

Stimulus or Austerity: A Comparative Analysis of Fiscal Policy in Response to the Great Recession

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Abstract

The Great Recession has provided a natural experiment and data for which to test Keynesian theory as well reignited the debate of the effectiveness of stimulus policy during recessions. In response to the proposition of expansionary stimulus, proponents of austerity have cited recent studies purporting austerity to also be expansionary. This paper provides an overview of the theoretical underpinnings and merits of these policy choices and argues based on current trends in economic indicators that stimulus was the appropriate action given the specific circumstances of the Great Recession. A comparative analysis is conducted of trends in economic indicators for the United States, United Kingdom, and euro area to evaluate which policy was more effective. Findings of this research show that initial stimulus measures in the U.K. and euro area were insufficient and austerity policy prolonged their recession's impact. Findings of this research also support the narrative that the larger and prolonged stimulus of the U.S. brought its economy out of official recession quicker and shows positive signs of economic health as of the end of 2014.

1. Introduction

For the past few decades, the popularity of Keynesian theory has been on the decline due to inadequacy in addressing the economic woes of the late 20th century; as a result, Keynesian theory has undergone much evolution. Today, New Keynesian models - an amalgamation of orthodox Keynesianism, monetarism and micro-foundations - has found its place in mainstream economic thought, but has never been put to the test quite so much as in the wake of the Great Recession of 2008-2009. Although painful, the Great Recession provided an unexpected natural experiment for which to test Keynesian oriented ideas in mainstream economics. Keynesianism has since been reinvigorated as many papers have since

been written on the subject of fiscal policy intervention during recession.

Keynesian theory is primarily predicated on the assumption that the economy is not a system of perfectly functioning markets and on occasion, given the right set of circumstances, government intervention is necessary to alleviate the consequences of a recession. Government intervention most typically comes in the form of monetary adjustments of the money supply and interest rates by the central bank. However, when monetary policy is not enough, the government should provide additional spending to make up the output gap in the form of expansionary fiscal policy, or more commonly referred to as stimulus. Stimulus often requires deficit spending, which bears no shortage of opponents. Those who do not endorse fiscal stimulus to avoid recessions typically support fiscal consolidation; now commonly referred to as austerity. The crux of the austerity position is to get one's fiscal house in order and deleverage until deficit spending is eradicated. Some recent papers have argued large fiscal deficits contract the economy and that austerity policies can be expansionary in certain cases (Bird and Mandilara, 2013). Some austerity supporters have even been persuaded that such a policy could be used to combat the Great Recession. But the very few cases where austerity was expansionary occurred under different economic conditions than that of the Great Recession (Baker, 2010; Foresti and Marant, 2014).

When the Great Recession began in late 2007, monetary authorities in the United States and Europe reacted quickly to reduce interest rates, but output and employment continued to decrease rapidly. The U.S. and European governments then intervened with stimulus packages to curtail the accelerating economic downturn. The packages included a combination of tax cuts and government spending to increase aggregate demand, thereby increasing output. The stimulus eases the painful process of deleveraging debt by non-governmental actors in the economy until growth by the private sector returns (Eggertsson and Krugman, 2010). The U.S. stimulus was approximately 6% of Gross Domestic Product (GDP) and planned to be spent over three years. The European government

stimulus packages introduced were smaller relative to the US averaging about 2% of GDP in spending over two years (The Economist 2013).

The cost of the stimulus packages meant more deficit spending and rapid increases in the debt to GDP ratio for many countries including the U.S. Should a country's debt to GDP ratio grow too large, financially invested stakeholders become worrisome. While some countries in the periphery of the European Union demonstrated political ineptitude for balanced budgets, it is a common misconception of the European Debt Crisis that deficit spending was the primary culprit of skyrocketing debt. It is true that European public spending as a percentage of GDP is higher relative to the U.S., but most of Europe runs budget deficits half the size of the US as a percentage of GDP (Lachman, 2013). In addition, European governments tend to have higher tax rates to sufficiently support those programs from contributing to deficits. The real cause of the debt crisis was the sudden drop in government revenues due to decreased taxes, high unemployment, and declining output. The massive loss of tax revenue caused government debt to spike by an estimated average of 60% across all countries impacted by the recession. Debt increased 79% of GDP in the United Kingdom and 98% in the United States by 2010. The sudden loss of revenue increased the risk of default for many countries, prompting the sovereign debt bailouts to keep the euro area from the precipice of financial collapse.

After growth returned in 2010, the United Kingdom (U.K.) and euro area implemented austerity policies to cut government spending and make structural adjustments to its public programs (The Economist 2013). For default risk countries of the euro area, spending cuts were much steeper as a conditionality of government bailouts by the International Monetary Fund (IMF), European Central Bank (ECB), and other euro area members. Greece, Italy, and Spain were the most notably strained by the recession, but the austerity plan exacerbated the problem by deepening the recession and inciting political turmoil. The IMF even had to revise the estimated impact the fiscal tightening had on the economies of the

periphery nations and concluded a reduction in growth on the order 2.25 to 4.5 percent, much higher than originally expected (Lachman, 2013). The higher the cuts, the further growth fell (The Economist 2013). Europe as a whole is still experiencing high unemployment, and annual growth declined from 2012-2013. The U.K. barely avoided a triple dip recession and recently had to announce additional spending cuts as there hasn't been enough tax revenue to reduce its large deficit (Harrison, 2014). The IMF, who originally advocated austerity, has since altered its doctrine in favor of stimulus to combat recessions (Ban, 2014).

The U.S., on the other hand, continued with stimulus measures as laid out in the American Recovery and Reinvestment Act (ARRA); even applying additional tax cuts later (The Economist 2013). The results of this divergence from Europe in fiscal policy are stark. Although the U.S. deficit has declined more slowly, the economy rose out of recession much faster compared to the UK and Europe. At the height of the recession, the U.S. unemployment rate was 10%, but has dropped to below 6% as of October 2014. And while the GDP growth rate has experienced some variance, it has continued to be positive since 2010.

For a more comprehensive assessment of the outcome of U.S. and European fiscal policy choices, a comparative analysis will be conducted based on economic growth measures. The remainder of this paper will be structured in the following way: Section 2 will provide an overview of Keynesian theory and merits of stimulus based on the conditions of the recession. Section 3 will provide an overview expansionary austerity and the specific conditions of the recession that made it ineffective. Section 4 will be a comparative analysis of the economic health measures after stimulus and austerity policies were introduced into the United States and the United Kingdom, as well comparison with the overall performance of the euro area. The U.K. and euro area will be analyzed separately as they each have their own monetary authority. Data analyzed in this section was procured from Trading Economics, a statistical online mainframe of

historical data of economic indicators from official sources¹. Section 5 will provide concluding remarks. Note that all Figures referred to in the above sections are provided in the appendix.

2. The Theoretical Underpinnings and Merit of Stimulus Policy

There is consensus on the effectiveness of monetary policy by economists. Where there is debate is on whether discretionary fiscal policy has much sway over the economy. The core assumption of the Keynesian model is that government spending does contribute to the level of domestic aggregate demand, and therefore fiscal stimulus can be used to increase it when private demand is too deficient.

2.1 Keynesian Theory

Any time there is a new injection of money into the economy, it reverberates throughout as it exchanges hands for goods and services. Spending is always someone else's income and that income generates more spending. When the government is doing the spending it is referred to as the fiscal multiplier, not to be confused with the monetary multiplier, which has a similar effect through changes in the money supply by the central bank.

When governments spend money in an open economy, it increases demand for the good or service it is purchasing. The subsequent income to the supplier is also spent in the economy, thereby increasing aggregate domestic demand. Now governments spend money all the time, but it is only considered fiscal stimulus in situations where private demand is deficient and requires the government to spend more than it normally would to make up for the gap. If the demand gap is left unaided, unemployment will increase, income will decrease, causing demand to further decrease, and possibly resulting in a deflationary trap.

Fiscal stimulus can be executed in two ways: government expenditures and tax cuts. Government spending can be used more narrowly to assist specific industries such as construction through

1 www.tradingeconomics.com

infrastructure improvement and expansion. This type of government expenditure would increase construction demand putting money into several industries and their workers, who in turn spend the money in the economy further stimulating demand for other goods and services. Government spending can also be used to increase transfer payments to put more money in the pockets of consumers. Tax cuts are essentially equivalent to transfer payments as less taxes collected by the government means more money in the pockets of consumers to spend in the economy.

There has been some debate amongst Keynesians as to which is better for the economy, but both have the effect of increasing aggregate demand (Seidman, 2011). Eggertsson and Krugman (2010) suggest that in a deleveraging shock, targeting “debt-constrained” agents with transfer payments and tax cuts would be more effective as consumer consumption make up approximately 70% of spending in the economy. However, such policy is impractical to implement, rendering traditional notions of government spending (e.g. infrastructure improvement) the better option. However, if the government does implement transfer payment and tax cuts, it is important to target households in the lower part of the income distribution as their marginal propensity to consume is higher. Tax cuts to the higher levels of income distribution are wasteful as affluent households are likely to save it.

It is also important to note that stimulus, no matter what form it takes, will not be effective without accommodative monetary policy to keep pressure on interest rates. As demand increases so too does the demand for money itself. That excess demand creates an excess supply of bonds pushing down their price. Decreases in bond prices tend to push up interest rates which discourages consumer and investment spending, which decreases demand and output. This is referred to as the “crowding out effect.” To avoid crowding, interest rates must be kept low. This can be accomplished through an accommodative monetary policy whereby the central bank engages in short term bond purchases to keep interest rates low and allow stimulus to be effective.

2.2 *The Merits of Stimulus*

In the case of the Great Recession, the Sub-Prime Mortgage Crisis and subsequent Financial Crisis of 2007 exposed several over leveraged firms who suffered enormous losses caused by bad derivative dealings. Firms had to begin the painful process of deleveraging their balance sheets causing an abrupt decline in investment spending and subsequent downsizing, which resulted in further downsizing by the other firms in the economy from decreased demand and increased unemployment. The Federal Reserve (Fed) and its European counterparts acted by reducing long term interest rates to historic lows (see Figures 1A-B) through the selective purchase of long term financial assets from commercial banks, a fairly recent innovation in monetary policy referred to as quantitative easing (QE). Unfortunately, QE had little to no immediate effect on the downturn, resulting in the “zero-bound problem” in which interest rates cannot go lower than zero and becomes a binding limit (Foresti and Marani, 2014)². The economy then enters a liquidity trap as firms and households are unwilling to borrow at even near zero interest rates due to necessary deleveraging and/or negative expectations (Seidman, 2011; Eggertsson and Krugman, 2010). Given this situation, fiscal stimulus was an effective tool the government could use to increase demand and output. In addition, once the economy is sufficiently out of recession, the Fed can increase nominal interest rates to prevent overheating and inflation (Foresti and Marani, 2014).

The US government took the right course of action by implementing two stimulus bills, and extending tax cuts. The U.K. and the euro area being in the same dilemma, also responded with stimulus, but it was far too small and short lived to have a long lasting effect. Shortly after growth returned, they turned to austerity measures based on the premise that any additional deficit spending would make the recession worse. But since its implementation, the U.K. and euro area have struggled to keep

² It is theoretically possible for interest rates to be negative and have been tested in Sweden and Denmark. However, a negative interest rate would be impractical and carry several drawbacks per Foresti and Marani.

above water and continue to endure long lasting effects from the recession.

3. Theoretical Underpinnings and Merits of Expansionary Austerity

Government debt and deficit spending has long been the subject of study in terms of their relationship to financial crises throughout history. There is a consensus among economists and lawmakers that deficit spending in the long run can be harmful to the economy and result in a debt crisis. Where there is not a consensus is how much debt is too much before it starts to be harmful (The Economist 2013). The U.S. has been a special case in this regard as it has been deficit spending for some time after the Bush tax cuts and two very costly wars, but its economy has remained resilient. Nonetheless, conservative lawmakers and economists continue pushing austerity measures in perturbation of approaching a 100% sovereign debt to GDP ratio.

3.1 The Theory of Expansionary Austerity

Put simply, austerity measures are a means to cut all excess spending above income to end deficit spending and allow the government to pay down on its debt. These measures typically involve some sort of combination of tax hikes and public spending cuts; which tend to be contractionary for the economy. Some fairly recent research purports austerity can be expansionary.³ The most notable cases of multi-year expansions from austerity occurred in Denmark, Ireland, Finland and Sweden.⁴ The researchers of these studies relied heavily on Ricardian equivalence, which assumes that private actors take into account the budget constraints of their government (Foresti and Marani, 2014). If the government increases deficit spending, there is an expectation of future tax increases to pay for it. With this expectation, consumers will save more rather than spend to account for the tax increase on future income. But

³ Cited authors reference Giavazzi and Pagano (1990, 1995, 1996), Alesina and Perotti (1995, 1997), and most recently Alesina and Ardagna (2010) as cited by Guajardo, Leigh, and Pescatori.

⁴ Denmark (1982-1986), Ireland (1987-1990), Finland (1992-1998), Sweden (1993-1998) per Foresti and Marani.

a balanced government budget should prevent increased taxes later, and may decrease taxes as debt decreases. This expectation provides stability to investors and households, and increases expected future income and revenue, thereby increasing aggregate demand. However, this can only occur with accommodative monetary policy (Foresti and Marani, 2014).

Just as fiscal stimulus requires accommodative monetary policy to be effective, so too does austerity measures in order for it to have an expansionary effect. Interest rates must be kept low by the central bank through expansionary monetary policy. Keeping interest rates low allows two things to happen: debtors to refinance at lower rates for quicker deleveraging and devaluation of domestic currency to increase exports. The combination of future income expectations and accommodative monetary policy is purported to increase aggregate demand in the long run and short run. In the previous cases of expansionary austerity policy mentioned, each occurred during a period when net exports were on the rise and interest rates had room for quick reductions to compensate for the decline in government spending (Baker, 2010; Guajardo, Leigh, and Pescatori, 2011; Foresti and Marani, 2014).

3.2 Why Austerity Policy would not be Expansionary

On examination of the economic conditions of the Great Recession, one would understand why austerity policy would be ineffective. First, investment and consumer spending must be responsive to changes in interest rates. By 2009 interest rates were already near zero with no effect on investment spending. Firms and households in Europe and the U.S. economies were too over leveraged to be responsive to even historically low interest rates (refer back to Figures 1A-B and Figures 3A-B). And since the nominal interest rate cannot be negative in practice, the Fed cannot use expansionary monetary policy to encourage spending by firms and households (Foresti and Marani, 2014). Therefore, any cuts to government spending would have only further decreased demand and output, driving the economy further into recession than it already

was. Second, as demand for imports declined in the U.S., so too did it decline in Europe making the possibility of increasing net exports to boost demand for either economy extremely unlikely (Figure 2A-B). Given these circumstances, any plausible expansionary effect of austerity was rendered impossible. Since the exact conditions that make austerity expansionary were not present, spending cuts and tax hikes contracted the economy as expected.

4. Comparison of Economic Health Measures After Stimulus and Austerity Policy

There have been many theoretical evaluations of stimulus and austerity since the Great Recession, many of which predicting the outcome found in this research. Since the theory laid out is relatively simple, we will conduct a simple comparative analysis of trends in relevant economic indicators of GDP annual growth, debt to GDP ratio and government spending, unemployment rate, inflation rate, and consumer and business confidence. These indicators provide a good indication of how each economy is now performing after their respective policy actions.

We will compare the U.S. against the U.K. and euro area. The U.K. and euro area are compared separately because each has their own central bank and conduct monetary policy independently. The Bank of England is the central bank in the U.K. and the ECB for the euro area. One thing to keep in mind when looking at a comparative analysis with the euro area is that although it operates under a single currency, it does not have a mandated fiscal union for which a unified fiscal policy can be implemented. The financially unstable member nations of the euro area that did enact austerity policy did so as a condition of the sovereign debt bailout.

Before we begin the comparative analysis, let's recap the timeline of events. GDP begins to decline in 2007. By 2008 the U.S. and U.K. are in recession, and the euro area follows shortly after in the same year. Stimulus packages are introduced in 2008 and 2009. As growth returns in

2010, the U.K. implements austerity with gradually introduced spending cuts and tax increases. Also by 2010, due to the quickening panic of skyrocketing debt in the periphery nations of the euro area, international institutions implement financial support measures and conditional debt reforms for default risk nations, which amounted to forced austerity policy. The U.S. continued stimulus spending with tax cut extensions in 2012. U.S. stimulus officially ends in 2013 with budget “sequestration,” a set of automatic spending cuts to be enacted in the event Democrats and Republicans could not come to terms on a budget proposal. However, by the time “sequestration” took effect, the U.S. economy already had some momentum. Today the U.S. economy is exhibiting positive trends in economic indicators while the U.K. and euro area continue to stagnate.

A good indicator to start with for comparative analysis is the GDP annual growth rate. Figures 3A through 3B provides GDP annual growth rate trends from 2007 to 2014. The U.S. annual growth rate reached a record low of -4.10% in 2009. The latest estimate from third quarter of 2014 by the Bureau of Economic Analysis put growth at 2.7%. Since 2010, the U.S. growth rate has fluctuated but has remained positive averaging above 2%⁵. The U.K. was hit harder by the recession with a record decrease in growth of -5.8%. Since 2010, the U.K. has managed to keep growth positive but came close to another recession in 2013. The Office of National Statistics reported 2.6% expansion as of the third quarter of 2014. The euro area has not been as lucky as it went into recession once more from 2012-2013. It emerged from recession in 2014 with 0.8% expansion as of the third quarter according to Eurostat.

Related to GDP is government debt to GDP ratio and government spending. For these trends refer to Figures 4A-B and 5A-B. The U.S. government debt to GDP ratio increased dramatically during the recession but has since tapered off. As of 2013 it was 101.53%. Government spending however has been on the decline since 2010 from over \$3,100

5 Related to GDP is productivity which has continued to increase in a positive trend despite some stalls in growth at the height of the recession. It was last recorded at 106.72 Index Points by the BLS.

Billion to \$2,911.90 Billion as of third quarter 2014 in large part due to sequestration cuts. The U.K. experienced much the same although not quite as high a ratio at \$90.6% as of 2014. But despite efforts to curtail government spending, the U.K. government has been unsuccessful as it has been on a steady upward trend. U.K. government spending is the highest it's been since 1955 at 87,983 Million GBP as of third quarter 2014. The euro area again has been no better off with a recording of 90.9% average debt to GDP ratio as of 2014, a record high. The euro area government spending also reached an all-time high in 2010 of 422.27 Billion EUR, but has since declined to 405.78 Billion EUR as of second quarter of 2014. From these measures, we can see that austerity has done nothing to prevent debt to GDP ratio or government spending from increasing. While the US may have a higher ratio it is still in better shape in terms of growth, making future spending cuts more palatable to the public.

Next we move to the unemployment rate represented in Figures 6A-B. During the height of the recession, the unemployment rate in the U.S. did reach as high as 10.8%, a figure not seen since the 80s, but dropped much quicker relative to the U.K. and euro area. As of December, 2014 the unemployment rate was 5.6%.⁶ In addition, employed persons in the U.S. surpassed precession levels and entered into an all-time high of 147442 Thousand as of December, 2014. The U.K. took much longer to come down with the rate peaking above 8% from 2010-2012. Since then, the U.K. has finally showed positive trends in this measure, which was last recorded at 6% in October 2014⁷. The U.K. has managed an all-time high as well at 29655 Thousand, but has seen a moderate decline from the previous quarter to the most recent. The euro area on the other hand is still experiencing a negative trend, reaching an all-time high of 12%

6 It should be noted that the labor force participation rate in the U.S. is at a historic low of 62.7%, and has trended negatively since 2000. This may in part explain some of the decrease in the unemployment rate as baby boomers and young adults opt out of the labor market in favor of early retirement and continued education, respectively.

7 An unemployment rate of 6% while good is still above the U.K. long run average of 2.17%.

in 2013 and only dropping modestly to 11.5% as of last reporting.⁸ The euro area experienced a serious decline in employed people to below 145 Million, but has since increased to 148.18 Million as of the third quarter of 2014.⁹ High unemployment bodes ill for firms and households as it means decreased income and decreased income for them means decreased income for the government to pay for public programs and spending to alleviate the decline.

Inflation is a measure of the price of goods that are representative of the whole economy. The Federal Reserve, which manages the interest rates in the economy, targets a 2% inflation rate. Figures 7A-B shows the trend in inflation from 2007 to 2014. Deflation occurred during the recession reaching -2% in 2009. While 2% than target in 2011, the inflation rate has been pretty stable at 2% since. The US last inflation recording was 0.8%, which has prompted concern about a deflation spiral which has the potential to reverse positive trends and retard growth¹⁰. But this is the first relatively low figure seen since the recession and more time will be needed to confirm if this is the start of a disinflation trend. Figure 7A shows a clear disinflation trend in the UK since 2011. While not below zero yet, the last inflation report was 0.5%.¹¹ The euro area also exhibited a disinflation trend and has officially crossed the threshold of deflation as last recording at -0.2%. This latest figure does not bode well as concerns of the euro area entering a deflation trap are beginning to spread.¹²

8 Unemployment for the euro area was last reported by Eurostat showing no change from 11.50% from October to November, 2014. The euro area unemployment has average 9.69% from 1995-2014. The periphery nations of the euro area constrained by imposed austerity continue with exceptionally high unemployment which drives up the average. Spain last recorded 23.67%, a slight decrease from the previous quarter, and Greece is slightly higher at 25.8%. Compare that to France who has 10.1% as of Q3 2014.

9 The euro area employed an all-time high of 150.37 Million people in 2008, before the recession really hit.

10 Decreasing interest rates through changes in the money supply is typically how the Fed combats deflation. However, there is concern over whether this would be an effective tool against deflation since interest rates are still relatively low.

11 The U.K. average inflation rate has been 2.75% since 1989.

12 This is especially concerning since nominal interest rates in the euro area are lower than the U.S., providing even less cushion to cut rates if deflation does continue a

Finally, let's look at the juxtaposition of consumer and business confidence¹³ represented by Figures 8A-C from 2006 to 2014. Consumer sentiment is represented by the solid line using the left y-axis and business by the dotted line and right y-axis. In the US, consumer sentiment is back up to precession levels. The overall index was 93.6 in December, 2014. Business confidence has dramatically increased from 2009 to 2010, but then waned before picking up again in 2013 (likely influenced by budget battles, a temporary government shutdown and near default). Business confidence currently stands at 55.5% as of December, 2014. In the UK, consumer confidence has trended negatively from 2007 to 2013. While still negative, the consumer confidence has been increasing since 2013. As of December, 2014 the UK index was -4 as reported by Gfk NOP (UK). Business confidence in the UK has been turbulent, dwindling below -20% in 2012 and reaching as high as 20%. Confederation of British Industry's last reported a decrease 19 to 8 from the third to fourth quarter of 2014.

5. Conclusion

In this paper we have reviewed the theoretical underpinnings of stimulus and austerity as an expansionary policy for ailing economies of the Great Recession. While some examples of expansionary austerity exist, the expansionary effect was shown to be unfeasible due to the constraint of monetary policy to keep interest rates at or above the zero bound. Since interest rates were near zero with no immediate effect on aggregate demand, fiscal stimulus was the more appropriate policy to fill in the demand gap left by debt constrained firms and households.

While the US, UK and euro area did implement stimulus measures, the UK and euro area stimulus proved not to be enough to keep them out of recession. The US introduced a much larger stimulus plan of 6% of GDP, which should have arguably been more, but proved enough to bring the US out of recession quicker and stronger relative the UK and euro area

negative trend.

13 Business confidence is measured based on the ISM Purchasing Managers Index (PMI) and reported by the Institute for Supply Management.

as shown based on trends in annual GDP growth rate. Further comparisons of relevant economic indicators also indicate a healthier economy for the U.S. than the U.K. and euro area. The U.S. unemployment rate is lower, the inflation rate has been stable, and consumer and business confidence is back to pre-recession levels. By 2010, the U.K. introduced austerity policies of cuts in government spending and tax hikes. Since interest rates were already low, austerity policy was contractionary instead of expansionary. The result was another near recession of negative growth. The U.K. unemployment rate is trending down, but a disturbing trend of disinflation is likely contributing to volatile consumer and business confidence indices. The conditional debt restructuring of the sovereign debt bailout for the periphery euro area nations amounted to de facto austerity policy resulting in a contraction of the euro area as a whole. The unemployment rate of these nations is at record highs driving up the euro area average. In addition, a potential deflationary trap is cause for concern with the ECB having little cushion to counteract it due to interest rates near their nominal zero lower bound for the euro area.

Austerity does have its place as debt should be a concern in the long run. But given the zero lower bound limit, austerity is not an appropriate policy to counter recessionary periods. Only when interest rates are high enough they can be reduced to compensate for the contractionary it has, should austerity be implemented to reduce deficits and debt. Based on this analysis of the competing theories and outcomes based on economic indicators, the U.S. response to the recession was more effective with a larger stimulus as Keynesian theory proscribes. The U.K. and euro area may have weathered the recession better if they had followed the lead of the U.S.

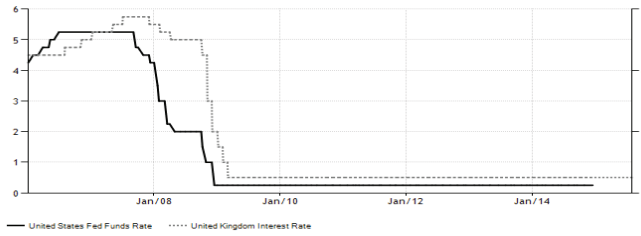
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Appendix

FIGURE 1A

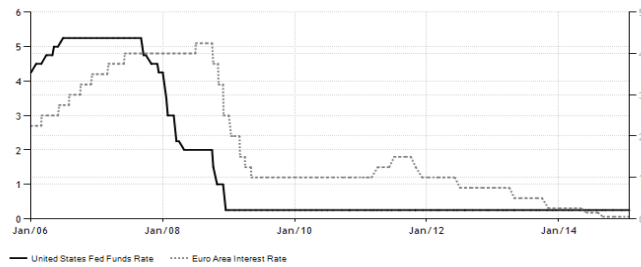
UNITED STATES FED FUNDS RATE / UNITED KINGDOM INTEREST RATE
BENCHMARK INTEREST RATE



SOURCE: FEDERAL RESERVE / BANK OF ENGLAND / EUROPEAN CENTRAL BANK

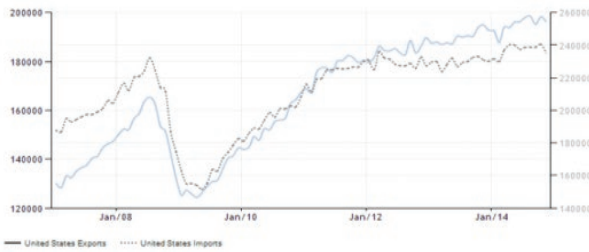
FIGURE 1B

UNITED STATES FED FUNDS RATE | EUROPEAN CENTRAL BANK BENCHMARK RATE
BENCHMARK INTEREST RATE



SOURCE: FEDERAL RESERVE | EUROPEAN CENTRAL BANK

FIGURE 2A
UNITED STATES
IMPORTS | EXPORTS



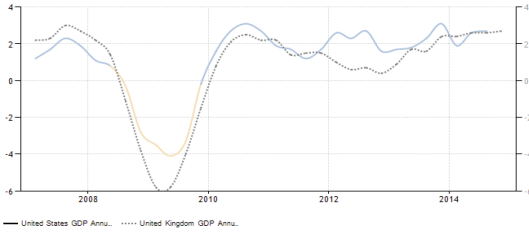
SOURCE: U.S. CENSUS BUREAU

FIGURE 2B
EUROPEAN UNION
IMPORTS | EXPORTS



SOURCE: EUROSTAT

FIGURE 3A
 UNITED STATES | UNITED KINGDOM
 ANNUAL GROWTH RATE



SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | U.K. OFFICE OF NATIONAL STATISTICS

FIGURE 3B
 UNITED STATES | EURO AREA
 ANNUAL GROWTH RATE



SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | EUROSTAT

SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | EUROSTAT

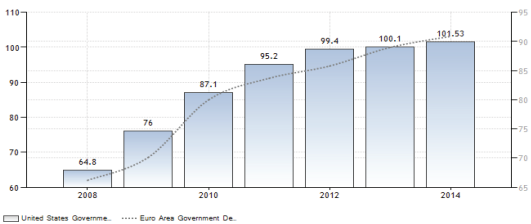
FIGURE 4A
 UNITED STATES | UNITED KINGDOM
 GOVERNMENT DEBT TO GDP



SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | EUROSTAT

SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | EUROSTAT

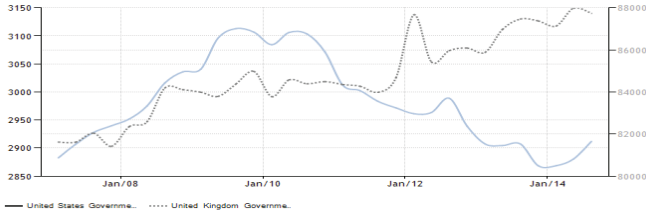
FIGURE 4B
 UNITED STATE | EURO AREA
 GOVERNMENT DEBT TO GDP



SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | EUROSTAT

SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | EUROSTAT

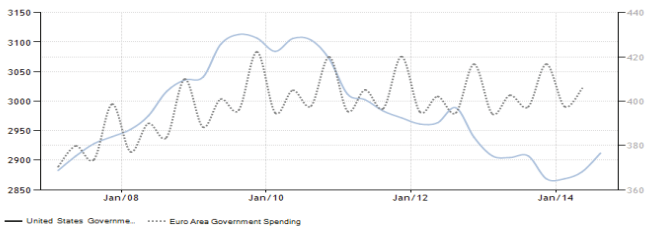
FIGURE 5A
 UNITED STATES | UNITED KINGDOM
 GOVERNMENT SPENDING



SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | U.K. OFFICE FOR NATIONAL STATISTICS

SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | U.K. OFFICE FOR NATIONAL STATISTICS

FIGURE 5B
 UNITED STATES | EURO AREA
 GOVERNMENT SPENDING



SOURCE: U.S. BUREAU OF ECONOMIC ANALYSIS | EUROSTAT

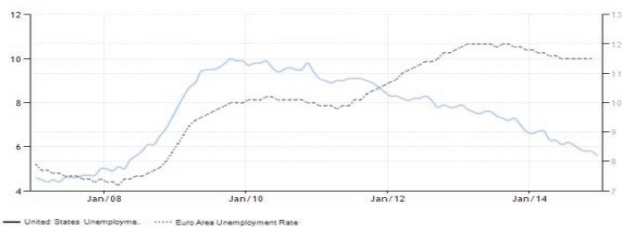
FIGURE 6A
 UNITED STATES | EURO AREA
 UNEMPLOYMENT RATE



SOURCE: U.S. BUREAU OF LABOR STATISTICS | U.K. OFFICE OF NATIONAL STATISTICS

SOURCE: U.S. BUREAU OF LABOR STATISTICS | U.K. OFFICE OF NATIONAL STATISTICS

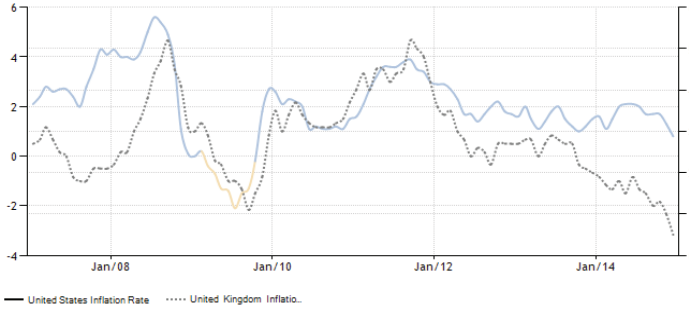
FIGURE 6B
 UNITED STATES | EURO AREA
 UNEMPLOYMENT RATE



SOURCE: U.S. BUREAU OF LABOR STATISTICS | EUROSTAT

SOURCE: U.S. BUREAU OF LABOR STATISTICS | EUROSTAT

FIGURE 7A
UNITED STATES | UNITED KINGDOM
INFLATION RATE
ANNUAL CHANGE ON CONSUMER PRICE INDEX



BUREAU OF LABOR STATISTICS | U.K. OFFICE OF NATIONAL STATISTICS

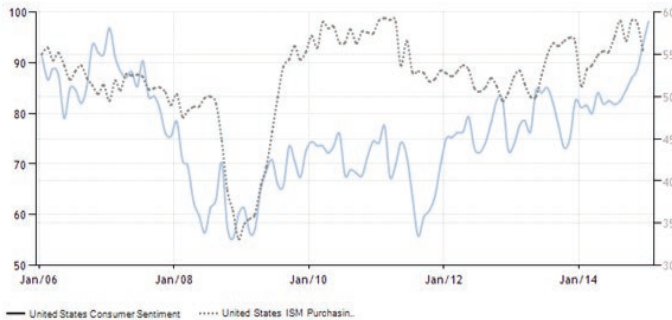
SOURCE: U.S.

FIGURE 7B
UNITED STATES | EURO AREA
INFLATION RATE
ANNUAL CHANGE ON CONSUMER PRICE INDEX



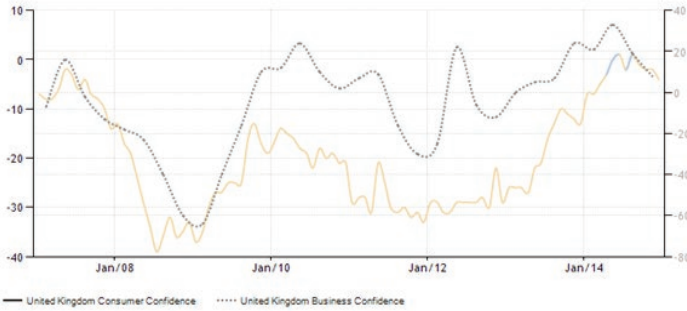
SOURCE: U.S. BUREAU OF LABOR STATISTICS | EUROSTAT

FIGURE 8A
UNITED STATES
CONSUMER SENTIMENT | ISM PURCHASING MANAGERS INDEX (PMI)



SOURCE: THOMSON
REUTERS / UNIVERSITY MICHIGAN | INSTITUTE FOR SUPPLY MANAGEMENT

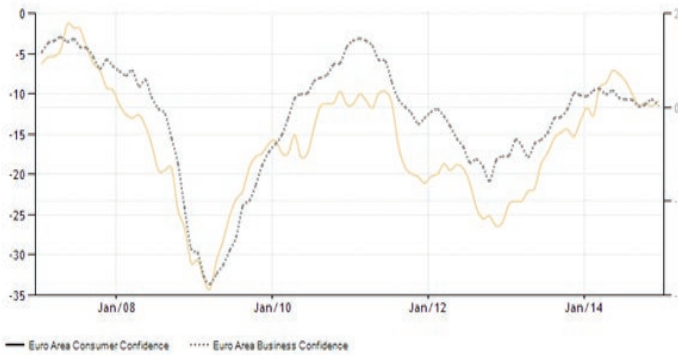
FIGURE 8B
UNITED KINGDOM
CONSUMER CONFIDENCE | BUSINESS CONFIDENCE



SOURCE: GFK NOP

(UK) | CBI, UK

FIGURE 8C
EURO AREA
CONSUMER CONFIDENCE | BUSINESS CONFIDENCE



SOURCE: EUROPEAN

COMMISSION

Aaron Medlin is a senior and will graduate with a Bachelor of Science (B.S) in Economics. This paper was written for Dr. Vicar S. Valencia's E322 Intermediate Macro Economics course.