.

Coordinative policies can also be important for decreasing the cost of recovery from the economic crisis. First of all, in a currency union the central bank cannot be the lender of last resort of a State Member, even if the ECB tried to cover this role by

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<sup>36</sup> Concerning the imbalances of trade, when a country has a negative one, automatically another country has a positive balance of trade. That explains why Keynes, during the Bretton Woods Conference, proposed that both countries, creditor and debtor, should participate in the cost of the readjustment. Indeed, the creditor country, through a positive balance of trade, benefits from keeping unemployment low and pulling production and economic growth.

buying the sovereign bonds on the secondary market of the peripheral countries. Therefore, when investors have not been willed anymore to finance the debt of peripheral countries, they started to look the balance of trade as the discriminator variable for lending or not money to Members of the euro area. Indeed, the balance of trade could approximate the capacity of repaying the debt in the future. However, the peripheral countries needed, during and after the economic crisis, to counter react to the reduction of the demand, of the GDP and investment. They also needed to stabilize the banking system, hence they increased their deficit. Despite increasing returns, investors were not willed anymore to finance additional private and public debt to peripheral countries with negative balance of trade. Canale and Marani (2014) suggest that the choice that peripheral governments face is, at least in the short run and in recessionary conditions, either to restore the equilibrium of public finance in order to attract investment, or to counteract the real shocks coming from the crisis in order to decrease the unemployment. If peripheral countries need to undergo years of fiscal retrenchment, the risk is this could further depress the internal demand, thus making debt repayment even more difficult. However, peripheral countries could decrease, with labor reforms, the level of wages, therefore decreasing the level of unemployment, increasing the internal demand, and increasing the saving of the new workers and improving the competitiveness. An external financial help from the core countries would decrease the cost that peripheral countries need to undergo for adopting those measures, and the cost for refinancing their debt. The advantage for the core countries would be to weaken the negative trade effect derived by weaker demand from peripheral countries, sharing partly the cost of structural imbalances in the euro area, and avoiding that countries, leaving the euro, could undergo a nominal exchange devaluation<sup>37</sup>. Therefore, coordinate policies can lead to a higher payoff for all the Members of the EU, than the case where every country pursue its own advantages.

The empirical results has also showed that technology and production improvements could be beneficial for peripheral countries. Thereby, it could be suggested that funds should be invested in projects that enhance the research and innovation. The EU could

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<sup>37</sup> It is important to remind that core countries, e.g. Germany, received beneficial effects from the euro introduction, because they maintained fixed exchange rate with the peripheral countries. With flexible exchange rate, peripheral countries could have devaluated their currencies, therefore core countries would have needed to face a nominal revaluation of their currencies.

play a major role in this process, targeting the loans to projects that could enhance and reward the firms that invest in innovation, even if the effects are visible only in the medium term. Moreover, policy makers don't have to follow the temptation to cut the expenditure on investment in research. It is arguable that one of the most easy measure to implement is to cut funds to universities and institutions that do research. However, even if could be beneficial in the short term on the balance of trade, as showed in the empirical section, it could have a negative effect in the medium term, enlarging the productivity and technology gap with more advance countries. Other reforms could be implemented, in order to enhance productivity, for instance increasing the competition between firms, deregulating markets and removing every kind of cartel or monopoly. Reforms are not only needed in the product markets, but also on the labor market. To argue that the index of labor freedom does not enter significantly in the regression can be counterproductive. As mentioned previously, labor reforms can increase the mobility of labor and the wage flexibility, that could be beneficial in order to recovery competitiveness. The point is not to assess if reforms are beneficial, but if they have been implemented and when take place their effects. Peripheral countries have, indeed, implemented reforms lately, especially Greece that display high levels of rigidity of the labor market, and high levels of workers employed by the public sector. Only after huge pressure from abroad peripheral countries have implemented labor reforms, however the stickiness of wages is still too high. Wages, intuitively, don't decrease because of the opposition of the workers that already have a job, in the form of labor union, even if unemployed people would be willing, sometimes, to perceive lower wages. Reforms could be beneficial, but the data confirms that have not been implemented sufficiently.

The same point can be proposed again with the level of wages. Wages differentials don't enter significantly in the regression, however, it does not imply that wage changes cannot be beneficial for correcting trade imbalances. If wages could be totally flexible, in recessive economies as the peripheral ones, lower levels could decrease the unemployment levels and have a positive effect on saving, since more people would have an income, more people could start to save money and not use the social protection from the State. On the other hand, competitiveness would be restored

through the price channel taking advantage of cheaper labor. The benefits from wage cuts is confirmed also by Zemanek, Belke and Schnabl (2010):

Sustaining wage rigidities in under-performing euro area countries in order to stimulate domestic demand would not prevent these countries from turning into deflation. Instead, it would finally lead to lower domestic demand and higher current account balances within the euro area by destroying domestic employment. This, in turn, is likely to strengthen economic nationalism and therefore the likelihood of a break-up of the euro area. The recent example of Greece is highly illuminating in this respect. Hence, in order to safeguard the European integration process, we should believe in markets (again) and put the emphasis of our political efforts on shaping incentives to enact structural reforms. (Zemanek, Belke and Schnabl, 2010)

In countries as Germany, where the wages have been maintained almost constant, an increase of the wages could leave more space for, what it has been called before, a competitive disinflation. Therefore, if the data did not confirm that the inflation channel has been not a determinant of the deepening of the imbalances of trade, it does not imply that it could not be beneficial for restoring the balance. However, the price adjustments has definitely shrunk after the introduction of the euro, because of fixed exchange rate. Moreover, Biroli, Mourre and Turrini (2010) shows that product market regulations, strict employment protection, high minimum wage, high union density and unemployment benefits appear to reduce the responsiveness of relative inflation to cyclical divergences.

Giavazzi and Spaventa (2010), instead, focus on the surveillance of the European institutions of the structural imbalances. They argue that the Stability and Growth Pact has been firstly ineffective, and secondly, too focused on public deficits. Other variables, e.g. relative productivity trends, credit and leverage, debt of private sector, asset prices related to bubbles, the savings-investment balance, the current account, have been neglected from the focus of European policy makers. Though those

variables are not, in the short term, binding for the existence of a common currency, they still represents an immediate indicator of the existence of structural imbalances.

It was the profligacy of the peripheral countries, so the argument ran, that was causing a lack of credibility in the Single Currency, without which there could be no long term growth [...] Fiscal discipline is vital to a viable monetary union. But this must be accompanied by the resolution of two main problems: the large intra-euro current account imbalances and the emergence of massive cross-border capital flight. The identification of the underlying causes of these imbalances, besides the lack of fiscal discipline, would guarantee the structural homogeneity inside the EMU and the proper functioning of the monetary policy. (Canale and Marani, 2014)

Indeed, whereas the Maastricht variables more or less converged (including the deficit variable, at least until 2007-2008), the situation in the euro area was unsettled by diverging trends of the neglected variables mentioned before. Thus a lesson of the crisis is that the stability of the monetary union depends on a wider set of conditions for member countries than mere compliance with budgetary discipline for which Ireland and Spain were praised. Giavazzi and Spaventa (2010) therefore argue that European institutions should improve the surveillance process and to accomplish with better enforcing procedures, that really force countries to respect the rules and to correct their imbalances. The procedures need also to be quicker and more efficient, and rules need to be also preventive, giving the right incentives to countries.

## **5.2 THE MAASTRICHT TREATY AND THE OPTIMUM CURRENCY AREA THEORY**

With a common currency, countries of the euroarea lost the control on monetary policies. They cannot set independently the interest rate applied by the central bank, the inflation target and the exchange rate. Therefore, countries need to converge their macroeconomic fundamentals. Different growth rates, different inflation rates, wages growth, productivity growth and unemployment rates imply that countries need to apply different monetary policies. Related to the balance of trade, fundamentals, e.g.

inflation and productivity can affect competitiveness and display growing imbalances. When monetary policies are not anymore sovereign, and fiscal policies are, however, in part constrained by the Maastricht pact, Members of the euro area have less instruments for correcting or reducing structural imbalances. A non convergence of macroeconomic fundamentals can create imbalances that would lead to smaller economic growth and higher unemployment rates. The imbalances of trade within European countries, and the related sovereign debt crisis, is a clear example of that. It is very costly, after an external shock, to counter react using only fiscal policies, without the support of monetary policies. Moreover, if the fiscal measures are reduced by the Maastricht pact, and no fiscal transfers mechanisms are available between European countries, the surveillance of the macroeconomic fundamentals convergence is very important.

The European Union has mainly pursued the process of convergence by controlling if countries were simply using prudential fiscal policies. In other words, the Maastricht pact introduced limits on the public debt and the annual government deficit, without checking the evolution of the private debt, productivity growth, asset and house prices, credit boom, inflation, wage growth and similar variables. Intuitively, those variables can still be influential on the development of structural imbalances, especially in relation with the balance of trade.

A quick overview of The Maastricht Treaty and its evolution can be beneficial for the discussion of its shortcomings. The Maastricht treaty came into force in 1992 and represented the first step toward the creation of an Economic and Monetary Union (EMU) in Europe. The countries that signed the Treaty had to accomplish some monetary criteria like the following ones:

- Government budget deficit of less than 3% of GDP;
- Government national debt of less than 60% of GDP;
- Price stability: an average rate of inflation no more than 1.5 percentage points above that of the three best performing member states;

- Convergence of the interest rates between countries: an average nominal long-term interest rate not more than 2 percentage points above that of the three best performing member states;
- Exchange rate stability: participation in the normal bands of the Exchange Rate Mechanism for at least two years without devaluations. All the above criteria were required to be fulfilled by 1999.

The reasoning behind those rules is quite clear: make euro area economies to converge, therefore permitting the ECB to implement a common monetary policy that could fit every Member. Moreover, prudential fiscal policies, e.g. public debt less than 60%, could leave the governments the necessary room for expansive fiscal measures when external shocks would have emerged, in order to restore the macroeconomic convergence.

In 1997, the EU Member States agreed to strengthen the monitoring and coordination of national fiscal and economic policies, in order to enforce the deficit and debt limits established by the Maastricht Treaty. The Stability and Growth Pact (SGP) was therefore introduced. In 2011, the SGP was enhanced through a collection of new laws, known as *the Six Pack*, and accompany, later, by the denominated *Fiscal Compact*. Overall, the new rules have been introduced in order to strengthen the surveillance process and the financial sanctions.

However, some observations can be proposed. First of all, the Maastricht pact, before the sovereign debt crisis, have not been respected by all the Members of the euro-zone, and no enough strong mechanisms of surveillance and sanctions were in place. For instance, Greece have cheated on his deficit, and Germany broke the 3% deficit over GDP rule in 2001, when the early 2000s recession was in place. However, countries like Spain and Ireland, that before the sovereign debt crisis have maintained and followed strictly the Maastricht rules, have been deeply hit by the sovereign debt crisis. When capitals have flown away quickly, investors did not look to the goodness of Spain and Ireland to follow the Maastricht rules, but they evaluate other structural imbalances, as the balance of trade and the private debt, that are not taken into consideration in the Maastricht pact.

In other words, countries as Greece have not respected the Maastricht treaty, and capitals from abroad have fueled domestic consumption and prodigal fiscal policies. However, Ireland and Spain have been respecting quite well the rules imposed by the Maastricht pact, keeping the level of public debt quite lower than the 60% to GDP before the debt crisis. However, in Ireland and Spain growth was led by a construction boom. The share of construction in total value added rose sharply in those two countries. The housing boom was accompanied by an extraordinary expansion of domestic credit. Between 2004 and 2007 loans for housing credit increased by 68 percent, in Ireland and by 65 per cent, in Spain, but only by 32 percent, in the average of the euro area (Giavazzi and Spaventa, 2010). Credit growth was fed by foreign borrowing. Ireland and Spain used, mainly, the foreign capital for producing non-tradable goods, that could not be used for repaying back the debt. Therefore, those countries did not use the resources for investing in project that could increase the productivity, therefore increasing the production frontier or to manufacture to a lower price the tradable goods. With a constant level of consumption, an higher level of production in the tradable sector would have led to higher savings, thus improving the balance of trade. Moreover, earnings on productive investment could have created resources for paying back the debt.

Therefore, even if Spain and Ireland have been following the Maastricht rules, they have been hit by the sovereign debt crisis. The Maastricht pact, indeed, does not refer at all to private debt, credit boom and investment surges. The dynamics with the house booming, and the related worsening of the balance of trade of Spain and Ireland, caused the investors to be more selective to the sovereign assets, thereby leading to a widening of the spreads of the sovereign bonds. In particular, Members of the euroarea do not have their own central bank which, in troubled times, can support the national Treasury as loaner of last resort. In sum, and this is an important point, the sovereign debt of a member of the euro area is related to its capacity of producing goods and service available to serve the debt, therefore the balance of trade.

However, the Maastricht pact, as already mentioned, took in consideration only the public debt evolution and not the balance of trade. In this matter, the Optimum Currency Area (OCA) theory can be helpful. The OCA theory does not give huge

importance to the balance of trade, however it stresses the need to create flexible labor and product market that can affect quickly the evolution of the balance of trade and to counter react to structural imbalances. Thus, the OCA theory doesn't imply that countries need to control the capital movements, indeed, it focuses mainly on other parameters, e.g. labor and market flexibility, that can increase the speed of adjustments and convergence of different economies.

The most striking aspect of the theory of optimum currency areas is that it is completely silent on the need for *prior* convergence in inflation rates, interest rates, budget deficits or the levels of government debt. In contrast, this theory stresses the need for real wage flexibility, mobility of labour, and fiscal integration as preconditions for a successful monetary union. [...] In addition, this theory suggests that when countries, that fail to satisfy the flexibility requirement, decide to form a monetary union, problems of macroeconomic management will arise in the union as a whole. For example, when a negative demand shock hits one or more countries while leaving the other members intact, the pressure on the central bank of the union to accommodate with a more expansionary monetary policy will be strong. This pressure will be all the more intense as the countries negatively affected by the demand shock lack the flexibility (wages, prices, labour mobility) to adjust. (De Grauwe, 1996)

Therefore, the first indicator for a OCA is the co presence, in the different economies, of price and wage flexibility. Friedman (1953) highlights that, when nominal prices and wages are flexible between countries of a single currency, the adjustment after a shock is probably less related with sustained unemployment in one country and/or inflation in another. Thus, there will be less need for nominal exchange rate adjustments. Therefore, it is important that European institutions work to force Members to introduce reforms that could increase the wage and prices flexibility. Another important element is related to the mobility of the factors of production, especially labor. Mundell (1961) points out that high factor market integration within a group of partner countries can reduce the need to modify the real factor prices, thus the nominal exchange rate between countries in response to shocks. Indeed, if workers move freely, the unemployment could be partly adjusted by labor movements from

country with high unemployment to countries with lower unemployment. In terms of international trade, movements of workers can also enhance the flexibility of wages after a shock, therefore restoring the balance of trade equilibrium more quickly. Therefore, the EU could invest in projects that simplify the procedures for entering in the foreign labor market for a worker. Moreover, other projects could be associated with the learning of a foreign language and the transfer of all the rest of the family of the worker abroad.

The OCA theory highlights also other elements that are related to market structure. Kenen (1969) points out that high diversification in production and consumption, therefore in imports and exports, decrease the potential impact of shocks specific to a particular sector. Therefore, diversification diminishes the necessity for changes in the terms of trade through the nominal exchange rates. Moreover, the same is valid for the partner countries. Thus, highly diversified partner countries are more likely to incur reduced costs in the case of facing a shock in a particular sector. At a first glance, the euro area market seems to be enough open and diversified. Fleming (1971) notes, also, that countries participating in an optimum currency area should display similar and low levels of inflation rates. That could reduce the potential imbalances of trade between countries, leading to stable terms of trade and equilibrated trade transactions, reducing the need for nominal exchange rate adjustments. The inflation displayed quite similar rates before the sovereign debt crisis, but maybe not close enough. Polito and Wickens (2014) argue that the low inflation policy of the ECB caused countries with higher inflation rates, e.g. Greece, Italy, Portugal, Spain, Ireland, to experience negative real interest rates, because of the convergence of the sovereign bond rates (figure 2), leading to an over borrowing in those countries, for instance public borrowing in Greece and private borrowing in Spain. Fiscal integration is also important, but is not enough developed in the euroarea, especially fiscal transfers are too slow and too narrow in their scope. Kenen (1969) points out that, if countries would share a supranational fiscal transfer system to redistribute funds in the case a member country is affected by an adverse asymmetric shock, that country would also be facilitated in the adjustment and it would be required less nominal exchange rate

adjustments. However, this would require an advanced degree of political integration, that is not yet in place in the euroarea.

### **5.3 THE EUROAREA: EX-ANTE AND EX-POST CONSIDERATIONS**

The analysis employed so far has shed light on different aspects of the sovereign debt crisis in Europe. First of all, the analysis mainly focused on the trade imbalances within countries of the European Union, however leaving out countries from East Europe. The trade imbalances have been one of the main determinant of the ongoing imbalances within countries of the EU. Moreover, the imbalances, and therefore the crisis, developed mainly in the euroarea.

Introducing a currency area can lead to advantages and disadvantages that need to be evaluated, in relation with the optimum currency area theory, as previously has been done. The main advantages of adhering to a currency union is to remove the exchange rate risk, especially when countries trade a lot between each other. Using the same currency increase the volume of trade and the level of competition, leading to GDP and productivity soars. Moreover, using the same currency can deeply improve the financial integration of European countries, because assets are priced with the same currency. Capital movements are therefore enhanced, leading to a more efficient use of the capitals. Moreover, for countries that had problems to be credible in the financial market, e.g. peripheral countries, relating to policies as inflation, exchange rate and interest rates, to deliver the power to set the monetary policies to an external body can lead to a better perceived credibility in the financial markets. Thus the cost for the refinancing of the debt could be lower, and low inflation targets are easier to implement. Moreover, for the central banks there is no need any longer to accumulate reserve currency for pegging the currency to the ones of other partners in the EU, as it happened with the agreements implemented before the introduction of the euro in Europe.

However, adopting the euro, Members of the euroarea needed to give up the control of their monetary policies. First of all, countries cannot affect anymore the nominal exchange rate, thus adjustments of the balance of trade are more difficult to

implement. Indeed, only price movements can affect the real exchange rate. The previous analysis has highlighted the following pattern: trade imbalances have been increasing in the euro area. Those have led to high public deficits in Greece and Portugal, and to a boom in the private debt in Spain and Ireland, that could not be sustainable in the long run. The results have been showing the main channel through that happened: productivity divergences not followed by congruent labor cost divergences on one hand, thus divergent competitiveness, and capital movements that boosted the public and private debt on the other hand, especially over confidence of the investors on the expected future performance of peripheral countries. The results have been showing also that market and labor reforms have not been implementing adequately in order to reverse the trade imbalances.

Before the conclusions, it is possible to argue what policy makers could have done before the introduction of the euro, and what could do afterwards, in relation with the economic crisis that hit the eurozone. In relation to a currency union, in order to decrease the need for Members to implement different monetary policies, some criteria need to be met. For instance, asymmetric external shock or different economic growth levels could lead to divergent trade balances. The same could happen with different inflation levels that could affect the balance of trade through the competitiveness channel, or that could influence the level of investment through the real interest rate. When those variables are not completely convergent, higher degree of labor mobility could lead to quicker adjustments. The same applies to flexible labor and product market, especially wages. Downward rigidity of wages can prolong the persistence of trade imbalances. Fiscal transfers could also be highly helpful in case of temporary divergences or when countries are facing the cost of the adjustments. As discussed before, the mobility of labor between Members of the eurozone is very low in Europe, due to different languages and legislations. Moreover, wages are downward rigid, and product and labor markets are not flexible. Therefore, before implementing the euro area, measures for increasing the flexibility of labor and product markets could have been introduced. Moreover, a system of fiscal transfers could have been introduced in combination with a better surveillance system. The Maastricht treaty did not take into consideration criteria like asset prices, productivity and labor indexes,

credit booms, and private debt. Moreover, no procedure of correction or punishment have been introduced, even when a country was not respecting the Maastricht treaty. Whenever it has been time of taking decisions and coordinate policies in the peak of the financial crisis, there was not an institutional framework that could set and implement quickly fiscal transfers, and countries in need of financial assistance needed, for a while, to undergo higher external pressures without help from other Members of the euroarea.

Therefore, regardless the question whether or not the eurozone is a optimum currency area, better could have been done in setting the institutional and surveillance framework before introducing the euro. It is arguable that after the economic crisis in Europe, the surveillance system has not been enhanced, beside the control of the public deficits evolution. Therefore, further steps need to be undergone, aiming also to enhance the monitoring of the mentioned variables as the credit evolution, productivity and labor costs, but also to increase mobility, and flexibility of labor and market product. Moreover, fiscal transfers could have been highly helpful during the peak of the crisis. Recessive policies imposed by the *troika* in Greece could have been combined with longer maturity loans, and policies that boost growth in the long run. Intuitively, recessive policies, needed for restoring the confidence of the investors and invert the evolution of the balance of trade and the public or private debt, can only increase and worsen the employment, leading to further recession and aggregate demand loss. Therefore, policies should also be aimed to improve the competitiveness of peripheral countries not only through price depreciation, but also through measures that could improve productivity in the long run. On the other hand, better coordinative policies, like higher consumption in Germany, could lead to restore competitiveness more quickly.

Zemanek et al. (2010) point out how is necessary that wage cuts are implemented in peripheral countries. That would lead to cut unemployment and to improve the balance of trade, since competitiveness would improve and domestic demand would be lower. The ECB, for instance, could have increased the inflation target, in order to leave more space for peripheral countries to recover competitiveness through inflation differentials, and get further away from a liquidity trap. With a higher inflation, even

with downward rigidity of wages, the recovery would be faster for peripheral countries, if they maintain constant wages. Schmitt-Grohé and Uribe (2013) suggest that a four percent for five years would be optimal. Moreover, higher inflation target could decrease the real value of the debt of peripheral countries.

Another problem that the policy makers from peripheral countries need to face is the obligation to restore the external balance, but through recessive policies that could, overall, decrease the prospects of the economy and worsen the unemployment rate. Therefore, without helps from the other better off countries, peripheral countries need to undergo costs that could worsen the future growth. Guajardo et al. (2011) report that, a fiscal consolidation of 1% of GDP could reduce the real GDP by 0.62% over the following two years in the absence of mitigating effects like expansive monetary policies. Alesina et al. (2012) point out that policy makers should apply fiscal adjustments through expenditure cuts rather than tax increases and accompanied by structural reforms, in order to reduce output losses. Nevertheless, Crafts (2013) highlights that cuts in expenditure on education and on infrastructure could be bad for long term growth, in terms of productivity and accumulation of physical capital. Therefore, policy makers need to perform carefully fiscal adjustments, in order to minimize the costs on the medium and long term growth of the economy.

## 6 CONCLUSIONS

This work has highlighted the factors that have mainly affected the imbalances of trade within countries in the EU. Technology gaps and capital movements have been the main factors that affected the balance of trade of the peripheral countries. Peripheral countries did not invest enough in projects that could enhance the productivity, leading to a competitiveness loss that was not followed by a correction of the wage levels. Moreover, capital movements have been financing consumption surge in Greece and Portugal, whereas in Spain and Ireland those capitals have fueled a credit boom and a house bubble. Therefore, those countries have been experiencing a worsening of their balance of trade, and investors have not been willed anymore to finance additional debt.

In relation to the Maastricht treaty, it has been pointed out that there is not a surveillance system, in the euro area, of the factors that could still affect deeply the balance of trade, e.g. productivity, credit boom, asset prices, inflation and wage levels. In the euro area, it is important that countries coordinate their policies in order to decrease the cost of a currency union. Fiscal transfers to peripheral countries could be beneficial for decreasing the cost of the adjustments, whereas reforms that aim to enhance productivity and increase the flexibility and the mobility of the product and labor market could be highly helpful. The sovereign debt crisis has highlighted the weaknesses of the currency union that was implemented in Europe, however, better coordinative policies and structural reforms could be beneficial for improving the currency area realized in Europe.

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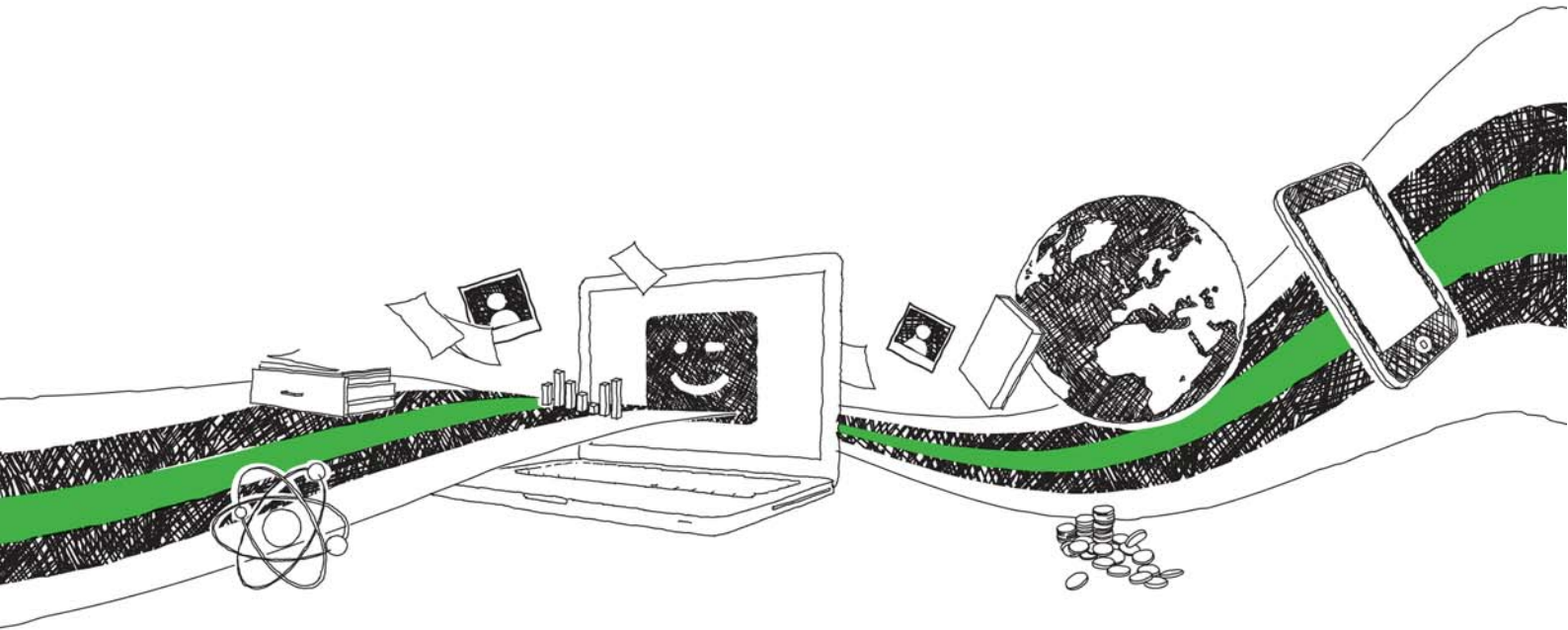
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