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Can Traditional IS-LM Model Explain the European Debt Crisis?

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Since from December 2009, when big three rating agencies started to downgrade Greek sovereign debt, the European debt crisis has lasted for over two years. Mass reports are given from the perspectives of fiscal deficit, default of sovereign debt, financial aid from European Central Bank (ECB) and International Monetary Fund (IMF) and public protest, but reports related to the comprehensive analysis of root of the European debt crisis are quite few. Actually, the nature of the European debt problems and Euro-Zone countries jointly-aid measures provided for countries in crisis can be easily analyzed and evaluated using traditional IS-LM model and its observation data from the economics perspective.

We know that, the Euro was officially born in 2002, which formerly functioned as European currency unit, and the famous economist Robert A. Mundell is known as "*Father of the Euro*". The Euro-Zone applies unified monetary policy, in the charge of European Central Bank (ECB) (Figure 3), an institution similar like the Fed. We can say that the Euro-Zone realizes the unification of monetary policy, but does not realize the unification of its fiscal policy and factor endowments structure. Although Euro-Zone member countries are allies with each other, each of 17 central governments does things in their own way. The inconsistence of its fiscal policy and the difference of factor endowments structure among each country make Euro-Zone exposed to serious crisis when born less than 10 years.

Matthew Effect

The Euro-Zone countries can be divided into two kinds: countries with strong economic power and those with weak economic power. Based on IS-LM model, and taking Germany and Greece as an example, assume that two countries' economies are in equilibrium when they just entered the Euro-zone. In the initial state, the real interest rate of the two countries is equal, since European central bank applies unified monetary policy. Because the size of two economics are quite different, the German output far outweigh the Greek, so the initial output level of the two countries must be quite different as well.

Since the monetary policy of the two countries is unified, when the European central bank doesn't take large loose or tightening policy, the real interest rate of the two countries will not change caused by monetary policy. However, due to the great difference in the fiscal policy and factor endowments structure of Germany and Greece, for example, the German people are diligent, Germany has rich resources, advanced technology, advanced manufacturing industry, and reasonable economic policy, which make German people enterprising and Germany with good economic development, the real interest rate of the German rises, and the rapid development of Germany causes serious impact on Greek economy. Why can we say that? Because capital is profit-seeking and complies with capital law of one price, that is to say, the capital will flow from the low real interest rates place to the direction of higher real interest rate place, and due to Euro-Zone's monetary unification, exchange rate adjustment does not exist between the two countries, and the capital can flow smoothly. The German economic prosperity makes domestic investment rate of return (real interest rates) much higher than that of Greece, which therefore attracts the Greek capital to flow to Germany. The outflow of the Greek capital will severely affect the development of domestic economy in Greece, so the Greek economy will appear passively decline, and the Greek recession will inevitably lead to fiscal imbalance. In order to maintain high domestic fiscal spending, Greece issues huge amounts of government bond for debt financing towards its people and allied country at any cost.

On the other hand, the inflow of Greek capital to Germany will make the real money supply increase in Germany. Of course, the Greek economy is much smaller when compared with Germany, so the capital inflow into the Germany accounts for relatively small percentage of total German economy, but that can still cause the real interest rate of Germany to fall slightly. That is equivalent to make Germany passively realize credit easing, and stimulate domestic economy for further development. The capital flow between the two countries will eventually make the real rate of return of the two countries reach equilibrium state. The ultimate result is the output of Germany increases, which not only because of its own enterprising spirit, but also because of the absorbed capital transferred from the Greece to make its output further increase. We can see that, in this process, German economy development depends on its own fiscal policy and resource factors. The increase of GDP causes real interest rate to rise, and therefore makes it need more

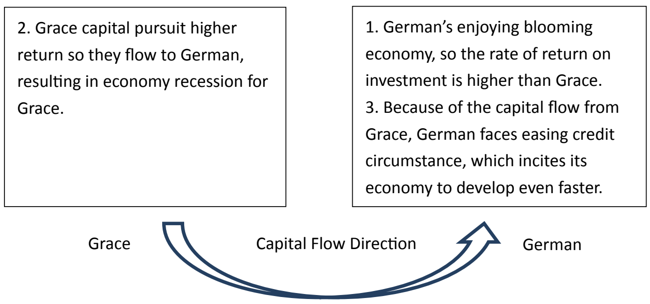

Figure 1: Explanation for the imbalance between German and Grace.

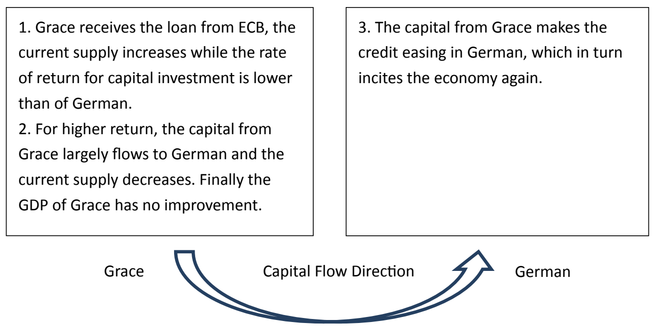

Figure 2: The results of capital assistance to Grace.

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money. At this time, if Germany has independent monetary policy, then the German central bank will need to pump some money into the real economy to meet the money demand of the real economy, and prevent the real interest rate from rising too high and foreign exchange appreciation. Yet Germany is in the Euro-Zone, so there is plenty of money around to supply automatically, which realizes money self-balanced mechanism. Germany (country with strong economic power) becomes stronger because of its enterprising spirit, while Greece (country with strong weak power) becomes weaker because of its non-enterprising spirit. That comes to the Matthew Effect: the stronger becomes stronger, the weaker becomes weaker.

The original intention of Greece joined the Euro-Zone is to enjoy the convenience of the monetary policy, and Greece never expected that their decision would make its economy passively decline due to their laziness. If Greece wants to solve this problem, they can only choose to become enterprising like Germany, to make Greek GDP rapid growth (Figure 2), so as to actively increase their Return On Invested Capital (ROIC), and stay at the same level with Germany for another time. Only in that case, Greece can prevent its capital outflow, and can even attract foreign capital inflow, and what more important is that only economic prosperity can achieve the fiscal surplus.

The above analysis is to assume that Greece and Germany are in equilibrium in the initial state, with same return on invested capital. But in fact, we have to revise a little bit. That is, Greece was in serious fiscal crisis before joining the Euro-Zone and its real interest rates was already lower than Germany. In order to meet the strict conditions to join the Euro-Zone, Greece cooperated with investment banks from the Wall Street at any costs, using their financial tools to mask their debt crisis, muddled through and successfully joined the Euro-Zone. Therefore, in the initial state, the return on invested capital in Greece was very low, and its domestic capital was doomed to inevitably outflow to Germany when Greece just joined the Euro-Zone.

The Paradox of Aid for European Debt Crisis

Countries with weak economic powers in the Euro-Zone like Greece are exposed to serious debt crisis, which is the problem of liquidity in the short term, and is the problem of output decline in the long term. To rescue Greece, the Euro-Zone, led by Germany, first has to solve the problem of liquidity in the short term. The solution is to let the European central bank and IMF continually provide huge loan for countries in the debt crisis. The latest aid occurred on February 21, 2012, when the European central bank provided 130 billion Euro loan for Greece. According to incomplete statistics, from 2011 to so far, the European central bank and IMF has provided about accumulative 900 billion Euros aid funds for countries in debt crisis. All those loans are the base money (high-powered money).When that money is dropped into the Euro-Zone, it can help solve the problem of liquidity in the short term, but what impact it can produce for Euro-Zone economy in the long run?

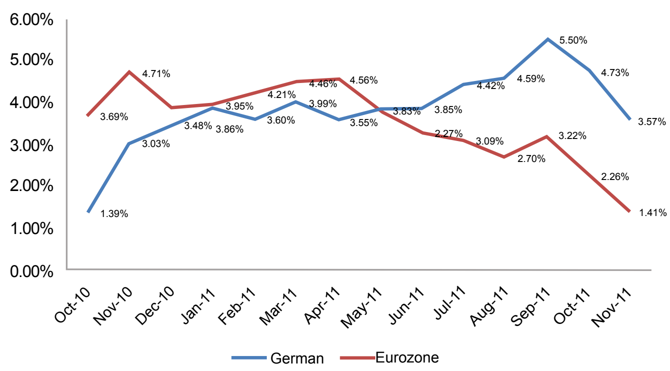

Figure 3: The YOY rate of bank deposits between Eurozone and German From: ECB, Deutsche Bundesbank.

Again, we will use IS-LM model for analysis. Assume in the initial state, the real return on invested capital in Germany and Greece are equal, the capital flow between two countries are in equilibrium. The German economic aggregate far outweigh that of the Greece. In order to ease the liquidity crisis in Greece, the European central bank decided to provide huge loans to Greece, which made Greek domestic real money supply increase sharply. When large amount of Euros were pumped into Greece, real return on invested capital in Greece would decline accordingly, while real return on invested capital in Germany still kept in the original level. As mentioned above, capital is profit-seeking, so the capital from Greek would flow into Germany, to seek for higher real rate of return. Capital outflow caused domestic money in Greece to fell greatly and interest rate to rise gradually. In the whole process, Greek GDP basically remained the same. So the loan aids for Greece cannot have real stimulation effect on its GDP, and the Greek economy is unable to hold the inflow capital to remain in its economy. The capital in Greece would inevitably outflow to Germany, or other non Euro-Zone countries like the United States. On August 29, 2011,Wall Street Journal published an article named "the Greek Banking Industry Difficultly Reacted to Deposit Outflow Problem", the article mentioned that, since the start of the European debt crisis, Greek banks encountered unprecedented withdrawal boom, and a lot of deposits had been transferred abroad or been stored at home safe. Ultimately, these original aid funds for Greece will flow into Germany, and increase money supply in Germany dramatically, which makes Germany passively realize credit easing, interest rate fall, domestic investment stimulated, and German GDP will further rise. We will be surprised to find that, it is originally to provide aids for Greece, but ultimately Germany benefit most from it and GDP in Greece basically remains the same, that becomes a paradox. Providing aid for the Greece can only solve its liquidity problem in the short-term, if capital continually outflows, it can even cause the Greek banking industry to fall in liquidity crisis, so the nature of the problem is not solved, and Greece is still difficult to walk out of trouble.

The above analysis is based on the assumption that the European central bank will provide unconditional loan aids for Greece. But in fact, when the other Euro-Zone countries agreed to provide aids for Greece, it forced the Greek government to cut fiscal spending and implement tightening fiscal policy, so as to remind the Greek government and Greek people to save spending. This tightening fiscal policy will obviously further intensifies the domestic economic recession and reduce the return on invested capital, which causes more capital to outflow. The ultimate result is that, when Greece accepted loan aids from the euro zone, the problem of liquidity was temporarily solved, but Greek economy was serious harmed. In 2011, German GDP realized 3% year-on-year growth, but Greek GDP year-on-year declined by 6.8%, which also supports our analysis above.

From the micro economics perspective, after the Greek government received aids, aids are first used to pay off the debts. National debt investors in Greece got principal repaid by Greek government, out of the capital gain and safety consideration, those investors will consider will to put funds to assets with higher yield and better safety. The most convenient way is to invest those funds into Germany, the country with strong economic power in the Euro-Zone. Figure 1 shows the Euro-

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Zone and German banks deposit amounts year-on-year growth from October 2010 to November 2011. We can easily see that the overall trend is the year-on-year growth of Germany's deposit becomes more and more quickly, while the year-on-year growth of Euro-Zone's deposit becomes slower, which suggests that the increase of liquidity in the Euro-Zone has trend of concentration towards Germany.

Therefore, in 2011, there was a period of time when German bond yields were turned negative, and that was due to the crazy capital inflow to Germany for safety reason. And at the same time, the German stock market performed best in the euro zone. The German DAX reached the highest of 8151.569 points on July 13, 2007, and reached the lowest of 3588.889 points on March 9, 2009.As of February 25, 2012, the German DAX closed at 6864.43 points, fell 15.79% relative to the peak in 2007. In contrast to German stock market, Athens General Index reached the highest of 5334.50 points on October 31, 2007, and went down afterwards, reached the lowest of 625.35 points on January 10, 2012. As of February 24, 2012, closing point of Athens General Index was 749.69 points, fell 85.95% relative to the peak in 2007. Thus we can judge the aid funds which solved for short-term liquidity problems of European debt countries mostly flowed into Germany, which stimulated the German asset prices to rise.

The inconsistent fiscal policy and structural difference in factor endowment among Euro-Zone member countries are the most fundamental problems that cause European debt crisis to happen. The current Euro-Zone development model will aggravate the gap between rich and poor and cause regional imbalance between member countries. This is to some extent similar with China's current situation, but different in nature. There are also two-dimension economic structure existed between urban and rural areas in China. If we simply divided China into first-tier cities and rural, currently, first-tier cities economically developed, output per capita is significantly higher than that of the rural, and the return on invested capital is also significantly higher than that of the rural, so the capitals in the rural (including labor factors) are willing to flow into the city to seek for higher rate of return, which further promotes the output increase in the first-tier cities, leading to growing wealth gap between rural and urban areas. However, China and the Euro-Zone have difference in nature, that is the first cities and the rural areas are regulated by the same central government in China. In order to narrow the gap between the urban and rural areas, the Chinese central government can make use of methods such as fiscal transfer payment to increase the support to rural areas. But that method cannot be realized in the Euro-Zone, and Germany will never allow its accumulated wealth transferred to Greece to spend.

As the size of loan aids to debt crisis countries provided by European central bank and IMF grows larger, this base money will flow into Germany continuously, equivalent to the European central bank

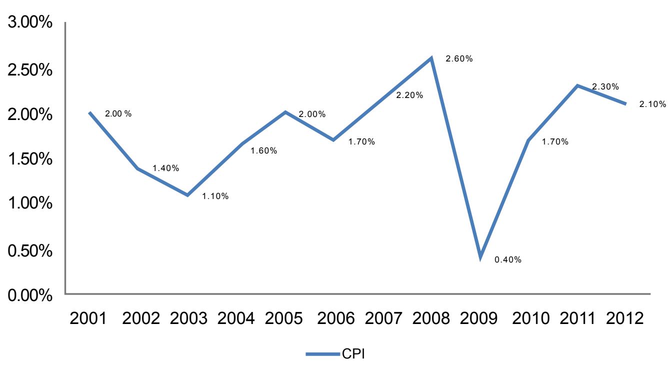

Figure 4: Recent CPI of German From: Statistisches Bundesamt.

provides credit easing for Germany. Through monetary amplification effect in the banking system, the base currency can form M2 with relative large scale. Such massive of credit influx into real economy, must push German price upwards. According to statistics from the German Federal Statistics Office, in 2011, German CPI rose by 2.3% on year-on-year basis, higher than warning line of 2.0% set by the European central bank; in January 2012, German CPI rose by 2.1% on year-on-year basis, still higher than warning line of 2.0%. (Figure 4) reflects the German CPI data on year-on-year basis in recent years. From 2001 to 2011, the average of German CPI growth on year-on-year basis was 1.7%, so the current German CPI growth rate is obviously at historic highs among recent years. This supports our above analysis that much of aid loans for European debt crisis countries flowed into Germany. Compared with inflation level of Germany this year, current situation can be regarded as "mild inflation", not a too bad thing for the real economy. In contrast, the Greek inflation rate dropped from 4.75% in 2010, to 2.4% in 2011, which can be attributed to capital outflow and economic recession.

Credit easing is not an issue only for Germany, and the whole euro zone will face the problem of "the anticipated inflation". In the long term, the Euro is expected to depreciation, as for how much it will depreciate specifically, that depends on further processing of Europe debt crisis, as well as the outside economic situations of United States, Japan and China. If international macro hedge funds can carry out careful analysis of countries economic situation under the situation of current global monetary and fiscal policy imbalance, it should be able to find the suitable investment target, and make good profit.

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