AN ANALYSIS OF GERMANY'S ECONOMY AND ITS IMPACT ON EUROZONE'S ECONOMY

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Abstract
One of the most important events in the World after World War II was the reuniting of Germany, during the late 1980's and early 1990's. The goal of the authors in this paper is to discuss the general economic conditions in Germany, before and after the reunification. In attempting to do that, we will in the introductory section present data and analysis for both East and West Germany for the years from World War II up until the time of reunification. The second section will present an evaluation of the economy of Germany since the reunification. In the third section a statistical model will be developed to show the general impact of the union on the German economy. In the fourth section, the authors will try to derive a conclusion as to whether the reunification has thus far been handled well. Finally in the Appendix we will run several regression models to measure the impact of W. Germany or E. Germany and the United Germany on the Eurozone of sixteen nations.

I. Introduction

Germany was broken down into East and West by the allies right after World War II. The East remained under Soviet control for a number of years, and then under Soviet influence until 1989, whereas the West was under western control and financial support until 1948, and since then under western influence. A lot of developments took place in both Germanies during those 40 years, but probably the most important one took place during 1961, when the East German government built a wall to separate East and West Berlin. In 1989, this wall opened as a result of a mass exodus of East Germans to the West, as well as a lot demonstrations in a number of East German cities. Finally, by October of 1990, the two German States were reunited, and in June of 1991, the German seat of government was moved to Berlin.

Because of the different political and economic influence in the two countries since the split, their respective economies headed in different directions. In this section of the paper, the authors would like to evaluate the economic performance of both East and West Germany from the end of World War II until 1989, the year of the unification. We will begin with West Germany first.

West Germany

1948 - 1960 **During this period the West German economy was very robust. It experienced very fast growth, low price inflation, declining unemployment and a good external trade balance. One of the most important factors driving this success was a strong improvement in labor productivity which was in turn due primarily to three things:**

a. **a rapid reconstruction of the capital stock**
b. **a powerful structural adjustment of employment**
c. **German wages were lower only than the US and the UK**

As a result of these things, wages rose by 15% between 1947-1950, while the consumer price index rose by 14.3%, and labor productivity rose by 17.7%. All these contributed to strong profit margins for firms. This success continued between 1950-60, during which time the GDP doubled, worker productivity rose by 75%, and there was virtual price stability. This growth was accompanied by only one significant recession, which was in 1957-58.

What were the factors contributing to this unbelievable success? Demand for German goods was very strong, and that pushed exports up by 17.5%. The strong demand for goods was fueled by a relatively loose monetary policy (made possible by the lack of inflation). On the fiscal side, policy between 1952-56 created a budget surplus of more than 3% of GNP. In short, during the years 1950-1955 the German economy performed amazingly.

In 1955 we begin to see some inflationary pressures develop. Specifically, inflation for that year was about 2%. While this seems mild by our standards, it must be remembered that Germany was not far removed from a period of hyperinflation in the 1930's and was therefore extremely wary of any inflation. As a result, the monetary authorities started changing their approach. They tightened credit by raising the discount rate from 3% to 5%. This brought on a recession in 1957, and to remedy it they again reversed their monetary policy, lowering the discount rate to 2.75%. The economy responded by emerging from the recession in 1958.

1960-1973 **This period is known as the transition years. During these years, we see very tight labor market conditions, due to labor shortages, with foreign workers being imported to fill the gaps. Unemployment was below 1%. All of this contributed to price inflation, and by 1960 the monetary authorities had to tighten credit by raising the discount rate to 5%, and raising the minimum required reserves by 55%. As a result the external trade balance was aggravated and exports declined, and by November of the same year the monetary policy was reversed to improve the external trade balance. By 1963 exports picked up and growth was up to 6.7%, but by 1965 the Germans experienced their first budget deficit since 1951, 1.4% of GNP. During the next year wages rose faster than productivity, and this continued for the next two years, with the result that profits were squeezed, investment collapsed, interest rates rose, and the GDP shrank by 0.1%. As a result of this recession, the monetary authorities adopted expansionary measures, and by 1968 exports rose to 8.4%, leading the economy out of its only recession of the decade. Between 1969-73, what has come to be called the German economic miracle reached its high water mark, a fact that was evident in three major areas:**

a. **In 1970, the degree of capital stock utilization reached the highest level since 1956**
b. **Inflationary pressures started showing up, with consumer price inflation between 5 - 7%**
c. **Germany realized maximum capacity and growth**

Another important thing that took place in the 1960-1973 period was growth of the government sector. In 1960 government spending was 32.9% of the GNP, but by 1973 this rose to 42.1%. Also, taxes and social security rose to 43.3% of GNP by 1973, a figure that was only 35.9% in 1960.

1973-1989 **This is the last period before the reunification. This period was not as good overall as the previous two. In 1973, Germany had the lowest GDP growth of the six most industrial countries, and this resulted in labor surpluses. There were two major recessions in this period, 1974-75 & 1981-82, with very slow recovery. Both of these recessions were world wide phenomena and both were preceded by a hefty raw material price shock. But what factors within Germany contributed to them? In 1973, the inflation rate rose to 7% so the authorities imposed a tight monetary policy, which by 1974 resulted in a discount rate of 7% and a prime rate of 10.2%. As a result, investment contracted by 10% and the economy sank into recession. The authorities responded to this with expansionary measures, and in 1976 exports grew by 10% and investment got back on the right track, pulling the economy from its slump. Despite this, persistent unemployment continued through the 1970's.**

East Germany

East Germany, more formally known as the German Democratic Republic (GDR), was created in 1949. It was formed from the German provinces which were part of Russia's zone of occupation at the end of World War II; as a result East Germany began its existence in a state of economic void. To fill this void the USSR began overlaying on East Germany its own Stalinist economic model. Industry and agriculture were nationalized, central planning bodies were formed, and generally all the important aspects of the Soviet system were put into place. Given that East Germany was under occupation by Soviet troops, it is not surprising that the whole imposition went fairly smoothly. Thus the GDR was poised to serve as a good test for economic development under a Soviet communist system.

The GDR from the outset possessed a well trained and efficient workforce and with this the economy began a respectable recovery. By 1961 the Soviet Communist system was fully functioning and had driven industrial production up an average of 8% for each of the preceding five years. The problem with this growth only appears by way of comparison. Inevitably, comparisons were made with the West German economy, which had recovered even faster and more impressively. This led to the construction of the Berlin Wall in 1961 in order to stem the rapid outflow of GDR citizens who were looking for a better standard of living in the west. This highlights a problem with the East German Economy which continued up until the collapse of communism - that of comparison with the West. For despite the fact that the GDR, economically, was a model for the rest of the Soviet Satellites, East Germany always measured itself not against Hungary, not against Czechoslovakia, but against West Germany. And in such comparisons the East Germans could, by virtue of physical proximity, language commonality, etc., easily see that their own standard of living was not equal to that of their former countrymen in the west.

Thus it continued up to the late 1980's, when economic stagnation in the Eastern bloc communist countries came to a head. Soviet President Gorbachev had instituted liberal reforms in the Soviet Union in an effort to revive the failing economy and address the people's desire for more political freedom. Once these reforms were put into place, however, they took on inertia and exploded out of Gorbachev's control as first one satellite, then another declared independence and the Soviet Union began disintegrating. In East Germany, it has been noted that the economy was at this time not in very bad shape. At least not in comparison with its East European counterparts. For this reason the collapse of communism in the GDR cannot really be seen as a dynamic internal to East Germany, but was perhaps more of a domino effect from the communist regimes that were falling all around it. Regardless, though, the East Germans were clearly not satisfied with their status quo. Demonstrations and riots occurred on the streets during the celebration of the GDR's 40th anniversary in 1989, and in November of that year a mass exodus from East Germany to West

occurred as the borders opened and the Berlin Wall came down. The communist political-economic system that had defined the GDR collapsed. This led, as with the other former communist countries, to the question of what direction to take now that communism had failed. East Germany had a unique solution to the question, namely, to reunite with its Western counterpart. Though the prospect of a reunited Germany created some measure of trepidation in a Europe mindful of the ravages of World War II, the idea caught on quickly and Germany reunited in the summer of 1990.

II. Germany Since Reunification

After the above economic review of the two German States prior to the unification, the purpose of this section is to do an evaluation of the Unified Germany since 1990.

As was discussed in the previous section, the two economies had become completely different since the split. While the West had linked its post war reform to a market economy, the East had transformed to a Soviet type command economy. The final outcome was that at the time of reunification the per capita GDP in East Germany was 40% less than the West, and labor productivity was 30% less. Economic unification came on July 1, 1990. While political unification followed on October 3, 1990.

It has already been a number of years since the unification, and the rebuilding of the Eastern economy has not been easy. Nevertheless, the Eastern economy has responded to reunification plan, and the inequalities between the two have narrowed tremendously. One of the first things that the parliament of East Germany did right after the economic unification was to create a trustee agency. The job of this agency was to make both large and small firms competitive and to help transfer them to private hands by 1994, since all of them were owned by the state.

Switching from a communist state to a capitalist state has benefits as well as costs. Not everything will be successful, and not everyone will have an easy ride. In the former East Germany (which we'll now refer to as eastern Germany), unemployment rose sharply as a result of bankruptcies and the effort by business managers to slash payroll. Western Germany was, and still is, carrying almost the entire burden of the reunification - helping eastern Germany recover. This is illustrated by the fact that during the first five years of unification it has spent more than $586.5 billion in eastern Germany for the improvement of infrastructure, such as transportation, housing and environmental protection. Another factor contributing to the eastern German development is the increase of investment by foreign firms. All these efforts began paying off, and by 1994, the Eastern economy grew by 9.4%, and the per capita GDP stood at about 50% of that of the other side. This figure was up from 30% at the end of 1990. The only thing that was very slow in responding was unemployment, which stood at 14% of the labor force.

In 1997, the economic production was under 57% of that of the west, and the wage costs in connection with real net output were nearly 30% higher. So, their most important goal was to increase productivity in order to reduce the impact of the high labor costs, and the way they tried to achieve this was by maintaining existing jobs and creating new ones, in cooperation with business management.
Obviously, the business sector had to contribute to the development of East Germany, and all the trade and industrial associations have pledged to implement measures to stabilize capital expenditure on equipment, but they made this pledge on three conditions:

a. **The trade tax be abolished**
b. **Investment and equity assistance remain available to trade and industry**
c. **Overall investment-friendly conditions exist**

On the other hand the Federal government did share in contributing to the development. Among other things, they continue providing large-scale assistance (such as tax incentives) to commerce and industry in the years to come, eliminate special depreciation allowances in return for a noticeable increase in investment allowances, provide assistance in the housing construction industry for the modernization of old buildings, and provide a six year plan and conditions for assistance.

One can say that all the data available indicates that both the German government and the German people are doing everything they can, and are working together to make this unification work. And it has, in fact, worked thus far, and this is supported by the latest data available. Germany now is the fifth largest economy in the world, with a GDP of $2.863 trillion in 2008, and a per capita GDP of $34800, which also makes Germany the largest economy in Europe. Other data that show a tremendous improvement in Germany include unemployment of 7.9%, and inflation of 2.8%. In conclusion, all the indications are that Germany came a long way since the fall of the Berlin Wall, especially with the negative economic and political conditions of East Germany.

III. Statistical Analysis

TABLE 1
Real GDP for East and West Germany and United
Germany in Bil. Of 1999 $ US
1989 - 2003

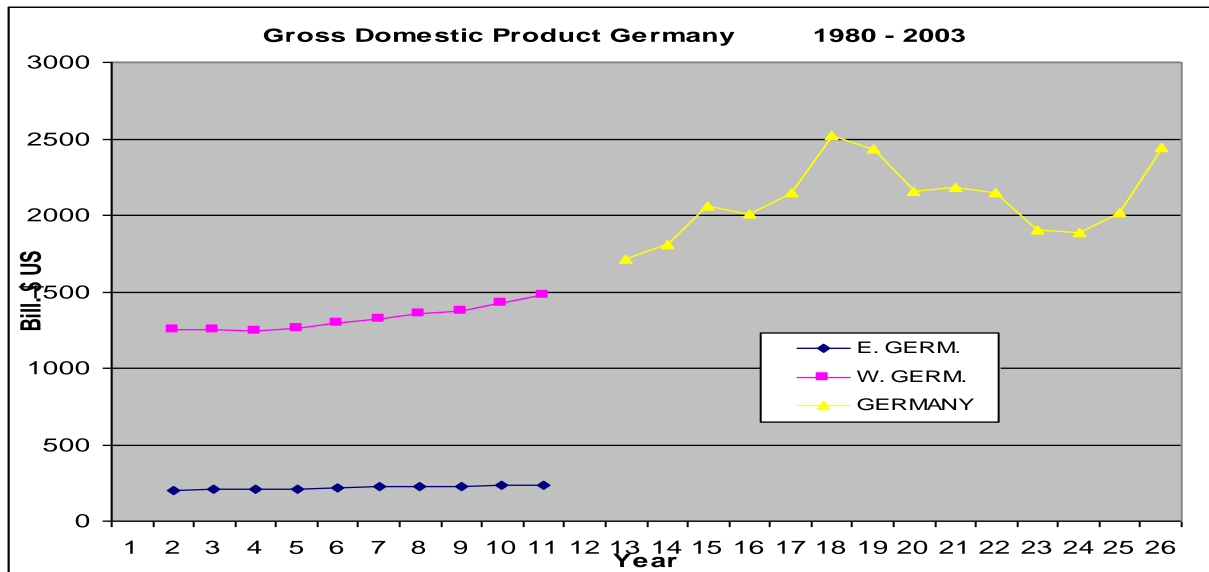
YEAR	E. GERM.	W. GERM.	GERMANY
1980	**201.9**	**1251.6**	
1981	**206**	**1252.8**	
1982	**205.3**	**1241.1**	
1983	**209.2**	**1263**	
1984	**215.2**	**1298.4**	
1985	**221.9**	**1325**	
1986	**225**	**1356**	
1987	**228.9**	**1376**	
1988	**231.3**	**1427**	
1989	**234**	**1479**	
1990			**1714.5**
1991			**1808.6**
1992			**2062.2**
1993			**2004.5**
1994			**2146.3**
1995			**2522.8**
1996			**2438.5**
1997			**2160.6**

1998			2184.5
1999			2143.6
2000			1900.2
2001			1890.9
2002			2016.9
2003			2442.2

SOURCES: Total Economy Database: Real Gross Domestic Product, OECD, 2004 August
Total Economy Database: Real Gross Domestic Product, Eastern Europe and Central Asia 2004 August.

In the previous table, Table 1, we show the GDP for East Germany and West Germany between 1980 and 1989 and the combined GDP until 2003, and we see that since the unification there is steady increase in the GDP. This is also shown in Figure 1 that follows. We can see how the two Germanies compared before uniting, and where they are headed now.

FIGURE 1



In Table 2 and Figure 2 that follow, we see the Growth rates for the two Germanies before 1990, and the combined rate after 1990. Again we can say with confidence that other than a couple of years, (1993 and 2003), the economy is moving the right direction and is fairly strong.

TABLE 2

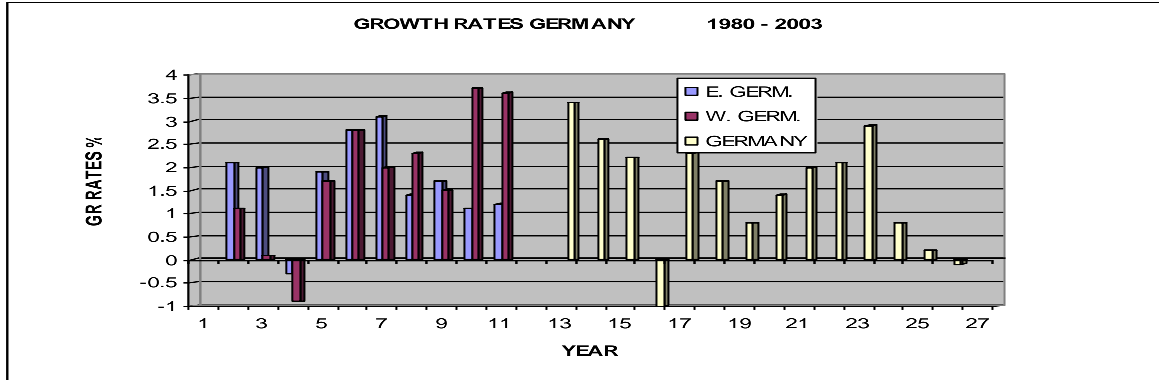
Growth Rates for W. Germany, East Germany and United Germany 1989 - 2003

YEAR	E. GERM.	W. GERM.	GERMANY
1980	**2.1**	**1.1**	
1981	**2**	**0.09**	
1982	**-0.3**	**-0.9**	

1983	**1.9**	**1.7**	
1984	**2.8**	**2.8**	
1985	**3.1**	**2**	
1986	**1.4**	**2.3**	
1987	**1.7**	**1.5**	
1988	**1.1**	**3.7**	
1989	**1.2**	**3.6**	
1990			**3.4**
1991			**2.6**
1992			**2.2**
1993			**-1**
1994			**2.3**
1995			**1.7**
1996			**0.8**
1997			**1.4**
1998			**2**
1999			**2.1**
2000			**2.9**
2001			**0.8**
2002			**0.2**
2003			**-0.1**

SOURCES: Total Economy Database: Groningen Growth and Development Center (GGDC) February 2004.

FIGURE 2



The next table, Table 3, shows total trade between the U.S. and W. Germany for the years 1980 – 1989, as well as the United Germany since 1989. It is obvious from both Table 3 and Figure 3 that Germany always had and has a surplus when trading with the U.S. and this is something that is advantageous for them as it helps their economy.

TABLE 3

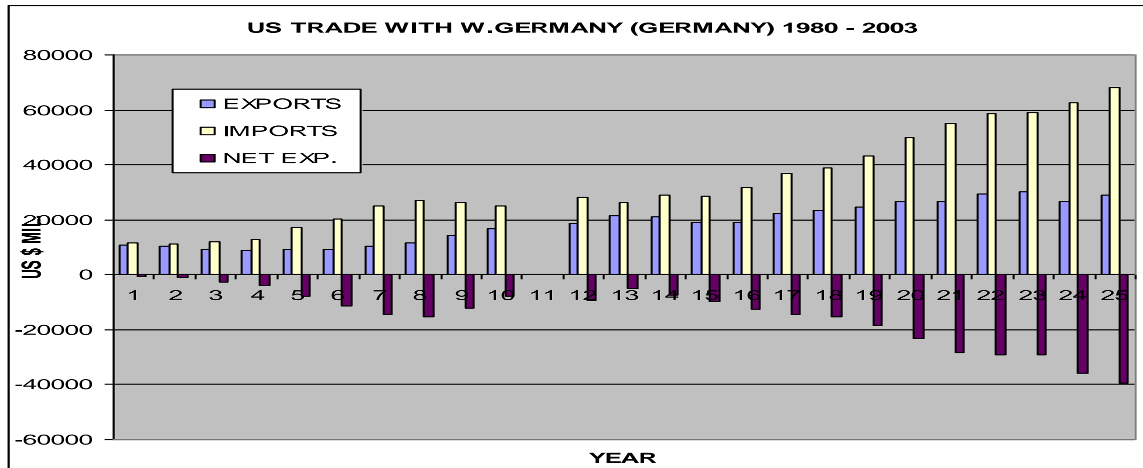
U.S. EXPORTS AND IMPORTS TO/FROM W. GERMANY 1980 - 1989
AND
UNITED GERMANY 1990 - 2003

YEAR		EXPORTS		IMPORTS		NET EXP.
1980		**10960**		**11693**		**-733**
1981		**10277**		**11379**		**-1102**
1982		**9291**		**11975**		**-2684**
1983		**8737**		**12695**		**-3958**
1984		**9084**		**16996**		**-7912**
1985		**9050.2**		**20239.2**		**-11189**
1986		**10560.6**		**25123.8**		**-14563.2**
1987		**11747.7**		**27069.4**		**-15321.7**
1988		**14347.5**		**26362**		**-12014.5**
1989		**16862.3**		**24832.3**		**-7970**
1990		**18759.9**		**28162**		**-9402.1**
1991		**21302.5**		**26136.4**		**-4833.9**
1992		**21248.5**		**28820.4**		**-7571.9**
1993		**18932.3**		**28562**		**-9629.7**
1994		**19229.1**		**31744.3**		**-12515.2**
1995		**22394.3**		**36843.9**		**-14449.6**
1996		**23494.9**		**38944.9**		**-15450**
1997		**24458.3**		**43121.4**		**-18663.1**

1998		**26657.2**		**49841.9**		**-23184.7**
1999		**26800.3**		**55228.3**		**-28428**
2000		**29448.4**		**58512.9**		**-29064.5**
2001		**29995.4**		**59076.6**		**-29081.2**
2002		**26629.6**		**62505.7**		**-35876.1**
2003		**28831.9**		**68112.7**		**-39280.8**

SOURCES: United States, Bureau of the Census, Statistical Abstract of the United States: 1987, 107th edition, Washington, DC, 1986.
United States, Bureau of the Census, Trade (Imports, Exports and Trade Balance) with Federal Republic of Germany, 14 Oct. 2004.

FIGURE 3



The last 2 tables show how Germany compares to a number of other countries. Table 4 compares the Gross Domestic Product and we can see that Germany's GDP is only less than Japan's, the European Union's as a whole ant the United States. This obviously is another indication that the union of the West and the East is successful and that the Union is beginning to pay off.

TABLE 4

GROSS DOMESTIC PRODUCT

Billion US dollars, current prices and PPPs, 2006 or latest available year

Iceland	**10.9**
Luxembourg	**36.9**
Slovak Republic	**94.8**
New Zealand	**107.3**
Finland	**172.4**
Ireland	**173.2**
Hungary	**182.8**
Denmark	**191.5**

Portugal	**220.6**
Czech Republic	**226**
Norway	**242.6**
Switzerland	**285.3**
Austria	**295.6**
Greece	**303.6**
Sweden	**316.7**
Belgium	**353.5**
Poland	**558.3**
Netherlands	**597.2**
Turkey	**639.7**
Australia	**735.3**
Korea	**1112.7**
Canada	**1201**
Mexico	**1267.9**
Spain	**1294.8**
Italy	**1699.2**
France	**1962.1**
United Kingdom	**1997**
Germany	**2631.6**
Japan	**4077.8**
EU15 total	**12245.8**
United States	**13132.9**

SOURCE: OECD Factbook 2008: Economic, Environmental and Social Statistics - ISBN 92-64-04054-4- OECD 2008

Finally, Table 5 that follows shows the Foreign Direct Investment (FDI) both inward and outward of a number of countries. In the outward site, only a handful of countries beat Germany, and this means that Germany is heavily involved with other countries by investing in them. On the other hand the inward FDI is very low compared to the majority of the countries and this is something they need to work on improving as they have a lot to benefit out of foreign investment.

TABLE 5-FDI STOCKS

As a percentage of GDP, 2005 or latest available year

	Outward FDI	**Inward FDI**
Japan	**8.5**	**2.2**
India	**1.6**	**6.5**
Greece	**4.8**	**10.3**
Italy	**16.6**	**12.7**
Korea	**4.9**	**13.3**
United States	**19.8**	**15.1**
Turkey	**2.3**	**17.8**

Austria	**22.3**	**20.5**
OECD total	**25.7**	**21.0**
China	**2.9**	**21.0**
Brazil	**9.0**	**22.2**
Russian Federation	**19.2**	**23.6**
Germany	**28.7**	**23.7**
Mexico	**3.7**	**27.3**
Finland	**41.6**	**27.8**
Australia	**24.2**	**28.0**
Iceland	**62.2**	**29.0**
France	**41.3**	**29.4**
Norway	**34.8**	**29.4**
Poland	**2.1**	**29.5**
Canada	**34.9**	**30.9**
South Africa	**15.2**	**32.0**
Spain	**33.0**	**32.9**
Slovak Republic	**1.3**	**33.3**
Portugal	**23.8**	**35.4**
United Kingdom	**54.7**	**37.1**
Denmark	**49.1**	**44.6**
New Zealand	**11.4**	**45.3**
Switzerland	**114.5**	**45.4**
Sweden	**58.4**	**48.1**
Czech Republic	**2.9**	**48.6**
Hungary	**7.2**	**56.0**
Netherlands	**99.5**	**70.6**
Ireland	**51.3**	**82.9**
Luxembourg	**89.5**	**117.1**

SOURCE: OECD Factbook 2008: Economic, Environmental and Social Statistics -

ISBN 92-64-04054-4- OECD 2008

IV. Conclusion

The purpose of this final section of the paper is to summarize the findings of the authors and to make some concluding remarks and recommendations. Both Germanys' as independent States have gone through a lot of ups and downs over the years, with those of East Germany being much more severe than the West for obvious reasons. Since 1989 - 1990, the time of the reunification, the economic future of Germany is much brighter than before. This conclusion is supported by all the tables discussed previously which illustrate the direction of the German economy. One set of data that is very encouraging for the Germans, is the trade data with the U.S. As can be seen in this table, Germany has a surplus when trading with the U.S., which means that Germany has a lot to offer for trade, and they should concentrate on increasing their exports to other countries as well. This will benefit their trade balance, as well as employment and productivity. All these things,

taken together, show that Germany is very promising and should be very attractive for investments to American businesses. In conclusion, this paper is not complete by any means, but it is the intention of the authors to draw attention to this topic and hopefully encourage further research in this area.

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APPENDIX

In the Appendix our purpose is to measure the economic influence that W. Germany had on E. Germany before they were united, and then measure the impact that Germany has on the Eurozone (sixteen nations), since it is the biggest and strongest economy. When this paper was being put together, the Eurozone was composed by the following 16 European nations: Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain.

Regression Model 1:

Dep. Variable: GDP East Germany

Indep. Variable: GDP West Germany

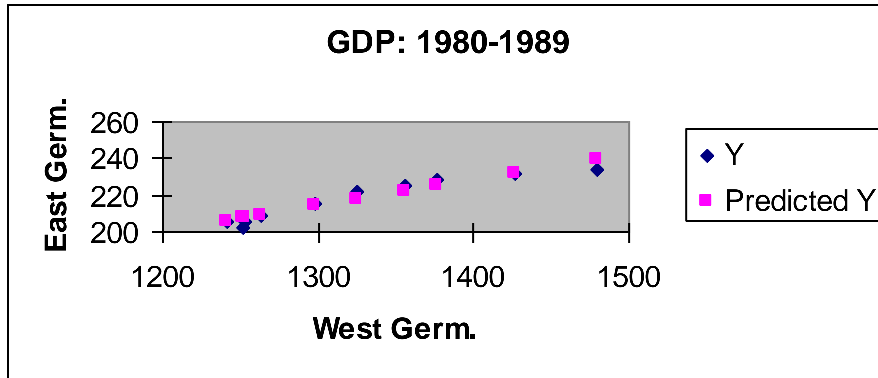
Hypothesis: West Germany's GDP did not have an impact on East Germany's GDP. The regression was run for the years 1980 – 1989.

R^2 = 0.916, and this means that almost 92% of East Germany's GDP could be explained by West Germany's GDP. $P = 1.39\times10^{-5} < .05$ so that the hypothesis is rejected.

Conclusion: at the 95% confidence level, a $1 billion increase in West Germany's GDP will cause an increase in East Germany's GDP, although a very small one.

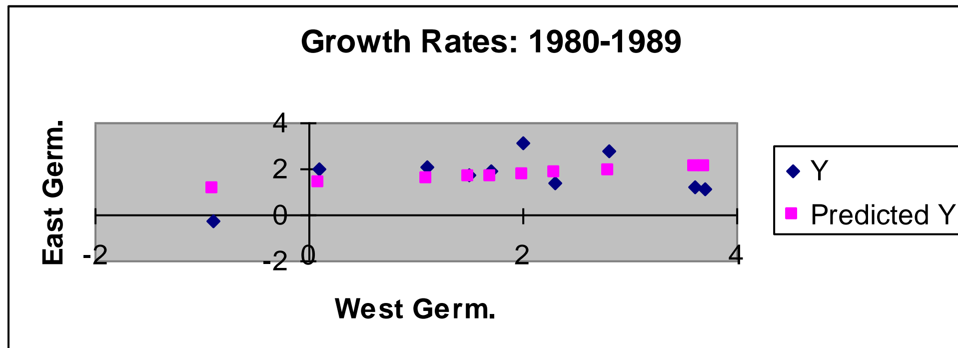
Figure 1B that follows shows the outcome of the first regression model.

FIGURE 1B



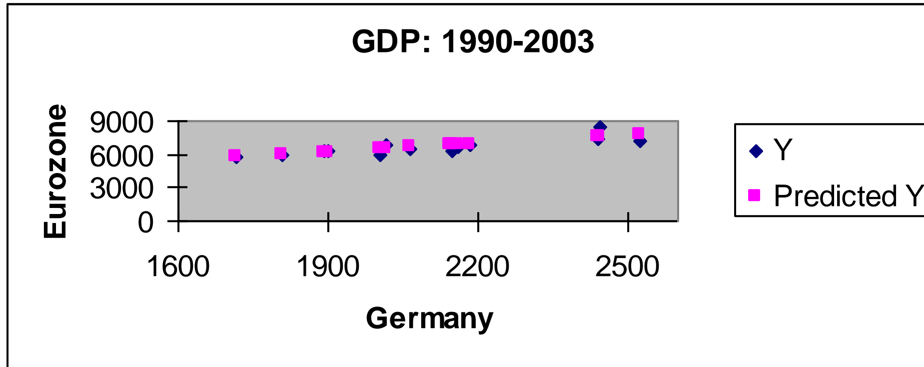
Regression Model 2:
Dep. Variable: East Germany's Growth Rate.
Indep. Variable: West Germany's Growth Rate.
Hypothesis: West Germany's Growth Rate does not have an impact on East Germany's Growth Rate. R^2 = 0.092, meaning that only 9% of East Germany's Growth Rate can be explained by West Germany's. P = 0.393 > .05, so in this case the hypothesis is accepted.
The results of the 2nd regression are shown on Figure 2B below.

FIGURE 2B



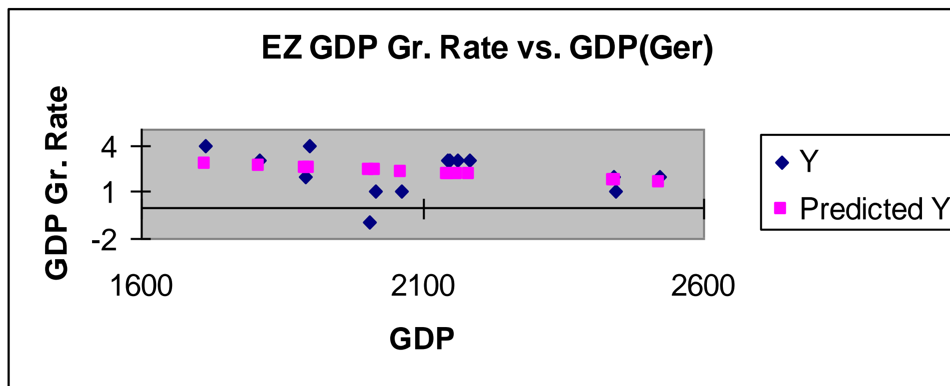
The next three regressions were ran for the years 1990 to 2009, which of course were after the unification, and measure the impact of United Germany on the Eurozone.
Regression Model 3:
Dep. Variable: Eurozone GDP
Indep. Variable: Germany GDP
Hypothesis: Germany's GDP does not have an impact on the Eurozone's GDP.
R^2 = 0.720, which shows that 72% of the Eurozone's GDP is explained by Germany's GDP. P = 0.00001 < 0.05, and because of this, the hypothesis is rejected, and at the 95% confidence level $1 billion increase in Germany's GDP will cause an increase in the Eurozone's GDP between $1.6 and 3.6 billion. This is shown below on Figure3B.

FIGURE 3B



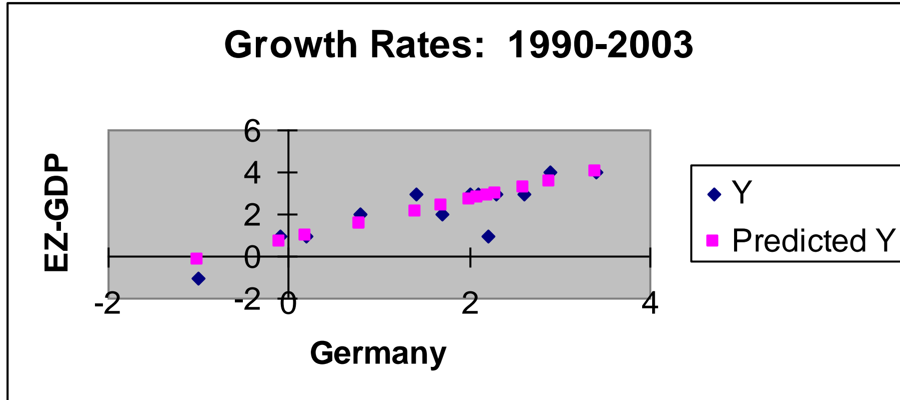
<u>Regression Model 4:</u>
Dep. Variable: The Eurozone's GDP Growth Rate
Indep. Variable: Germany's GDP
Hypothesis: Germany's GDP does not impact the Eurozone's GDP Growth Rate.
R^2 = 0.074, stating that only 7% of the Eurozone's GDP Growth Rate is explained by Germany's GDP. P = 0.347 > .05, so that the hypothesis is accepted. We have some questions about this result and we plan to do further research on this. This is shown below on Figure 4B.

FIGURE 4B



<u>Regression Model 5:</u>
Dep. Variable: The Eurozone's GDP Growth Rate
Indep. Variable: Germany's Growth Rate
Hypothesis: Germany's Growth Rate does not have an impact on the Eurozone's GDP Growth Rate. R^2 = 0.750, so 75% of the Eurozone's GDP Growth Rate can be explained by Germany's.
P = 6.21×10^{-5} and this is much smaller than .05, so there is a strong rejection of the hypothesis, and at the 95% confidence level, a 1% increase in Germany's Growth Rate will cause an increase in the Eurozone's GDP Growth Rate between 0.61% and 1.3%. This is shown on the next page in Figure 5B.

FIGURE 5B



In conclusion, out of regressions models 3, 4 and 5, only one accepts the hypothesis, and this raises some questions. As a result we would like to take a closer look to the 4th regression to see if we can get a more solid result. To that end, any suggestions will be appreciated.

The Eurozone data as well as the Germany data are available for anyone that needs them on the following site: http://ddp-ext.worldbank.org, "The World Bank Group".