

**A study to gain insights into effectiveness of fiscal policy
between countries with high and low public debt, pre- and
post- 2007 great recession**

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Abstract

A study to gain insights into effectiveness of fiscal policy between countries with high and low public debt, pre- and post- 2007 great recession

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The Great Recession in 2008 has provided the researcher with an opportunity to study the effectiveness of fiscal policy in high debt and low debt countries in the pre-recession and post-recession period. The research was centred around the effect of national debt level on the effectiveness of fiscal stimuli which has become increasingly crucial in the current economic condition as increasing number of countries has fallen into the high debt category. In order to investigate the impact of fiscal stimuli in different national debt level countries, the researcher has utilised hierarchical multiple linear regression model. In this study, the researcher has performed preliminary statistical analysis of fiscal stimulus, investigation of the behaviour of the marginal propensity to consume (MPC) and investment slope coefficient before performing the hierarchical multiple linear regression analysis. Result for hierarchical multiple linear regression analysis on high and low debt countries suggested that the effect of fiscal stimulus in low debt countries were larger than the effect of fiscal stimulus in high debt countries. This research is important because better understanding of the impact of national debt on fiscal policy could add to the current literature bodies on the researched topic. From a policy perspective, these findings could provide additional support to national economic policymakers to design substantially enhanced, effective and efficient fiscal stimulus packages.

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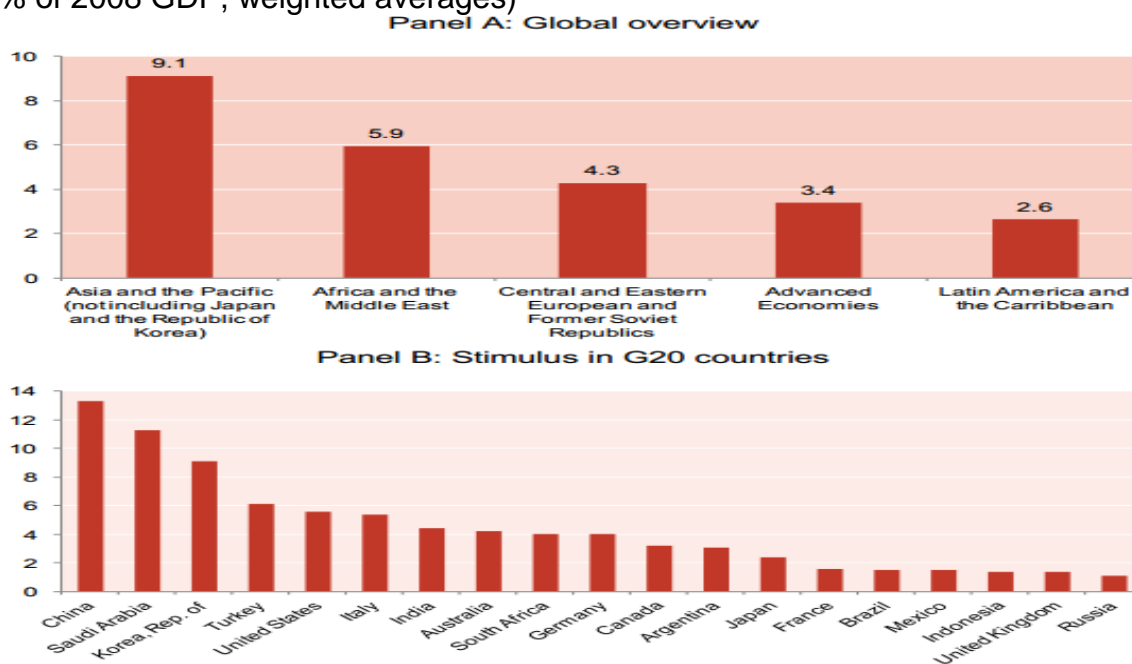
Chapter 1

Introduction

1.1 Introduction

The global economic and financial crisis that began in 2008 represents a major watershed in recent global economic history. In response to this event, many nations commence on an unparalleled level of fiscal expansion in the form of stimulus packages with the aim of keeping the economy buoyant and stabilising economic fluctuations (Nickel and Tudyka, 2014). As a result, huge fiscal policy packages have been implemented in various nations around the world. Figure 1a provides an example of the extent of fiscal packages implemented across different regions. Within few months of the crisis outbreak, fiscal stimulus packages were declared by several nations ranging from 1.4% to nearly 6% of the GDP in the United Kingdom and United States respectively, while this value was over 12% of the GDP in China (International Institute for Labour Studies, 2011).

Figure 1 a: Overview of global economic stimulus in response to the 2008-09 crisis (as a % of 2008 GDP, weighted averages)



Note: Panel A is based on 65 countries. Source: IILS.

Source: International Institute for Labour Studies (2011)

Among the G20 countries alone, the cumulative size of the fiscal stimulus amounted to be close to 1.4 percent of the world GDP, with the value of nearly \$2 trillion (International Institute for Labour Studies, 2011). These trends clearly demonstrate

the propensity for policymakers to utilise fiscal policy as an important tool for controlling national economies over the course of business cycles (O'Sullivan and Sheffrin, 2003). However, utilisation of fiscal policy to manage national economies remains as a source of substantial debates.

Fiscal policy can be defined as an economic tool that countries utilised in an effort to influence the economy by adjusting their tax rates and government spending. Modern fiscal policy is mainly based on the ideas of John Maynard Keynes (1883–1946), who firmly believed that governments could manage economic performance by regulating government spending and tax rates (Krajewski & Krajewska, 2011). The concept proposed by Keynes stated that crises are the outcome of the market mechanisms weakness and could be resolved by increased state involvement (Krajewski and Krajewska, 2011), which emphasizes the effectiveness of fiscal policy (Hur, 2007).

In sum, Keynesian economists believe that in order to influence the level of economic activity and aggregate demand of the country, the government has to adjust the level of public expenditures and taxation rates.

Fiscal policy is implemented by varying tax rate or government spending level together or alone, in order to manage the aggregate demand of the country's economy with respect to the stances of the implemented fiscal stimulus package (Hoag and Hoag, 2006), which could be expansionary, contractionary or neutral (Benczés, 2008). In an effort to manage the economy, regulators try to stabilise business cycles, improve unemployment rates, control inflation and influence interest rates through fiscal policy.

The great economic recession which began in late 2007 and ended in late 2010 has reignited interest in fiscal policy function (Baum & Koester, 2011), effects and stabilisation capacities of fiscal policy (Šimović & Deskar-Škrbić, 2013).

On the other hand, fiscal policy has been known to be unsatisfactory in economies such as Korea (Hur, 2007). Consequently, the natural question that emerges from these debates concerns whether policymakers have underestimated fiscal multipliers, which are the influences of tax increase or government spending cuts on the economy (Blanchard and Leigh, 2013).

The study of the effectiveness of fiscal policy in countries with high or low debt signifies a timely and important enterprise, in order to shed new light on the manner that

national economies react to fiscal multipliers, thereby facilitating the development of effective and efficient fiscal policy packages by national policymakers of the highly geared countries. Consequently, evaluation of the effectiveness of fiscal policy across high or low debt countries is currently of the prime interest (Kluza, 2014).

Our approach in investigating the effectiveness of fiscal stimulus was different from previous studies as in this study we measured the effect of public balance on growth rate rather than using government spending or tax. To this end, hierarchical multiple-linear regression model was utilised in this study, which is estimated in Keynesian fashion for several European countries. This framework was able to the relationship between real GDP growth rate and public balance while taking into account the effect of national debt.

Therefore, the purpose of this study is twofold. Firstly, to gain new insights into the effectiveness of fiscal policy, by examining the size of fiscal multipliers in a selected representative sample of high and low debt countries before and after a major global recession period. Secondly, to provide relevant information and knowledge for policymakers, which could be valuable in designing more effective and efficient fiscal policy stimulus packages in the near future.

1.2 Context and Rationale

The utilisation of government taxation regimens and spending in order to influence national economies is termed fiscal policy (Horton and El-Ganainy, 2012). Generally, national governments attempt to apply fiscal policy in an effort to reduce poverty and promote sustainable economic growth (Horton and El-Ganainy, 2012). It is strongly believed that fiscal policy packages have helped many countries to recover from economic crises; however, as Baum and Koester, (2011) point out, policy-relevant macroeconomics questions such as the effect of fiscal policy on economic growth; effectiveness of fiscal policy in smoothing the business cycle and the effect of business cycle on fiscal multipliers are still highly controversial and are source of debate.

Moreover, fiscal policy could have undesirable impact on national economies by increase public debt, which eventually lead to a weaker fiscal position (International Monetary Fund, 2010). This undesirable outcome is due to the fact that knowledge on the effectiveness of fiscal policy in various business cycles and economic condition are still very limited (Baum and Koester, 2011), as fiscal policy has received less

attention compared to the vast empirical studies that have been done on the effect of monetary policy on the economic activity (Afonso and Sousa, 2012). In addition, fiscal policy has assumed an even more important role in mitigating the adverse impact of economic downturns, since other available economic tools which were used in the past have become weaker and ineffective (Baum and Koester, 2011). In this regard, Baum and Koester state that the traditional monetary transmission mechanism and monetary policy is no longer effective in countering the vast decline in demand, as many countries are reaching the zero lower bound with no possibility to further decrease the central bank interest rates. Consequently, fiscal policy continues to play a crucial role in the world economy, while study of its effectiveness in times of high debt has become interestingly relevant in recent years.

The rationale of this study is that as more countries fall into the high-debt categories due to inefficient practice of fiscal policy, there has been a corresponding increase in the numbers of countries that have high public debt levels (Nickel and Tudyka, 2014). The recent debt ratio of 17 European Union (EU) member-states was 64%, this debt ratio indicates many of these nations are highly geared, and the study of the effects that high public debt or low public debt have on the fiscal multipliers has therefore become even more crucial today (Nickel and Tudyka, 2014). As stated by Eggertsson (2014), the exact relationship between the level of public debt and aggregate demand (AD) in the short run is still ambiguous.

Therefore, studies of fiscal policy are imperative as it could provide a better understanding which has the potential to help national economic policymakers to design substantially enhanced, effective and efficient fiscal stimulus packages. However, as stated by Batini, et al. (2014), improving the accuracy of macroeconomic forecasts requires better estimation, while the use of fiscal multipliers will invariably play a crucial role in this analysis Blanchard & Leigh (2013) noted that underestimation of fiscal multipliers at the early stage of the crisis leads to significant errors in the growth forecast. In line with that statement, Eyraud and Weber (2013) further emphasized the significance of undervalued multipliers, which may lead to unattainable fiscal targets being set by countries, resulting in miscalculating of the extent of adjustment necessary to curb the debt ratio. This statement indicates the significant role of fiscal multipliers in designing of an effective fiscal stimulus package.

1.3 Research Aims and Objectives

Research Aim: This study aims to compare the effectiveness of fiscal policy between countries with high and low public debt, pre- and post- 2007 great recession.

The great world recession that occurred between 2007 and 2009 provided the economic researchers with a valuable opportunity to study the effects of large fiscal stimulus packages in Europe. As stated by Blanchard and Leigh (2013), significantly large multiyear fiscal consolidation strategies were announced following the great recession, particularly in Europe. Indeed, throughout 2010, the primary focus of fiscal policy in a number of European countries focused on debt reduction, notwithstanding the fact that their recovery from the great recession still remained weak (Wren-Lewis, 2011).

Consequently, as countries implement fiscal policy to deal with economic recession, the public debt level of these countries would increase thus increasing the number of high public debt countries. It is essential to understand the effect of debt on the size of fiscal multipliers and key macroeconomic variables before and after a major global recessionary period, in order to help the policymakers to develop effective fiscal policy strategies in the future.

As projected by International Monetary Fund (IMF) (2014), if the inflation remains very low, the euro region would see an increase in debt to GDP ratio of 5.75% by 2019, an outcome that would amplify the necessity to further enhance the existing understanding regarding the short- and long-term effects of high debt to fiscal multipliers and national economies. As highlighted in the introduction, though, studies of fiscal policy are still limited, especially on the effect of high debt on fiscal multipliers and economic growth. This study will evaluate the data obtained and research methods which have been utilized in previous studies (e.g., Nickel and Tudyka [2014] which used a vector-autoregression [VAR] model to analyse the effect of high debt to fiscal multipliers size, Ilzetzki, Mendoza and Végh [2013] concerning the effectiveness of fiscal policy stimuli based on key country characteristic by utilizing structural VAR [SVAR], Kirchner, Cimadomo and Hauptmeier [2010] who used a time-varying SVAR model to analyse the impact and effectiveness of government spending on macroeconomic variables, and Bi, Shen and Yang [2014] who analysed the economy

in a high debt state using a dynamic stochastic general equilibrium[DSGE] model¹), although this study did not expand the model to examining the consumption function over time and comparing the growth rate of the countries in which the fiscal policy was implemented.

Taken together, it is clear that despite the importance of fiscal policy in mitigating the adverse effects of economic downturns, there remains a relative dearth of timely and relevant research in this area. Consequently, a research problem has been identified as the need for deeper understanding of the effect of public debt on the economy and fiscal multipliers, with the aim of assisting policymakers to implement effective fiscal stimulus strategies.

Therefore, the main objective of this study is to examine the size of fiscal multipliers and to evaluate the potential effectiveness of fiscal policy in selected samples of high and low debt countries, before and after a major global recessionary period.

To achieve the main objective, this study will evaluate the effect of specific fiscal measures used to smoothen the business cycle in both high debt and low debt nations, based on the size of relevant fiscal multipliers. This will include assessment of the consumption patterns at a macro-level by taking into account the income variations , which will be related to the consumption function.

In addition, this study aims to address the following sub-objectives:

1. To gain insight into the effects of the Great Recession on public finances in selected high and low debt countries.
2. To examine the impact of the Great Recession on the aggregated propensity to consume in selected countries through the calculation of country specific consumption functions.
3. To investigate the monetary effects of variations in government spending and taxes on key macroeconomic variables such as growth, income, tax, and retail

¹All the literature mention will be discussed in more detail in Chapter 2.

consumption in selected countries, in addition to comparing these effects across a cohort of low debt and high debt countries.

1.4 Conclusion

The following sections of this paper are organised as follows.

Chapter 2 will examine the key literature regarding fiscal policy, fiscal multipliers variable and the effectiveness of fiscal stimulus, by aligning literatures that exhibit the impacts of fiscal policy on countries along with studies done on fiscal multipliers and effect of debt on them together with the main themes that have emerged.

Chapter 3 will further illustrate the procedure and will demonstrates the approaches taken in this research paper to achieve the objectives. Chapter 4 will look at the results obtained in this study.

Finally, Chapter 5 contains the key findings, discussion of key findings, recommendations and conclusions made from this study, with hope that the results obtained could be implemented by policymakers in order to design a more effective fiscal policy stimulus package. Proposals for future research will also be recommended.

Ultimately, it is anticipated that this study could offer fresh insights into the fiscal policy to further enhance the policymakers' understanding of the effects of debt on fiscal policy and factors that influence fiscal multipliers in order to improve the fiscal policy strategies in the future.

Chapter 2

Literature Review

2.1 Introduction:

The global economic and financial crisis in 2008 and 2009 has ignited interest on the impact of discretionary fiscal policies and its effectiveness. Even though the economy fluctuations could be smoothed by utilisation of fiscal policy, however, uncertainty and inconsistency have been observed over its effectiveness in countries where it has been implemented. These inconsistencies are mainly due to the structural characteristics such as the size of the automatic stabilisers; national debt level; exchange rate regime; trade openness; rigidity of the labour market; public expenditure management; revenue administration and temporary factors that the country is experiencing (Batini et al., 2014). Hence, studies on the effectiveness of fiscal policy are of great importance for numerous reasons. As described earlier in chapter one, the purpose of this study is to gain new insights into the potential effectiveness of fiscal policy, by examining the size of fiscal multipliers in a selected representative sample of high debt and low debt countries, before and after a major global recession period. To this end, the study's theoretical background, an overview of fiscal multipliers and a discussion of structural characteristics are followed by an analysis of the effects of key temporary factors. Finally, an evaluation of the effects of fiscal stimulus and the relationship between public debt and the private sector is followed by a summary of the findings that emerged from the literature review and important findings concerning these issues in the chapter's conclusion.

2.2 Theoretical Framework:

The focus of this paper is Keynesian theoretical model, as this theory revolves around total spending and its effect on output, aggregate demand and inflation. Keynes (1965) stated that the free market has no self-balancing mechanism, thus government intervention is required in order to achieve price stability and full employment. Keynes (1965) further explained that aggregate demand is calculated by summation of consumptions by government, household and businesses, as these variables are the key driving forces of an economy. Fiscal policy consists of either increasing or decreasing the net public spending, in which the government can influence by raising or reducing both spending and tax, together or separately. It has been suggested that

in case of inadequate private spending and investment, public spending should be increased to compensate for the loss in the aggregate demand.

Keynesian economics believe that fiscal policy can affect the unemployment rate. This is due to the fact that an increase in the aggregate demand leads to higher output value which would reduce the unemployment rate through the creation of more jobs. This view is supported by Okun (1962), as Okun's law asserted that an increase in GDP growth by 3% would decrease the unemployment rate by 1%. Through increasing the values of investment and consumption, the government raises the demand for products or employment in the market, thus reducing the effect of a contractionary economy (Henderson, 2008). The Keynesian theory's consumption function describes the relationship between the income levels and consumption levels, while the expenditures on consumption will vary with corresponding changes in income levels (Ofwona, 2013). In sum, the consumption function has been utilised to track the consumption expenditures that are associated with economic factors such as interest rates and income, while these expenditures typically account for the largest percentage of a nation's GDP (Ofwona, 2013).

Keynesian traditional multiplier model is used to capture the effectiveness of fiscal measures on the output. Referring to *The General Theory of Employment, Interest and Money* on the description of Keynesian multiplier and marginal propensity to consume; *"Our normal psychological law that, when the real income of the community increases or decreases, its consumption will increase or decrease but not so fast, can, therefore, be translated – not, indeed with absolute accuracy but subject to qualifications which are obvious and can easily be stated in a formally complete fashion – into the propositions that ΔC_w and ΔY_w have the same sign, but $\Delta Y_w < \Delta C_w$, where C_w is the consumption in term of wage units. Let us define, then, $\frac{dC_w}{dY_w}$ as the marginal propensity to consume. This quantity is of considerable importance, because it tells us how the next increment of output will have to be divided between consumption and investment. For $\Delta Y_w = \Delta C_w + \Delta I_w$, where ΔC_w and ΔI_w are the increment of consumption and investment; so that we can write $\Delta Y_w = k\Delta I_w$, where $1 - \frac{1}{k}$ is equal to the marginal propensity to consume. Let us call k the investment multiplier. It tells us that, when there is an increment of aggregate investment, income*

will increase by an amount which is k times the increment of investment.” (Keynes, 1965).

This theory is in strong contrast to the theory and views of Classical economists. Basically, the Classical theoretical model indicates that the government expenditure has a significantly different effect in comparison to the Keynesian model, especially on private consumption (Blanchard and Perotti, 1999). Furthermore, Blanchard states that on several occasions, the economic response to the past fiscal consolidation measures are in contradiction with the conventional Keynesian model, while reduction in government spending indicate a significant increase in private consumption and GDP.

2.3 Fiscal Multipliers:

Fiscal multipliers could be defined in numerous ways due to existence of various methods for their measurement.

As noted above, fiscal multipliers can generally be defined as the ratio of change in real GDP or other measures of output due to variations in government spending or tax revenue (Ilzetzki, Mendoza and Végh, 2013; Batini et al., 2014). In other words, fiscal multipliers measure the impact of alteration in government spending and tax revenue on economic output. For example, a one-euro increase in the government spending or a one-euro reduction in tax revenue will lead to a seventy cent increase in the nation output, while the fiscal multiplier will have a value of 0.7.

Impact Multipliers: Impact multipliers are measurement methods suitable for examination of the short-term effects of fiscal policy. Impact multipliers are defined as the ratio of change in output to the change in government spending measured at the time of impulse (Batini et al., 2014).

Cumulative Multipliers: Cumulative multipliers are measurement methods suitable for examining the long-term effects of fiscal policy. Cumulative multipliers are defined as measures of the cumulative change in national output to the change in government spending, measured from the time of the impulse occurrence to the reported time (Batini et al., 2014).

Multiplier determinants: Batini et al. (2014) stated that in the technical notes and manuals of the International Monetary Fund (IMF), determinants of the size of multipliers are divided into two types:

- a) Country Structural Characteristics: Determinants which affect the behaviour of the economy due to fiscal policy shocks in normal economic conditions. Here, 'structure' refers to the way which economy operates.
- b) Temporary Factors:- Determinants that will diverge the fiscal multipliers from the expected levels in the economy.

2.3.1 Structural Characteristics:

Various structural characteristics could affect the operation manner of fiscal multipliers, including the following:

- *Size of automatic stabilisers:* According to Dolls, Fuest and Peichl (2012), larger values of automatic stabilisers will lead to smaller values of fiscal multipliers. This is due to the fact that a portion the initial fiscal shock and its effect on the GDP will be offsetted by automatic stabilisers.
- *National debt level:* High debt to GDP ratio will erode the country fiscal multiplier by reducing the confidence of the private sector, as they fear from raise of tax rates in future (Ilzetki, Mendoza and Végh, 2013)
- *Exchange rate regime:* Ilzetki et al. (2013) state that a decrease in the size of fiscal multipliers can be caused by a flexible exchange rate regime. This is due to the fact that the movement of the exchange rate can offset the effect of the discretionary fiscal policy which has been implemented.
- *Trade openness:* Ilzetki et al. (2013) also explain that fiscal multipliers tend to be much lower in open economies as an increase in propensity to import (MPT) would increase the money leakage.
- *Rigidity of the labour market:* High wage rigidity tends to improve the supply response to the demand shock. Thus, nations with high labour market rigidity tend to have larger fiscal multipliers (Gorodnichenko, Mendoza and Tesar 2012).

Although these research has helped to advance the body of knowledge concerning the effects of fiscal multipliers, it is also important to note that the researchers

published to this date concerning the effects of these structural characteristics have been constrained due to differences in initial economic conditions and definitions of policy variables in high-debt and low-debt country-specific scenarios (Auerbach and Gorodnichenko, 2015). Moreover, it is significant to note the depth of an economic downturn in order to achieve the optimal outcomes from these analyses, which has not been taken into account by many researchers (Auerbach and Gorodnichenko, 2015), as well as any key temporary factors that could affect the impact of fiscal multipliers as noted below.

2.3.2 Key Temporary Factors:

- *Business cycle state:* Jordà and Taylor (2016) stated that in times of economic recession, fiscal multipliers tend to be larger in size in comparison to economic expansion period, mainly due to the 'crowding out' effect in the private sector.
- Effect of the monetary policy on fiscal shocks: Monetary policy could moderate the contraction effect of fiscal shocks by lowering the interest rates (Batini et al., 2014).

2.4 The Effect of Fiscal Stimulus:

The rising high value of public debt has renewed attention of academic scholars on the topic of fiscal policy in the academic literature. Significant strengths could be observed in studies regarding the effect of fiscal stimulus packages on national economies, including utilisation of especial robust research designs for demonstration of these effects (e.g., one study, Reinhart and Rogoff [2010], data of public debt levels of more than 200 years from 44 countries were used). Conversely, comparisons of these findings are complicated due to their different time frames. Furthermore, country-specific data were used in the studies discussed below, while different fiscal crises with vastly diverse characteristics were experienced during these study periods. Notwithstanding these limitations, as will be further discussed below, the findings that emerged from the research to this date supports the relationship between high public debt levels and fiscal crises as well as their adverse impact on GDP levels. These issues have gained importance and relevance in recent years as national policymakers have attempted to identify optimal stimulus strategies. While this growing body of research indicates that high levels of public debt can diminish the effectiveness

of stimulus strategies, the extent of this effect remains unclear. Hence, it can be seen that further research on this area is highly desired.

2.4.1 Public Debt Level:

Generally, debt has been acknowledged to be one of the key variables in various dynamic settings by Favero, Giavazzi, and Perego (2011), Nickel and Tudyka, (2014), Corsetti, Meier, and Müller (2012), Chung and Leeper (2007) and Favero and Giavazzi (2007). In fact, high public debt levels accumulated over time have been cited as a common feature of most fiscal crises (Steil, 2010). In their studies, these researchers acknowledged the significant influence of debt level on the economy.

It is generally accepted that fiscal policy stimulus can stabilise economic fluctuation. However, Perotti (1999) argued that due to the public fear of future fiscal crises and increases in tax rates, implementation of fiscal policy in times of high public deficit and public debt will cause an adverse effect on the nation economy. These researchers further emphasized that ignoring debt or debt dynamic could lead to significant error in evaluation of coefficients or multipliers due to the unaccounted effect of government debt on spending.

Numerous authors have emphasized that surpassing of GDP ratio from a certain limit will have a detrimental effect on economic growth. For instance, in a study performed by Reinhart and Rogoff (2010) consist of large data set of 44 countries in over 200 years, debt to GDP ratio of above 90% was discovered to be linked with lower GDP growth. Reinhart and Rogoff (2010) and Vranceanu and Besancenot, (2013) arrived at the same conclusion that high level of debt to GDP ratio will negatively affect fiscal multipliers, real interest rate and the economic growth of the country. Furthermore, Vranceanu and Besancenot, (2013) found that 10% increase in the debt to GDP ratio could decrease the annual growth rate by 0.28%.

A study performed by Checherita and Rother (2012) on 12 euro countries reaches a similar conclusion, where the debt to GDP ratio above 90% will have a negative effect on long-term growth. In consonance with that statement, Cecchetti, Mohanty, and Zampolli (2011) conducted a study on 18 OECD countries while examining the household, non-financial corporate and government debt. Results obtained indicated that debt to GDP ratio of above 80% for government debt, above 85% for household

and above 90% for corporate possess a negative effect on the economic growth, while moderate level of debt can improve welfare.

Recent research performed by Nickel and Tudyka, (2014) on 18 European countries compromised data from 1970 to 2010 to examine the impact of fiscal stimuli at different levels of government debt. Results indicated that high debt to GDP ratio (e.g., above 90%) has an adverse effect on fiscal multipliers. Similarly, another study was conducted by Bi, Shen and Yang (2014) on the effect of external debt and sovereign default risks on fiscal policy, which was implemented in developing countries. Results indicated that estimated future revenue has a crucial role in low fiscal limits of developing countries, while external debt possess additional risks, as debt obligation could increase unexpectedly when large devaluation of real exchange rate occurs.

Based on observation done on these studies, it indicates that debt has become a key variable that is considered in their studies. Although the debt level threshold identified varies in these research, all the researchers agreed that debt has detrimental effect on economic growth and fiscal multipliers. Although Keynesian theory did not emphasize in-depth on debt, Aspromourgos (2014) characterised that Keynes's position on public debt as cautious as Keynes stated that national debt could not keep on growing and public debt should be used to finance capital expenditure. It is important to note that the significant difference between this study and previous studies, is that this study utilised fiscal balance rather than government expenditure or tax as the main independent variable in the regression model. Secondly, this study focus on the consumption function over time and comparison of the growth rate of the countries before and after a fiscal shock across a range of variables.

2.4.2 Relationship of Public Debt and Private Sector:

A source of nonlinearity in fiscal policy is expectation, while the fiscal policy has an impact on the formation of expectations of the private sector. For instance, when public debt increases and it is expected to be followed by consolidative fiscal, actions will be done to decrease the disposable income lifetime, which will lead to reduction in marginal propensity to consume, as spending decreases while saving increases. Additionally, this phenomenon can work through interest rate (low government bond interest rate), which could be caused by credible fiscal consolidation, will lead to reduction in the real interest rate faced by the private sector.

An early study regarding the relationship between public debt and private consumption was conducted by Nicoletti (1988), using a sample of eight OECD countries. The results stated that, as public debt accumulation exceeds a certain limit, it would become unsustainable and will encourage precautionary savings. In contrast, a study done by Sutherland (1997) and Perotti (1999) found that initial level of public debt could influence the effect of fiscal policy. The effect of fiscal policy on private consumption, while government debt is at a moderate level, is of Keynesian style. However, this will have a contradictory effect when the government debt is at an extreme level. This result is consistent with research conducted by Nickel and Tudyka, (2014). A study conducted on whether national saving behaves nonlinearly to fiscal impulses by Giavazzi, Jappelli, and Pagano (2000) reported that in case of a large and persistent fiscal stimulus, private sector is likely to respond nonlinearly. This study also stated that, responses to the change in net taxes are higher in comparison to the change in public consumption, while responses are smaller for fiscal expansions compared to fiscal contractions, whereas the share of public debt does not appear to play any important role. Similarly, a study of expansionary fiscal consolidations of cases in Ireland and Denmark conducted by Giavazzi and Pagano (1990) reported that expansionary effects could be seen in a large fiscal adjustment in the form of spending cuts.

Based on these findings, we can conclude that in situations where the debt level is moderate, private consumption behaves as of Keynesian style, while in high debt level, this behaviour becomes nonlinear, as it would decrease the private consumption and induce precautionary savings. These findings are crucial for this study, as the relationship between public debt and private consumption has to be established, in order to address the research question, which is the effect of the Great Recession on the aggregated propensity to consume in selected countries.

2.5 Conclusion:

Despite the fast-growing body of research concerning the potential effectiveness of fiscal policy, through examining the size of fiscal multipliers in a selected representative sample of high debt and low debt countries before and after a major global recession period, there remains a dearth of timely and relevant research concerning the effect of high and low debt on the fiscal policy, as it relates to the safe

limit of public debt. In addition, there is still a significant gap concerning the short-term effects of debt on the fiscal policy and the economy. The uniqueness of this study compared to previous studies is that rather than using government spending or tax as the main independent variable, this study utilises public balance as the main predictor variable. Although numerous researchers agreed on the effects of debt on the effectiveness of fiscal stimuli, the extent of this effect remains unclear, and additional research in this area is highly desired. Therefore, a comparison of the findings from the previous studies could provide a fresh insight into these issues.

Based on the study of the previous literature a research question has been formulated;

- How does the effectiveness of fiscal policy differ between countries that have high public debt and low debt, and pre and post the 2007 financial crisis?
 - To what extent does the Great Recession affect public finances in selected high and low debt countries?
 - To what extent does the Great Recession affect the aggregated propensity to consume in selected countries through the calculation of country specific consumption functions?

In this study, hierarchical multiple-linear regression model will be utilised. It is expected that this approach is suitable for examining the effect of fiscal policy, since fiscal variables are affected by various reasons known as exogenous fiscal shocks. Therefore, a model that takes into account these exogenous fiscal shocks is highly desired.

Chapter 3

Methodology

In this chapter, we will outline the research philosophy, research design, research method which include an explanation of data source and characteristic, statistical methods and regression model. This chapter will also address the ethical consideration and limitation of this approach.

There are different views on the term 'methodology', as based on explanation done by Hussey & Hussey, (1997), the term 'methodology' can be used interchangeably with the word 'method'. There is also another believe that 'methodology' refers to the general style used and the underlying paradigms, while the term 'method' is believed to refer to the different methods of data collection and analysis (Hussey & Hussey, 1997). Furthermore, according to Mason (2002), 'methods' are the elements in a strategy, while 'methodology' is the strategy. Based on these views, this chapter will further discuss the research method and approaches adopted to accomplish the aims of this study. Furthermore, this chapter will provide detailed justification of the chosen method, along with a discussion on strengths and limitations of the used approach.

3.1 Research Philosophy

Research philosophy is considered to be an important aspect of any research. According to Levin (1988), research philosophy indicates the method that data should be collected and analysed. However, according to Saunders et al. (2012, p.127), the term research philosophy could be linked to the expansion and advancement of the nature of knowledge. Furthermore, Saunders et al. (2012) reported that philosophy adopted by the researcher reflects the researcher views and important assumptions.

Ontology or reality was defined as "the science or study of being" by (Blaikie 1993), that focuses on the nature of reality. This philosophy revolves around the question of whether entities should be considered in a subjective or objective manner. Ontology consists of objectivism, which considers that social entities exist in reality outside to the social actors who are concerned with their presence (Saunders et. al., 2012), and subjectivism, which considers that perceptions and resultant actions of the social actors are the main cause of the social phenomena (Saunders et al. 2012, p.131). The researcher standpoint in ontology will greatly affect their epistemological standpoint, which could have an influence on the researcher's view of human nature.

Epistemology of knowledge is concerned with the established knowledge, known as the views which are generally accepted in the study field. This is supported by Saunders et al. (2012, p.132), who explained that epistemology is a part of the research philosophy that is focus on the nature of the knowledge, along with the generally accepted views and 'what constitutes acceptable knowledge in a field of study'.

There are two approaches in executing a research; the first approach is interpretive approach, which generally used when a study aims to provide an interpretive understanding of the social phenomena in a particular context that can be achieved through an inductive process (Collis and Hussey 2009, p.57). Saunders et al. (2012, p.146) explained that inductive approach is implemented when the purpose of the study is to improve the knowledge regarding the nature of the problems. Furthermore, Saunders et al, (2012) stated the importance of reorganisation of differences between humans and social actors when this approach is being implemented. Social actors can be defined as humans who utilise the world as a stage and inquire, whether the interpretations are from themselves or someone else.

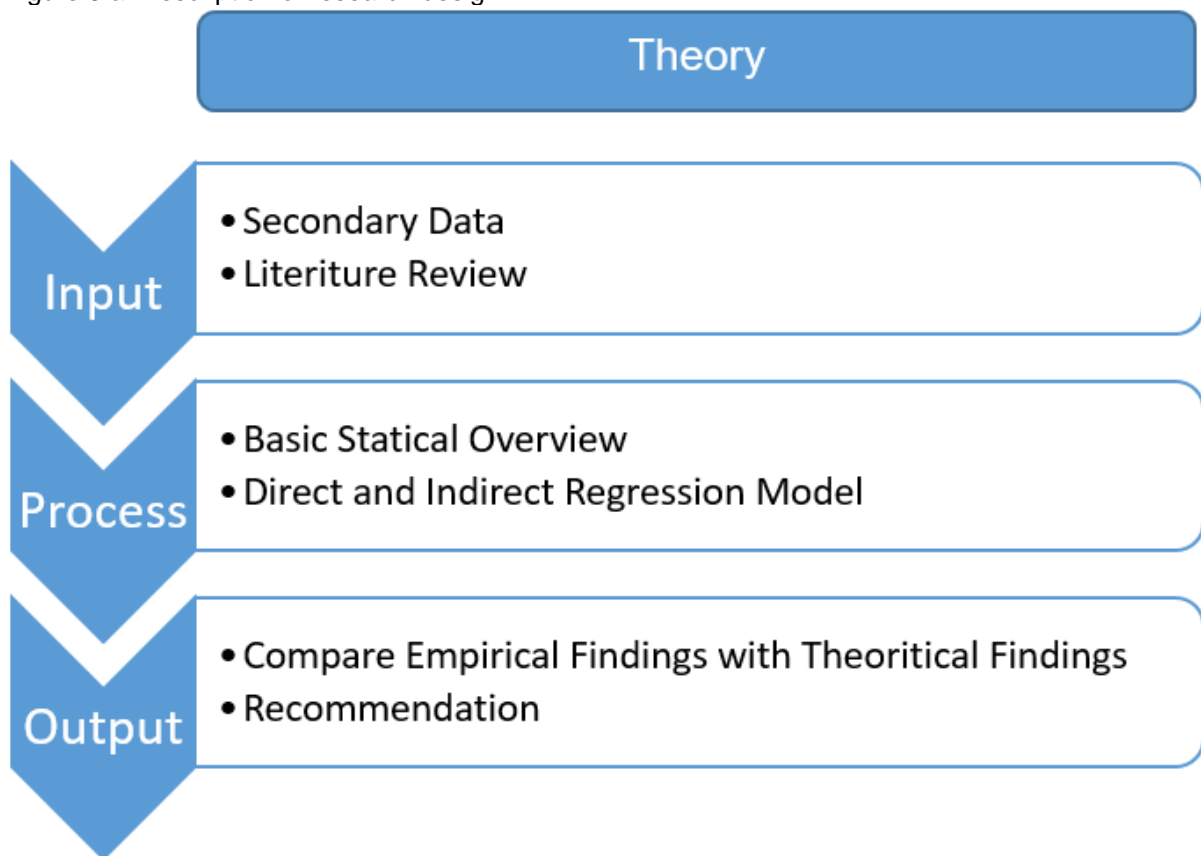
The second approach is the positivist approach, which is based on the deductive theory testing processes (Collis and Hussey 2009) and promotes the application of natural science methods (Bryman and Bell 2011, p15). The philosophy of positivism revolves around the belief that the social world exists externally and the characteristic should be measured through objective methods, as an alternative to being evaluated through subjectivity methods such as instinct, sensations or reflection (Easterby-Smith et al 2002, p.28). Researches done using positivist approach are often quantitative research, as this approach typically requires significant amounts of data (Travers, 2001). The positivism philosophy is closely linked to the deduction approach. In order to implement this approach, researchers are required to establish a theoretical position prior to the data collection (Saunders et al 2012).

In this study, methodology in the manner of positivism has been adopted, which involves a deductive process. A deductive process starts with the general theory and gradually deduces it, so it can be used in the study. The main purpose of the deductive process is to evaluate and confirm the previous theoretical findings, in order to gain insight into the effect of fiscal shock on economic variables in various debt levels. This

process is similar to the process that is undertaken in this study, as the nature of this research is to examine whether the general theory on fiscal policy is consistent with the result produced. The main theory utilised in this research is Keynesian theory, which will be compared with the result produced. This is due to the fact that the main objective of this study is to examine the size of fiscal multipliers along with the potential effectiveness of fiscal policy in a selected sample of high debt countries and low debt countries, pre and post a major global recessionary period. This indicates that the result will be subjected to critical comparative analysis.

3.2 Research Design

Figure 3 a: Description of research design



This study has chosen quantitative approach as the research design. This is due to the fact that quantitative research will facilitate the purpose of this study, which is to gain insights into the effect of debt on the efficiency of fiscal policy, in order to improve the strategies of fiscal policy in future. It can be seen from Figure above that this study evaluates various theories and practices related to the fiscal policy strategies. The theoretical position of this research is developed by the researcher prior to the analysis of the secondary data, by means of conducting a literature review. Based on the

developed theoretical position and emerging themes from the literature review, statistical analysis was conducted through direct and indirect approaches. Regression model with deductive methods were utilised in order to gain new insights and evaluating the previous theories related to the effectiveness of fiscal shock in high and low debt condition. Detailed discussion of the direct statistical approaches will be discussed in this chapter.

Upon completion of the preliminary statistical analysis, known as the direct regression model analysis, the findings will be analysed and compared with previous theoretical findings. Furthermore, the outline of the result will indicate the validation or rejection of various theoretical views which leads to contribution of this research on theoretical body of knowledge of fiscal policy. Finally, recommendations and highlights for further studies will be indicated, so this study could provide an even more practical contribution.

3.3 Research Method

3.3.1 Data Sources:

Given the nature of this study which includes the examination of secondary data sources to analyse the effectiveness of fiscal policy across low-debt and high-debt countries, it was decided that the key data sources would comprise of time series data. The time series data will be taken from 10 European countries; Belgium, Germany, Portugal, France, Austria, Czech Republic, Slovakia, Finland, United Kingdom and Netherlands. This time series data will cover the period of 1995–2014. All the variables have been taken from Eurostat online database, World Bank Data Base and European Commission's Statistical Annex of European Economy database (European Commission 2015; Eurostat 2016; *World Data Bank*, 2016).

The choice of countries is determined by the intended focus of the research question. The extant literature postulates that, the effectiveness of fiscal policy and its underlying marginal propensity to consume dynamic is determined by the national debt level of a country. It is known that low debt countries tend to exhibit higher multipliers than countries with higher debt level. However, clear findings in this area are scant and tend to change according to time frame studied and geographical location of the study. Resultantly, the chosen countries for this study include Belgium, Germany, Portugal,

France, Austria, Czech Republic, Slovakia, Finland, United Kingdom and Netherlands were determined according to number of explicit inclusion criteria.

Selected European Union countries in this study will be divided into two categories, according to their debt to GDP ratio. The inclusion criteria for the first sample countries (low debt) are countries that have debt to GDP level of below 60% in the period of 2005-2006, while the second sample countries (high debt) have a debt to GDP level of above 60% in the period of 2005-2006, as shown in Table 3a. The table shows the debt to GDP level of countries that is considered as low debt country and high debt country, the debt level observed are between 2005 to 2006. The time period of debt to GDP level observed for the selection of sample countries is two years before the 2007 because the recession post of 2007 is a 'highly significant global macroeconomic event, which means that any type of macroeconomic metric after 2007 do not represent the long-term trend as the recession in 2007 is the largest recession since the great world depression in 1930s. The threshold of 60% that the researcher adopted is taken from the stated rule that was set forth in the Maastricht Treaty (European Commission, 2014). The researcher viewed that choosing sample based on asymmetric event or an outlier event is not reliable. The sample countries chosen are: Belgium, Germany, Portugal, France and Austria for high debt countries and Czech Republic, Slovakia, Finland, United Kingdom and Netherlands for low debt countries. The researcher chooses countries in the European Union because of the similarities that these countries shares, as suggested by Nickel & Tudyka, (2014). Another main determination for the choice of the countries are the data availability and data quality.

Table 3 a: List of high and low debt countries with debt to GDP level in 2005 and 2006

High Debt				Low Debt					
Country	Debt 2005	Level	Debt 2006	Level	Country	Debt 2005	Level	Debt 2006	Level
Belgium	94.6%		91.0%		Czech Republic	28%		27.9%	
Germany	66.9%		66.3%		Slovakia	33.9%		30.8%	
Portugal	67.4%		69.2%		Finland	40%		38.2%	
France	67.2%		64.4%		United Kingdom	41.5%		42.4%	
Austria	68.3%		67%		Netherlands	48.9%		44.5%	

Data Source: Eurostat, (2016)

Variables for statistical analysis of each country includes Government consolidated gross debt to GDP ratio, Household Disposable income, Fiscal Balance, Gross fixed capital formation (investments), Short-term interest rate, Total trade, Final household consumption, Real GDP Growth Rate and Gross domestic product, which will be further described in the next section. It must be mentioned that, the variables used in this research are in current price.

Annual data was selected to be used in this study, due to the fact that the availability of truly quarterly non-interpolated data of fiscal variables for European countries that reach adequate amount of time was limited. Several advantages have been reported on utilisation of annual data by Beetsma, Giuliadori, and Klaassen (2006), as annual data is not affected by the seasonal effects and significant data such as fiscal budget is published annually. Through utilisation of annual data, the true government spending shock can be well captured, as structural shocks identified by this data are closer to unforeseen shocks, since policy actions are not likely to be foreseen one year ahead. Similarly, by using annual data the researcher is not concerned regarding the implementation of lags for purchasing decisions that may resulted in an incorrect dating of policy shock, as it is more likely to be the concern for quarterly data. Furthermore, Perotti, (2005) pointed out that the difference in the institutional framework that reflect the tax collection payment method and lag across the countries are less pronounced in annual data. In a study conducted by Born and Muller (2012) it was concluded that government expenditure shocks can be well identified by utilisation of annual data. It must be mentioned that usage of annual data is not without a drawback, since observation is limited in comparison to quarterly data.

3.3.1.1 Independent Variables:

- Government consolidated gross debt to GDP ratio: The researchers choose this variable because it is the total debt accumulated by all the governments at the end of the year. Eurostat (2016) define this variable as “*consolidated general government gross debt at nominal (face) value, outstanding at the end of the year in the following categories of government liabilities (as defined in ESA 2010): currency and deposits, debt securities and loans. The general government sector comprises the subsectors: central government, state government, local government and social security funds*”. This variable

has been used to identify the debt level of the sample countries and to categorise them accordingly.

- Household Disposable income: This variable represents the net disposable income as defined by Eurostat (2016) as “*Disposable income of households may be defined as the net amount they have earned, or received as social transfers, during the accounting period excluding exceptional flows linked to capital transfers or changes in the volume/value of their assets. It is mainly composed of wages received, revenues of the self-employed and net property income such as interest received on deposits minus interest paid on loans and dividends*”. This variable reflects the disposable income of the household at a particular time.
- Fiscal Balance or Net lending (+) /net borrowing (-): This variable is defined by Eurostat (2016) according to the European System of Accounts 1995 (ESA95) as “*the Government Sector measures the change in financial net worth of Government. This is derived by getting the difference between the sum of all General Government revenues and the sum of General Government expenditures*”. This variable is represented in percentage of GDP, that will reflect the deficit spending habit of the government.
- Gross fixed capital formation (investments): represents the investment as defined by Eurostat (2016) “*Gross fixed capital formation consists of resident producers’ acquisitions, less disposals, of fixed tangible or intangible assets. This covers in particular machinery and equipment, vehicles, dwellings and other buildings*”.
- Short-term interest rate: Eurostat (2016) define short-term interest rate as “*An interest rate may be defined as the charge for borrowing money, measured as the percentage ratio between the sum payable to the lender and the amount borrowed, at an annual rate. Short-term interest rates – Rates on money markets for different maturities (overnight, 1–12 months)*”.
- Total trade: defined by World Data Bank (2016) as “*Trade is the sum of exports and imports of goods and services measured as a share of gross*

domestic product'. This variable has been selected to determine the trade openness of an economy.

3.3.1.2 Dependent Variables:

- Final household consumption: This variable has been selected to illustrate the total expenditure of the household as defined by Eurostat (2016) "*Household expenditure refers to any spending done by a person living alone or by a group of people living together in shared accommodation and with common domestic expenses. It includes expenditure incurred on the domestic territory (by residents and non-residents) for the direct satisfaction of individual needs and covers the purchase of goods and services, the consumption of own production (such as garden produce) and the imputed rent of owner-occupied dwellings*". This variable is in current price with unit measurement of million euros. Furthermore, consumption functions of the sample countries will be evaluated by this variable, since it reflects the spending habit of the household at a particular time.
- Real GDP Growth Rate: This variable is defined as change in GDP less inflation rate in percentage of GDP. Eurostat (2016) define this variable as "*Gross domestic product (GDP) is a measure of the economic activity, defined as the value of all goods and services produced less the value of any goods or services used in their creation. The calculation of the annual growth rate of GDP volume is intended to allow comparisons of the dynamics of economic development both over time and between economies of different sizes. For measuring the growth rate of GDP in terms of volumes, the GDP at current prices are valued in the prices of the previous year and the thus computed volume changes are imposed on the level of a reference year; this is called a chain-linked series. Accordingly, price movements will not inflate the growth rate*". This variable reflects the economic performance of the sample countries.
- Gross domestic product: This variable is defined by Eurostat (2016) as "*an indicator for a nation's economic situation. It reflects the total value of all goods and services produced less the value of goods and services used for intermediate consumption in their production*". This variable is at current prices.

This variable is chosen by the researcher because it represents an important output and performance indicator for the sample country.

3.3.2 Model and Statistical Methods

In the present study, a straightforward experiment method will be utilised, involving the manipulation of independent variables in order to generate statistically analysable data. The analysis will be in several stages;

- a) The first stage of the analysis will be a preliminary statistical analysis that will be performed in order to observe the trend and stance in fiscal policy via Government finance statistics across the selected countries.
- b) In the second stage, the impact of fiscal policy on national level consumption patterns will be examined, such as marginal propensity to consume (MPC). This will be evaluated through the relationship between the net household disposable income and final household consumption expenditure. Furthermore, the impact of investment on GDP growth rate will be analysed through the relationship between GDP growth rate and gross fixed capital formation, which will be achieved using bivariate analysis.
- c) In the third stage, further examination will be conducted on fiscal multipliers and the impact that public debt has on them. This examination will be done using a regression model, the regression model will examine the effectiveness of fiscal measures on the economic output while taking into account the effect of fiscal balance and government debt level. There is two part which consists of statistical methods and hierarchical multiple-linear regression model in order to analyse the data and tackling the research problems.

3.3.2.1 Statistical Methods

The first stage comprises of a preliminary statistical analysis that was performed in order to observe the trend and stance in fiscal policy via Government finance statistics across the selected countries. This intends to reveal an indication of the use of fiscal policy over time and to highlight any large discretionary fiscal policy changes undertaken by the Governments. The component of the macroeconomic variable that was used in the first stage was National debt to GDP ratio, public balance and GDP growth rate. The variable will be plotted on a graph in which time will be at the x-axis while the y-axis will be the variables mentioned above in order to identify the in

changes in the variables. The observation will be focused on changes in the period of 2007, which is considered as the beginning of the Great Recession. By performing this analysis, the researcher can identify the trend and stance in fiscal policy that was utilised by the government and also gains insight into the effect of the Great Recession on the public finance of the selected sample countries.

In the second stage of this analysis, the researcher utilises bivariate analysis in order to investigate the impact of the Great Recession on the aggregate propensity to consume in the selected sample countries. This will be achieved by plotting a scatter graph and observing a) the relationship between net household disposable income (x-axis) and final consumption expenditure (y-axis) and b) the relationship between gross fixed capital formation (x-axis) and GDP growth rate (y-axis). The independent variables for the first part of the analysis are household disposable income and gross fixed capital formation while the dependent variables are final consumption expenditure and GDP growth rate. These variables will be analysed using basic bivariate analysis over a distinct time period that will be represented in the form of a scatter plot. The scatter plot graph will be divided into two periods, the first period is taken from 1995 to 2004 and the second period is taken from 2005 to 2014. This analysis will produce marginal propensity to consume (MPC) and investment slope coefficient that will be compared through both periods. The bivariate equation for the scatter plot;

Equation:

$$C = a + bY_d$$

C= Consumption

Y_d = Disposable national income

b= The marginal propensity to consume

a= intercept of C axis when Y_d equals zero

Regarding the relationship between real disposable income and consumer spending, the hypothesis indicates that the amount of consumption will decrease in recession period. While according to the hypothesis regarding the relationship between gross

fixed capital formation and GDP growth rate, the amount of investment will decrease in recession period.

Concurrently, dependency test will be performed in this study, in order to compare the mean value of the variables. Basically, the dependency test will be performed to examine whether there is significant changes in the marginal propensity to consume (MPC) and investment slope coefficient, while evaluating the slope coefficient between the two-time periods or public debt levels. There are two categorical independent variables in this study with two different levels;

- 1) high debt countries which were marked as (Group 1) and;
- 2) low debt countries which were marked as (Group 2),
- 3) period 1995-2004 which was marked as (Group 1) and;
- 4) period 2005-2014 which was marked as (Group 2)

along with one continuous dependent variable. This study aims to examine the variation in statistical significant difference in the mean score of two time periods and two public debt level groups, for of marginal propensity to consume (MPC) and investment slope coefficient value. This will be determined based on the p-value or the Sig. (2-tailed) value. It is known that if the p-value is less than or equal to 0.05, there is a statistically significant difference between the two groups, whereas if the p-value is greater than 0.05, there is no statistically significant difference between the two groups. In order to determine the type of test to be utilised, preliminary tests such as normality test has to be performed in order to determine the characteristic of the data.

3.3.2.2 Hierarchical Multiple Regression Model:

3.3.2.2.1 Time series analysis:

Time series analysis is one of the most widespread methods for the analysis of the time series data. Time series or stochastic process can be defined as a sequence of data points with equally spaced time intervals recorded over a period of time (Wang, 2012). An economic example of time series data is annual GDP and net household disposable income. Time series consist of four main components known as Secular Trend, Cyclical variation, Seasonal variation and Irregular variation (Adhikari and Agrawal, 2013). Secular trend is the tendency of the time series to decrease, increase or remain stagnant over a long period of time. Adhikari and Agrawal, (2013)

demonstrate the cyclical variation as changes of medium term in time series due to variation of circumstances. Seasonal variation is the fluctuation within a year in the time series due to seasonal characteristics such as weather condition, climate and customs (Adhikari and Agrawal, 2013). Adhikari and Agrawal further demonstrated the non-regular random variation in the time series caused by unpredictable influences such as war, flood or earthquake are termed as Irregular variation.

Time series analysis is the statistical method of analysing time series data in order to extract important statistics and information (Wang, 2012). Time series analysis is often utilised for the purpose of forecasting, monitoring and to provide an understanding of factors and structure that affect the observed data. Time series analysis model can be divided into linear, nonlinear, univariate and multivariate. Univariate time series is a time series that comprise of a single variable date records, while multivariate time series consist of records of multiple variables (Adhikari and Agrawal, 2013). The significant advantage of utilisation of time series analysis over other methods is the fact that time series analysis takes into account the internal structure such as autocorrelations and trends. A regression analysis is a process of analysing the relationship that exists between the variables which consist of a dependent variable and one or several independent variables (Tabachnick and Fidell, 2001).

3.3.2.2.2 Model:

The third stage of the analysis consists of developing a hierarchical multiple-linear regression model that will examine the impact of fiscal stimulus on GDP growth rate that will indicate the direct relationship between the variables. The dependent variable for this model will be GDP growth rate while the independent variables will be the fiscal balance and national debt to GDP. A dummy variable was added to represent the identified fiscal shock which was labelled as “fiscal stimulus”, the time of the fiscal shock was labelled as 1 and period with no fiscal shock was labelled 0. The control variables in this model will be the degree of trade openness and interest rate. According to Ilzetki, Mendoza and Végh (2013), country that has the total trade to GDP ratio above 60% is classified as an open economy, while country that has total trade to GDP ratio below that is classified as a close economy. The regression equation for this model is:

$$\Delta y = a + Cv + \Delta G + \epsilon$$

Δy = Dependent variable

a= Intercept (constant)

Cv= Control Variable

ΔG = Independent Variables

ϵ = error term;

Which will take the following form;

Real GDP Growth Rate = a + Trade Openness + Interest Rate + Fiscal Balance + National Debt + Fiscal Stimulus + ϵ

In the hierarchical multiple regression models for both high and low debt countries, and pre and post-recession period, Block 1 consisted of Interest Rate and Trade Openness which represented the controlled variables while Block 2 consist of Fiscal Balance ratio, National Debt ratio and Fiscal Stimulus.

In the regression model, the researcher performed an assumption check for multicollinearity, autocorrelation and linearity. Multicollinearity is a phenomenon that usually happens when a predictor variable can be used to forecast another predictor variable (Tabachnick and Fidell, 2001). This normally happens when two or more predictor variables are highly correlated, this can typically be observed in a multiple regression model. For multicollinearity test, the minimum level of tolerance used is 0.10 as recommended by Tabachnick and Fidell (2001). Autocorrelation or lagged correlation is the degree of similarity a time series have with a lagged version of itself, it is basically the correlation that a time series has with its own future or past values (Tabachnick and Fidell, 2001). For autocorrelation test, the researcher will examine the Durbin-Watson coefficient that will range between 0-4 and with an ideal value of 2. For the test of linearity and equal variance test will be done visually by examining ZRESID vs ZPRED scatter plot.

Aside from these test, the researcher also has conducted theoretical robustness check by changing the dependent variables, independent variables and the lag nature. The theoretical robustness check consisted of changing the dependent variable to unemployment rate in the model, lag-structure imposed on the dummy variable in model and imposing lead-structure on the dependent variable in model, which

indicated that there was no significant difference in the regression models results. Therefore, the researcher has chosen to report the base case model without the lag or lead structure as it was the most suitable.

3.4 Ethical Considerations

There are no ethical considerations for this study because the research is conducted using secondary data that was produced, collected and verified by Eurostat and the national statistic bodies.

3.5 Limitations

The main limitation of this research is the small number of selected sample countries used coupled with the use of annual data that is mainly due to the limited data availability and data quality. This limits the number of observation can be done compared to using quarterly data, may affect the observation 'power' of the model, therefore may divert the model result. The limited number of observation also made the result not suitable to be generalised across other sample countries. Another limitation of the model was that the model reveals the relationship among variables but do not suggest that the relationship between the variables were casual, which means that the result in the model might include the effects of other variables that were not measured in the model.

Chapter 4

Result

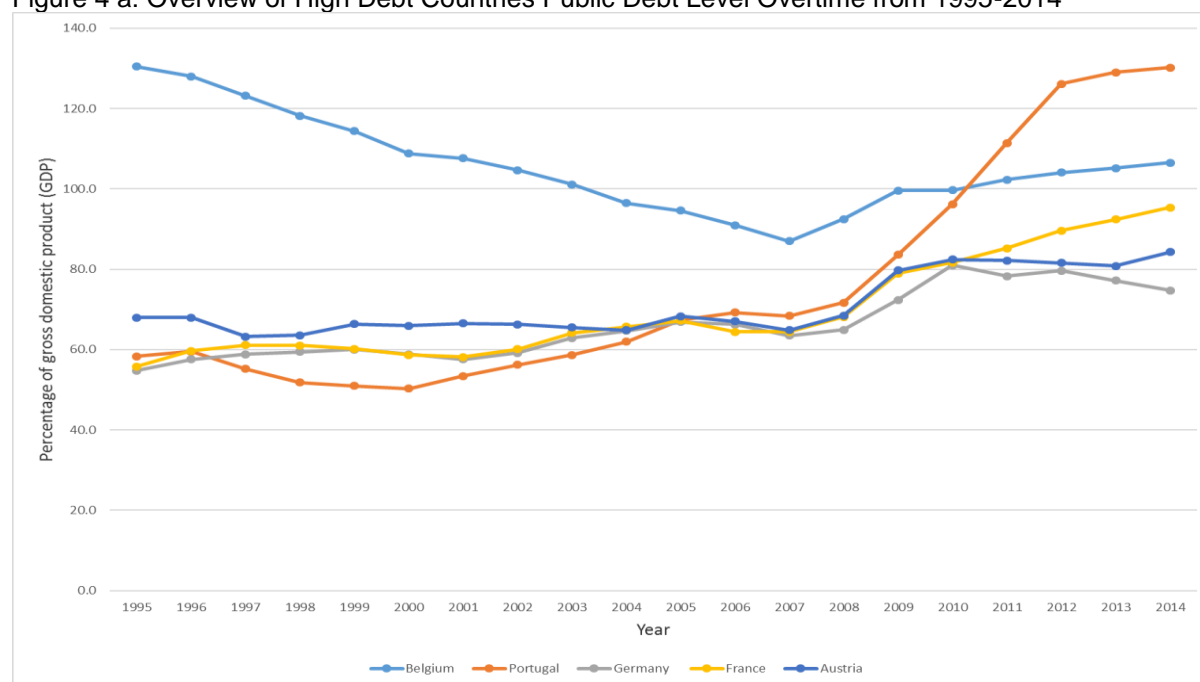
In this chapter, the researcher will outline the findings of the analysis performed along with the discussion on evaluation of fiscal stimulus, investigation of consumption function and regression model.

4.1 Investigation of Fiscal Stimulus:

In this section, we will discuss abnormalities or fluctuation of key indicators such as the public debt to GDP, GDP growth rate and public balance in an effort to gain insight into the effects of the Great Recession on public finances and investigate whether there are fiscal policy measures taken by the sample countries.

4.1.1 High Debt Country:

Figure 4 a: Overview of High Debt Countries Public Debt Level Overtime from 1995-2014



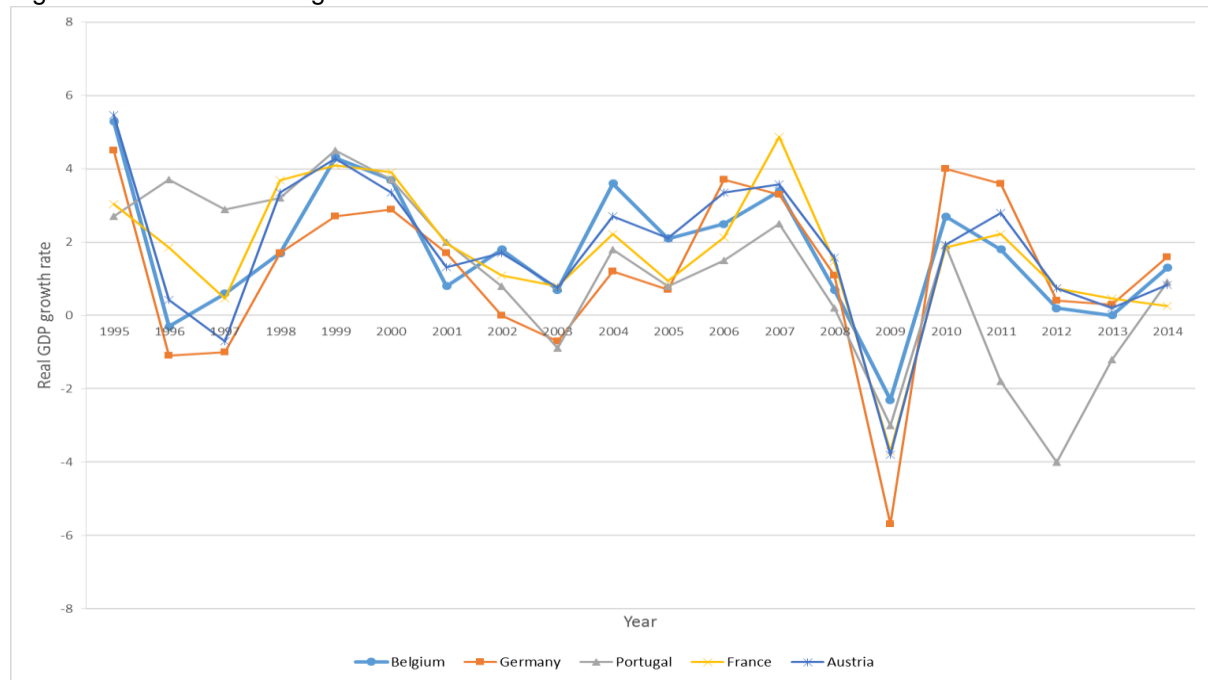
Data: Table 1

Based on Figure 4a, we can observe that there is a significant increase in the high debt countries public debt level between 2007 to 2009. Observing the change in the high debt sample countries public debt level between 2007 to 2009 indicate that Belgium experiences an increase of 12.6%, Portugal (15.2%), Germany (8.9%), France (14.6%) and Austria (14.9%)². Further examination indicates that generally

² For a more detail view of sample country debt level please refer Figure 1 for Belgium, Figure 3 for Portugal, Figure 7 for Germany, Figure 9 for France and Figure 10 for Austria in the Appendix D.

Portugal, Germany, France and Austria indicates that the public debt level remains with no significant fluctuation from 1995-2007 before experiencing a significant increase in public debt level, while Belgium public debt level indicates that is a steady decrease from 1995 to 2007 before experiencing a significant increasing in public debt level.

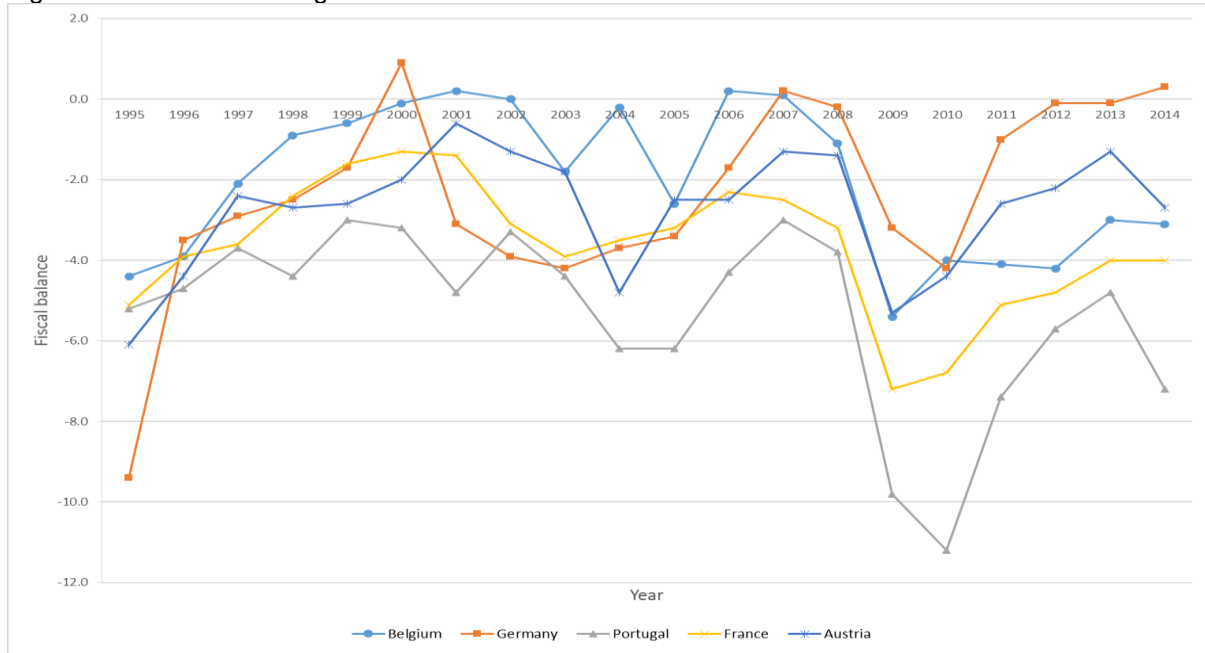
Figure 4 b: Overview of High Debt Countries Real GDP Growth Rate Overtime from 1995-2014³



Data: Table 8

³ For a more detail view of sample country real GDP growth rate and public balance, please refer Figure 11 for Belgium, Figure 13 for Portugal, Figure 17 for Germany, Figure 19 for France and Figure 20 for Austria in Appendix E.

Figure 4 c: Overview of High Debt Countries Public Balance Overtime from 1995-2014



Data: Table 2

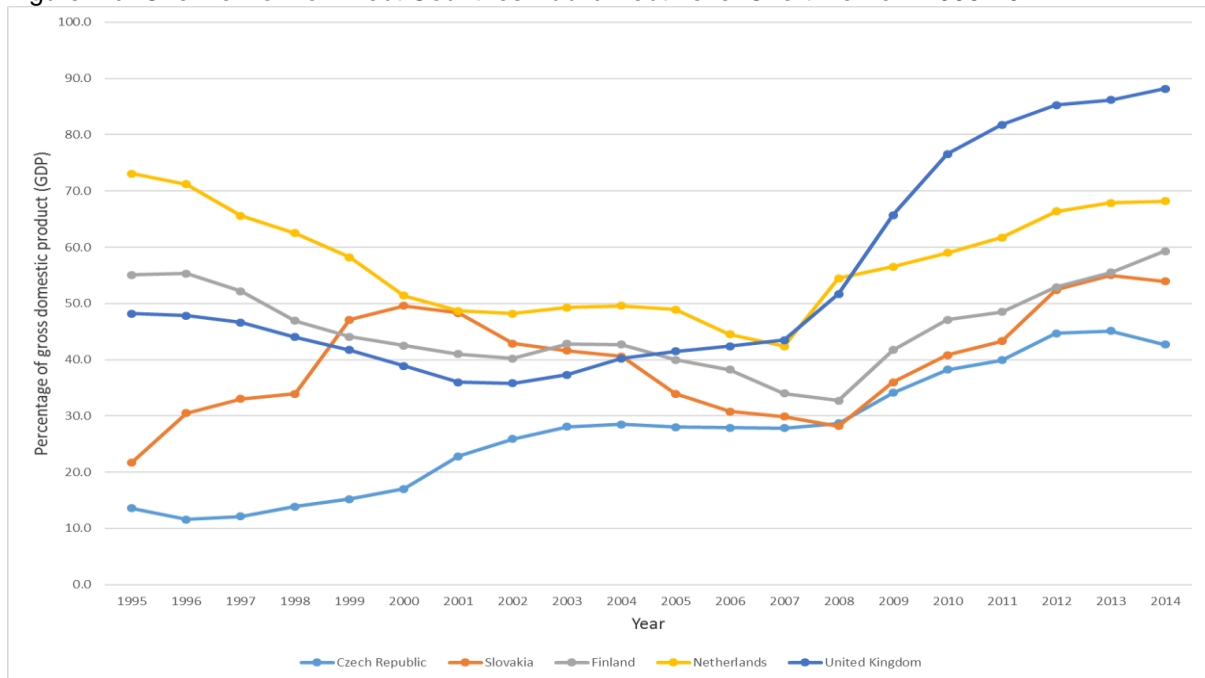
Table 4 a: Summary of the change in real GDP growth rate and public balance in 2008-2009 for high debt countries.

Country	Real GDP growth rate	Public balance
Belgium	-3%	-4.3%
Germany	-6.8%	-3%
Portugal	-3.2%	-6%
France	-5.2%	-4%
Austria	-5.4%	-3.9%

Based on Figure 4b, it is observed that all the high debt countries experienced economic expansion from 2004 to 2007. These countries experienced significant economic contraction in 2008 and 2009 as all of the countries indicates negative GDP growth rate in these period. Figure 4c indicate that all of the high debt countries were in deficit spending most of the time. It is also observed that all the high debt countries experience significant increase in deficit spending in 2008 and 2009. The significant change in real GDP growth rate and public balance can be seen in Table 4a.

4.1.2 Low Debt Country:

Figure 4 d: Overview of Low Debt Countries Public Debt Level Overtime from 1995-2014

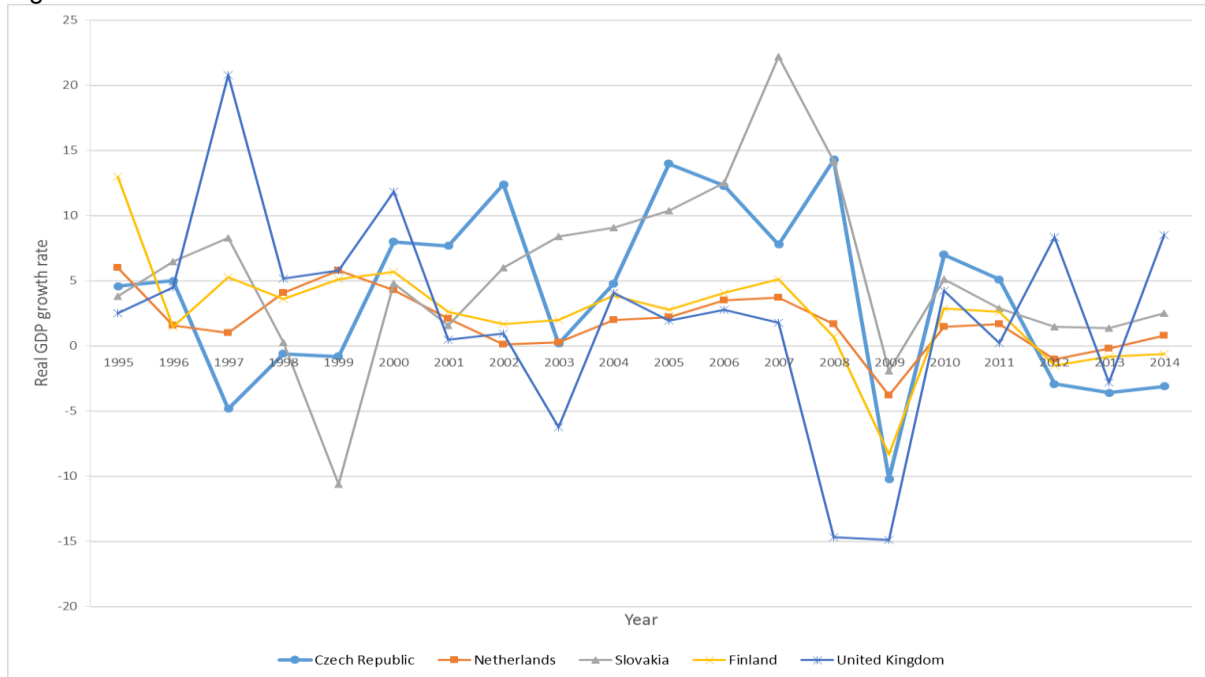


Data: Table 1

Figure 4d indicates that there is a significant increase in the low debt country public debt level between 2007 to 2009. Examination on these time period indicates that Czech Republic experiences an increase of 6.3%, Slovakia (7.8%), Finland (9%), Netherlands (14.1%) and United Kingdom (22.2%)⁴. Further examination indicates that the public debt level for Slovakia, Finland, Netherlands and United Kingdom experience a general decrease until 2007, while Czech Republic indicates a steady increase in public debt level before experiencing significant increase from 2007.

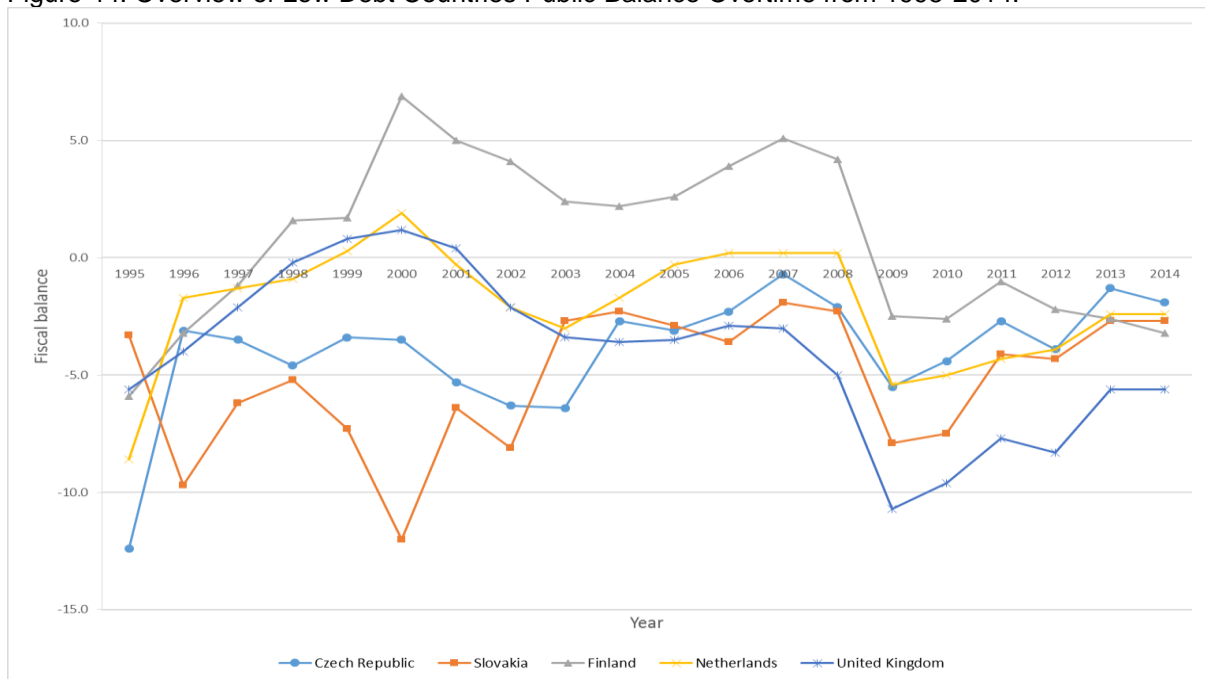
⁴ For a more detail view of sample country debt level please refer Figure 2 for Czech Republic, Figure 4 for Slovakia, Figure 5 for Finland, Figure 6 for Netherlands and Figure 8 for United Kingdom, in Appendix D.

Figure 4 e: Overview of Low Debt Countries Real GDP Growth Rate Overtime from 1995-2014⁵.



Data: Table 8

Figure 4 f: Overview of Low Debt Countries Public Balance Overtime from 1995-2014.



Data: Table 2

⁵ For a more detail view of sample country real GDP growth rate and public balance, please refer Figure 12 for Czech Republic, Figure 14 for Slovakia, Figure 15 for Finland, Figure 16 for Netherlands and Figure 18 for United Kingdom in Appendix E

Table 4 b: Summary of the change in real GDP growth rate and public balance in 2008-2009 for high debt countries.

Country	Real GDP growth rate	Public balance
Czech Republic	-24.5%	-3.4%
Slovakia	-16.1%	-5.6%
Finland	-9%	-6.7%
Netherlands	-5.5%	-5.6%
United Kingdom ¹	-16.7%	-5.7%

¹ The change in real GDP growth rate for United Kingdom was taken from 2007-2009.

Figure 4e suggested that all the low debt countries experienced economic expansion from 2004 to 2007 as in this period the real GDP growth rate were positive. Majority of these countries experienced significant economic contraction in 2008 and 2009 as all of the countries indicates negative GDP growth rate in these period. For United Kingdom, the figure indicates that the country experienced significant economic contraction in 2007 which is one year earlier other countries. Figure 4f indicate that majority of the low debt countries were in deficit spending most of the time. further examination revealed that only Finland indicate surplus spending majority of the time. The figure also suggested that all the low debt countries experience significant increase in deficit spending in 2008 and 2009. The significant change in real GDP growth rate and public balance can be seen in Table 4b.

4.2 Investigation of Marginal Propensity to Consume (MPC):

In this section, we will examine and discuss the impact of the Great Recession on the aggregated propensity to consume in selected countries through the calculation of country specific consumption functions.

Table 4 c: Summary of bivariate regression analysis between net disposable income and household final consumption.

Countries	Figure	Time period	Slope Equation	R ²	MPC
Belgium	Figure 21	1995-2004	$y = 0.9754x + 15779$	0.9785	0.9754
	Figure 22	2005-2014	$y = 1.0128x + 23190$	0.9543	1.0128
Germany	Figure 33	1995-2004	$y = 0.867x + 379.85$	0.985	0.867
	Figure 34	2005-2014	$y = 0.9558x + 123612$	0.9957	0.9558
Portugal	Figure 25	1995-2004	$y = 1.0329x + 4287.5$	0.9992	1.0329
	Figure 26	2005-2014	$y = 0.9875x + 3654.5$	0.8025	0.9875
France	Figure 37	1995-2004	$y = 0.8634x + 9227.3$	0.9975	0.8634
	Figure 38	2005-2014	$y = 0.8474x + 39691$	0.9818	0.8474
Austria	Figure 39	1995-2004	$y = 1.0789x + 21827$	0.9791	1.0789
	Figure 40	2005-2014	$y = 1.1017x + 32645$	0.9724	1.1017
Czech Republic	Figure 23	1995-2004	$y = 0.9768x + 28.609$	0.9988	0.9768
	Figure 24	2005-2014	$y = 0.9601x + 949.62$	0.9929	0.9601
Slovakia	Figure 27	1995-2004	$y = 1.0319x + 1008.1$	0.9931	1.0319
	Figure 28	2005-2014	$y = 0.9269x + 1838.6$	0.9947	0.9269
Finland	Figure 29	1995-2004	$y = 0.9269x + 898.41$	0.9951	0.9269
	Figure 30	2005-2014	$y = 0.8927x + 5017.5$	0.9783	0.8927
Netherlands	Figure 31	1995-2004	$y = 1.0523x + 21387$	0.9876	1.0523
	Figure 32	2005-2014	$y = 0.8985x + 24318$	0.9526	0.8985
United Kingdom	Figure 35	1995-2004	$y = 1.0216x + 45611$	0.9936	1.0216
	Figure 36	2005-2014	$y = 1.18x + 232773$	0.9001	1.18

Note. All the figures mentioned is in the Appendix F.

Based on Table 4c, the slope equation indicates that the interception in the graph for all of the countries has a positive slope which means that the variables in the graph have a direct relationship. The R² value represents, how much changes in the household consumption can be directly explained by the changes in the household disposable income. Basically, the R² value represents how close the fitted regression line to the data, as Guerard (2013) explained that R² is the percentage of change of the dependent variable that can be explained by independent variable. The R² value for all the countries ranges from 0.8025-0.9992, which means that 80.25%-99.92% of changes in the dependent variable is explained by the independent variable. This indicates that there is a strong relationship between these two variable in all of the countries that 97.85% changes in the household consumption can be directly explained by the changes in the household disposable income. The MPC value for all of the countries was extracted from the slope coefficient that was produced by the slope equation. There seems to be a pattern in the increase or decrease of MPC between both period and both debt level group, to confirm the significant of the changes that were observed, the researcher conducted the dependency test. The dependency test was conducted to determine the significant of the changes in MPC value that were observed between both time periods and public debt level.

4.2.1 Test of Normality:

Table 4 d: Tests of Normality for Marginal Propensity to Consume (MPC)

Pre and Post Recession High Debt and Low Debt Countries		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
MPC	1995-2004	.197	10	.200*	.909	10	.271
	2005-2014	.164	10	.200*	.930	10	.451
MPC	High Debt Countries	.180	10	.200*	.931	10	.462
	Low Debt Countries	.152	10	.200*	.901	10	.224

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The tests of normality were performed to test whether the data sample of the groups is normally distributed. The null hypothesis states that the data sample is normally distributed while the alternative hypothesis states that the data sample is not normally distributed. Table 4d indicate that the result for the test of normality done on the dataset which indicates that for period 1995-2004 and 2005-2014, the p-value under the Shapiro-Wilk column for period 1995-2004 is 0.271 and period 2005-2014 is 0.451 which is higher than 0.05, both time periods are normally distributed. While the p-value under the Shapiro-Wilk column for high debt countries is 0.462 and low debt countries are 0.224, both p-values is higher than 0.05 which indicate that both high and low debt countries are normally distributed. Thus, the researcher failed rejects the null hypothesis. Based on this result, independent-sample t-test will be performed on this data sample.

4.2.2 Test of Significant:

Table 4 e: Group Statistics for Marginal Propensity to Consume (MPC)
Group Statistics

Pre and Post Recession		N	Mean	Std. Deviation	Std. Error Mean
High and Low Debt Countries					
MPC	1995-2004	10	.982710	.0755522	.0238917
	2005-2014	10	.976340	.1008060	.0318776
MPC	High Debt Countries	10	.972280	.0897408	.0283785
	Low Debt Countries	10	.986770	.0878775	.0277893

Table 4 f: Independent-sample t-test for Marginal Propensity to Consume (MPC)
Independent Samples Test

Pre and Post Recession		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
MPC	Equal variances assumed	.386	.542	.160	18	.875	.0063700	.0398371	-.0773247	.0900647
	Equal variances not assumed			.160	16.686	.875	.0063700	.0398371	-.0777997	.0905397
High and Low Debt Countries		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
MPC	Equal variances assumed	.022	.883	-.365	18	.720	-.0144900	.0397189	-.0979362	.0689562
	Equal variances not assumed			-.365	17.992	.720	-.0144900	.0397189	-.0979389	.0689589

The independent-sample t-test was performed in order to compare the mean-value of the groups and test whether there was significant difference between the compared mean-value. The null hypothesis for this test is that there is no statistically significant difference between the tested groups. Table 4e indicate that for period 1995-2004 (M= 0.98271, SD= 0.0755522, SEM= 0.0238917) and for period 2005-2014 (M= 0.976340,

SD= 0.1000, SEM= 0.0318776) while for high debt countries (M= 0.97228, SD= 0.0897408, SEM= 0.0283785) and for low debt countries (M= 0.98677, SD= 0.0878775, SEM= 0.0277893). Table 4f indicate that for pre and post-recession groups, the Levene's test indicate that there are equal variances assumed and conditions; $t(18) = 0.160$, $p = 0.875$. For high and low debt countries groups, the Levene's test indicate that there are equal variances assumed and conditions; $t(18) = 0.365$, $p = 0.720$. The result in Table 4f indicate that the p-value for pre and post-recession groups and high and low debt countries groups are higher than 0.05, thus the researcher failed to reject the null hypothesis.

4.3 Investigation of Investment:

In this section, we will examine and discuss the impact of the Great Recession on investment in selected countries through the relationship between gross fix capital formation and real GDP growth rate.

Table 4 g: Summary of bivariate regression analysis relationship between gross fix capital formation and real GDP growth rate.

Countries	Figure	Time period	Slope Equation	R ²	Slope Coefficient
Belgium	Figure 41	1995-2004	$y = 0.1915x + 1.6972$	0.141	0.1915
	Figure 42	2005-2014	$y = 0.2869x + 0.6921$	0.5568	0.2869
Germany	Figure 43	1995-2004	$y = 0.2425x + 1.1536$	0.1556	0.2425
	Figure 44	2005-2014	$y = 0.5415x + 0.32$	0.9561	0.5415
Portugal	Figure 45	1995-2004	$y = 0.1866x + 1.77$	0.5763	0.1866
	Figure 46	2005-2014	$y = 0.2952x + 0.875$	0.8081	0.2952
France	Figure 47	1995-2004	$y = 0.3811x + 1.149$	0.716	0.3811
	Figure 48	2005-2014	$y = 0.5171x + 0.7937$	0.9097	0.5171
Austria	Figure 49	1995-2004	$y = 0.0095x + 2.2488$	0.0002	0.0095
	Figure 50	2005-2014	$y = 0.4663x + 1.0795$	0.6764	0.4663
Czech Republic	Figure 51	1995-2004	$y = 0.2937x + 2.296$	0.2134	0.2937
	Figure 52	2005-2014	$y = 1.0082x + 2.3864$	0.5613	1.0082
Slovakia	Figure 53	1995-2004	$y = 0.2214x + 2.9366$	0.2155	0.2214
	Figure 54	2005-2014	$y = 0.3904x + 5.8894$	0.3025	0.3904
Finland	Figure 55	1995-2004	$y = 0.3883x + 2.0672$	0.3193	0.3883
	Figure 56	2005-2014	$y = 0.5938x + 0.89$	0.8659	0.5938
Netherlands	Figure 57	1995-2004	$y = 0.3156x + 1.736$	0.4213	0.3156
	Figure 58	2005-2014	$y = 0.2985x + 0.9025$	0.6949	0.2985
United Kingdom	Figure 59	1995-2004	$y = -0.5175x + 6.1616$	0.0399	-0.5175
	Figure 60	2005-2014	$y = 1.1138x + 1.5981$	0.76	1.1138

Note. All the figures mentioned is in the Appendix G.

Based on Table 4g, the slope equation indicates that the interception in the graph for majority of the countries except for United Kingdom in period 1995-2004 has a positive slope which means that the variables in the graph have a direct relationship. In the

observation, it is identified that in United Kingdom the relationship between gross fixed capital formation and GDP growth rate in expansionary period indicate a negative relationship, this might be due to the market saturation in the period. The R² value for all the countries range from 0.0002 in Austria to 0.9561 in Germany, that implies that the R²-value varies across the countries. The varies R²-value indicate that there are other variables that also affect real GDP growth rate. There seems to be a pattern in the increase or decrease of investment during both period and public debt level, to confirm the significant of the changes that were observed, the researcher conducted the dependency test (Mann-Whitney Test). The dependency test was conducted to determine the significant of the changes in the slope coefficient value that were observed between both time periods.

4.3.1 Test of Normality:

Table 4 h: Tests of Normality for investment slope coefficient value
Tests of Normality

Pre and Post Recession High and Low Debt Countries		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Investment	1995-2004	.163	10	.200*	.975	10	.935
	2005-2014	.242	10	.101	.826	10	.030
Investment	High Debt Countries	.140	10	.200*	.958	10	.763
	Low Debt Countries	.255	10	.064	.810	10	.019

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The tests of normality were performed to test whether the data sample of the groups is normally distributed. The null hypothesis states that the data sample is normally distributed while the alternative hypothesis states that the data sample is not normally distributed. Table 4h indicate that the p-value under the Shapiro-Wilk column for period 1995-2004 is 0.935 which is higher than 0.05 while period 2005-2014 is 0.030 which is lower than 0.05. Thus, we can conclude that period 1995-2004 is normally distributed while period 2005-2014 is not normally distributed. The researcher rejects the null hypothesis.

The normality test for high and low debt countries indicate that the p-value under the Shapiro-Wilk column for high debt countries is 0.763 which is higher than 0.05 while low debt countries are 0.019 which is lower than 0.05. This result indicates that sample data for high debt countries is normally distributed while sample data for low debt countries is not normally distributed. Thus, the researcher rejects the null hypothesis. Based on these result, a non-parametric test will be performed on both pre and post-recession and high and low debt countries.

4.3.2 Test of Significant:

Table 4 i: Mean rank for u-test on investment slope coefficient value.

Pre and Post Recession		Ranks		
High and Low Debt Countries		N	Mean Rank	Sum of Ranks
Investment	1995-2004	10	7.10	71.00
	2005-2014	10	13.90	139.00
	Total	20		
Investment	High Debt Countries	10	8.20	82.00
	Low Debt Countries	10	12.80	128.00
	Total	20		

Table 4 j: Non-parametric dependency test (Mann-Whitney U-Test) result.

Pre and Post Recession		Investment
Mann-Whitney U		16.000
Wilcoxon W		71.000
Z		-2.570
Asymp. Sig. (2-tailed)		.010
Exact Sig. [2*(1-tailed Sig.)]		.009 ^b
High and Low Debt Countries		Investment
Mann-Whitney U		27.000
Wilcoxon W		82.000
Z		-1.739
Asymp. Sig. (2-tailed)		.082
Exact Sig. [2*(1-tailed Sig.)]		.089 ^b

a. Grouping Variable: High and Low Debt Countries

b. Not corrected for ties.

The Mann-Whitney test was performed in order to compare the mean-rank of the groups and test whether there was significant difference between the compared mean-rank. The null hypothesis for this test is that there is no statistically significant difference between the tested groups. Table 4i indicate that for period 1995-2004 (M= 7.10) and for period 2005-2014 (M= 13.90) while for high debt countries (M= 8.20) and for low debt countries (M12.80). Table 4j indicate that for pre and post-recession group (Mann–Whitney $U = 16$, $n_1 = n_2 = 10$, $p\text{-value} = 0.010 < 0.05$ two-tailed) thus, the researcher rejects the null hypothesis while for high and low debt countries group (Mann–Whitney $U = 27$, $n_1 = n_2 = 10$, $p\text{-value} = 0.082 > 0.05$ two-tailed) thus, the researcher failed to reject the null hypothesis.

4.4 Hierarchical Multiple-linear Regression:

4.4.1 High Debt and Low Debt:

High Debt Countries:

Table 4 k: Summary of hierarchical regression analysis for variable predicting real GDP growth rate for high debt countries

Variable	R ²	ΔR ²	Sig. ΔF	F	ρ (Sig. F)	β	t	ρ
Model 1	.194	.194	.000*	11.676	.000*			
Trade Openness						-.013	-.143	.887
Interest Rate						.443	4.782	.000*
Model 2	.254	.060	.063	6.396	.000*			
Trade Openness						-.002	-.021	.984
Interest Rate						.334	3.195	.002*
Fiscal Balance						.129	1.273	.206
National Debt						-.058	-.566	.573
Fiscal Stimulus						-.170	-1.628	.107

Note. N = 100; *p.05

A hierarchical multiple-linear regression analysis was performed to predict real GDP growth rate based on fiscal balance ratio, fiscal stimulus and national debt while considering the effect of trade openness and interest rate in a sample of high debt countries. Checking assumption of this model indicates that the Durbin-Watson coefficient was 1.920 which implies that there was no autocorrelation present in this model. The tolerance value for all the independent variables in both models was above 0.1 which indicate that there was no multicollinearity present in the model. Figure 61 in the Appendix C indicate that the model was nonlinearity and non-constant variance. The hierarchical multiple-linear regression analysis revealed that in Model 1, trade

openness and interest rate contributed significantly to the regression model, $F(2,97) = 11.676$, $p = 0.000$) with an R^2 of 0.194 which implies that 19.4% of the variation in real GDP growth rate were accounted by trade openness and interest rate. Introducing the fiscal balance ratio, fiscal stimulus and national debt ratio in Model 2 ($\Delta R^2 = 0.060$, Sig. $\Delta F = 0.063$) indicated that the change in R^2 was not significant and explained an additional 6.0% of variation in real GDP growth rate. The model as a whole $F(5,94) = 6.396$, $p = 0.000$) was significant and explained 25.4% of the variation in real GDP growth rate. Table 4k indicate that Interest Rate ($\beta = 0.334$, $p = 0.002$) have a statistically significant contribution on the model while Trade Openness ($\beta = 0.009$, $p = 0.925$) Fiscal Balance ($\beta = 0.129$, $p = 0.206$), Fiscal Stimulus ($\beta = -0.170$, $p = 0.107$) and National Debt ($\beta = -0.079$, $p = 0.420$) did not have a statistically significant contribution on the model.

Low Debt Countries:

Table 4 l: Summary of hierarchical regression analysis for variable predicting real GDP growth rate for low debt countries

Variable	R ²	ΔR^2	Sig. ΔF	F	p (Sig. F)	β	t	p
Model 1	.009	.009	.660	.418	.660			
Trade Openness						-.069	-.685	.495
Interest Rate						.065	.643	.552
Model 2	.123	.114	.009*	2.634	.028*			
Trade Openness						-.027	-.272	.787
Interest Rate						-.127	-1.035	.303
Fiscal Balance						-.023	-.207	.837
National Debt						-.236	-2.050	.043*
Fiscal Stimulus						-.295	-2.729	.008*

Note. N = 100; *p.05

The hierarchical multiple-linear regression analysis conducted on a sample of low debt countries indicate that the Durbin-Watson coefficient for this model was 1.549 which was within 1.5-2.5, thus suggested that there was no autocorrelation present in this model. The tolerance value indicates that all independent variables in both models were higher than 0.1 and implied that there was no multicollinearity present in the model, while Figure 62 in the Appendix H indicated that this model was nonlinearity and heteroscedastic. Examination of the result revealed that independent variable in Model 1, $F(2,97) = 0.418$, $p = 0.660$) with an R^2 of 0.009 indicate that there was no statistically significantly impact on the regression model and only explained 0.9% of the variance in the real GDP growth rate. In Model 2, the introduction of fiscal balance ratio, fiscal stimulus and national debt ratio ($\Delta R^2 = 0.114$, Sig. $\Delta F = 0.009$) implies that

the contribution of these variables was significant as Model 2 explains an additional 11.4% of variation in real GDP growth rate. Examining the hierarchical multiple-linear regression model as a whole, $F(5,94) = 2.634$, $p = 0.028$) implies that there was significant relationship between the independent variables and real GDP growth rate, the whole model explains 12.3% of the variation in real GDP growth rate. Further observation on Table 4 I revealed that National Debt ($\beta = -0.236$, $p = 0.043$) and Fiscal Stimulus ($\beta = -0.295$, $p = 0.008$) statistically significant contribution on the model while Interest Rate ($\beta = -0.127$, $p = 0.303$), Trade Openness ($\beta = -0.027$, $p = 0.787$), Fiscal Balance ($\beta = -0.023$, $p = 0.837$), National Debt ($\beta = -0.236$, $p = 0.043$) and Fiscal Stimulus ($\beta = -0.295$, $p = 0.008$) have no statistically significant contribution on the model.

4.4.2 Pre-Recession and Post-Recession Period:

Pre-Recession Period:

Table 4 m: Summary of hierarchical regression analysis for variable predicting real GDP growth rate for pre-recession period (1995-2004)

Variable	R ²	ΔR ²	Sig. ΔF	F	ρ (Sig. F)	β	t	ρ
Model 1	.001	.001	.963	.038	.963			
Trade Openness						.027	.269	.789
Interest Rate						.008	.076	.939
Model 2	.020	.019	.403	.478	.752			
Trade Openness						.012	.114	.909
Interest Rate						-.052	-.434	.665
Fiscal Balance						.012	.110	.913
National Debt						-.152	-1.350	.180

Note. N = 100; *p.05

A hierarchical multiple-linear regression analysis was performed to predict real GDP growth rate based on fiscal balance ratio, fiscal stimulus and national debt while considering the effect of trade openness and interest rate in a sample of high debt countries. Checking assumption of this model indicates that the Durbin-Watson coefficient was 1.551 which implies that there was no autocorrelation present in this model. The tolerance value for all the independent variables in both models was above 0.1 which indicate that there was no multicollinearity present in the model. Figure 63 in the Appendix H indicate that the model was nonlinearity and non-constant variance. The hierarchical multiple-linear regression analysis revealed that in Model 1, trade openness and interest rate did not contribute significantly to the regression model,

$F(2,97) = 0.038, p = 0.963$) with an R^2 of 0.001 which implies that 0.1% of the variation in real GDP growth rate were accounted by trade openness and interest rate. Introducing the fiscal balance ratio, fiscal stimulus and national debt ratio in Model 2 ($\Delta R^2 = 0.019, \text{Sig. } \Delta F = 0.752$) indicated that the change in R^2 was not significant and only explained an additional 1.9% of variation in real GDP growth rate. The model as a whole $F(4,94) = 0.478, p = 0.752$) was also not significant and only explained 2.0% of the variation in real GDP growth rate. Table 4m indicate that all the independent variables have no statistically significant contribution on the model as Interest Rate ($\beta = -0.052, p = 0.665$), Fiscal Balance ($\beta = 0.012, p = 0.913$), Trade Openness ($\beta = 0.012, p = 0.909$) and National Debt ($\beta = -0.152, p = 0.180$).

Post-Recession Period:

Table 4 n: Summary of hierarchical regression analysis for variable predicting real GDP growth rate for post-recession period (2005-2014)

Variable	R ²	ΔR^2	Sig. ΔF	F	p (Sig. F)	β	t	p
Model 1	.105	.105	.005*	5.702	.005*			
Trade Openness						-.197	-2.015	.047*
Interest Rate						.297	3.035	.003*
Model 2	.200	.095	.014*	4.691	.001*			
Trade Openness						-.159	-1.571	.120
Interest Rate						.133	1.182	.240
Fiscal Balance						-.070	-.557	.579
National Debt						-.267	-2.476	.015*
Fiscal Stimulus						-.272	-2.449	.016*

Note. N = 100; *p.05

The hierarchical multiple-linear regression analysis conducted on a sample of low debt countries indicate that the Durbin-Watson coefficient for this model was 1.589 which was within 1.5-2.5 and suggested that there was no autocorrelation present in this model. The tolerance value indicates that all independent variables in both models were higher than 0.1 and implied that there was no multicollinearity present in the model, while Figure 64 in the Appendix H indicated that this model was nonlinearity and heteroscedastic. Examination of the result revealed that independent variable in Model 1, $F(2,97) = 5.702, p = 0.005$) with an R^2 of 0.105 indicate that Model 1 was statistically significantly and explained 10.5% of the variance in the real GDP growth rate. In Model 2, the introduction of fiscal balance ratio, fiscal stimulus and national debt ratio, ($\Delta R^2 = 0.095, \text{Sig. } \Delta F = 0.014$) implies that the contribution of these variables was significant and explained an additional 9.5% of variation in real GDP growth rate. Examining the hierarchical multiple-linear regression model as a whole, $F(5,94) =$

4.691, $p= 0.001$) implies that there was significant relationship between the independent variables and real GDP growth rate as whole model explains 20% of the variation in real GDP growth rate. Further observation on Table 4n revealed that National Debt ($\beta= -0.267$, $p= 0.015$) and Fiscal Stimulus ($\beta= -0.272$, $p= 0.016$) have a statistically significant contribution on the model while Interest Rate ($\beta= 0.133$, $p= 0.240$), Trade Openness ($\beta= -0.159$, $p= 0.120$) and Fiscal Balance ($\beta= -0.070$, $p= 0.579$) has no statistically significant contribution on the model.

Chapter 5

Discussion, Conclusion and Recommendations

In this chapter, the researcher will discuss the result findings for preliminary statistical analysis of fiscal stimulus, investigation of marginal propensity to consume, investigation of investment slope coefficient and the result from the hierarchical multiple-linear regression analysis for high and low debt countries, and pre and post-recession period. The researcher will also discuss the limitation of the model and its implication. The researcher will outline the conclusion and recommendation for future studies.

5.1 Preliminary Statistical Analysis of Fiscal Stimulus for High Debt and Low Debt Countries:

Based on the examination of key indicators in the selected sample countries, we discover that most the selected sample countries economic growth rate experience contraction in 2009 that lead to the increase in deficit spending. Concurrently, we discovered that debt to GDP ratio fluctuates in 2009 that was probably caused by the increase in government deficit spending. Comparing pattern between both group shows that, the real GDP growth rate trend for high debt countries are more uniform, and smooth compare to the real GDP growth rate trend for low debt countries which explain the generally lower change in real GDP growth rate that was indicated in high debt countries as indicated in Table 4a. While, observation on the public balance trend in both group indicate that the change in fiscal balance tends to be higher in low debt countries as indicated in Table 4b. Based on further examination, the researcher identified that there is a strong pattern of fluctuation in all of the key indicators across all the sample countries between 2008-2009 which suggested that all of the countries implemented fiscal policy.

Based on the observation done on the key indicators, we identified that there were fiscal policy measures implemented by all of the sample countries as indicated by OECD (2009) and Riet (2010). OECD indicate that Czech Republic, Slovakia and United Kingdom has implemented discretionary fiscal measures in 2009 and 2010, the size of discretionary fiscal packages was 3%, 1.1% and 1.5% of the country 2008 GDP respectively. OECD (2009) indicate that the discretionary fiscal measures taken by Czech Republic, Slovakia and United Kingdom largely consist of tax measures, the

size of tax measures taken was 2.5%, 0.6% and 1.5%. For Belgium, Germany, Portugal, France, Austria, Finland and Netherlands, Riet (2010) indicate that these countries implemented discretionary fiscal measures in 2009 and 2010, which sum up to 0.8%, 3.3%, 1%, 1.1%, 3.6%, 3.4% and 1.9% of the country GDP respectively⁶. The discretionary fiscal measures taken by these countries was mainly aimed at household, public investment, business and labour market measures (Riet, 2010).

Outlier results are revealed across these country specific Government finance dynamics. For example, in the Netherlands, debt to GDP level increased rapidly prior to that witnessed in other comparator countries, however this is accounted for by the Netherlands government bailout operation to save the Dutch banking sector (Notten and Tanzer, 2010). Finally, we conclude that the Great Recession has increased the debt level of all the sample countries and induce or increase government deficit spending which explains the fluctuation in public balance. Concurrently, we can conclude that all of the selected sample countries has implement discretionary fiscal measures in the Great Recession period, which mainly consist of tax measures that are aimed to support household purchasing power (Riet, 2010).

5.2 Investigation of Marginal Propensity to Consume (MPC):

Based on the observation done on all the selected sample countries, we have identified that Belgium, Germany, United Kingdom and Austria MPC increase in the recession period which contradict our initial hypothesis. The increase in MPC for this countries might be due to the fiscal stimulus implemented as large tax measures have been recorded in the recession period. While majority of the sample countries such as Portugal, Czech Republic, Slovakia, Finland, Netherlands and France MPC decrease in recession period which is consistent with our initial hypothesis. This indicates that majority of the sample countries demonstration consumption behaviour as predicted in our initial hypothesis. Assessing MPC trend through the perspective of high and low debt countries revealed that majority of the low debt countries (Czech Republic, Slovakia, Finland and Netherlands) MPC decrease in the recession period while majority of the high debt countries (Belgium, Germany and Austria) MCP increase in the recession period.

⁶ Refer Table 11 in the Appendix B for more detail.

Based on the result in Table 4d, we can conclude that period 1995-2004 and 2005-2014 are normally distributed as the researcher failed to reject the null hypothesis. Concurrently, we also can conclude that high debt and low debt countries are normally distributed as the researcher failed to reject the null hypothesis. Based on the result in Table 4f, we can conclude that there was no statistically significant difference between the period 1995-2004 and period 2005-2014 as the p-value is higher than 0.05. The results suggested that time period does not really have an effect on the change in marginal propensity to consume (MPC) observed. The result also indicates that there was no statistically significant difference between high and low debt countries as the p-value is higher than 0.05, which suggested that public debt level does not really have an effect on the change in marginal propensity to consume (MPC). The results suggested that public debt level does not really have an effect on the change in marginal propensity to consume (MPC) observed.

5.3 Investigation of Investment Slope Coefficient:

Based on the observation done on the sample countries slope coefficient value in both period, we have identified that all the sample countries except for Netherlands indicate that there was an increase in the slope coefficient value in the recession period which contradicts our initial hypothesis. It is also identified that in the expansionary period, the impact that investment has on output growth is significantly weaker than in times of economic recession period. This pattern is similar to the pattern observed by Jordà and Taylor (2016) in their study on fiscal multipliers size in different business cycle as mentioned in the literature review section. Outlier results are revealed across these countries as for Austria in period 1995-2004, the R^2 -value was 0.0002 which indicates that there was no relationship between the two tested variables. Evaluating the investment slope coefficient trend through the perspective of high and low debt countries revealed that all the high debt countries (Belgium, Germany, Portugal, France and Austria) slope coefficient value increase in the recession period. Concurrently, majority of the low debt countries except for Netherlands indicate that the slope coefficient value increase in the recession period. These findings implied that there was no significant pattern identified between high and low debt countries.

Based on the result in Table 4h, we conclude that period 1995-2004 is normally distributed while period 2005-2014 is not normally distributed. The researcher rejects

the null hypothesis. This result also indicates that sample data for high debt countries is normally distributed while sample data for low debt countries is not normally distributed. Thus, the researcher rejects the null hypothesis. The result in Table 4j indicates that for pre and post-recession group, there was a statistically significant difference between the investment slope coefficient mean-rank in both periods while for high and low debt countries group, there was no statistically significant difference between the investment slope coefficient mean-rank in both high and low public debt countries. These results implied that time period have an effect on the change in investment coefficient observed while public debt level does not really have an effect on the change in investment coefficient observed.

5.4 Hierarchical multiple-linear regression model:

5.4.1 High Debt and Low Debt Countries:

Observation done on the hierarchical multiple-linear regression model for high debt and low debt countries indicate that both regression models were significant, which indicated that the model has a strong Keynesian effect. The high debt countries regression model revealed that Interest Rate was the only significant variable that influenced real GDP growth rate, which means that monetary policy has a strong influence in real GDP growth rate for high debt countries. While the low debt countries regression model suggested that National Debt and Fiscal Stimulus have a significant influence on real GDP growth rate, which suggests that low debt countries were debt sensitive, and fiscal policy has a stronger impact on the real GDP growth rate.

Although the result indicated that the high debt countries regression model were statistically significant, the main tested independent variable which was fiscal balance and national debt ratio were not significant which can be considered as an abnormality and could indicate that both variables were not the main predictor variable for real GDP growth rate. While the low debt countries regression model also indicated that fiscal balance was not significant which also suggest that fiscal balance was not the main predictor variable for real GDP growth rate. Even though these variables were not significant, there is still useful information that can be extracted from both regression model result. For example, the β -value for National Debt in both high debt and low debt countries suggested that there was negative relationship between national debt and real GDP growth rate which indicate that increase in National Debt

will decrease real GDP growth rate which was similar with Vranceanu and Besancenot, (2013) findings.

Further examination on β -value for fiscal stimulus in high debt countries (-0.170) while the β -value in low debt countries (-0.295) suggested that a decrease in fiscal balance (increase in government spending or decrease in government revenue) by 1% would increase the real GDP growth rate by 0.170% for high debt countries and 0.295% in low debt countries. This indicated that low debt countries fiscal multiplier are larger than high debt countries fiscal multiplier, thus, suggest that the effectiveness of fiscal stimulus in low debt countries was higher than the effectiveness of fiscal stimulus in high debt countries which were consistent with result found by [Reinhart and Rogoff (2010), Cecchetti, Mohanty, and Zampolli (2011), Vranceanu and Besancenot, (2013) Ilzetzki et al. (2013) and Nickel and Tudyka, (2014)].

5.4.2 Pre-Recession and Post-Recession Period:

Observation done on both hierarchical multiple-linear regression model for pre and post-recession period indicated that the pre-recession period regression model was not significant while the post-recession period model was significant. The outlier in the result might indicate that the hierarchical multiple-linear regression model used in this researcher was not suitable for pre-recession period. Examining the β -value for fiscal balance indicated that in pre-recession period (0.012) while in post-recession period (-0.070). These findings suggested that in pre-recession period an increase in fiscal balance (decrease in government spending or increase in government revenue) would increase the real GDP growth rate, while in post-recession period a decrease in fiscal balance (increase in government spending or decrease in government revenue) would increase the real GDP growth rate. The findings suggested that in pre-recession period a contractionary fiscal stance or fiscal consolidation would have a positive impact on real GDP growth rate which shows strong Classical effect while in post-recession period an expansionary fiscal stance would have a positive effect on real GDP growth rate which shows strong Keynesian effect. This finding was consistent with Jordà and Taylor (2016) findings as Jordà stated that fiscal multipliers in economic recession period were larger than fiscal multipliers in economic expansion period.

5.5 Limitation:

Although the result produced from both high debt and low debt countries, models indicate a significant relationship between the independent variables and real GDP growth rate, the standard error for both groups were significant which implies that there was deviation in the results. The deviation in the result might be caused by the small size of sample countries in the model, which is the limitation of this model. The low R^2 value in both group models indicate that there are other variables that might influence real GDP growth rate, which points out another limitation of the model. The linearity test in both models suggested that both models were nonlinear and heteroscedastic. For these reasons, the researcher was not fully certain that there is major difference between high debt and low debt countries because of the limitations in this model. The findings of this study would need further research.

5.6 Conclusion:

In the presented study, effects of fiscal stimuli at varying degrees of public indebtedness were evaluated. To this end, interacted panel hierarchical multiple-linear regression to a sample of 10 European countries for the period of 1995-2014 was employed and estimated in Keynesian fashion. The result for preliminary statistical analysis of fiscal stimulus indicates that the Great Recession has decreased real GDP growth rate while increased the national debt level of all the sample countries and induced government deficit spending. Investigation of marginal propensity to consume (MPC) indicated that in low debt countries the marginal propensity to consume tend to decrease in recession period while high debt countries marginal propensity to consume tend to increase in recession period. Investigation of investment slope coefficient indicated that all the sample countries except for Netherlands experienced an increased in the investment slope coefficient value during the recession period. Result for hierarchical multiple-linear regression analysis on high and low debt countries suggested that the effect of fiscal stimulus in low debt countries were larger than the effect of fiscal stimulus in high debt countries. This finding supports the negative association between debt and growth, as found in the literature so far. The hierarchical multiple-linear regression model result for pre-recession and post-recession period suggested that the effect of fiscal stimulus in economic recession period was larger than the effect of fiscal stimulus in economic expansion period. The regression model also implies that there was negative relationship between national

debt and real GDP growth rate in both models. This qualifies debt as an imperative endogenous variable, which aids to capture the internalization of the government budget constraint by the private sector. Overall, findings of this study provide support for debt limits such as the set forth in the Maastricht Treaty. These findings suggest that policy makers should diligently scrutinize the government debt situation before implementing fiscal stimuli programs as their effectiveness to boost economic activity or resolve external imbalances may not be guaranteed.

5.7 Recommendation:

As mentioned above, the major limitation of this study was that the small number of sample countries analysed in this research, therefore cause the result to deviate and made the result not suitable to be generalised across other sample countries. The researcher recommends that for future research, the number of the sample countries or the size of the time series data could be expanded. Another limitation of this research was the independent variable used as the regression model indicate that there was a weak relationship between the dependent and the independent variables. Consequently, this can be a scope for further research, as different independent variables can be examined using the same regression model.

Appendices

6.1 Appendix A: Time-Series Data

Table 1: General government consolidated gross debt, 1995-2014 (% of GDP)

GEO/TIME	Belgium	Czech Republic	Portugal	Slovakia	Finland	Netherlands	Germany	United Kingdom	France	Austria
1995	130.5	13.6	58.3	21.7	55.1	73.1	54.8	48.2	55.8	68.0
1996	128.0	11.6	59.5	30.5	55.3	71.2	57.6	47.8	59.7	68.0
1997	123.2	12.1	55.2	33.0	52.2	65.6	58.8	46.6	61.1	63.2
1998	118.2	13.9	51.8	33.9	46.9	62.5	59.4	44.0	61.0	63.6
1999	114.4	15.2	51.0	47.1	44.1	58.2	60.0	41.7	60.2	66.4
2000	108.8	17.0	50.3	49.6	42.5	51.4	58.8	38.9	58.7	65.9
2001	107.6	22.8	53.4	48.3	41.0	48.7	57.6	36.0	58.2	66.5
2002	104.7	25.9	56.2	42.9	40.2	48.2	59.2	35.8	60.1	66.3
2003	101.1	28.1	58.7	41.6	42.8	49.3	62.9	37.3	64.2	65.5
2004	96.5	28.5	62.0	40.6	42.7	49.6	64.7	40.2	65.7	64.8
2005	94.6	28.0	67.4	33.9	40.0	48.9	66.9	41.5	67.2	68.3
2006	91.0	27.9	69.2	30.8	38.2	44.5	66.3	42.4	64.4	67.0
2007	87.0	27.8	68.4	29.9	34.0	42.4	63.5	43.5	64.4	64.8
2008	92.5	28.7	71.7	28.2	32.7	54.5	64.9	51.7	68.1	68.5
2009	99.6	34.1	83.6	36.0	41.7	56.5	72.4	65.7	79.0	79.7
2010	99.7	38.2	96.2	40.8	47.1	59.0	81.0	76.6	81.7	82.4
2011	102.3	39.9	111.4	43.3	48.5	61.7	78.3	81.8	85.2	82.2
2012	104.1	44.7	126.2	52.4	52.9	66.4	79.6	85.3	89.6	81.6
2013	105.2	45.1	129.0	55.0	55.5	67.9	77.2	86.2	92.4	80.8
2014	106.5	42.7	130.2	53.9	59.3	68.2	74.7	88.2	95.4	84.3

Source: Eurostat, (2016)

Table 2: Public Balance, 1995-2014 (% of GDP)

GEO/TIME	Belgium	Czech Republic	Portugal	Slovakia	Finland	Netherlands	Germany	United Kingdom	France	Austria
1995	-4.4	-12.4	-5.2	-3.3	-5.9	-8.6	-9.4	-5.6	-5.1	-6.1
1996	-3.9	-3.1	-4.7	-9.7	-3.2	-1.7	-3.5	-4.0	-3.9	-4.4
1997	-2.1	-3.5	-3.7	-6.2	-1.2	-1.3	-2.9	-2.1	-3.6	-2.4
1998	-0.9	-4.6	-4.4	-5.2	1.6	-0.9	-2.5	-0.2	-2.4	-2.7
1999	-0.6	-3.4	-3.0	-7.3	1.7	0.3	-1.7	0.8	-1.6	-2.6
2000	-0.1	-3.5	-3.2	-12.0	6.9	1.9	0.9	1.2	-1.3	-2.0
2001	0.2	-5.3	-4.8	-6.4	5.0	-0.3	-3.1	0.4	-1.4	-0.6
2002	0.0	-6.3	-3.3	-8.1	4.1	-2.1	-3.9	-2.1	-3.1	-1.3
2003	-1.8	-6.4	-4.4	-2.7	2.4	-3.0	-4.2	-3.4	-3.9	-1.8
2004	-0.2	-2.7	-6.2	-2.3	2.2	-1.7	-3.7	-3.6	-3.5	-4.8
2005	-2.6	-3.1	-6.2	-2.9	2.6	-0.3	-3.4	-3.5	-3.2	-2.5
2006	0.2	-2.3	-4.3	-3.6	3.9	0.2	-1.7	-2.9	-2.3	-2.5
2007	0.1	-0.7	-3.0	-1.9	5.1	0.2	0.2	-3.0	-2.5	-1.3
2008	-1.1	-2.1	-3.8	-2.3	4.2	0.2	-0.2	-5.0	-3.2	-1.4
2009	-5.4	-5.5	-9.8	-7.9	-2.5	-5.4	-3.2	-10.7	-7.2	-5.3
2010	-4.0	-4.4	-11.2	-7.5	-2.6	-5.0	-4.2	-9.6	-6.8	-4.4
2011	-4.1	-2.7	-7.4	-4.1	-1.0	-4.3	-1.0	-7.7	-5.1	-2.6
2012	-4.2	-3.9	-5.7	-4.3	-2.2	-3.9	-0.1	-8.3	-4.8	-2.2
2013	-3.0	-1.3	-4.8	-2.7	-2.6	-2.4	-0.1	-5.6	-4.0	-1.3
2014	-3.1	-1.9	-7.2	-2.7	-3.2	-2.4	0.3	-5.6	-4.0	-2.7

Source: Eurostat, (2016)

Table 3: Short-term interest rates, 1995-2014

GEO/TIME	Belgium	Czech Republic	Portugal	Slovakia	Finland	Netherlands	Germany	United Kingdom	France	Austria
1995	4.7	11.0	9.8	8.4	5.8	4.4	4.5	6.8	6.6	4.5
1996	3.2	12.0	7.4	11.9	3.6	3.0	3.3	6.1	3.9	3.3
1997	3.4	16.0	5.7	21.8	3.2	3.3	3.3	6.9	3.5	3.5
1998	3.5	14.3	4.3	21.1	3.6	3.4	3.5	7.4	3.6	3.6
1999	3	6.9	3	15.7	3	3	3	5.6	3	3
2000	4.4	5.4	4.4	8.6	4.4	4.4	4.4	6.2	4.4	4.4
2001	4.3	5.2	4.3	7.8	4.3	4.3	4.3	5	4.3	4.3
2002	3.3	3.5	3.3	7.8	3.3	3.3	3.3	4.1	3.3	3.3
2003	2.3	2.3	2.3	6.2	2.3	2.3	2.3	3.7	2.3	2.3
2004	2.1	2.4	2.1	4.7	2.1	2.1	2.1	4.6	2.1	2.1
2005	2.2	2	2.2	2.9	2.2	2.2	2.2	4.8	2.2	2.2
2006	3.1	2.3	3.1	4.3	3.1	3.1	3.1	4.9	3.1	3.1
2007	4.3	3.1	4.3	4.3	4.3	4.3	4.3	6	4.3	4.3
2008	4.6	4	4.6	4.2	4.6	4.6	4.6	5.5	4.6	4.6
2009	1.2	2.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
2010	0.8	1.3	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8
2011	1.4	1.2	1.4	1.4	1.4	1.4	1.4	0.9	1.4	1.4
2012	0.6	1	0.6	0.6	0.6	0.6	0.6	0.8	0.6	0.6
2013	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2
2014	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2

Source: European Commission (2015)

Table 4: Total Trade, 1995-2014 (% of GDP)

GEO/TIME	Belgium	Czech Republic	Germany	France	Netherlands	Austria	Portugal	Slovakia	Finland	United Kingdom
1995	115.5111	84.23115	43.54472	43.27202	108.3758	68.39204	59.90703	111.2383	64.06916	53.91314
1996	118.0604	81.75041	44.99673	43.93653	109.1288	70.20658	60.20823	115.2233	65.73682	55.22886
1997	124.3666	85.30997	49.60104	47.58132	114.8827	74.99297	62.28731	119.5408	68.26383	53.73361
1998	123.4842	84.83889	51.58287	49.00572	113.345	77.0878	63.81068	103.9222	67.01832	51.30961
1999	123.997	86.45854	53.36945	49.23301	115.1363	78.37927	63.29318	99.35649	66.23622	51.75474
2000	141.079	98.51313	61.39	55.25936	126.452	85.47378	67.42339	110.6994	74.99431	54.48126
2001	138.6947	99.52815	61.9778	54.31667	120.9865	87.63861	65.06407	123.6156	70.26593	54.54833
2002	135.1248	91.76586	60.77301	52.41551	114.7104	86.95995	62.16105	122.1961	69.29037	52.87409
2003	131.9901	95.3279	61.51913	50.13197	112.6548	86.49206	60.43827	126.283	68.03766	51.79653
2004	136.0378	114.0465	65.85611	51.19678	119.1482	90.93435	62.76298	140.1618	70.99137	51.61632
2005	143.3763	122.2759	70.42119	53.15201	124.5538	94.16201	62.57181	149.166	76.62771	54.04482
2006	147.6939	127.8387	77.08217	55.18725	129.8259	98.23026	68.07304	166.5212	82.18279	57.99086
2007	151.1634	130.6552	79.37053	55.5477	131.7219	100.8188	69.65308	168.1225	83.17594	53.96359
2008	158.9079	124.5603	80.9449	56.52384	134.6586	102.1251	71.96333	163.3241	86.51187	58.44142
2009	136.3566	113.7411	70.66505	49.56785	118.9805	86.80704	61.08228	137.1397	70.53124	55.99542
2010	151.1001	129.2546	79.30308	53.96844	135.545	98.68309	67.30485	154.5581	76.08979	59.90101
2011	162.754	139.2819	84.74774	58.169	146.1732	104.8239	72.86388	171.4537	79.1699	63.0059
2012	164.0175	148.3246	85.88923	59.20038	154.2709	105.0203	75.92896	179.8953	80.40572	62.29539
2013	163.0496	148.7411	84.97072	59.0988	154.2747	103.4562	78.02734	183.4277	78.51361	62.03704
2014	167.136	160.9159	84.71493	60.0925	154.3824	102.7419	79.71134	180.0573	76.51558	58.39963

Source: World Data Bank (2016)

Table 5: Net household disposable income, 1995-2014 (Current prices, million euro)

GEO/TIME	Belgium	Czech Republic	Portugal	Slovakia	Finland	Netherlands	Germany	United Kingdom	France	Austria
1995	137,824	23,933	61,801	8,215	54,772	178,021	1,242,232	656,690	761,585	118,158
1996	135,568	27,850	65,105	9,723	54,125	182,442	1,241,957	711,997	785,627	117,301
1997	134,403	29,997	67,958	11,223	57,488	189,181	1,225,884	884,021	792,256	114,337
1998	138,453	31,783	72,882	11,936	59,366	198,066	1,240,408	940,974	822,672	117,551
1999	143,095	32,566	78,793	11,546	63,942	209,779	1,279,928	1,003,305	849,220	123,142
2000	150,549	35,865	83,703	13,171	66,824	221,511	1,300,134	1,157,967	898,930	127,697
2001	157,860	39,943	88,294	14,035	70,049	243,938	1,359,937	1,189,216	946,309	129,893
2002	159,076	46,080	92,381	15,432	73,369	250,576	1,367,257	1,204,492	985,038	132,347
2003	161,424	46,403	94,178	17,015	77,010	251,811	1,401,517	1,128,315	1,008,283	137,014
2004	164,722	48,899	98,983	19,722	80,711	254,913	1,426,503	1,179,479	1,051,636	142,539
2005	170,582	55,377	103,507	22,177	82,544	257,082	1,451,672	1,218,257	1,079,147	151,962
2006	179,726	62,559	107,184	24,961	85,825	264,484	1,482,390	1,269,030	1,126,435	159,305
2007	188,651	67,819	112,374	30,931	90,556	275,655	1,506,758	1,321,904	1,184,141	166,807
2008	198,855	80,889	116,712	36,650	95,702	278,968	1,541,208	1,187,567	1,218,051	171,615
2009	202,243	78,646	116,146	38,584	98,503	277,898	1,524,948	1,101,245	1,221,769	171,950
2010	203,222	82,743	119,432	40,103	102,857	278,768	1,561,663	1,179,664	1,251,561	172,879
2011	206,999	85,107	114,582	40,688	107,259	286,457	1,608,286	1,181,815	1,276,057	177,935
2012	212,008	84,084	110,687	41,327	110,043	288,386	1,642,446	1,316,554	1,283,161	185,776
2013	212,855	81,352	110,602	42,576	113,184	291,325	1,671,758	1,280,032	1,288,200	185,901
2014	214,717	78,462	111,256	43,865	113,770	292,151	1,710,094	1,388,096	1,298,740	190,701

Source: Eurostat, (2016)

Table 6: Final household consumption expenditure, 1995-2014 (Current prices, million euro)

GEO/TIME	Belgium	Czech Republic	Germany	Netherlands	Portugal	Slovakia	Finland	United Kingdom	France	Austria
1995	115,284.3	23,070.1	1,066,329.6	162,778.8	59,402.0	8,052.7	50,377.6	623,330.4	663,830.9	102,474.5
1996	116,208.3	27,082.6	1,071,657.2	170,188.8	63,098.3	9,020.2	51,701.3	680,524.7	689,373.3	104,505.6
1997	116,528.3	29,063.7	1,062,144.9	175,706.3	66,467.1	10,213.2	54,235.7	852,543.7	688,294.6	103,205.8
1998	121,016.7	31,406.7	1,077,614.0	188,393.1	70,692.7	10,906.4	56,661.5	917,298.2	718,925.2	106,285.7
1999	124,565.1	32,186.3	1,113,532.0	203,916.0	76,593.2	10,784.3	59,743.0	989,917.1	747,032.0	109,882.3
2000	132,323.5	35,067.8	1,144,713.0	217,573.0	82,504.9	12,346.7	62,829.0	1,127,133.0	793,188.0	115,630.7
2001	136,257.9	39,049.8	1,184,352.0	229,731.0	86,595.9	13,729.2	66,292.0	1,141,947.7	827,600.0	119,789.2
2002	138,549.0	44,549.9	1,188,714.0	239,376.0	90,662.3	14,976.0	69,046.0	1,173,479.3	852,420.0	122,108.3
2003	141,252.1	45,095.2	1,208,458.0	243,444.0	93,450.9	16,694.7	72,502.0	1,116,959.8	878,889.0	125,923.0
2004	146,708.6	48,038.4	1,232,148.0	249,311.0	98,164.7	19,430.4	75,175.0	1,194,607.0	917,976.0	131,266.1
2005	152,417.3	54,335.4	1,258,469.0	255,356.0	103,230.5	21,840.2	78,354.0	1,244,431.1	955,909.0	137,558.4
2006	159,582.8	60,727.4	1,294,263.0	261,130.0	108,631.1	25,201.1	82,623.0	1,304,121.9	998,435.0	143,130.1
2007	167,111.7	66,206.5	1,314,268.0	272,424.0	115,317.8	30,623.2	86,970.0	1,361,932.7	1,044,753.0	148,404.7
2008	175,014.5	78,730.3	1,343,244.0	280,319.0	119,878.7	36,626.1	91,758.0	1,203,667.1	1,077,254.0	153,639.6
2009	174,219.2	74,794.7	1,340,434.0	270,973.0	114,599.2	37,793.0	90,143.0	1,049,497.2	1,059,779.0	154,054.2
2010	181,783.6	79,340.1	1,372,877.0	274,571.0	119,862.0	38,403.4	94,456.0	1,122,090.4	1,088,615.0	158,463.8
2011	188,180.6	82,998.5	1,418,510.0	281,016.0	117,888.0	39,652.8	100,731.0	1,144,979.7	1,113,956.0	166,045.2
2012	192,454.2	81,879.4	1,450,985.0	281,705.0	113,880.3	40,786.9	104,092.0	1,273,854.0	1,130,121.0	170,977.6
2013	195,723.4	80,155.6	1,475,511.0	284,823.0	113,836.0	40,995.5	106,055.0	1,266,110.5	1,142,231.0	174,798.9
2014	196,980.1	77,162.0	1,502,229.0	288,639.0	117,872.9	41,859.0	107,925.0	1,385,971.1	1,147,362.0	177,734.3

Source: Eurostat, (2016)

Table 7: Gross domestic product at market prices, 1994-2015 (Current prices, million euro)

GEO/TIME	Belgium	Czech Republic	Germany	Netherlands	Portugal	Slovakia	Finland	United Kingdom	France	Austria
1994	207700.0	39900.0	1860000.0	315600.0	83900.0	13380.0	87200.0	960,428	1,182,192	171,300.0
1995	221,430.6	45,541.7	1,982,061.1	341,584.8	91,024.7	15,259.4	102,650.9	1,009,479	1,231,447	183,907.2
1996	221,664.1	52,605.3	1,973,016.0	351,158.6	96,626.6	16,990.3	104,118.7	1,097,198	1,271,858	186,550.1
1997	224,891.3	54,364.3	1,958,532.0	363,789.7	103,332.8	19,299.1	111,963.7	1,356,139	1,289,316	187,441.5
1998	232,869.0	59,435.4	2,004,600.1	386,516.7	110,715.3	20,315.3	119,641.9	1,449,238	1,350,164	194,497.0
1999	244,226.0	60,657.7	2,064,880.0	414,838.0	119,639.2	19,491.5	126,923.0	1,550,240	1,408,159	203,418.3
2000	258,222.0	66,648.8	2,116,480.0	448,061.0	128,466.3	22,346.8	136,261.0	1,773,418	1,485,303	213,196.1
2001	265,788.0	75,222.5	2,179,850.0	476,696.0	135,827.5	23,871.6	144,437.0	1,801,944	1,544,629	220,095.7
2002	275,065.0	86,827.5	2,209,290.0	494,501.0	142,631.4	26,305.6	148,289.0	1,864,816	1,594,259	226,302.7
2003	282,637.0	87,959.6	2,220,080.0	506,671.0	146,158.3	30,064.5	151,569.0	1,795,473	1,637,438	230,999.2
2004	298,711.0	95,878.5	2,270,620.0	523,939.0	152,371.6	34,702.3	158,477.0	1,922,721	1,710,760	241,505.0
2005	311,481.0	109,394.0	2,300,860.0	545,609.0	158,652.6	39,219.9	164,387.0	2,017,340	1,771,978	253,009.3
2006	326,662.0	123,743.2	2,393,250.0	579,212.0	166,248.7	45,396.2	172,614.0	2,135,221	1,853,267	266,478.0
2007	344,713.0	138,004.0	2,513,230.0	613,280.0	175,467.7	56,090.6	186,584.0	2,237,031	1,945,670	282,346.9
2008	354,066.0	160,961.5	2,561,740.0	639,163.0	178,872.6	65,839.8	193,711.0	1,964,450	1,995,850	291,930.4
2009	348,781.0	148,357.4	2,460,280.0	617,540.0	175,448.2	63,818.5	181,029.0	1,705,456	1,939,017	286,188.4
2010	365,101.0	156,369.7	2,580,060.0	631,512.0	179,929.8	67,387.1	187,100.0	1,833,021	1,998,481	294,627.5
2011	379,106.0	164,040.5	2,703,120.0	642,929.0	176,166.6	70,443.5	196,869.0	1,876,151	2,059,284	308,630.3
2012	387,447.0	161,434.3	2,754,860.0	645,164.0	168,398.0	72,420.0	199,793.0	2,065,737	2,086,929	317,117.0
2013	392,675.0	157,741.6	2,820,820.0	652,748.0	170,269.3	73,835.1	203,338.0	2,048,328	2,115,256	322,539.2
2014	400,408.0	156,660.0	2,915,650.0	663,008.0	173,446.2	75,560.5	205,364.0	2,260,805	2,139,964	330,417.6

Source: Eurostat, (2016)

Table 8: Real GDP growth rate, 1995-2014 (% of GDP)

GEO/TIME	Belgium	Czech Republic	Germany	Netherlands	Portugal	Slovakia	Finland	United Kingdom	France	Austria
1995	5.3	4.6	4.5	6	2.7	3.8	13	2.5	3.0	5.5
1996	-0.3	5	-1.1	1.6	3.7	6.5	1.5	4.5	1.9	0.4
1997	0.6	-4.8	-1	1	2.9	8.3	5.3	20.8	0.5	-0.7
1998	1.7	-0.6	1.7	4.1	3.2	0.3	3.6	5.2	3.7	3.4
1999	4.3	-0.8	2.7	5.8	4.5	-10.6	5.1	5.8	4.1	4.3
2000	3.7	8	2.9	4.3	3.7	4.8	5.7	11.8	3.9	3.4
2001	0.8	7.7	1.7	2.1	2	1.6	2.6	0.5	2.0	1.3
2002	1.8	12.4	0	0.1	0.8	6	1.7	1.0	1.1	1.7
2003	0.7	0.2	-0.7	0.3	-0.9	8.4	2	-6.2	0.8	0.8
2004	3.6	4.8	1.2	2	1.8	9.1	3.9	4.1	2.2	2.7
2005	2.1	14	0.7	2.2	0.8	10.4	2.8	2.0	1.0	2.1
2006	2.5	12.3	3.7	3.5	1.5	12.5	4.1	2.8	2.1	3.4
2007	3.4	7.8	3.3	3.7	2.5	22.2	5.1	1.8	4.9	3.6
2008	0.7	14.3	1.1	1.7	0.2	14.2	0.7	-14.7	1.5	1.6
2009	-2.3	-10.2	-5.7	-3.8	-3	-1.9	-8.3	-14.9	-3.7	-3.8
2010	2.7	7	4	1.5	1.9	5.1	2.9	4.2	1.8	1.9
2011	1.8	5.1	3.6	1.7	-1.8	2.9	2.6	0.2	2.2	2.8
2012	0.2	-2.9	0.4	-1	-4	1.5	-1.5	8.4	0.7	0.7
2013	0	-3.6	0.3	-0.2	-1.2	1.4	-0.8	-2.8	0.5	0.2
2014	1.3	-3.1	1.6	0.8	0.9	2.5	-0.6	8.5	0.3	0.8

Source: Eurostat, (2016)

Table 9: Inflation rate

GEO/TIME	Belgium	Czech Republic	Germany	Netherlands	Portugal	Slovakia	Finland	United Kingdom	France	Austria
1994	2.1	12.3	2.2	2.1	6.8	13.4	1.8	1.2	0.9	2.5
1995	1.2	9.1	2.0	2.1	5.6	9.9	4.2	2.5	1.1	1.8
1996	0.4	10.0	0.6	1.2	2.4	4.5	-0.1	4.0	1.4	1.0
1997	0.9	8.5	0.3	2.6	3.9	4.9	2.1	2.3	0.9	1.2
1998	1.8	10.0	0.6	2.1	3.8	5.0	3.1	1.6	1.0	0.4
1999	0.6	2.9	0.3	1.4	3.4	7.3	0.9	1.1	0.2	0.3
2000	2.0	1.7	-0.4	3.6	3.5	9.4	1.6	2.3	1.5	1.4
2001	2.1	4.8	1.3	4.2	3.7	5.1	3.3	1.1	2.0	1.9
2002	1.7	2.7	1.4	3.6	4.2	4.0	1.0	2.5	2.1	1.1
2003	2.0	1.1	1.2	2.2	3.4	5.4	0.2	2.7	1.9	1.3
2004	2.0	4.0	1.1	1.4	2.4	5.8	0.6	2.9	2.2	1.8
2005	2.1	0.1	0.6	1.9	3.3	2.4	0.9	2.9	2.6	2.6
2006	2.3	0.7	0.3	2.6	3.2	2.9	0.9	3.0	2.4	1.9
2007	2.1	3.5	1.7	2.1	3.0	1.1	2.8	2.9	0.1	2.3
2008	2.0	2.0	0.8	2.5	1.7	2.8	3.1	2.9	1.1	1.8
2009	0.8	2.6	1.8	0.4	1.1	-1.2	1.9	2.0	0.9	1.9
2010	1.9	-1.5	0.8	0.8	0.6	0.5	0.4	3.1	1.2	1.0
2011	2.0	-0.2	1.1	0.1	-0.3	1.6	2.6	2.1	0.8	1.9
2012	2.0	1.4	1.5	1.4	-0.4	1.3	3.0	1.6	0.6	2.0
2013	1.3	1.4	2.1	1.4	2.3	0.5	2.6	2.0	0.9	1.5
2014	0.7	2.5	1.7	0.8	1.0	-0.2	1.6	1.7	0.9	1.6

Source: Eurostat, (2016)

Table 10: Gross Fixed Capital Formation, 1995-2014 (annual percentage change)

GEO/TIME	Belgium	Czech Republic	Germany	Netherlands	Portugal	Slovakia	Finland	United Kingdom	France	Austria
1995	3.4	23.3	0.0	5.9	4.2	0.6	12.5	-0.5	1.3	0.2
1996	0.8	9.8	-0.5	6.1	5.1	27.4	10.0	4.7	0.8	4.4
1997	6.6	-5.2	0.8	6.9	14.3	13.5	10.9	-1.6	0.8	0.7
1998	2.5	-1.1	3.9	6.5	11.7	8.1	10.7	7.6	6.4	3.4
1999	3.8	-2.6	4.6	9.5	6.1	-15.3	4.5	2.3	7.8	1.2
2000	4.4	8.4	2.3	1.9	4.1	-8.8	6.2	3.2	6.6	5.9
2001	1.6	5.6	-2.5	0.6	1.0	12.9	1.8	-1.1	2.3	-1.3
2002	-4.3	2.2	-5.8	-4.5	-3.4	0.0	-3.0	2.8	-0.9	-2.9
2003	-0.4	1.8	-1.3	-1.6	-7.3	-3.2	2.8	2.3	1.9	3.8
2004	8.9	3.9	0.0	0.2	0.1	4.7	4.7	2.8	3.5	0.9
2005	6.1	6.4	0.7	3.1	0.1	16.5	3.2	3.4	2.9	0.2
2006	2.0	5.9	7.5	7.2	-0.8	9.1	1.3	3.0	3.6	1.1
2007	6.8	13.5	4.1	6.5	3.1	8.9	10.0	5.7	5.5	4.6
2008	1.9	2.5	1.5	4.1	0.4	1.6	0.3	-5.9	0.9	1.4
2009	-6.6	-10.1	-10.1	-9.2	-7.6	-18.7	-12.5	-14.4	-9.1	-7.3
2010	-0.8	1.3	5.4	-6.5	-0.9	7.2	1.1	5.0	2.1	-2.1
2011	4.2	1.1	7.2	5.6	-12.5	12.7	4.1	2.0	2.1	6.7
2012	0.2	-3.2	-0.4	-6.3	-16.6	-9.2	-2.2	1.5	0.2	1.3
2013	-1.7	-2.7	-1.3	-4.4	-5.1	-1.1	-5.2	2.6	-0.6	-0.3
2014	7.0	2.0	3.5	3.5	2.8	3.5	-3.3	7.5	-1.2	-0.2

Source: Eurostat, (2016)

6.2 Appendix B: Total Fiscal Stimulus Package

Table 11: Total fiscal impulse and its components by euro area country

Fiscal variable	Fiscal impulse (-Δ general government balance; p.p. of GDP ¹⁾)			Automatic stabilisers (-Δ cyclical component; p.p. of GDP ¹⁾)			Fiscal stance and change in interest expenditure (-Δ cyclically adjusted balance; p.p. of GDP ¹⁾)			Fiscal stimulus packages (levels; % of GDP)	
	(a) = (b) + (c)			(b)			(c)			(d)	
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2009	2010
Belgium	1.0	4.7	-0.1	0.4	2.2	0.2	0.6	2.5	-0.3	0.4	0.4
Germany	0.2	3.4	1.6	-0.2	3.0	-0.1	0.3	0.4	1.7	1.4	1.9
Ireland	7.4	5.3	2.2	2.0	2.9	0.2	5.4	2.5	1.9	0.5	0.5
Greece	4.1	4.9	-0.4	0.3	1.3	0.8	3.8	3.6	-1.3	0.0	0.0
Spain	6.0	7.2	-1.1	0.3	1.6	0.3	5.7	5.6	-1.5	2.3	0.6
France	0.7	4.9	0.0	0.5	1.7	0.0	0.1	3.2	0.0	1.0	0.1
Italy	1.2	2.5	0.0	0.8	2.5	-0.2	0.5	0.1	0.2	0.0	0.0
Cyprus	2.5	4.4	2.2	-0.4	1.2	0.4	2.8	3.2	1.8	0.1	0.0
Luxembourg	1.2	4.7	2.1	1.8	2.8	0.3	-0.5	1.9	1.7	1.2	1.4
Malta	2.5	-0.1	-0.1	-0.3	1.1	0.0	2.8	-1.2	-0.1	1.6	1.6
Netherlands	-0.5	5.4	1.5	-0.2	3.2	0.2	-0.4	2.2	1.2	0.9	1.0
Austria	-0.1	3.9	1.1	-0.2	2.4	0.2	0.1	1.5	1.0	1.8	1.8
Portugal	0.1	5.3	0.1	0.3	1.3	0.0	-0.2	4.0	0.1	0.9	0.1
Slovenia	1.8	4.5	0.7	-0.1	4.2	0.0	1.9	0.3	0.7	0.6	0.5
Slovakia	0.4	4.0	-0.2	-0.5	2.9	0.4	0.9	1.0	-0.6	0.1	0.0
Finland	0.8	7.3	1.7	0.6	4.1	-0.1	0.2	3.2	1.8	1.7	1.7
Euro area	1.4	4.4	0.5	0.3	2.4	0.0	1.1	2.1	0.4	1.1	0.8

Sources: European Commission (2009b and 2009f), ECB calculations.

Note: For Italy, the fiscal stimulus data reflect the net impact of the measures taken in response to the crisis.

1) A positive sign indicates an expansionary fiscal position, i.e. a deterioration of the respective fiscal balance.

Source: Riet (2010)

6.3 Appendix C: SPSS Result

Table 12: Hierarchical multiple-linear regression model summary for high debt countries

Model Summary^{a,d}

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.440 ^b	.194	.177	1.863	.194	11.676	2	97	.000	
2	.504 ^c	.254	.214	1.821	.060	2.512	3	94	.063	1.920

a. High/Low debt = High Debt Countries

b. Predictors: (Constant), Interest Rate, Trade Openness

c. Predictors: (Constant), Interest Rate, Trade Openness, Fiscal Balance to GDP ratio, National debt to GDP ratio, Fiscal Stimulus

d. Dependent Variable: Real GDP Growth Rate

Table 13: Hierarchical multiple-linear regression model ANOVA test result for high debt countries

ANOVA^{a,b}

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	81.015	2	40.507	11.676	.000 ^c
	Residual	336.531	97	3.469		
	Total	417.545	99			
2	Regression	105.989	5	21.198	6.396	.000 ^d
	Residual	311.556	94	3.314		
	Total	417.545	99			

a. High/Low debt = High Debt Countries

b. Dependent Variable: Real GDP Growth Rate

c. Predictors: (Constant), Interest Rate, Trade Openness

d. Predictors: (Constant), Interest Rate, Trade Openness, Fiscal Balance to GDP ratio, National debt to GDP ratio, Fiscal Stimulus

Table 14: Coefficients of hierarchical multiple-linear regression model for high debt countries

Coefficients^{a,b}

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.150	.606		.247	.805		
	Trade Openness	-.062	.437	-.013	-.143	.887	.970	1.031
	Interest Rate	.519	.109	.443	4.782	.000	.970	1.031
2	(Constant)	1.378	1.247		1.106	.272		
	Trade Openness	-.009	.453	-.002	-.021	.984	.863	1.159
	Interest Rate	.392	.123	.334	3.195	.002	.725	1.380
	Fiscal Balance to GDP ratio	.118	.093	.129	1.273	.206	.778	1.285
	National debt to GDP ratio	-.006	.010	-.058	-.566	.573	.746	1.341
	Fiscal Stimulus	-1.155	.709	-.170	-1.628	.107	.732	1.367

a. High/Low debt = High Debt Countries

b. Dependent Variable: Real GDP Growth Rate

Table 15: Hierarchical multiple-linear regression model summary for low debt countries

Model Summary^{a,d}

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.092 ^b	.009	-.012	6.043	.009	.418	2	97	.660	
2	.351 ^c	.123	.076	5.774	.114	4.085	3	94	.009	1.549

a. High/Low debt = Low Debt Countries

b. Predictors: (Constant), Interest Rate, Trade Openness

c. Predictors: (Constant), Interest Rate, Trade Openness, Fiscal Balance to GDP ratio, Fiscal Stimulus, National debt to GDP ratio

d. Dependent Variable: Real GDP Growth Rate

Table 16: Hierarchical multiple-linear regression model ANOVA test result for low debt countries

ANOVA^{a,b}

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.533	2	15.266	.418	.660 ^c
	Residual	3542.673	97	36.522		
	Total	3573.206	99			
2	Regression	439.159	5	87.832	2.634	.028 ^d
	Residual	3134.047	94	33.341		
	Total	3573.206	99			

a. High/Low debt = Low Debt Countries

b. Dependent Variable: Real GDP Growth Rate

c. Predictors: (Constant), Interest Rate, Trade Openness

d. Predictors: (Constant), Interest Rate, Trade Openness, Fiscal Balance to GDP ratio, Fiscal Stimulus, National debt to GDP ratio

Table 17: Coefficients of hierarchical multiple-linear regression model for low debt countries

Coefficients^{a,b}

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4.097	2.043		2.005	.048		
	Trade Openness	-1.104	1.611	-.069	-.685	.495	.997	1.003
	Interest Rate	.096	.149	.065	.643	.522	.997	1.003
2	(Constant)	8.965	2.788		3.215	.002		
	Trade Openness	-.424	1.560	-.027	-.272	.787	.971	1.030
	Interest Rate	-.186	.180	-.127	-1.035	.303	.623	1.605
	Fiscal Balance to GDP ratio	-.038	.184	-.023	-.207	.837	.770	1.298
	National debt to GDP ratio	-.089	.044	-.236	-2.050	.043	.701	1.427
	Fiscal Stimulus	-5.878	2.154	-.295	-2.729	.008	.798	1.252

a. High/Low debt = Low Debt Countries

b. Dependent Variable: Real GDP Growth Rate

Table 18: Hierarchical multiple-linear regression model summary for pre-recession period (1995-2004)

Model Summary ^{a,d}										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.028 ^b	.001	-.020	3.819	.001	.038	2	97	.963	
2	.140 ^c	.020	-.022	3.822	.019	.918	2	95	.403	1.551

a. Pre/Post Recession = Pre-Recession Period (1995-2004)

b. Predictors: (Constant), Interest Rate, Trade Openness

c. Predictors: (Constant), Interest Rate, Trade Openness, Fiscal Balance to GDP ratio, National debt to GDP ratio

d. Dependent Variable: Real GDP Growth Rate

Table 19: Hierarchical multiple-linear regression model ANOVA test result for pre-recession period (1995-2004)

ANOVA ^{a,b}						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.102	2	.551	.038	.963 ^c
	Residual	1414.582	97	14.583		
	Total	1415.684	99			
2	Regression	27.927	4	6.982	.478	.752 ^d
	Residual	1387.757	95	14.608		
	Total	1415.684	99			

a. Pre/Post Recession = Pre-Recession Period (1995-2004)

b. Dependent Variable: Real GDP Growth Rate

c. Predictors: (Constant), Interest Rate, Trade Openness

d. Predictors: (Constant), Interest Rate, Trade Openness, Fiscal Balance to GDP ratio, National debt to GDP ratio

Table 20: Coefficients of hierarchical multiple-linear regression model for pre-recession period (1995-2004)

Coefficients^{a,b}

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.671	1.309		2.040	.044		
	Trade Openness	.234	.872	.027	.269	.789	.996	1.004
	Interest Rate	.008	.105	.008	.076	.939	.996	1.004
2	(Constant)	4.518	1.891		2.389	.019		
	Trade Openness	.100	.879	.012	.114	.909	.982	1.018
	Interest Rate	-.054	.124	-.052	-.434	.665	.722	1.384
	Fiscal Balance to GDP ratio	.015	.133	.012	.110	.913	.862	1.160
	National debt to GDP ratio	-.024	.018	-.152	-1.350	.180	.817	1.225

a. Pre/Post Recession = Pre-Recession Period (1995-2004)

b. Dependent Variable: Real GDP Growth Rate

Table 21: Hierarchical multiple-linear regression model summary for post-recession period (2005-2014)

Model Summary ^{a,d}										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.324 ^b	.105	.087	4.930	.105	5.702	2	97	.005	
2	.447 ^c	.200	.157	4.736	.095	3.700	3	94	.014	1.589

a. Pre/Post Recession = Post -Recession Period (2005-2014)

b. Predictors: (Constant), Interest Rate, Trade Openness

c. Predictors: (Constant), Interest Rate, Trade Openness, Fiscal Stimulus, National debt to GDP ratio, Fiscal Balance to GDP ratio

d. Dependent Variable: Real GDP Growth Rate

Table 22: Hierarchical multiple-linear regression model ANOVA test result for post-recession period (2005-2014)

ANOVA ^{a,b}						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	277.123	2	138.562	5.702	.005 ^c
	Residual	2357.228	97	24.301		
	Total	2634.351	99			
2	Regression	526.084	5	105.217	4.691	.001 ^d
	Residual	2108.268	94	22.428		
	Total	2634.351	99			

a. Pre/Post Recession = Post -Recession Period (2005-2014)

b. Dependent Variable: Real GDP Growth Rate

c. Predictors: (Constant), Interest Rate, Trade Openness

d. Predictors: (Constant), Interest Rate, Trade Openness, Fiscal Stimulus, National debt to GDP ratio, Fiscal Balance to GDP ratio

Table 23: Coefficients of hierarchical multiple-linear regression model for post-recession period (2005-2014)

Coefficients^{a,b}

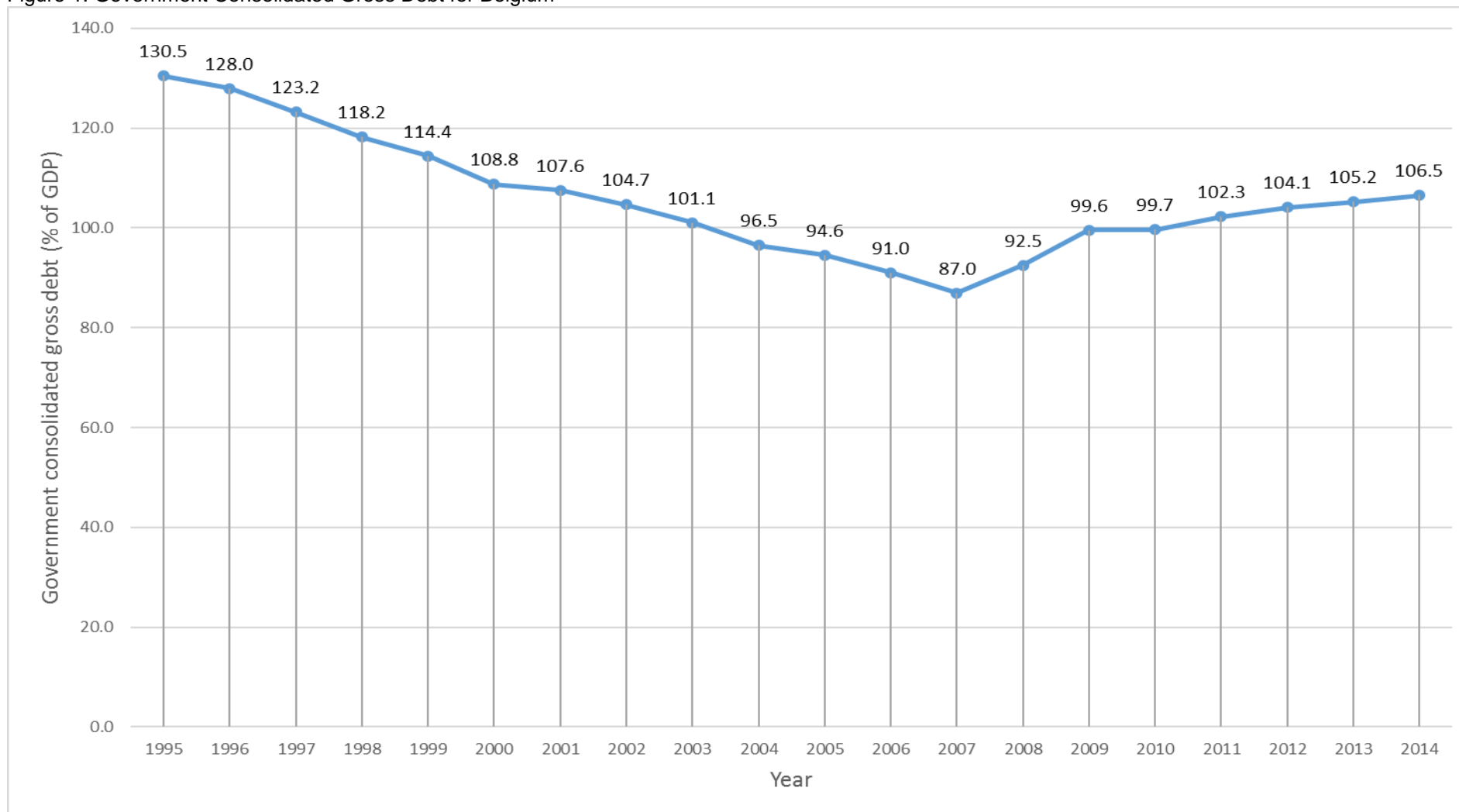
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.093	1.665		1.858	.066		
	Trade Openness	-2.757	1.368	-.197	-2.015	.047	.966	1.035
	Interest Rate	.940	.310	.297	3.035	.003	.966	1.035
2	(Constant)	7.541	2.257		3.341	.001		
	Trade Openness	-2.231	1.421	-.159	-1.571	.120	.827	1.209
	Interest Rate	.423	.358	.133	1.182	.240	.669	1.495
	Fiscal Balance to GDP ratio	-.127	.229	-.070	-.557	.579	.531	1.882
	National debt to GDP ratio	-.057	.023	-.267	-2.476	.015	.732	1.366
	Fiscal Stimulus	-3.494	1.426	-.272	-2.449	.016	.689	1.452

a. Pre/Post Recession = Post -Recession Period (2005-2014)

b. Dependent Variable: Real GDP Growth Rate

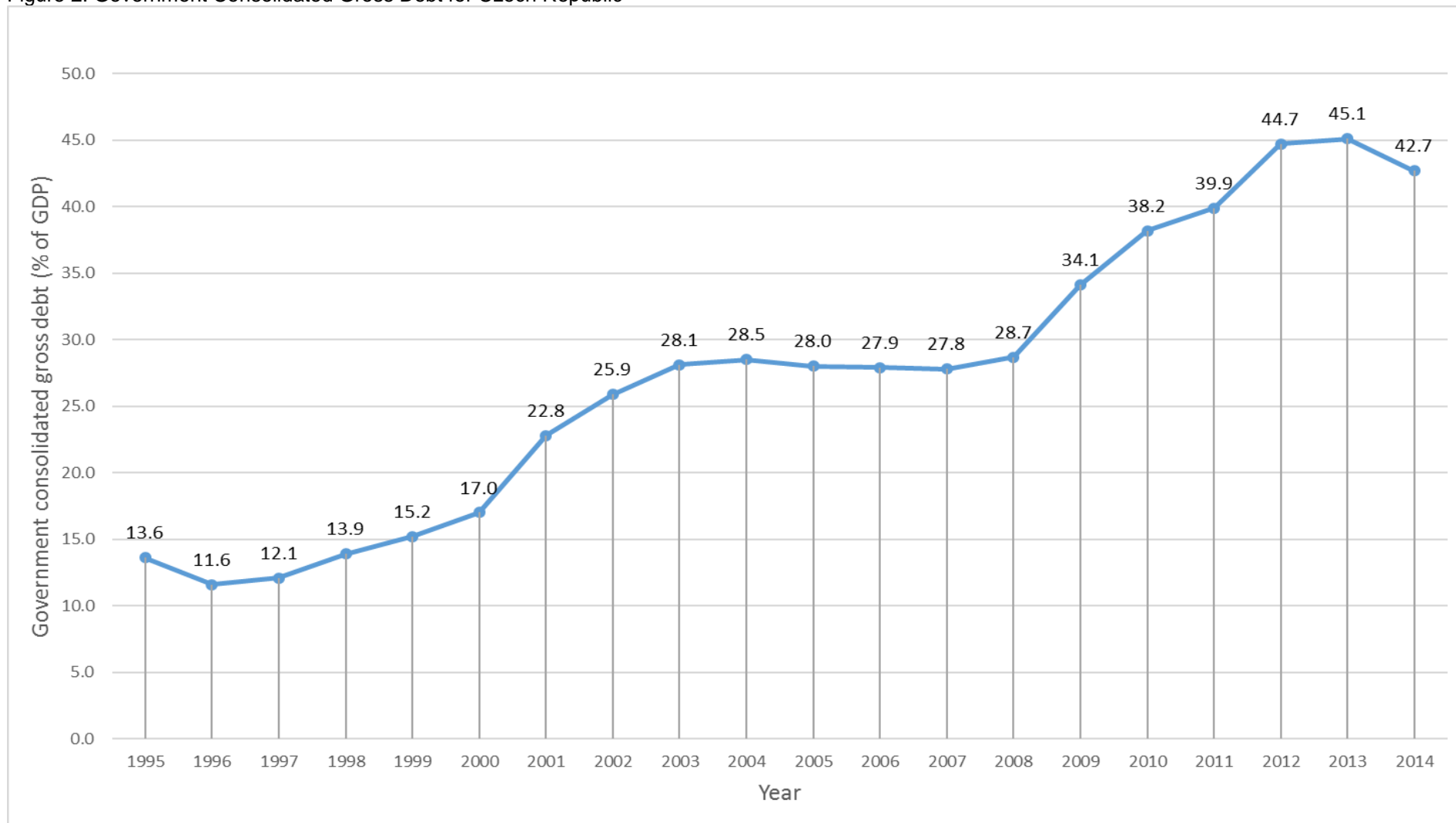
6.4 Appendix D: Government Consolidated Gross Line Graph

Figure 1: Government Consolidated Gross Debt for Belgium



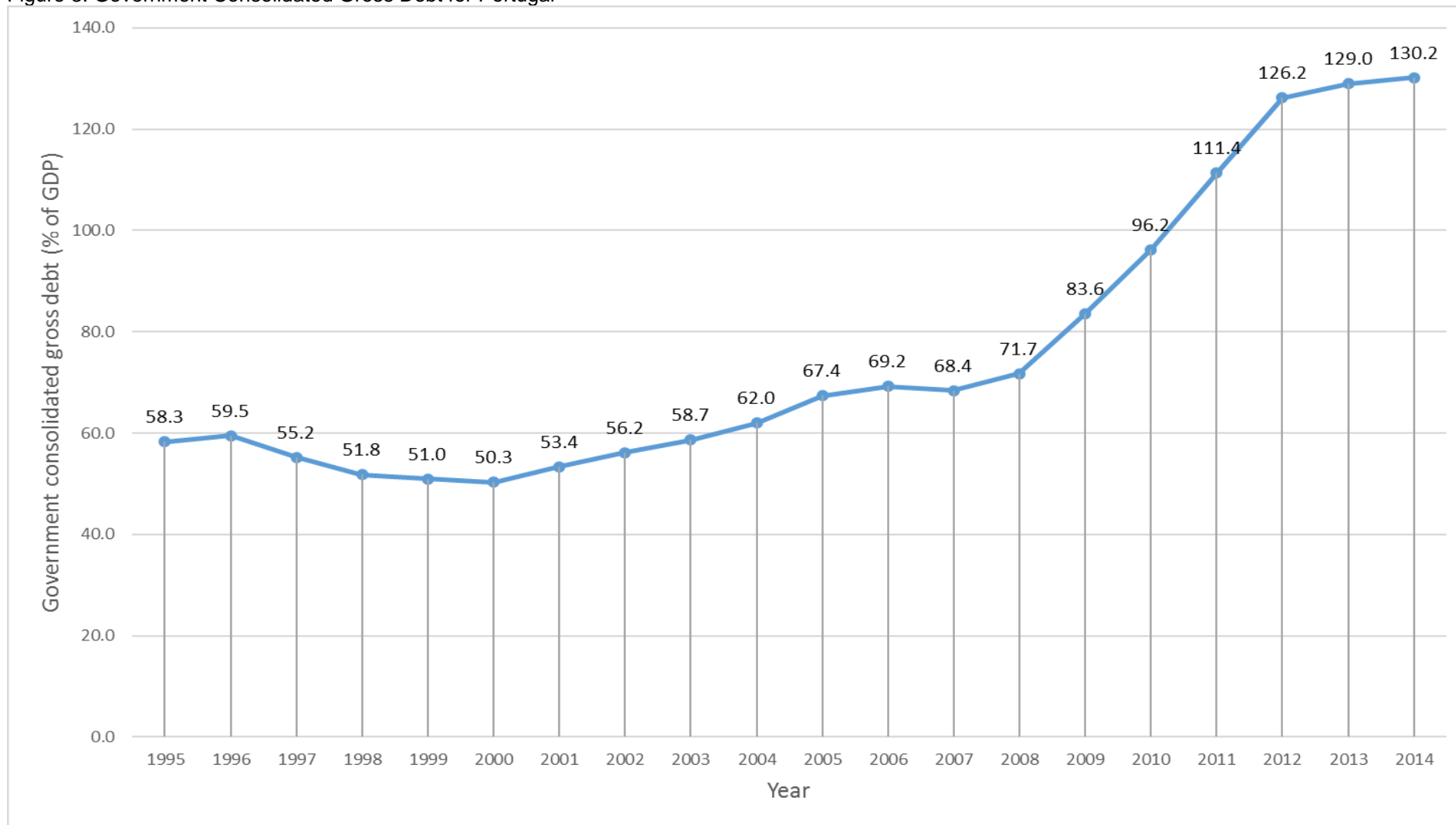
Data: Table 1

Figure 2: Government Consolidated Gross Debt for Czech Republic



Data: Table 1

Figure 3: Government Consolidated Gross Debt for Portugal



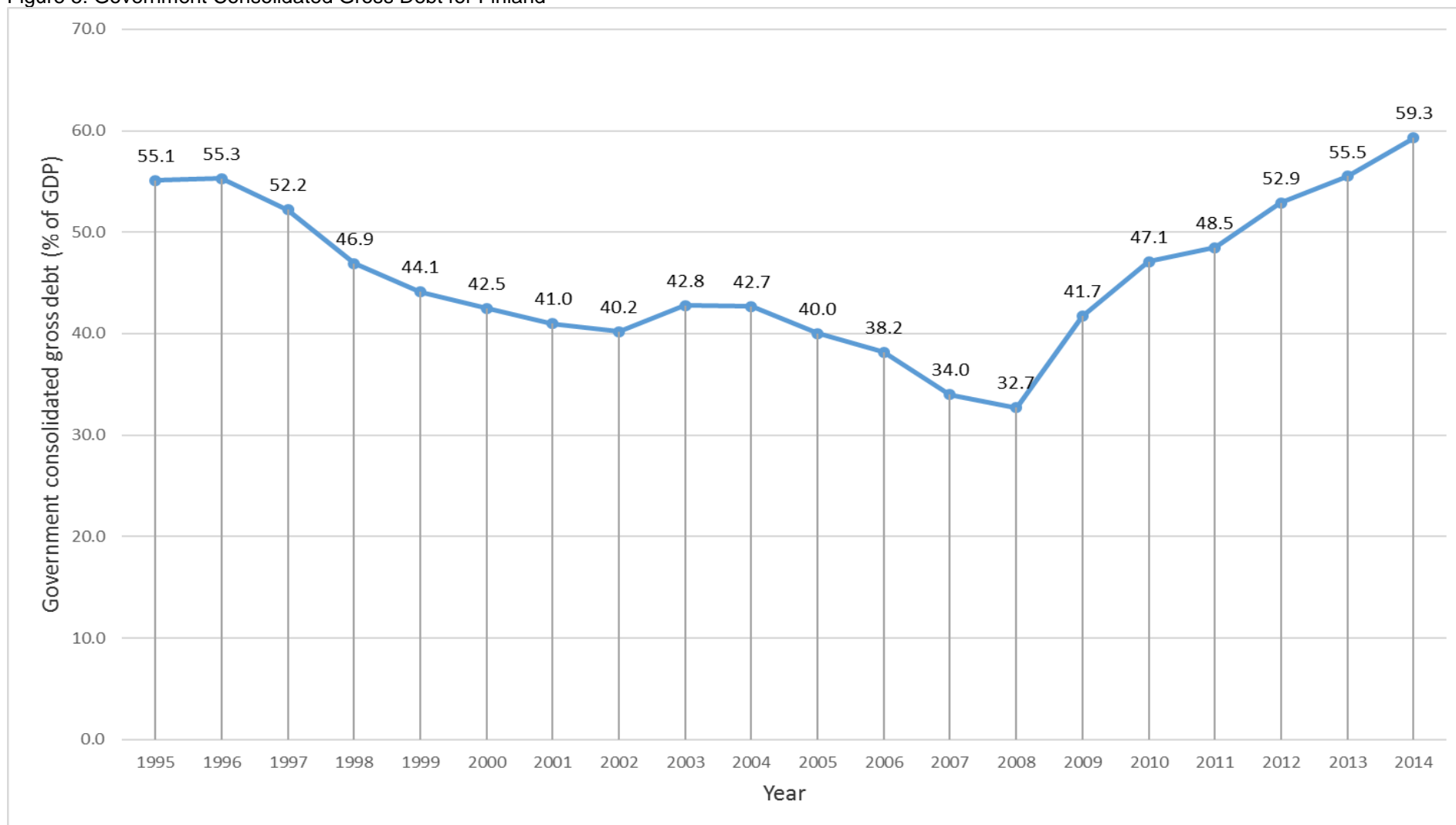
Data: Table 1

Figure 4: Government Consolidated Gross Debt for Slovakia



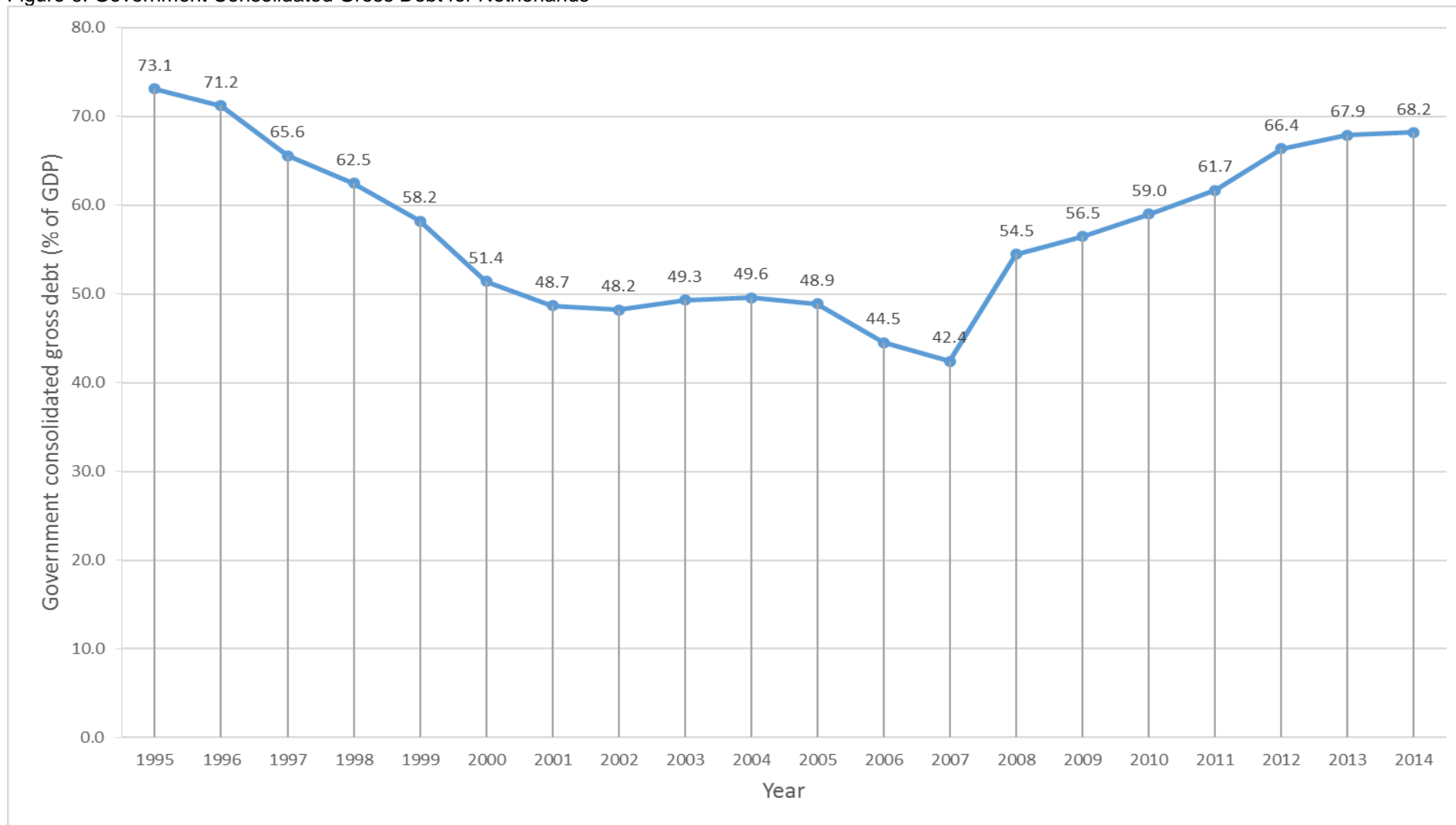
Data: Table 1

Figure 5: Government Consolidated Gross Debt for Finland



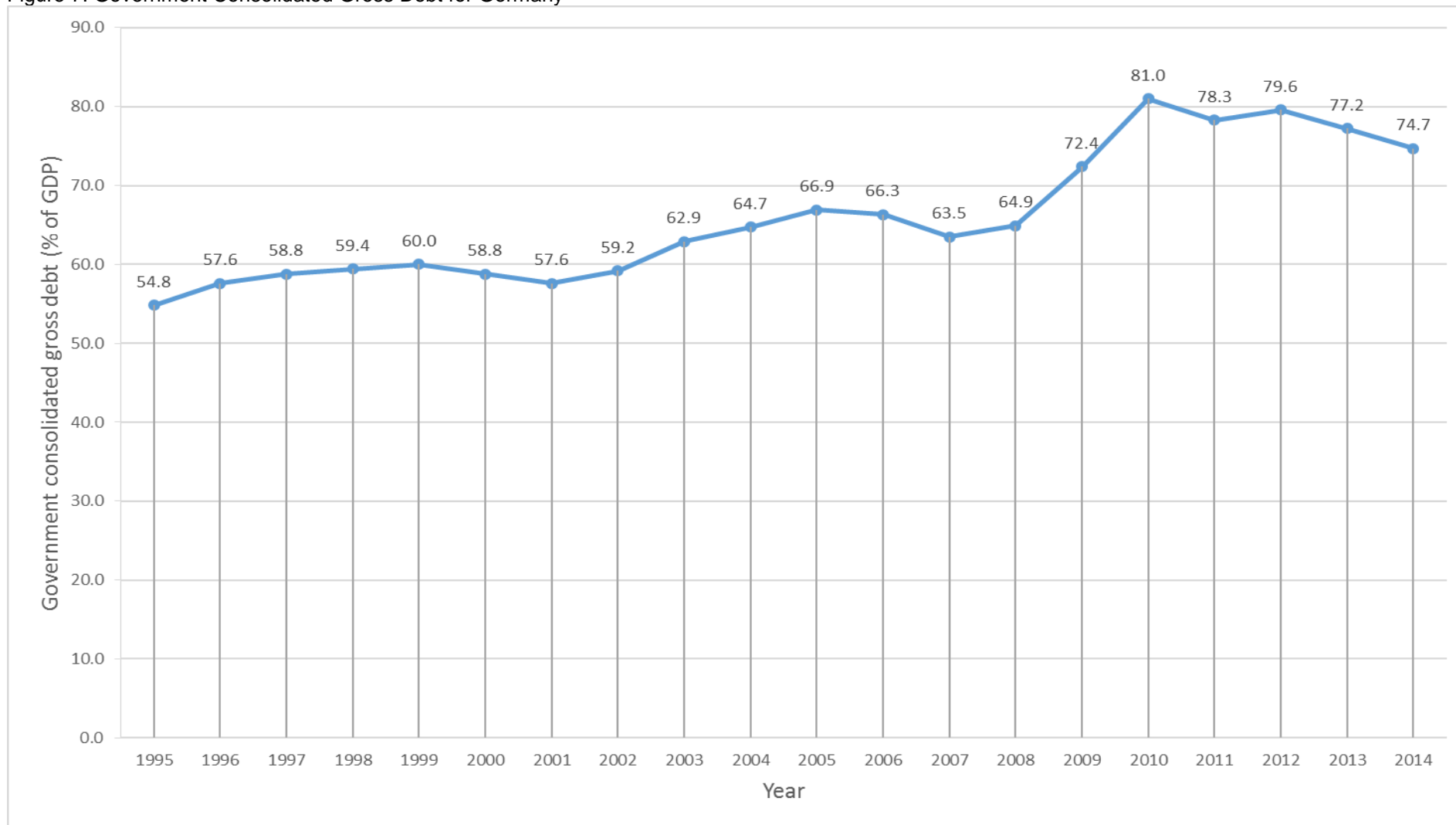
Data: Table 1

Figure 6: Government Consolidated Gross Debt for Netherlands



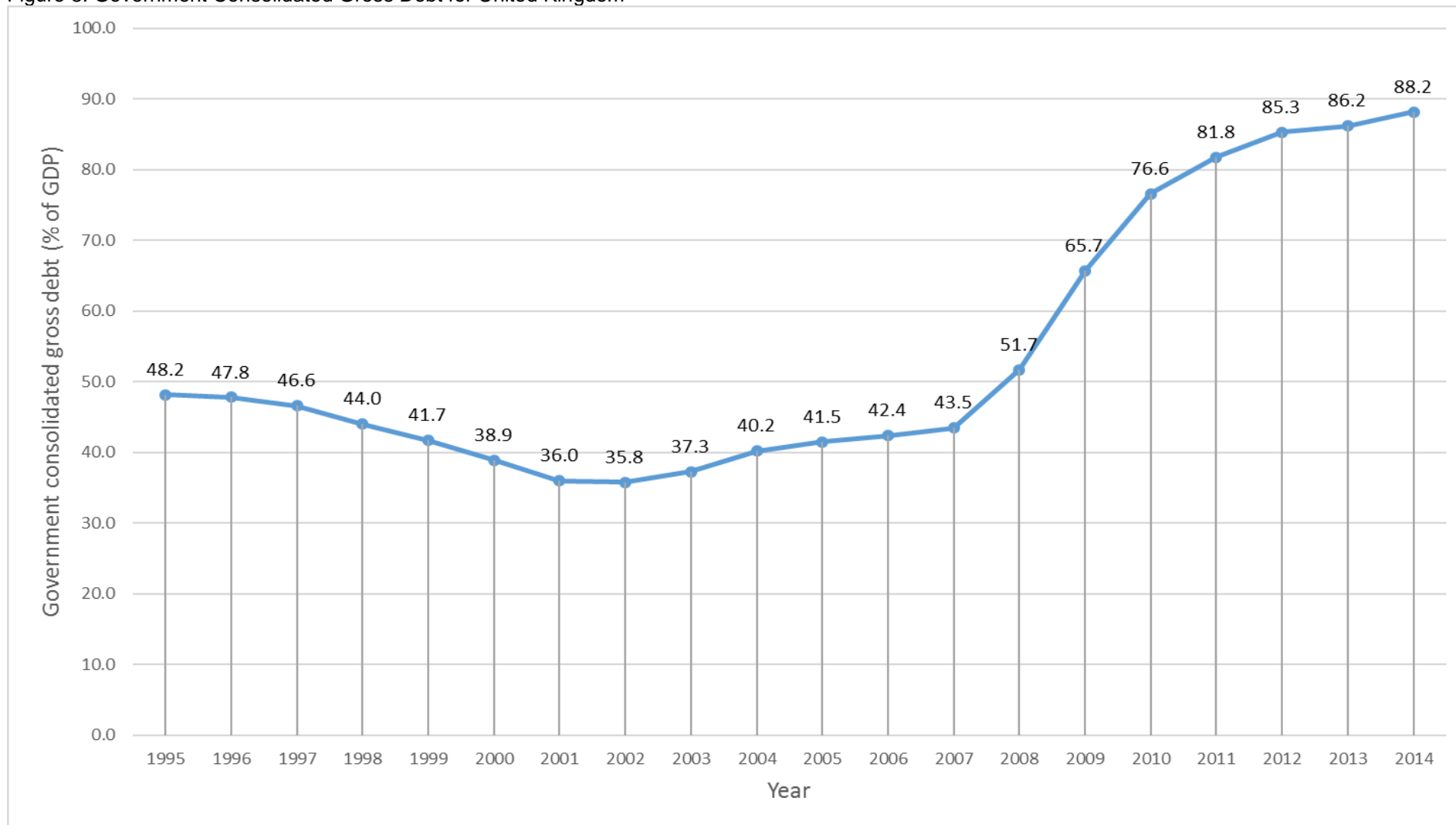
Data: Table 1

Figure 7: Government Consolidated Gross Debt for Germany



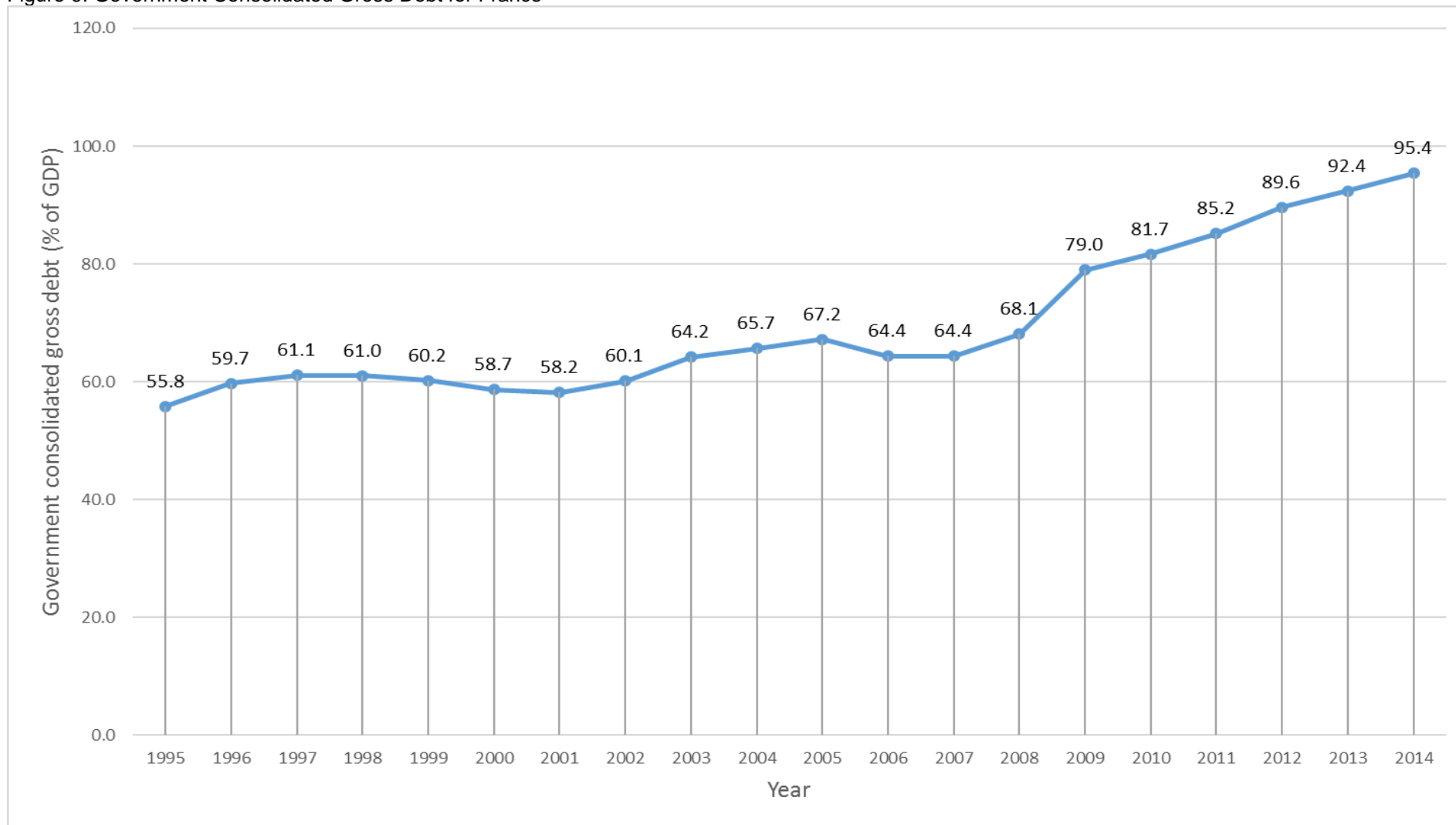
Data: Table 1

Figure 8: Government Consolidated Gross Debt for United Kingdom



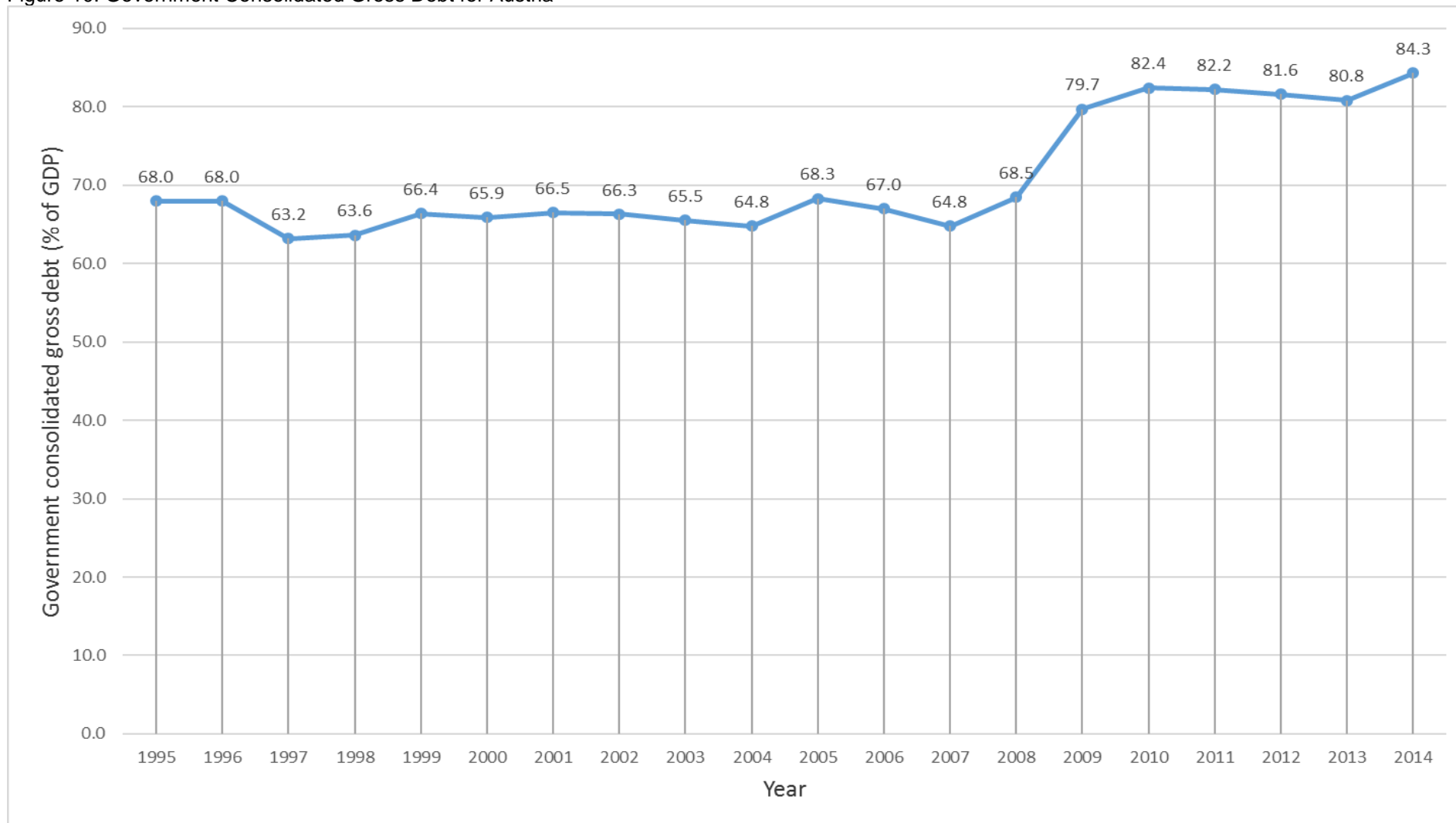
Data: Table 1

Figure 9: Government Consolidated Gross Debt for France



Data: Table 1

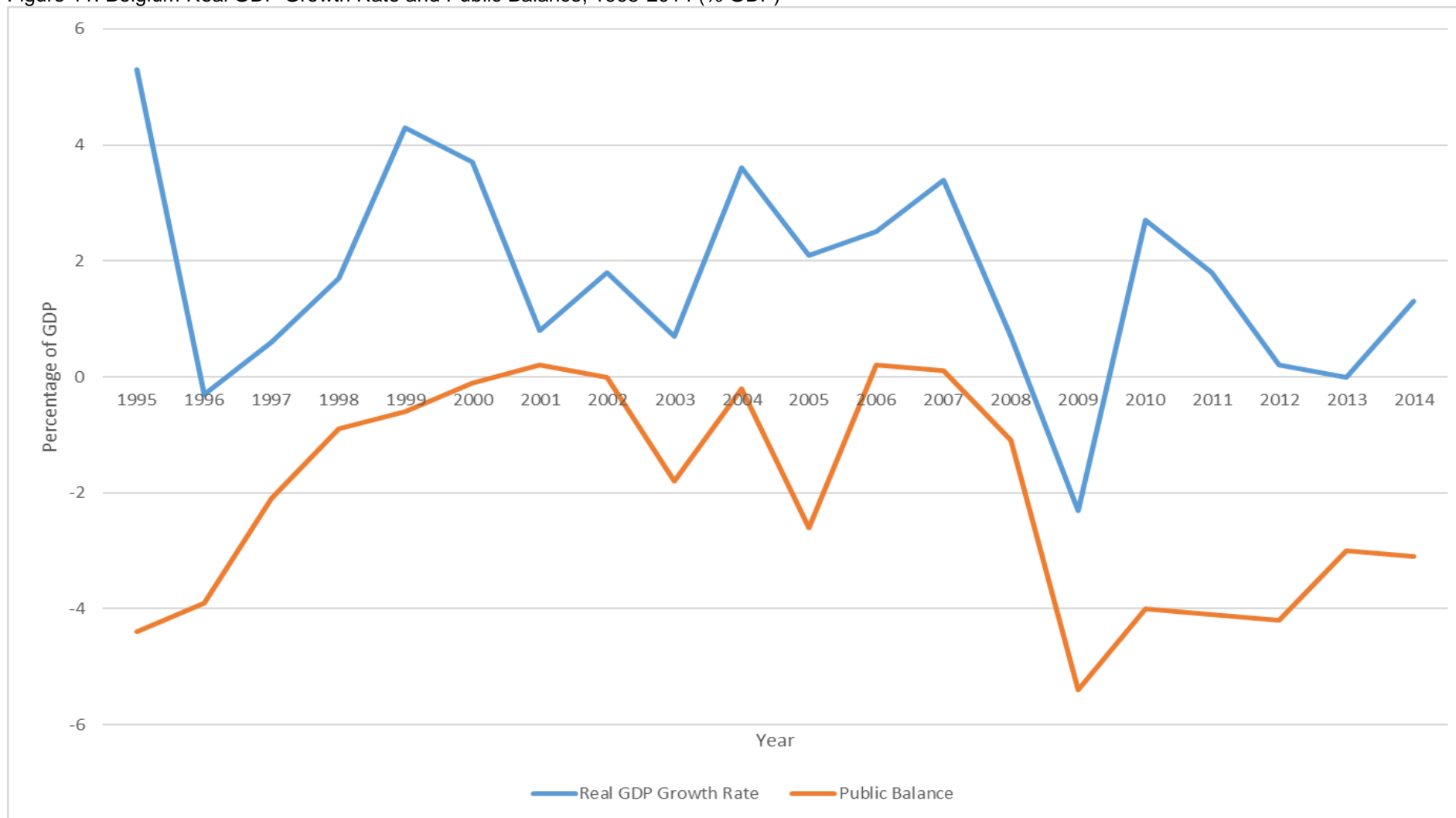
Figure 10: Government Consolidated Gross Debt for Austria



Data: Table 1

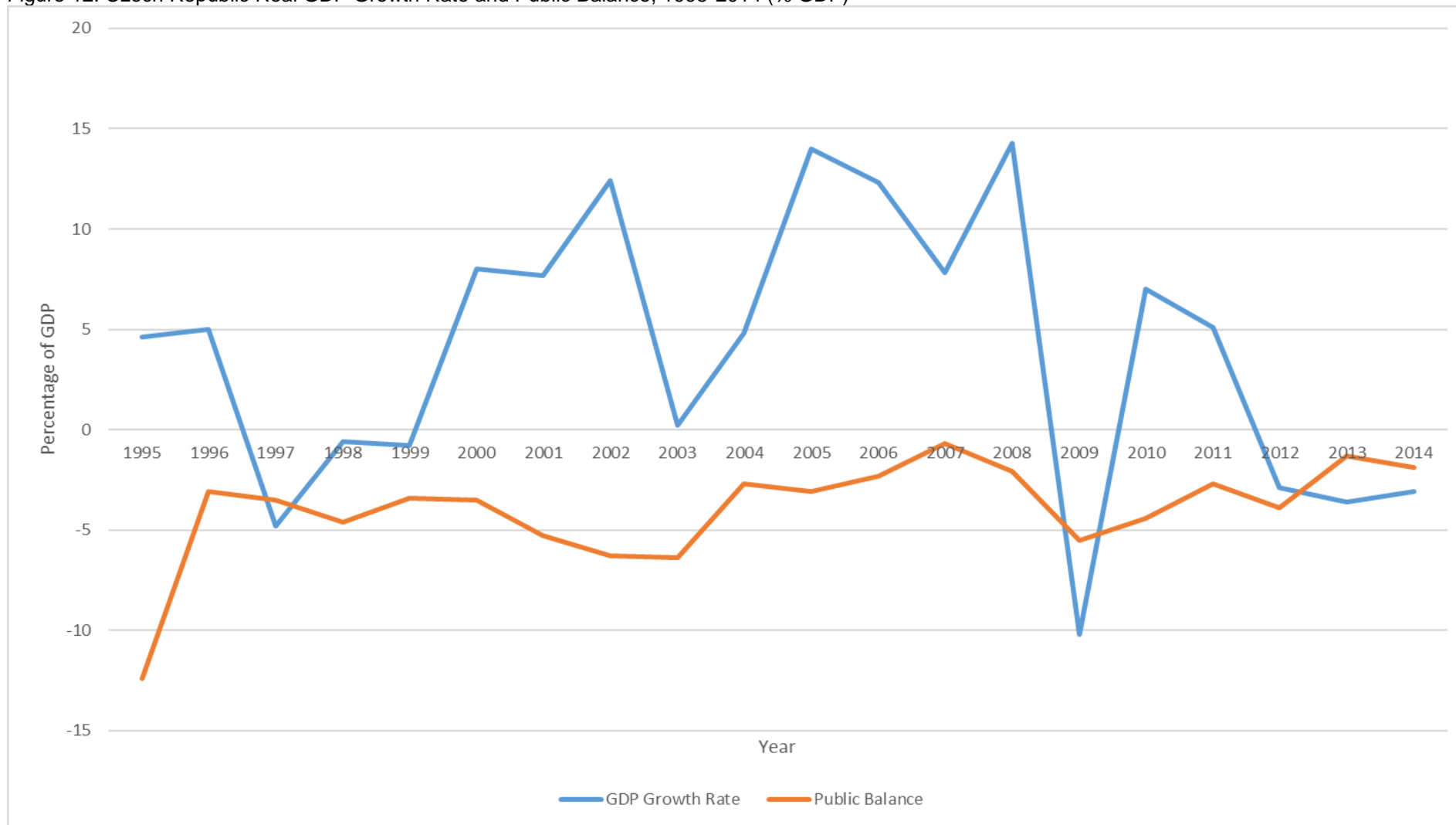
6.5 Appendix E: Real GDP Growth Rate and Public Balance Line Graph

Figure 11: Belgium Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



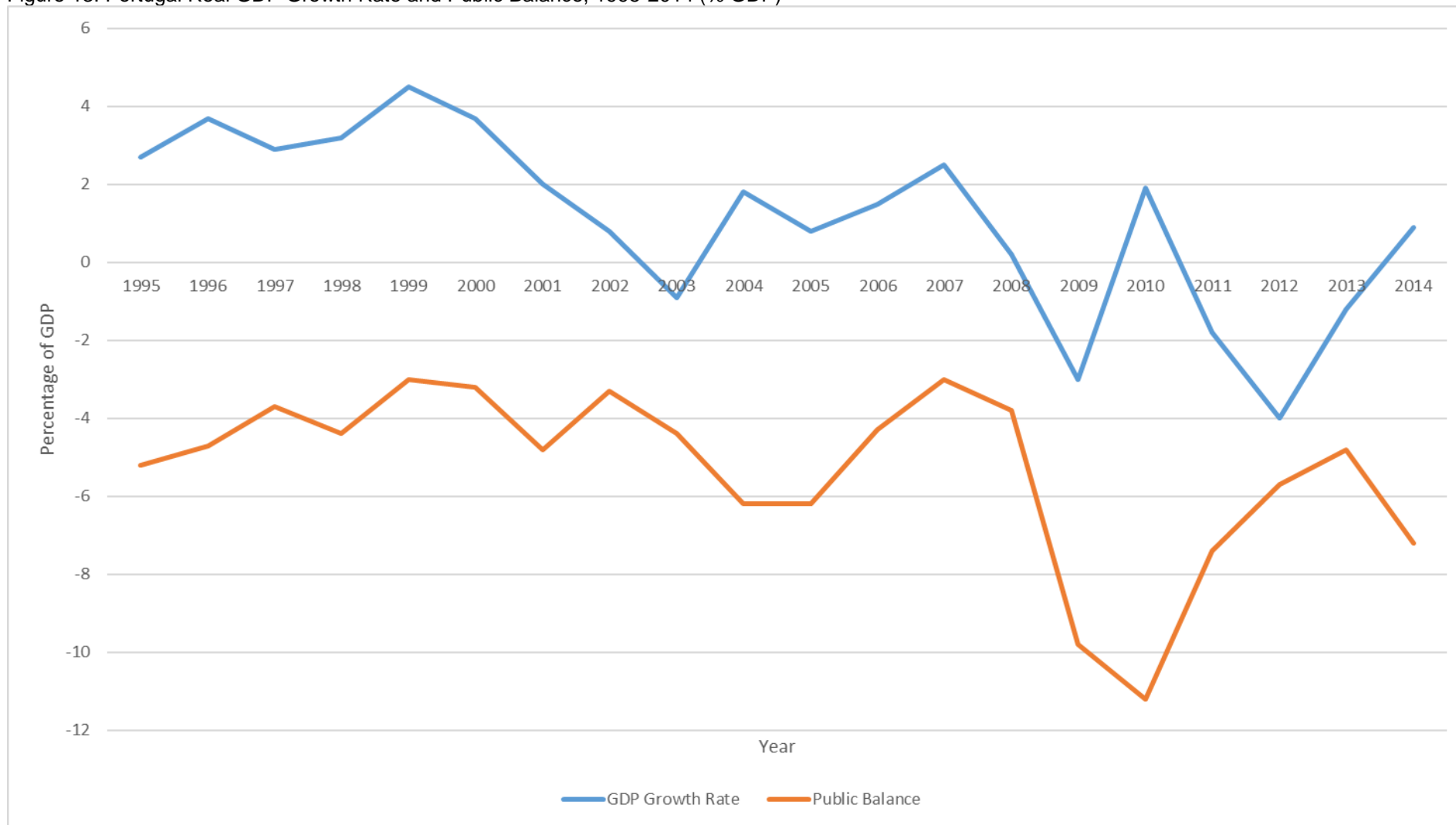
Data: Table 8&2

Figure 12: Czech Republic Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



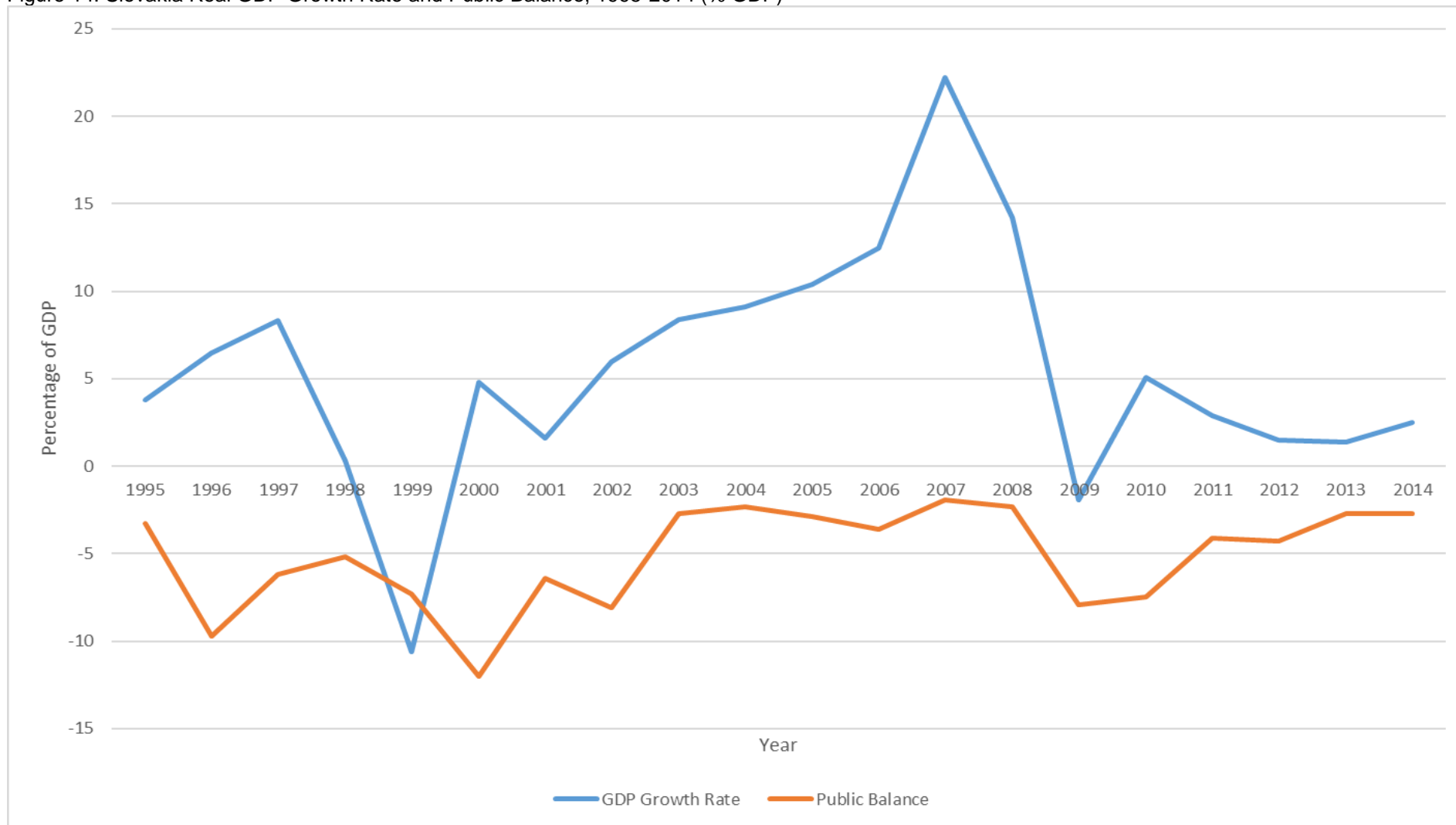
Data: Table 8&2

Figure 13: Portugal Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



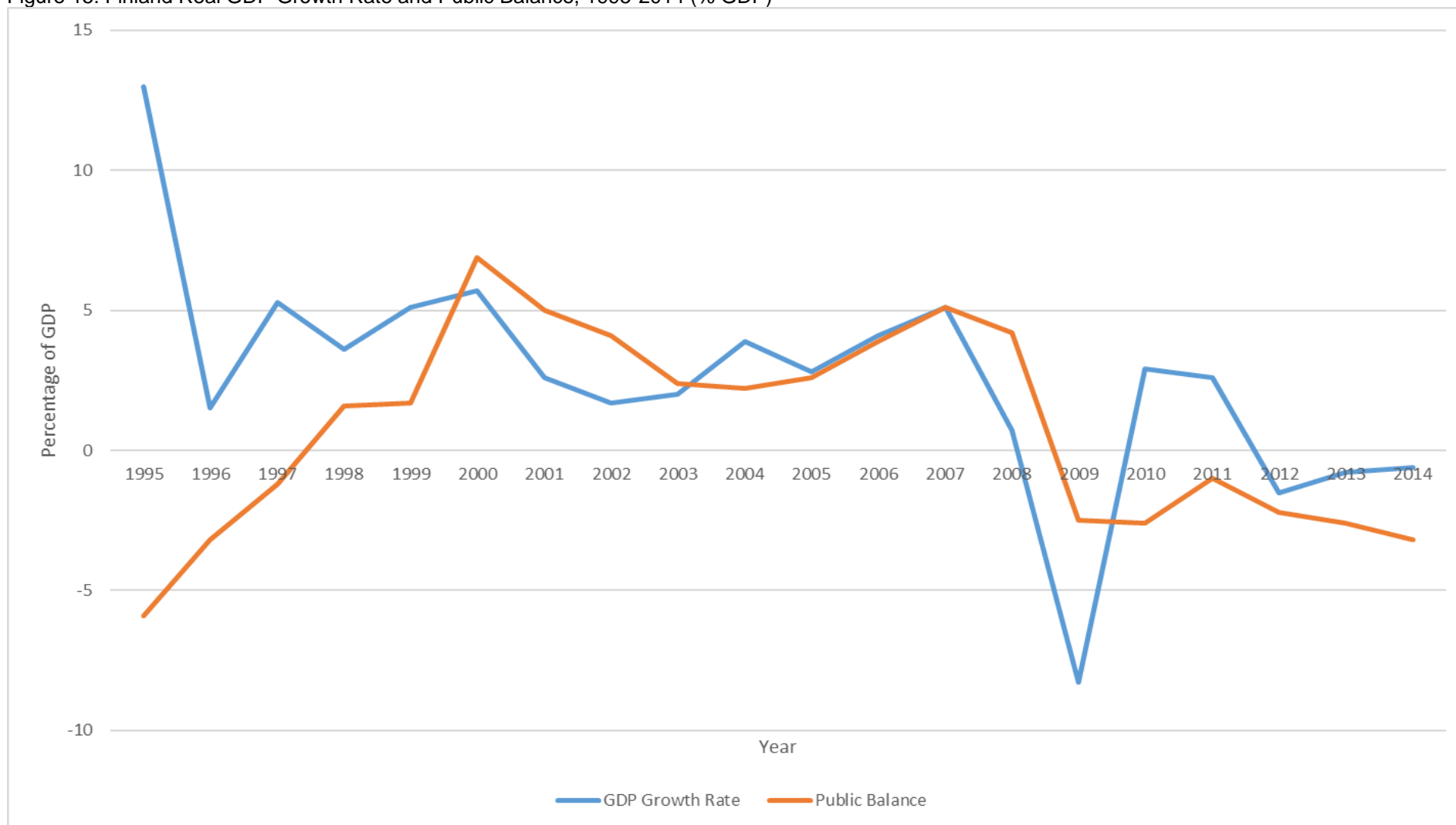
Data: Table 8&2

Figure 14: Slovakia Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



Data: Table 8&2

Figure 15: Finland Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



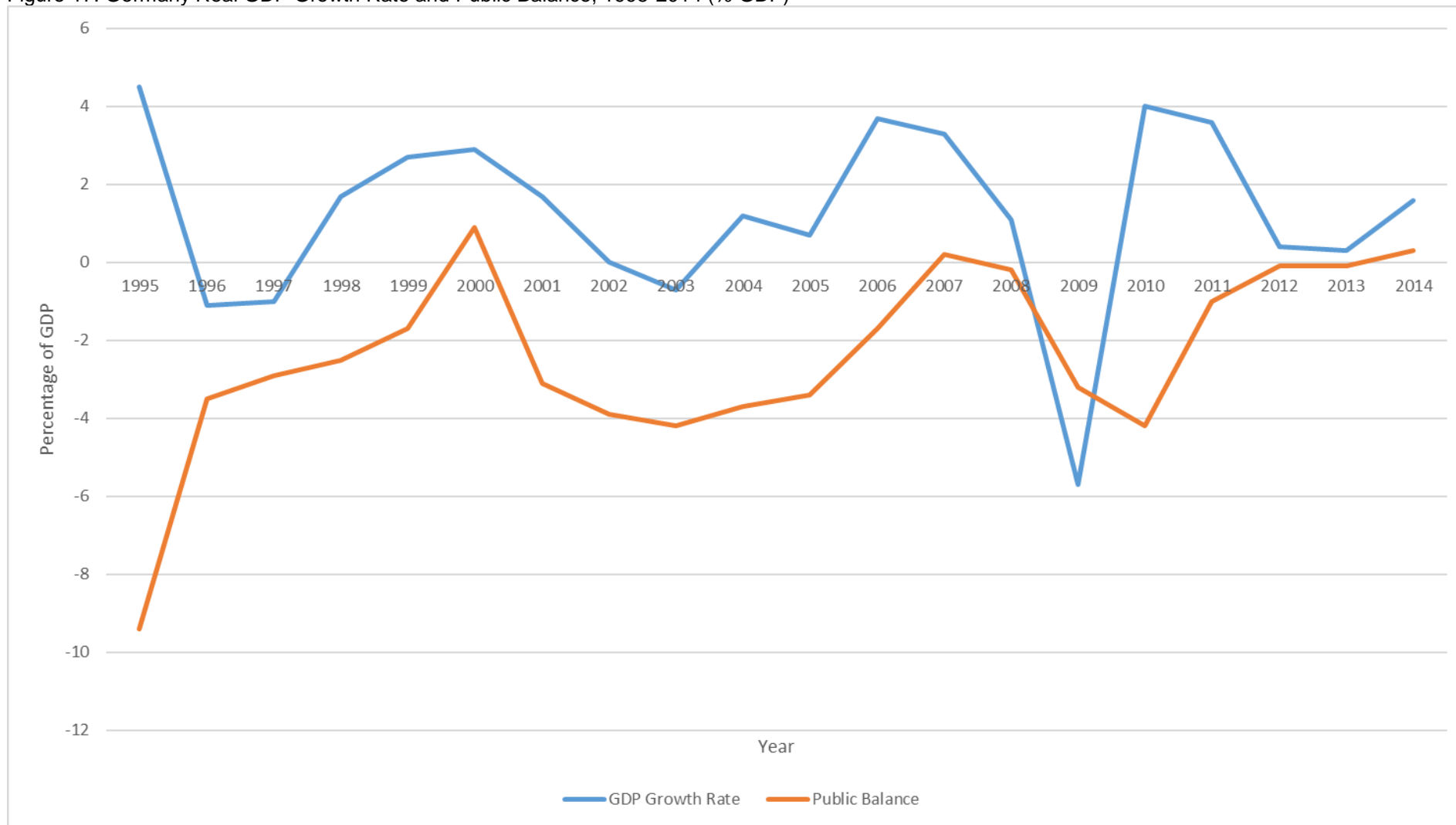
Data: Table 8&2

Figure 16: Netherlands Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



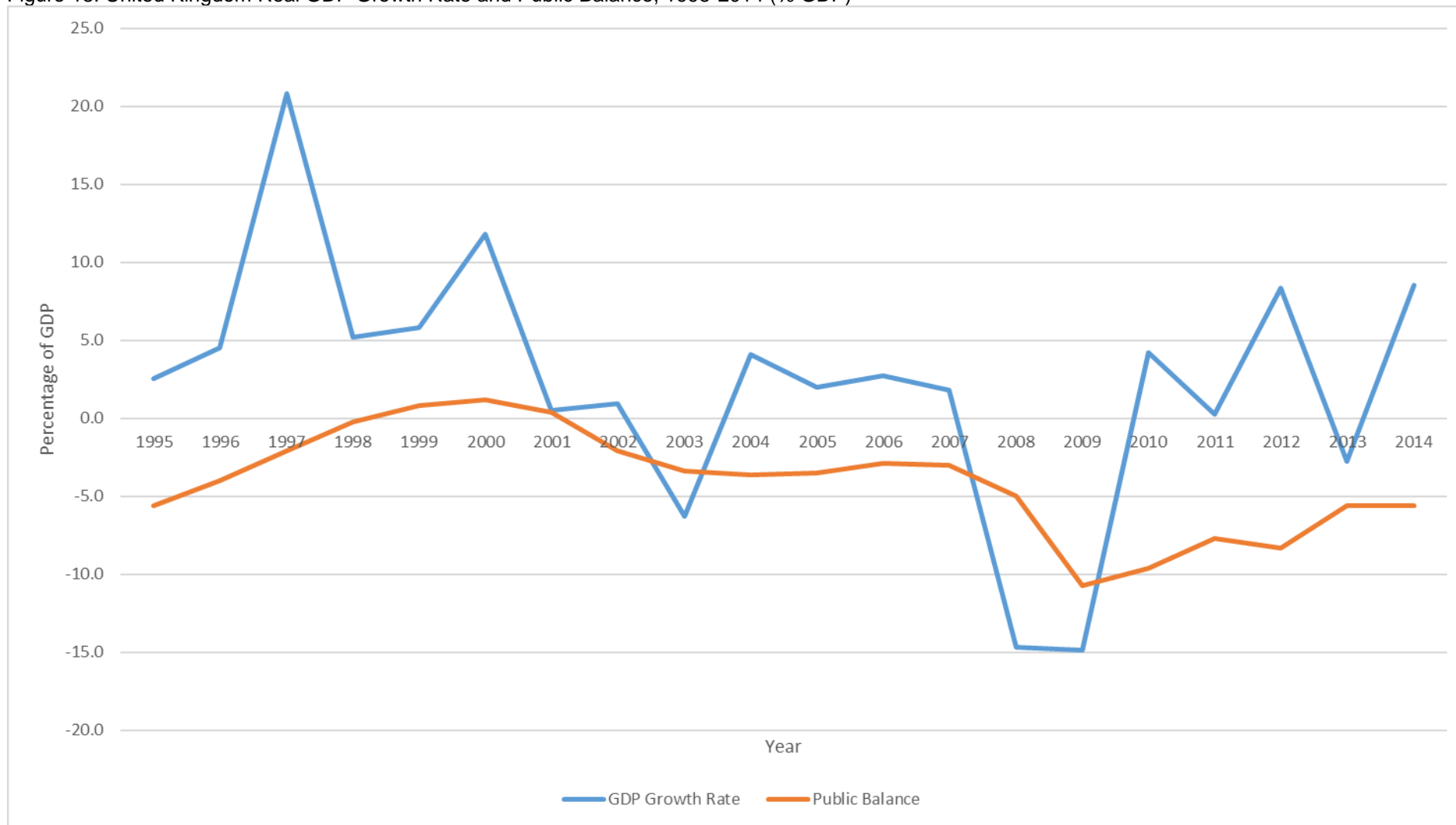
Data: Table 8&2

Figure 17: Germany Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



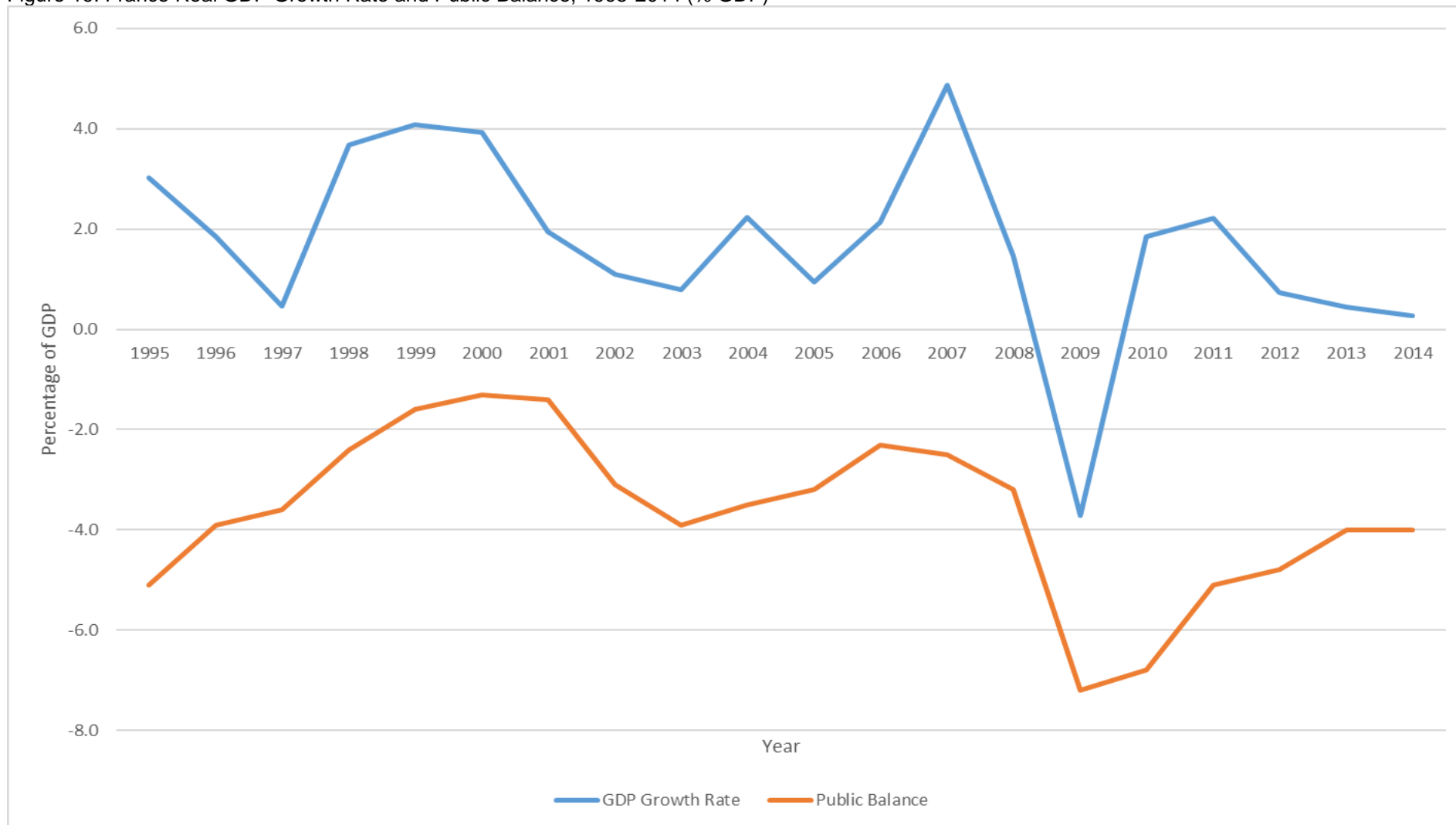
Data: Table 8&2

Figure 18: United Kingdom Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



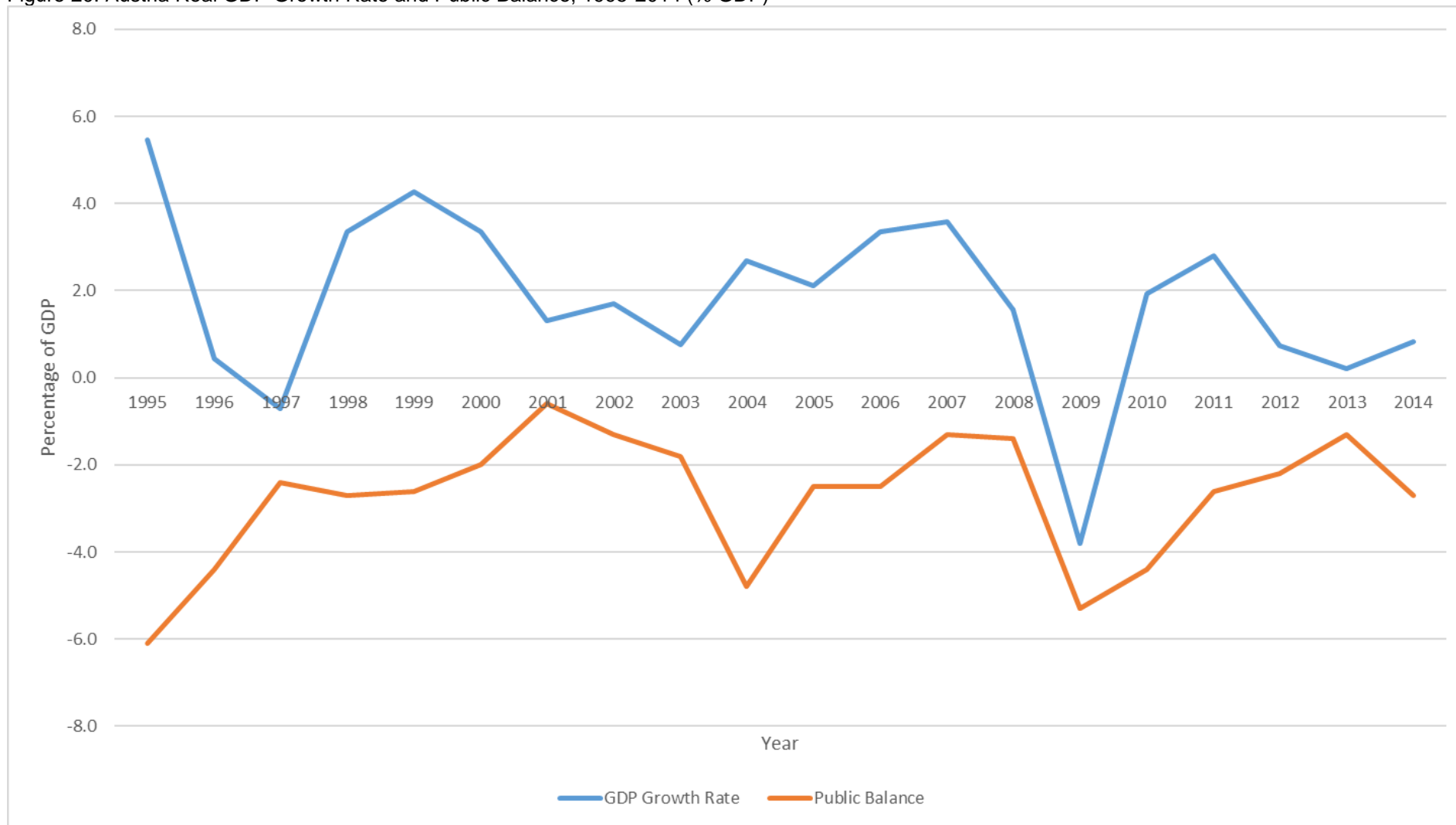
Data: Table 8&2

Figure 19: France Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



Data: Table 8&2

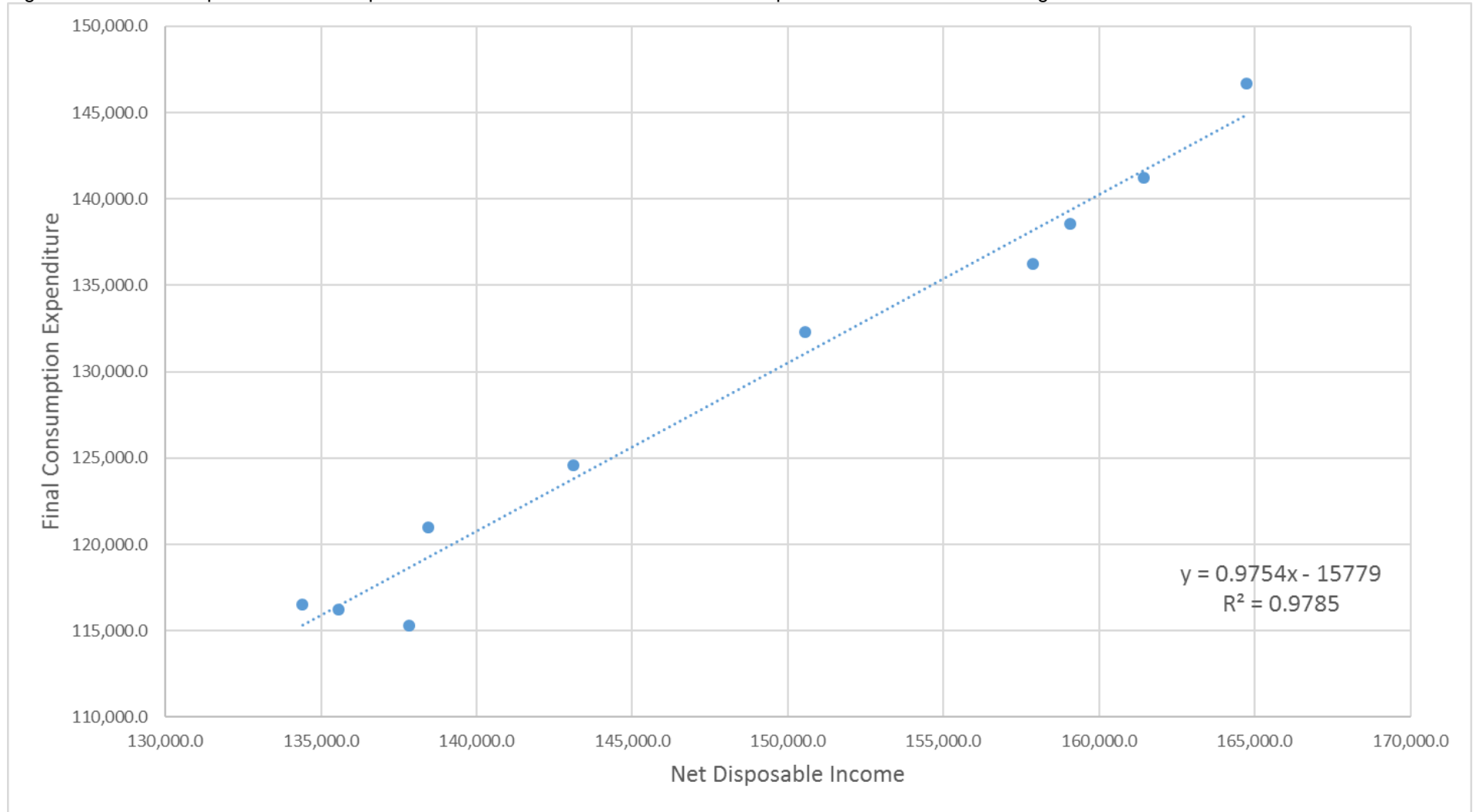
Figure 20: Austria Real GDP Growth Rate and Public Balance, 1995-2014 (% GDP)



Data: Table 8&2

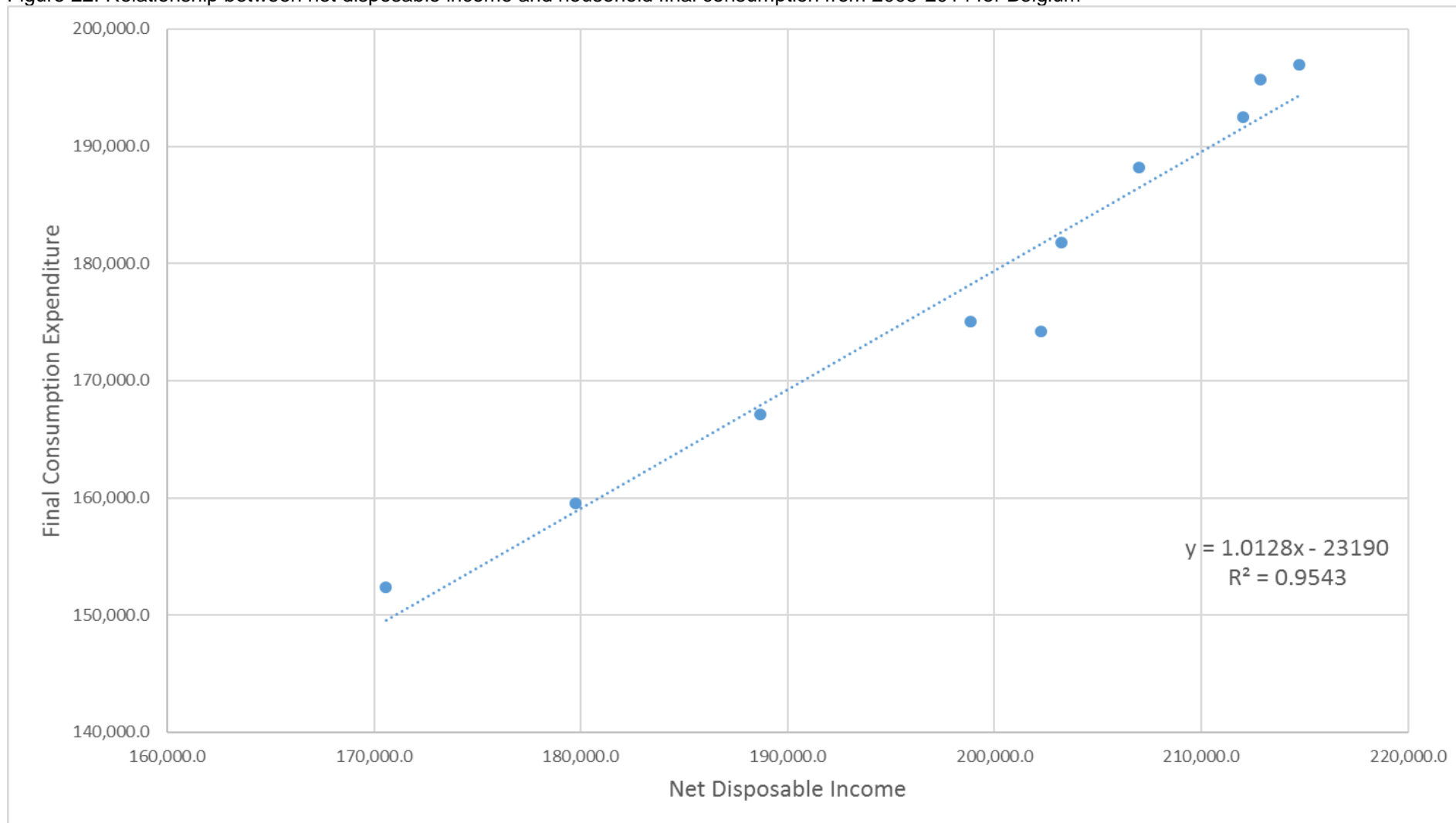
6.6 Appendix F: Scatter Plot for Marginal Propensity to Consume (MPC)

Figure 21: Relationship between net disposable income and household final consumption from 1995-2004 for Belgium



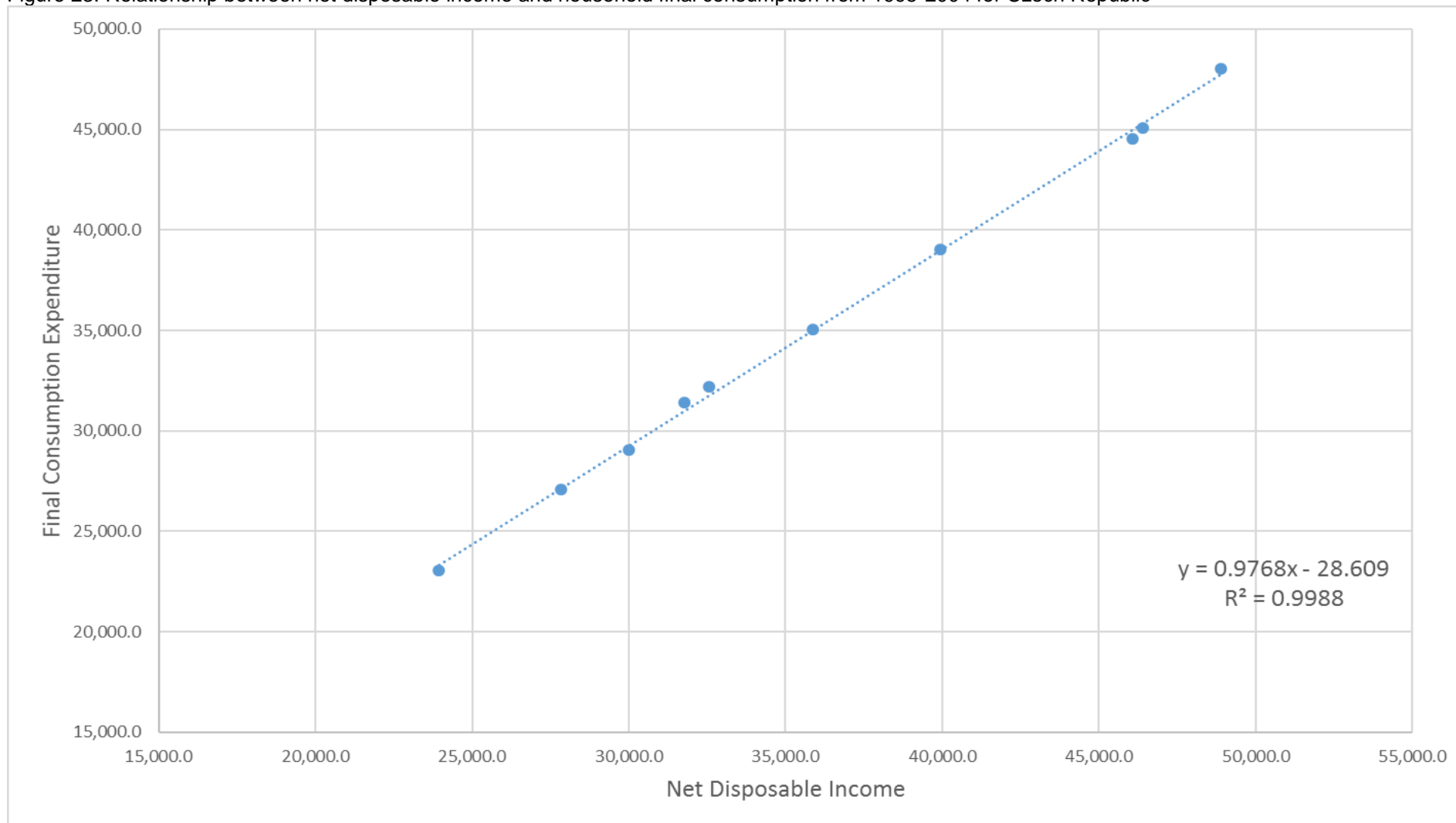
Data: (Table 5 & 6)

Figure 22: Relationship between net disposable income and household final consumption from 2005-2014 for Belgium



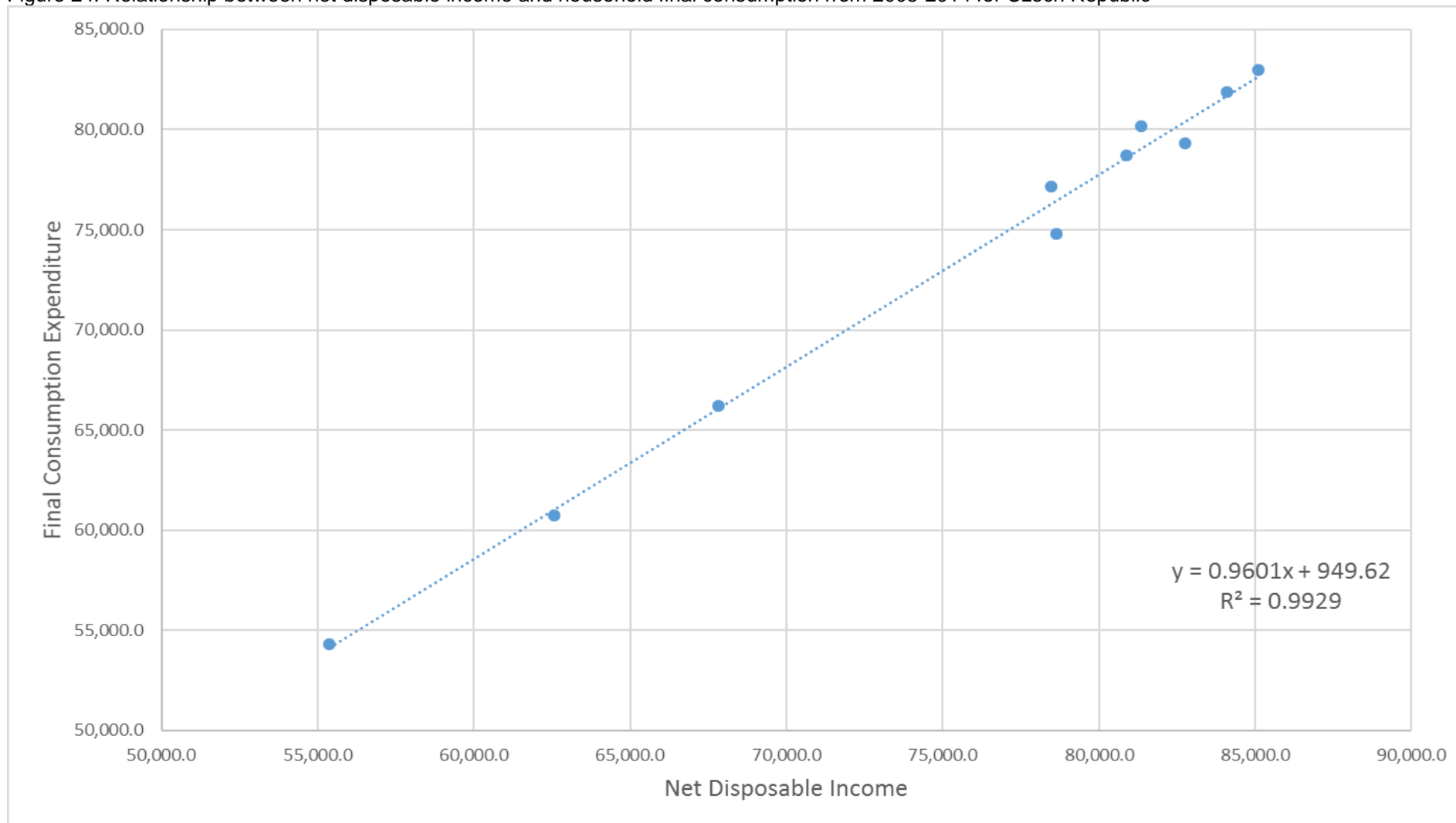
Data: (Table 5 & 6)

Figure 23: Relationship between net disposable income and household final consumption from 1995-2004 for Czech Republic



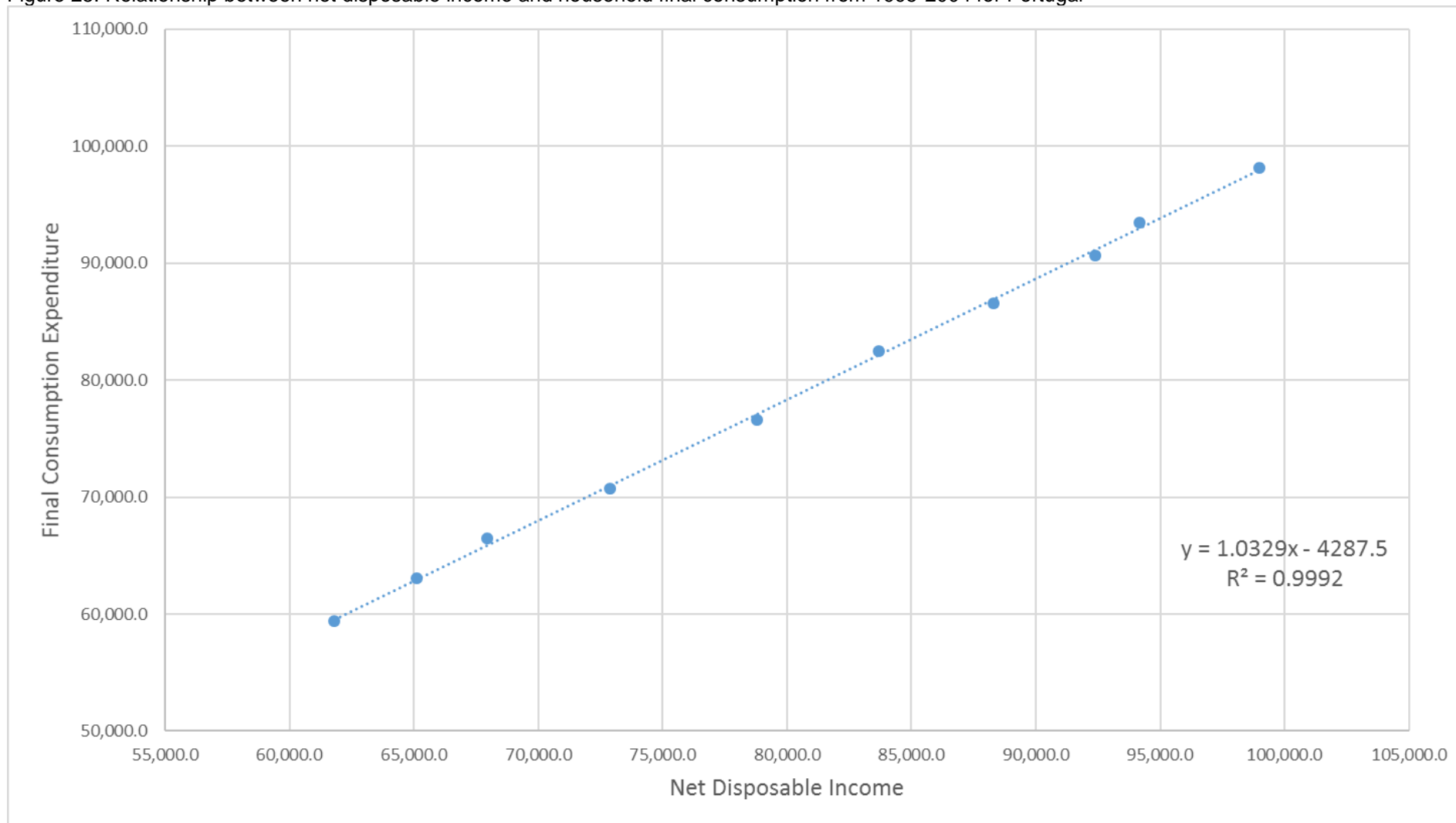
Data: (Table 5 & 6)

Figure 24: Relationship between net disposable income and household final consumption from 2005-2014 for Czech Republic



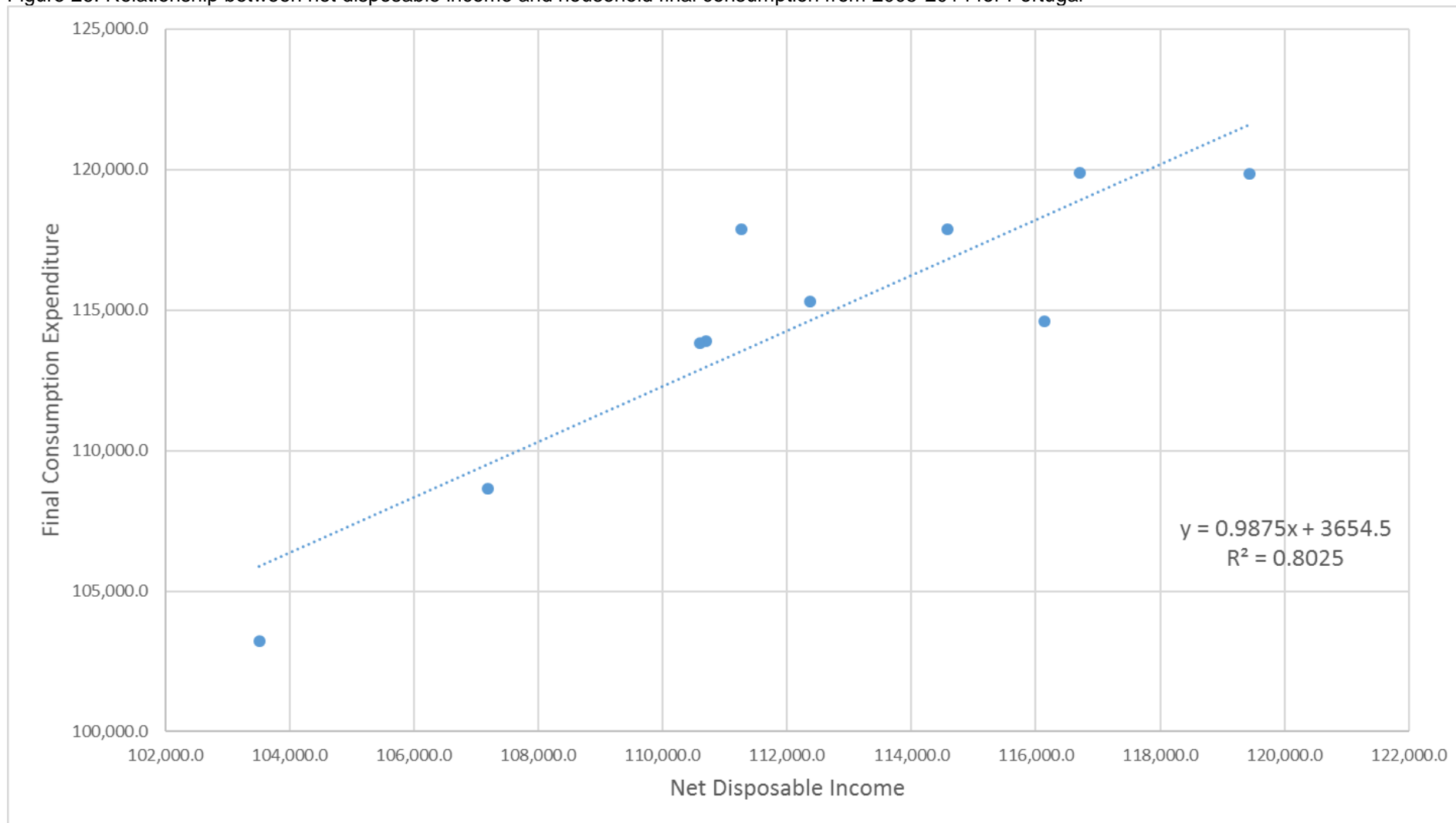
Data: (Table 5 & 6)

Figure 25: Relationship between net disposable income and household final consumption from 1995-2004 for Portugal



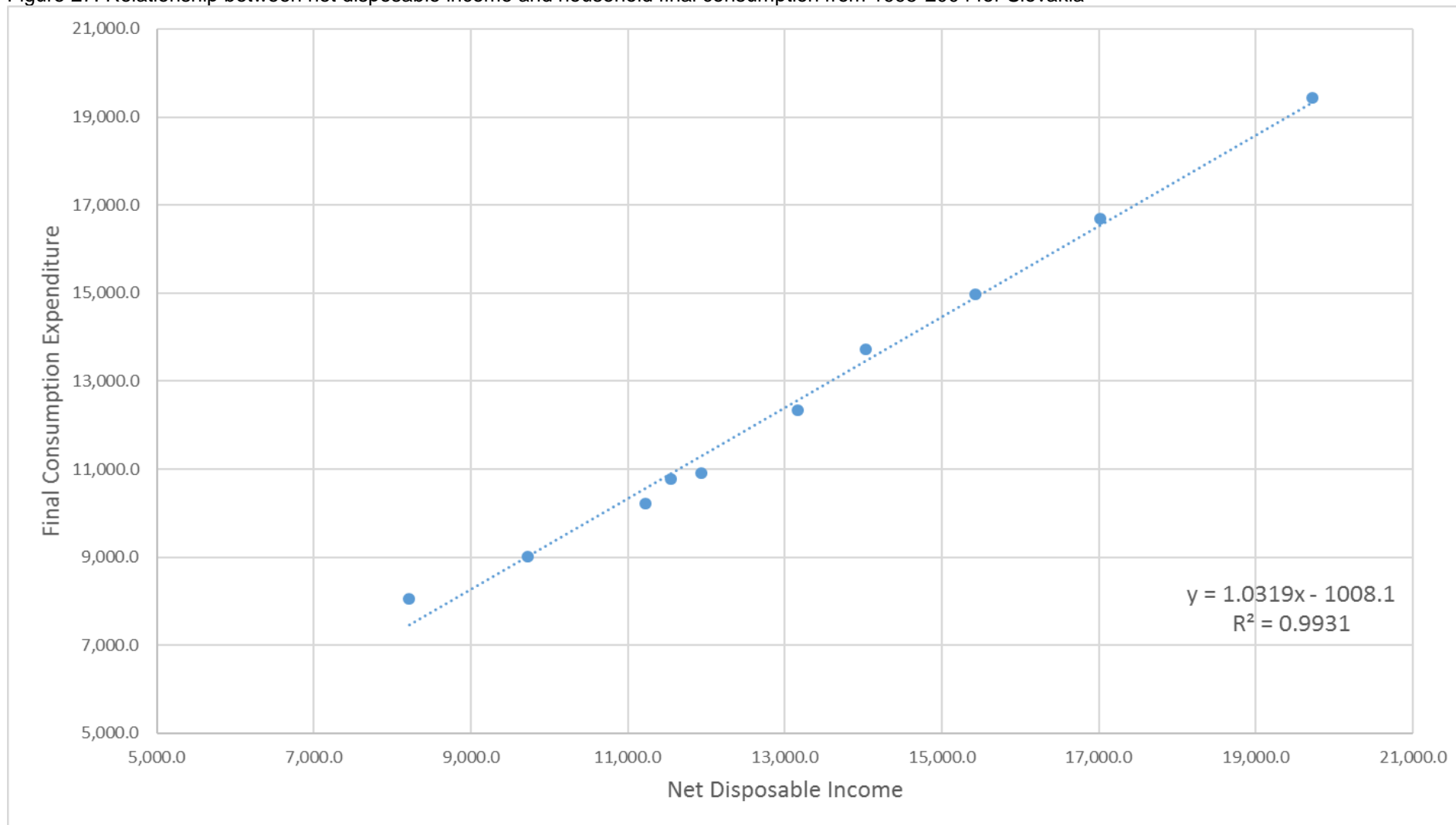
Data: (Table 5 & 6)

Figure 26: Relationship between net disposable income and household final consumption from 2005-2014 for Portugal



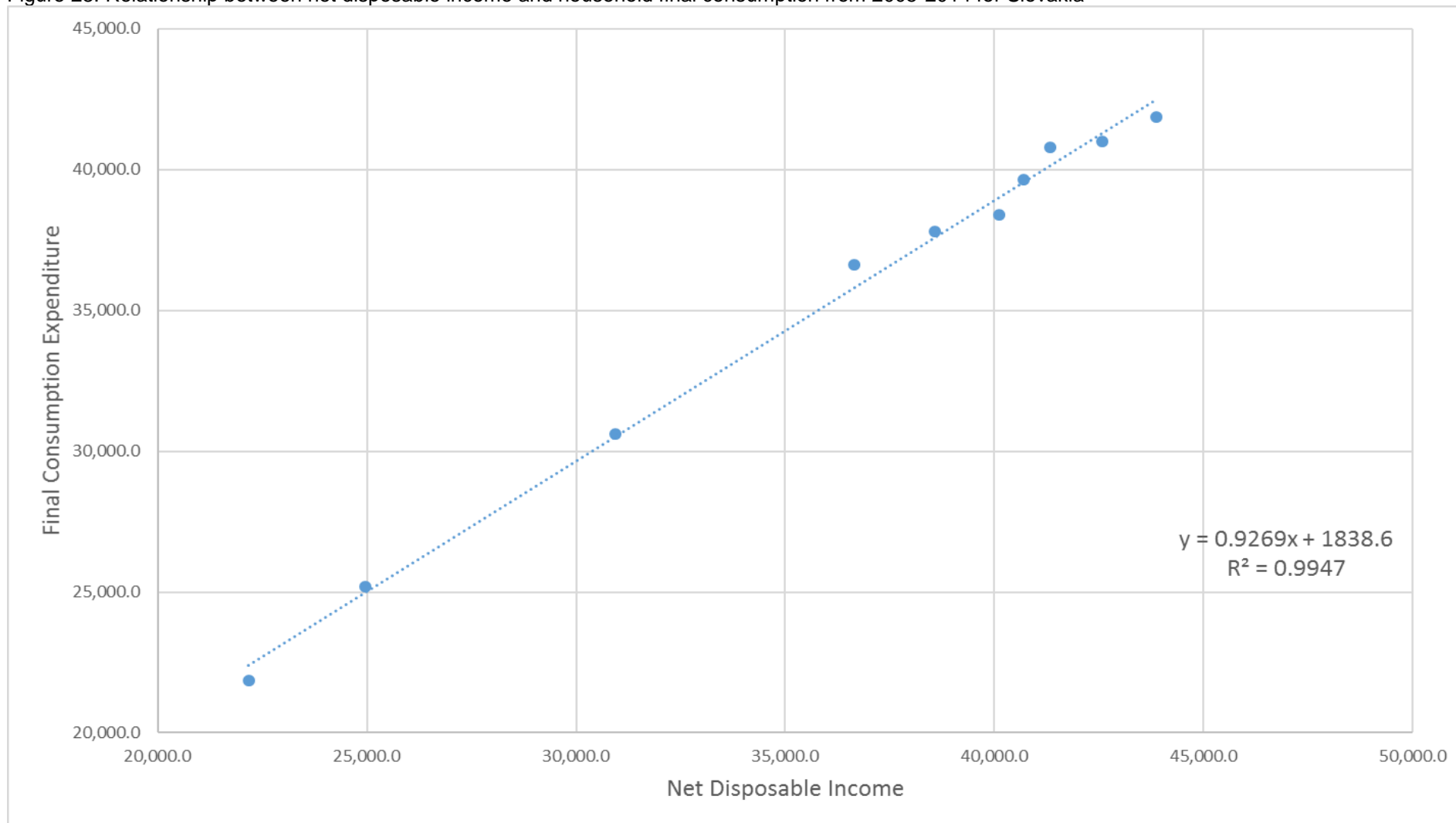
Data: (Table 5 & 6)

Figure 27: Relationship between net disposable income and household final consumption from 1995-2004 for Slovakia



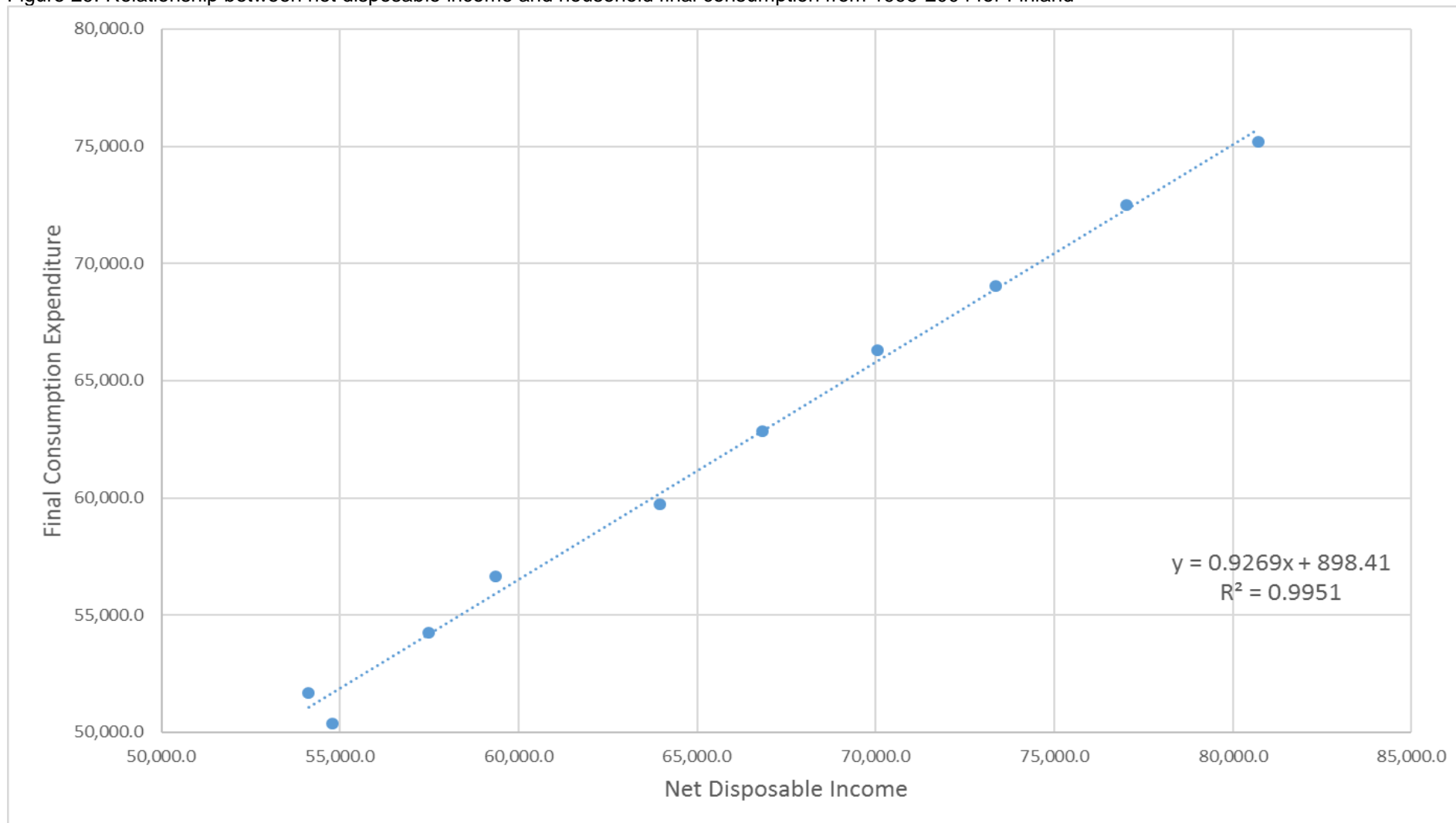
Data: (Table 5 & 6)

Figure 28: Relationship between net disposable income and household final consumption from 2005-2014 for Slovakia



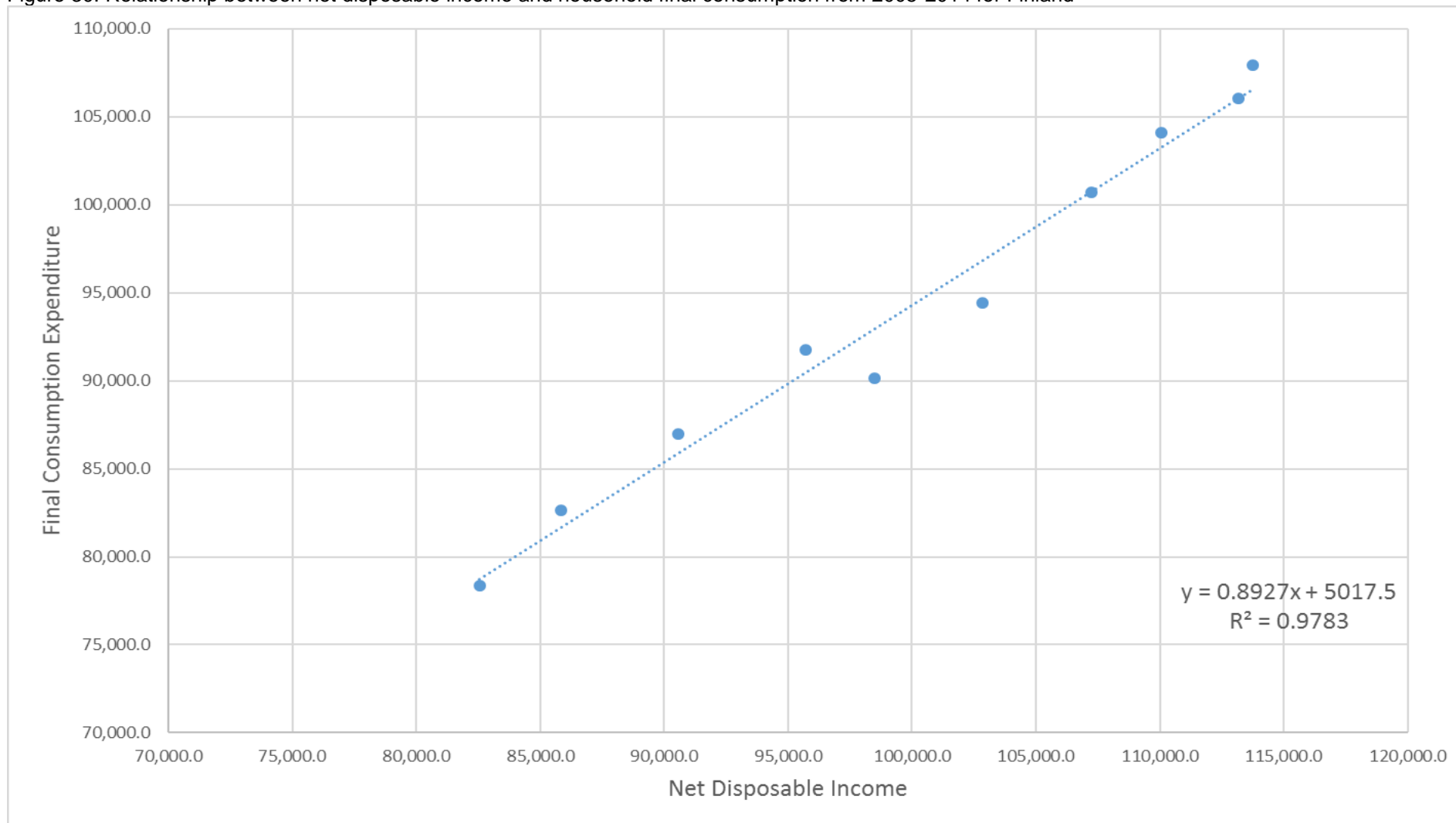
Data: (Table 5 & 6)

Figure 29: Relationship between net disposable income and household final consumption from 1995-2004 for Finland



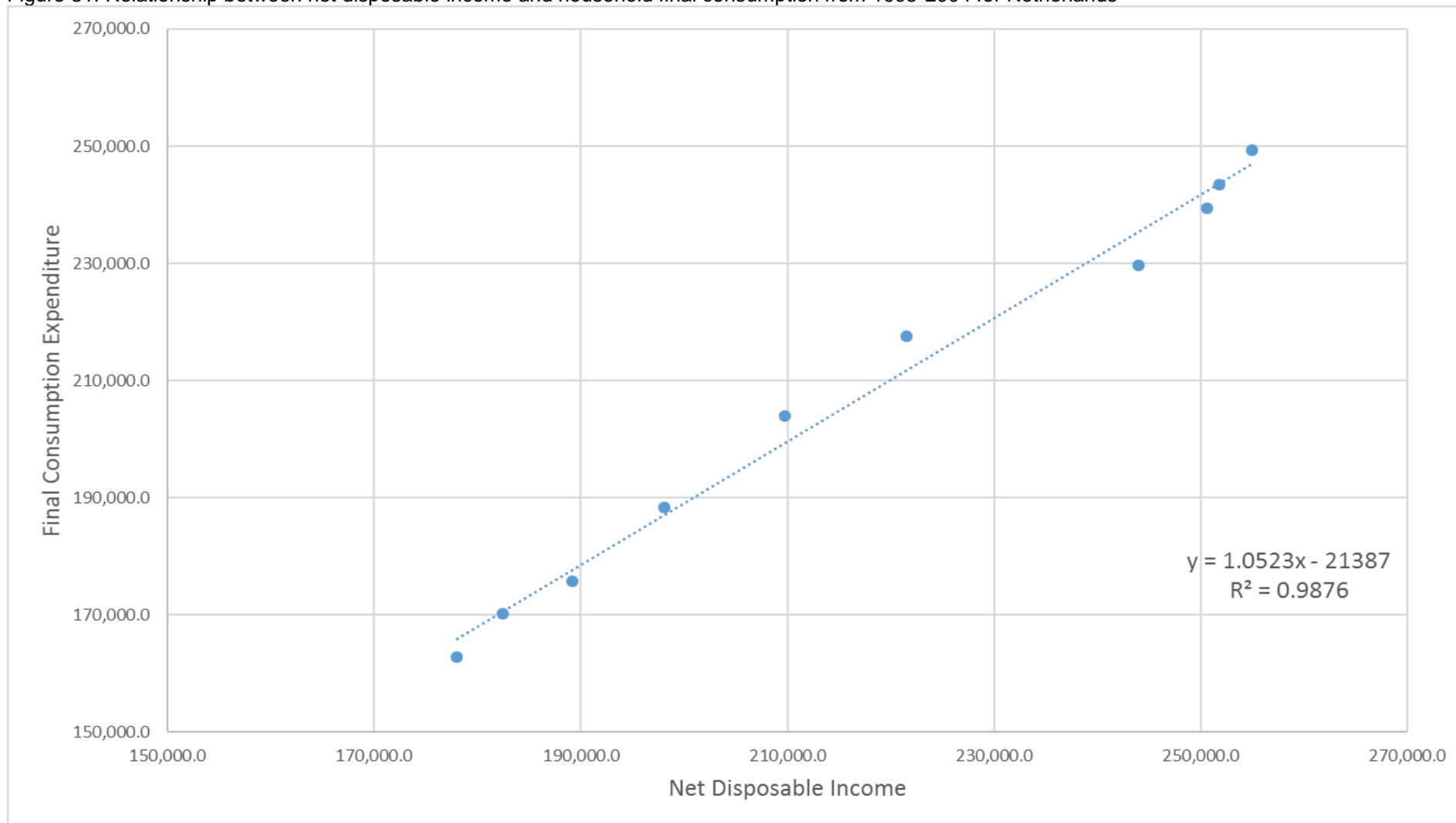
Data: (Table 5 & 6)

Figure 30: Relationship between net disposable income and household final consumption from 2005-2014 for Finland



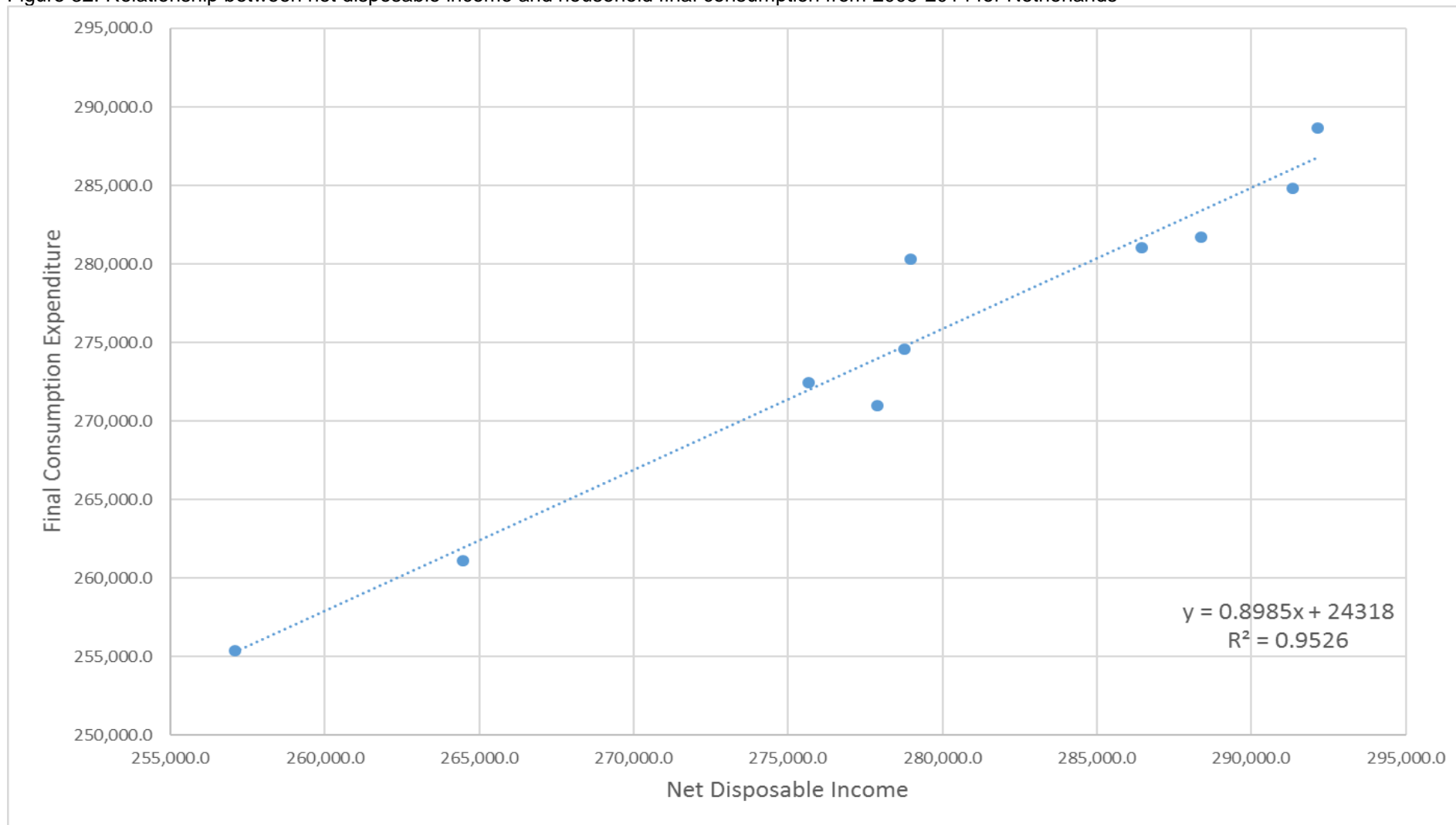
Data: (Table 5 & 6)

Figure 31: Relationship between net disposable income and household final consumption from 1995-2004 for Netherlands



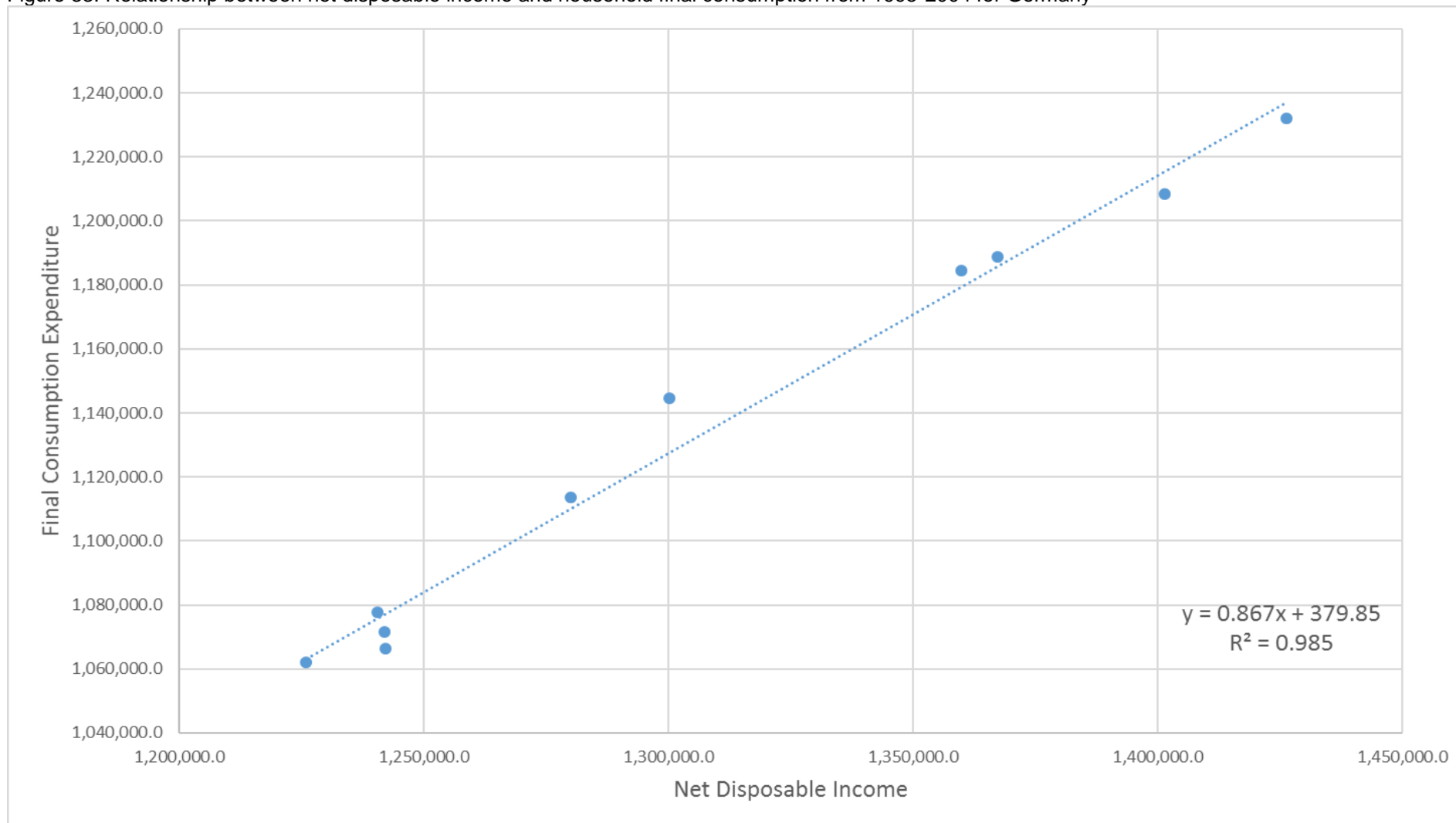
Data: (Table 5 & 6)

Figure 32: Relationship between net disposable income and household final consumption from 2005-2014 for Netherlands



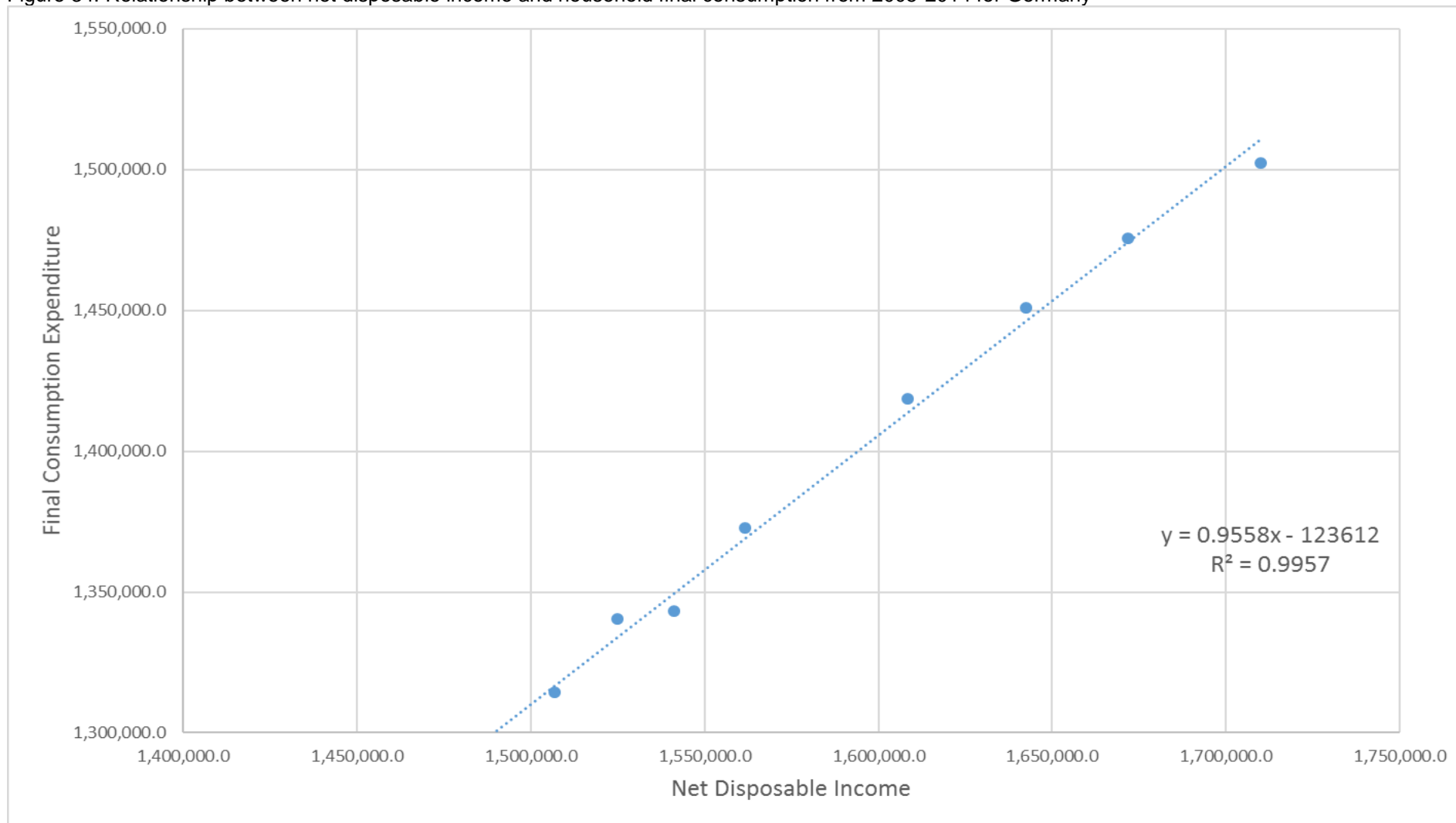
Data: (Table 5 & 6)

Figure 33: Relationship between net disposable income and household final consumption from 1995-2004 for Germany



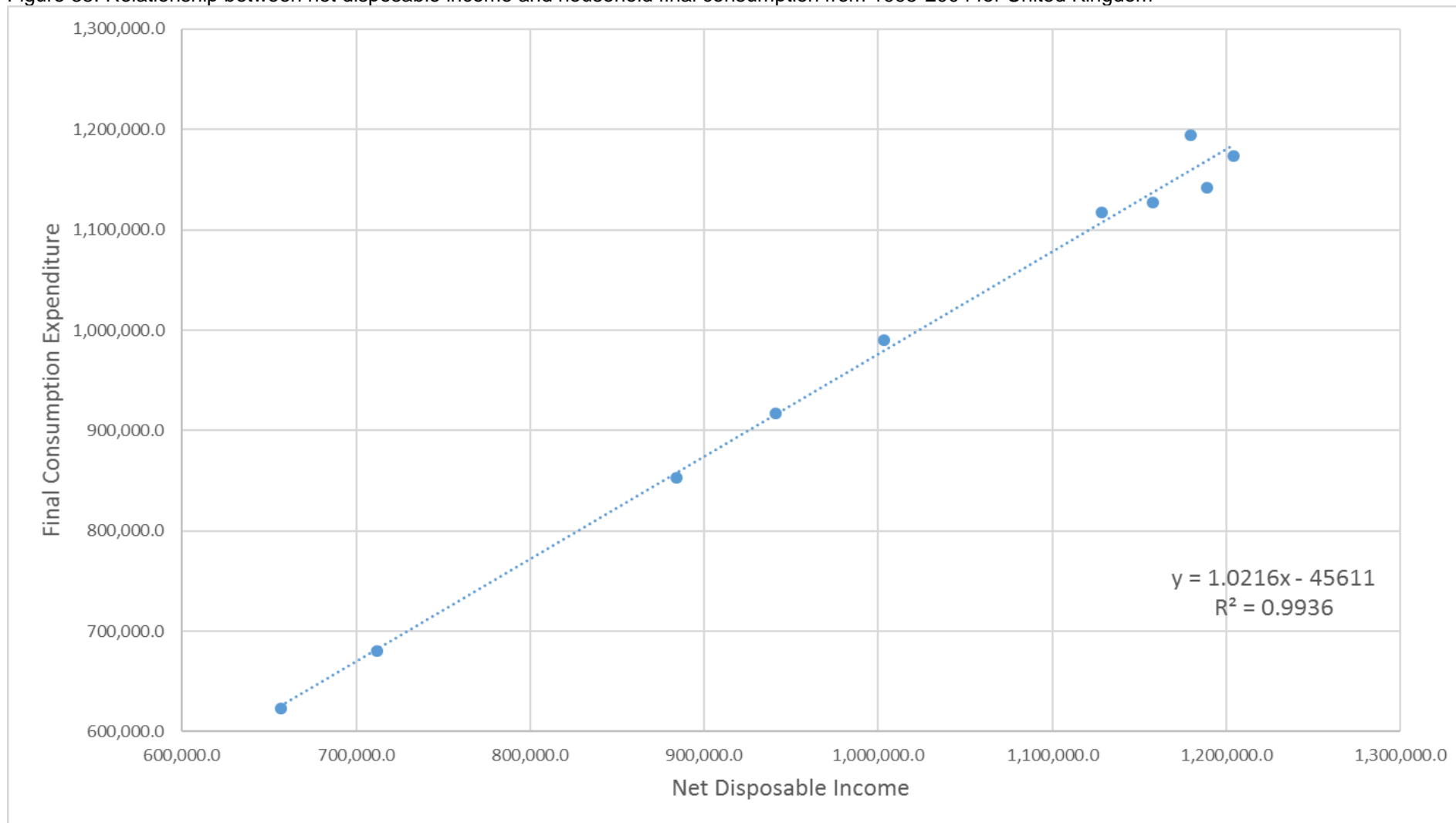
Data: (Table 5 & 6)

Figure 34: Relationship between net disposable income and household final consumption from 2005-2014 for Germany



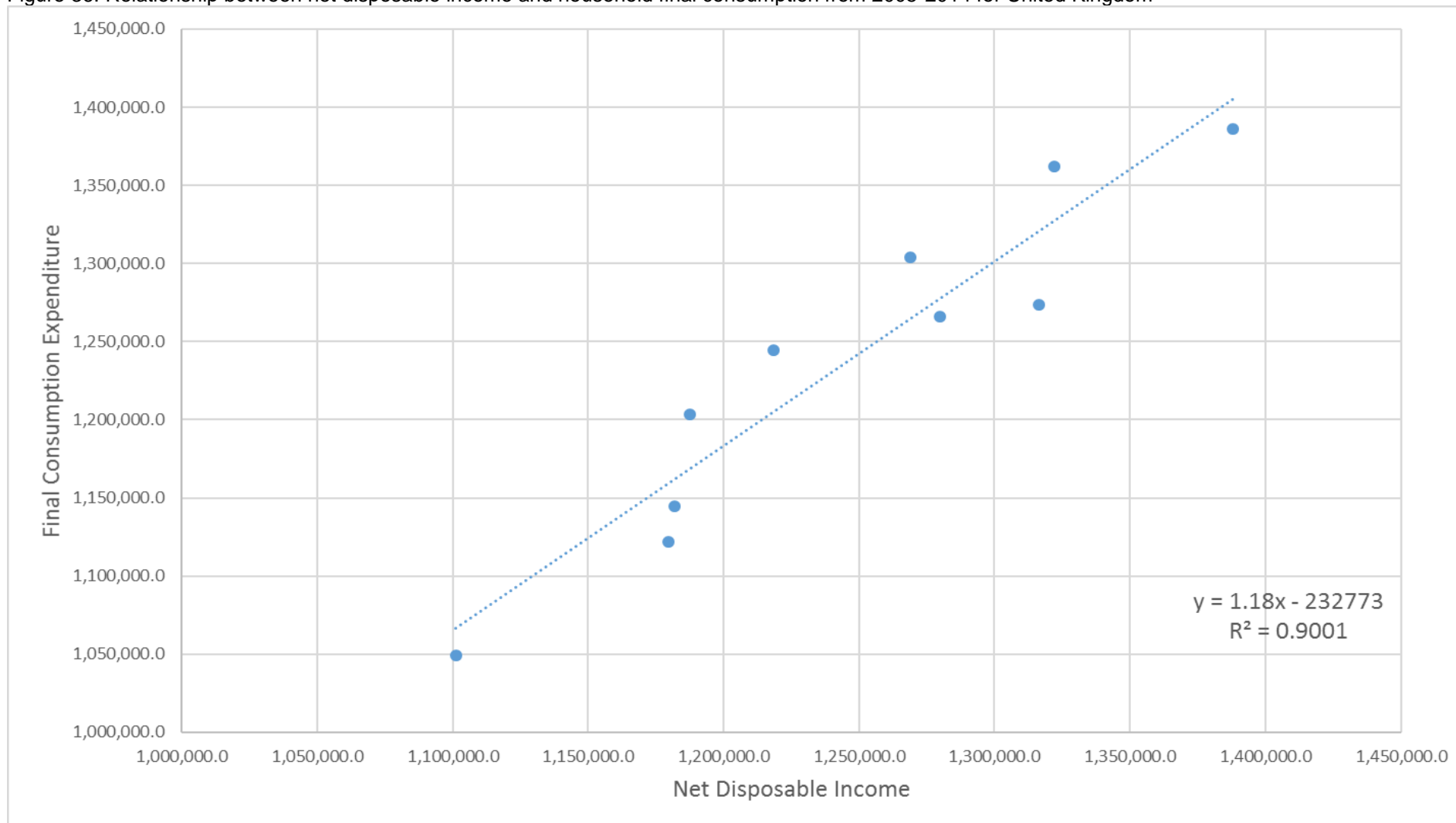
Data: (Table 5 & 6)

Figure 35: Relationship between net disposable income and household final consumption from 1995-2004 for United Kingdom



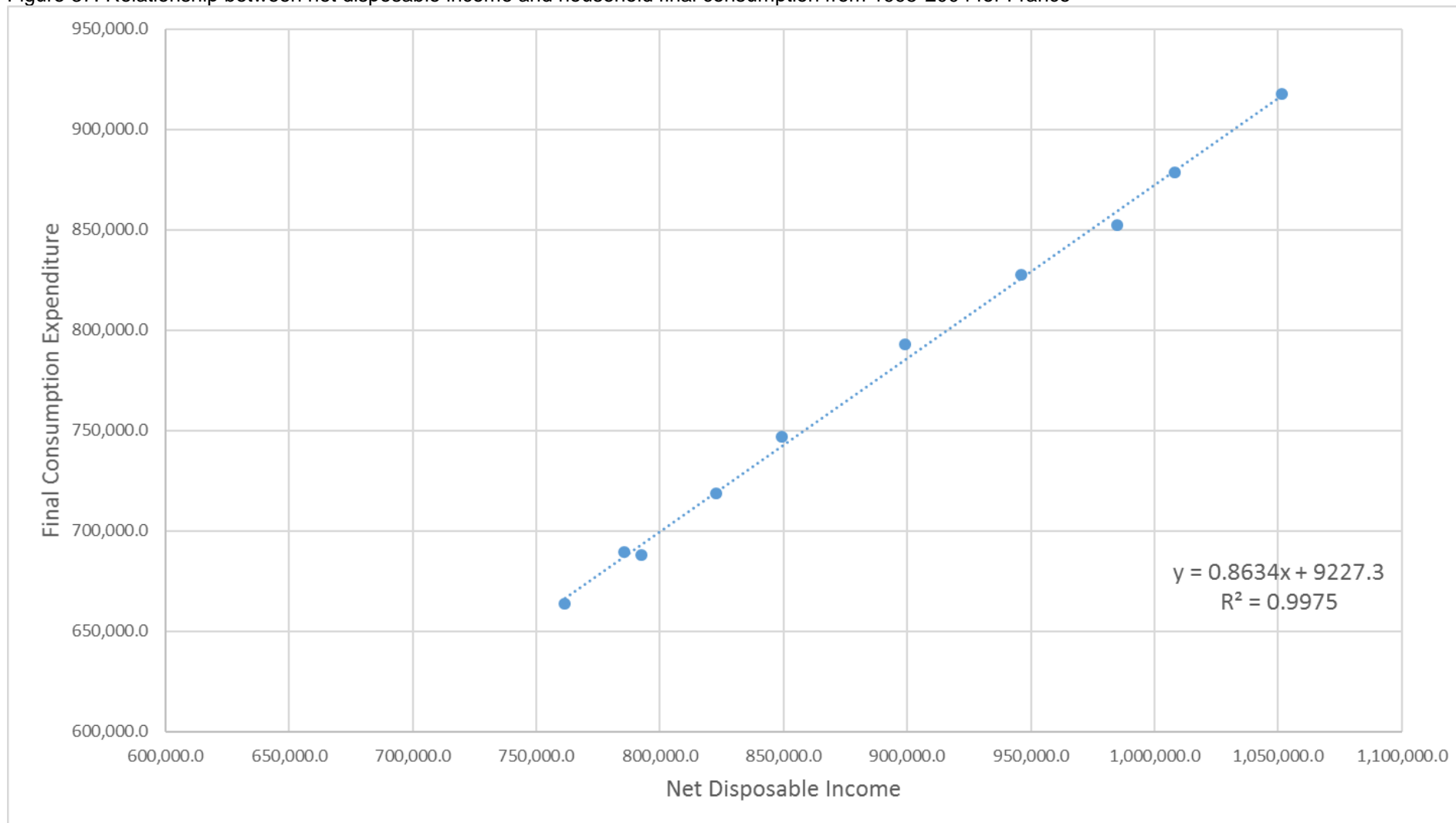
Data: (Table 5 & 6)

Figure 36: Relationship between net disposable income and household final consumption from 2005-2014 for United Kingdom



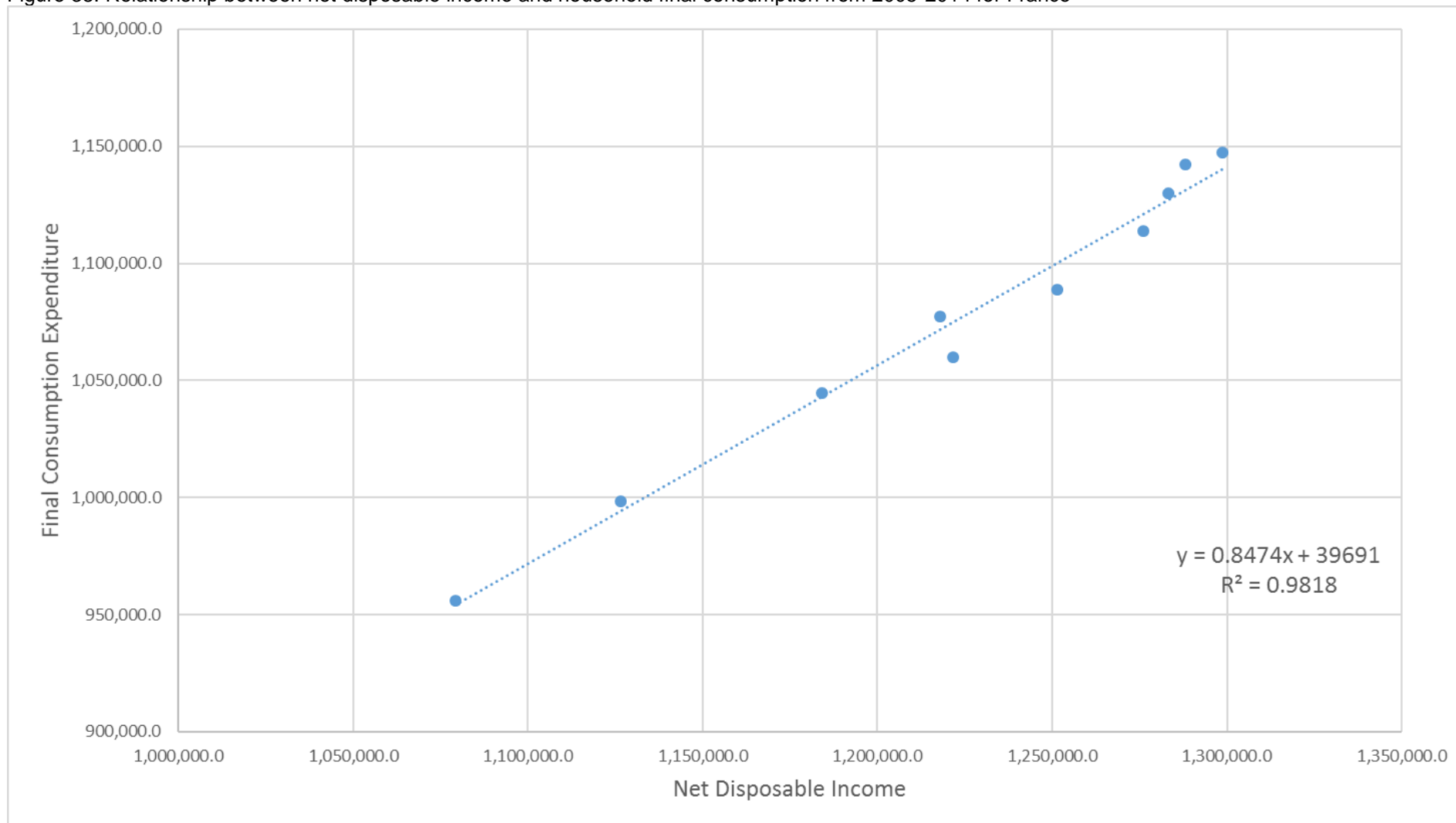
Data: (Table 5 & 6)

Figure 37: Relationship between net disposable income and household final consumption from 1995-2004 for France



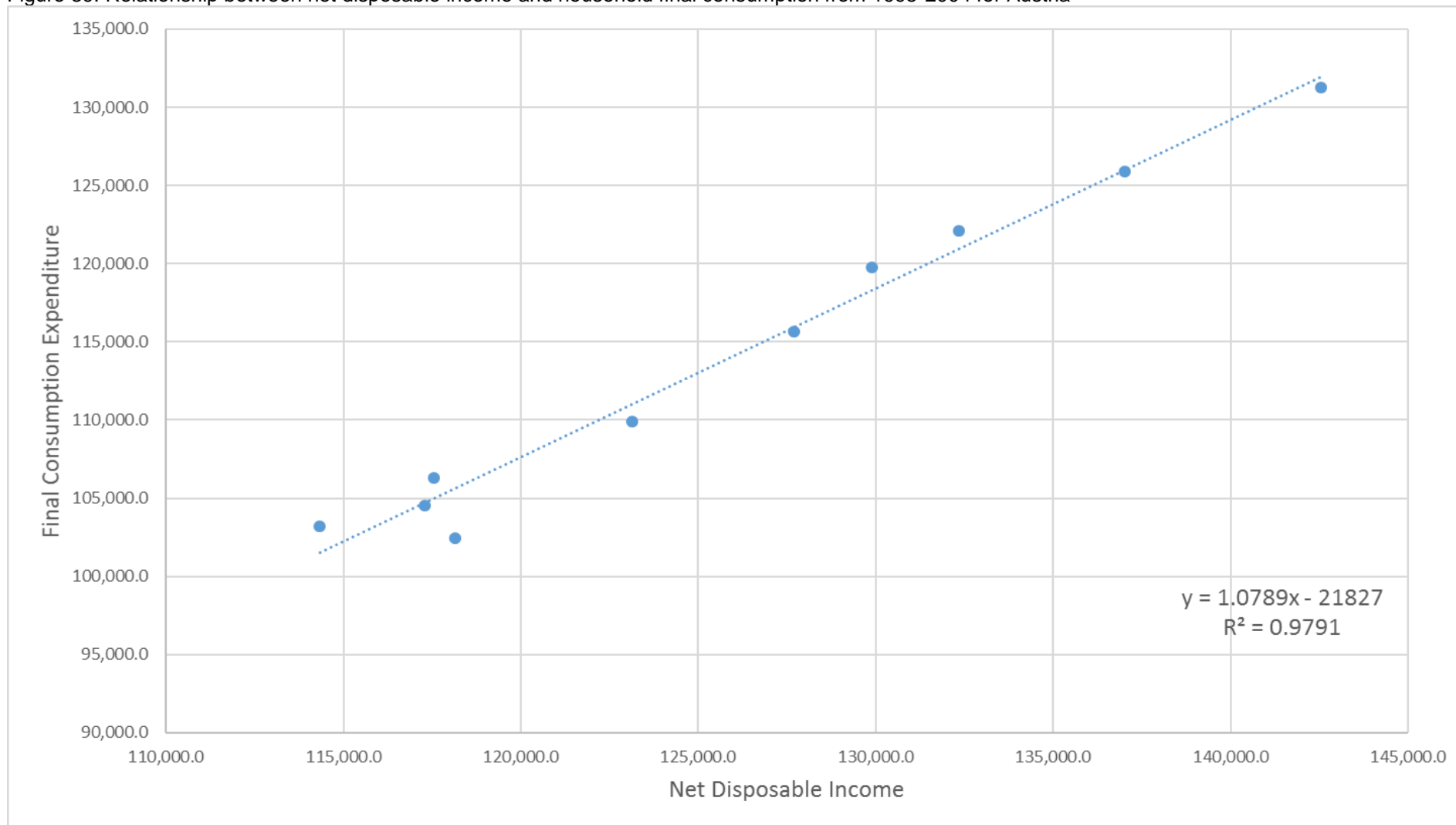
Data: (Table 5 & 6)

Figure 38: Relationship between net disposable income and household final consumption from 2005-2014 for France



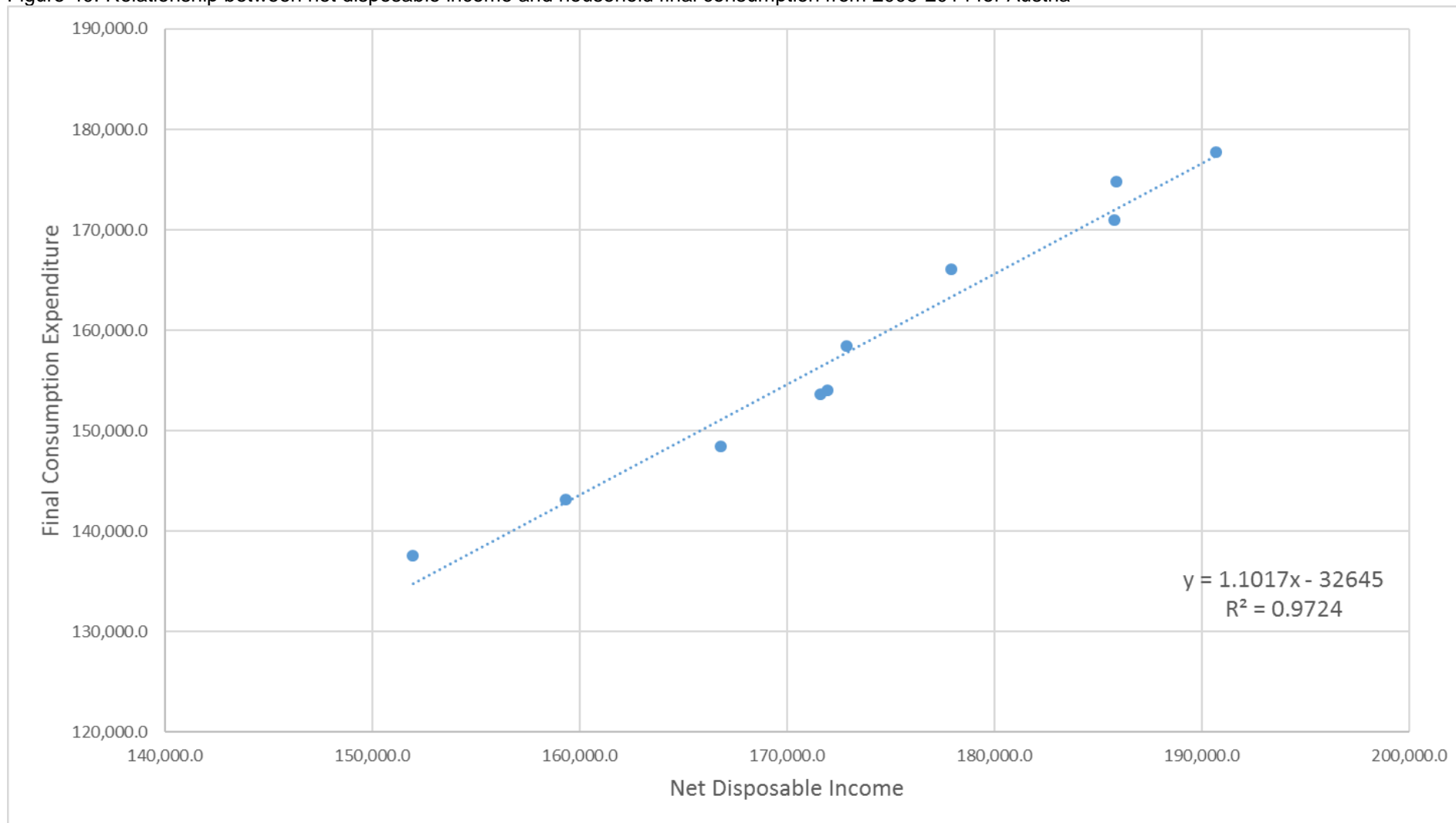
Data: (Table 5 & 6)

Figure 39: Relationship between net disposable income and household final consumption from 1995-2004 for Austria



Data: (Table 5 & 6)

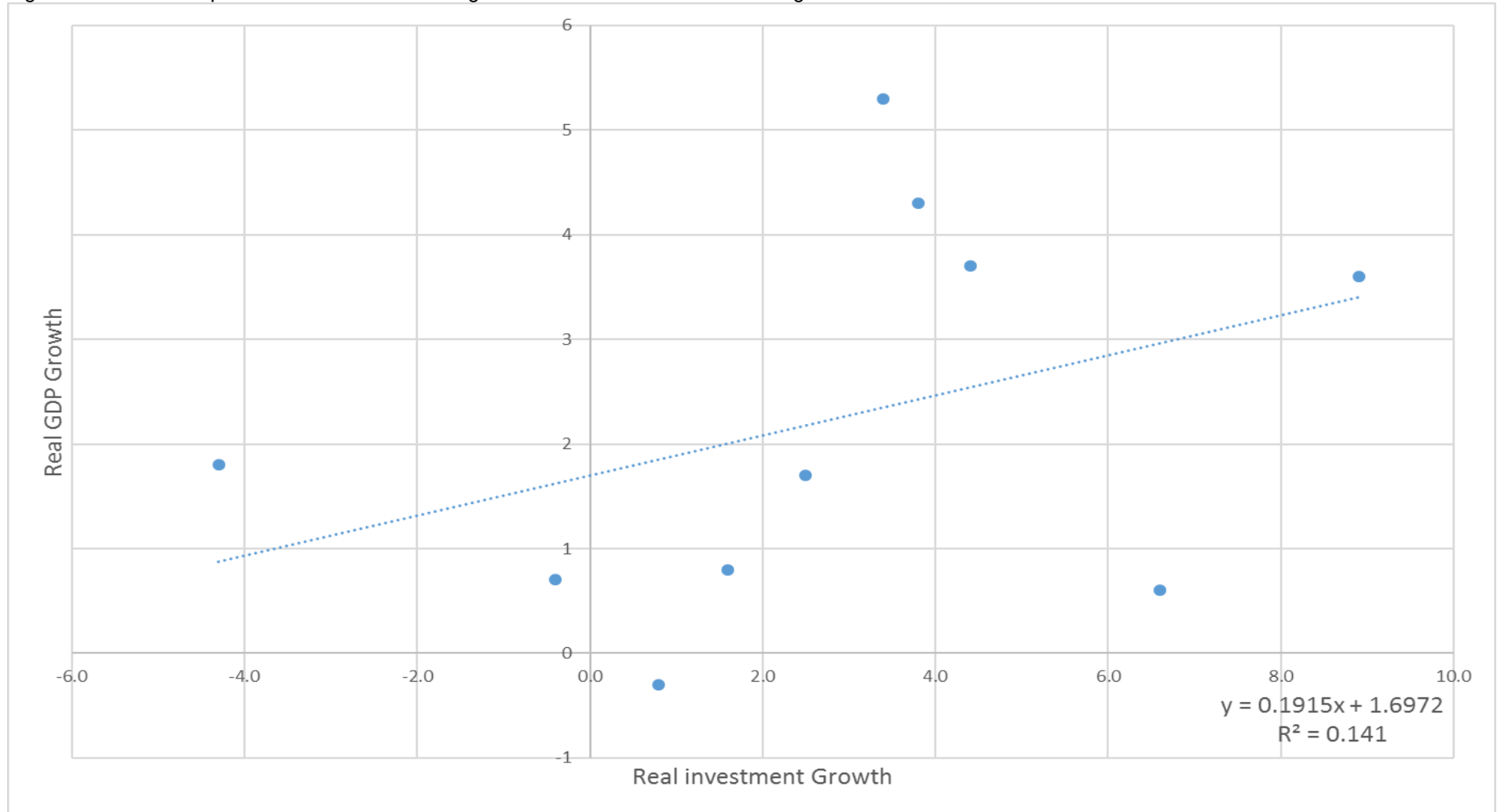
Figure 40: Relationship between net disposable income and household final consumption from 2005-2014 for Austria



Data: (Table 5 & 6)

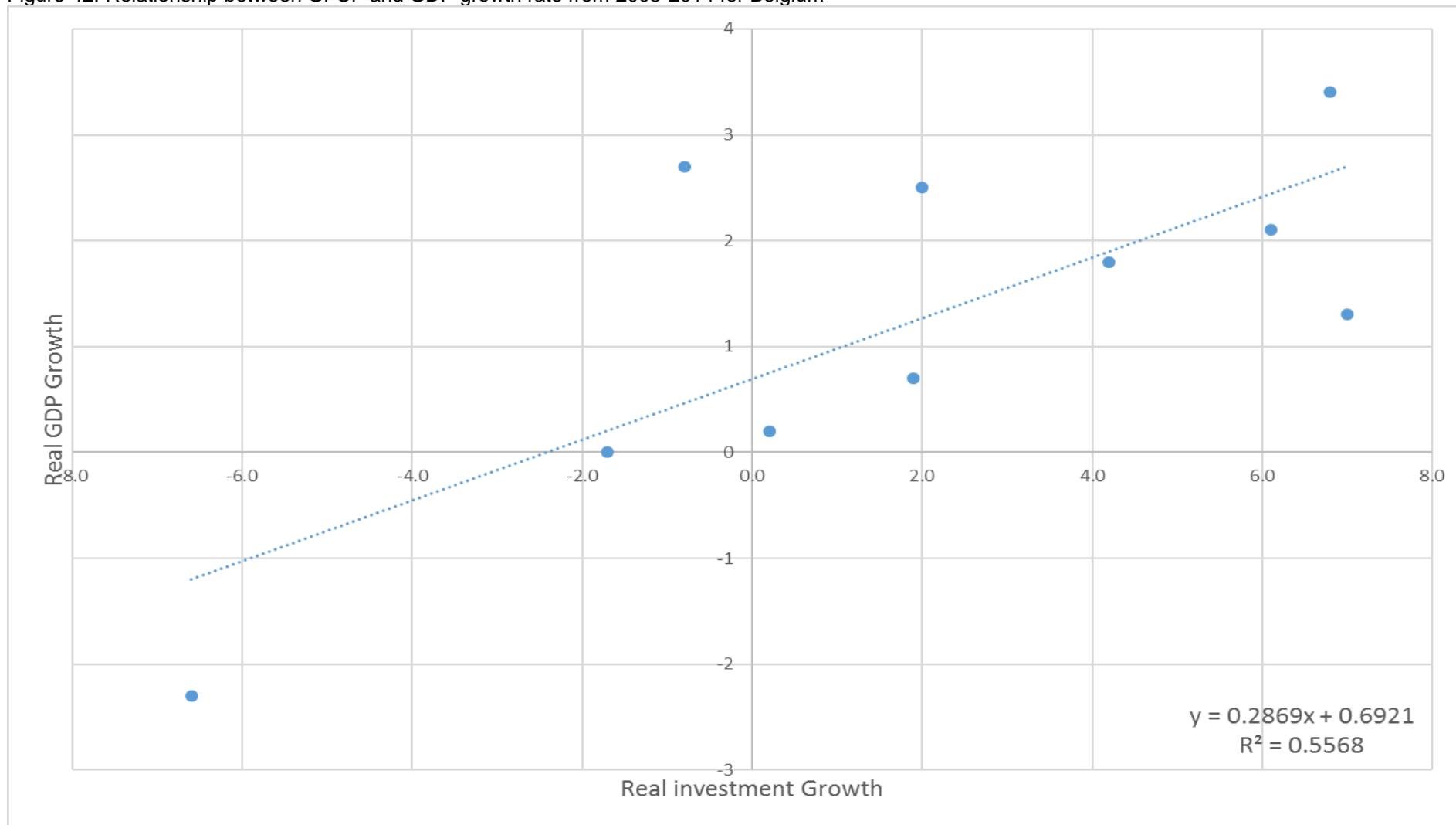
6.7 Appendix G: Scatter Plot for Investment and GDP growth rate

Figure 41: Relationship between GFCF and GDP growth rate from 1995-2004 for Belgium



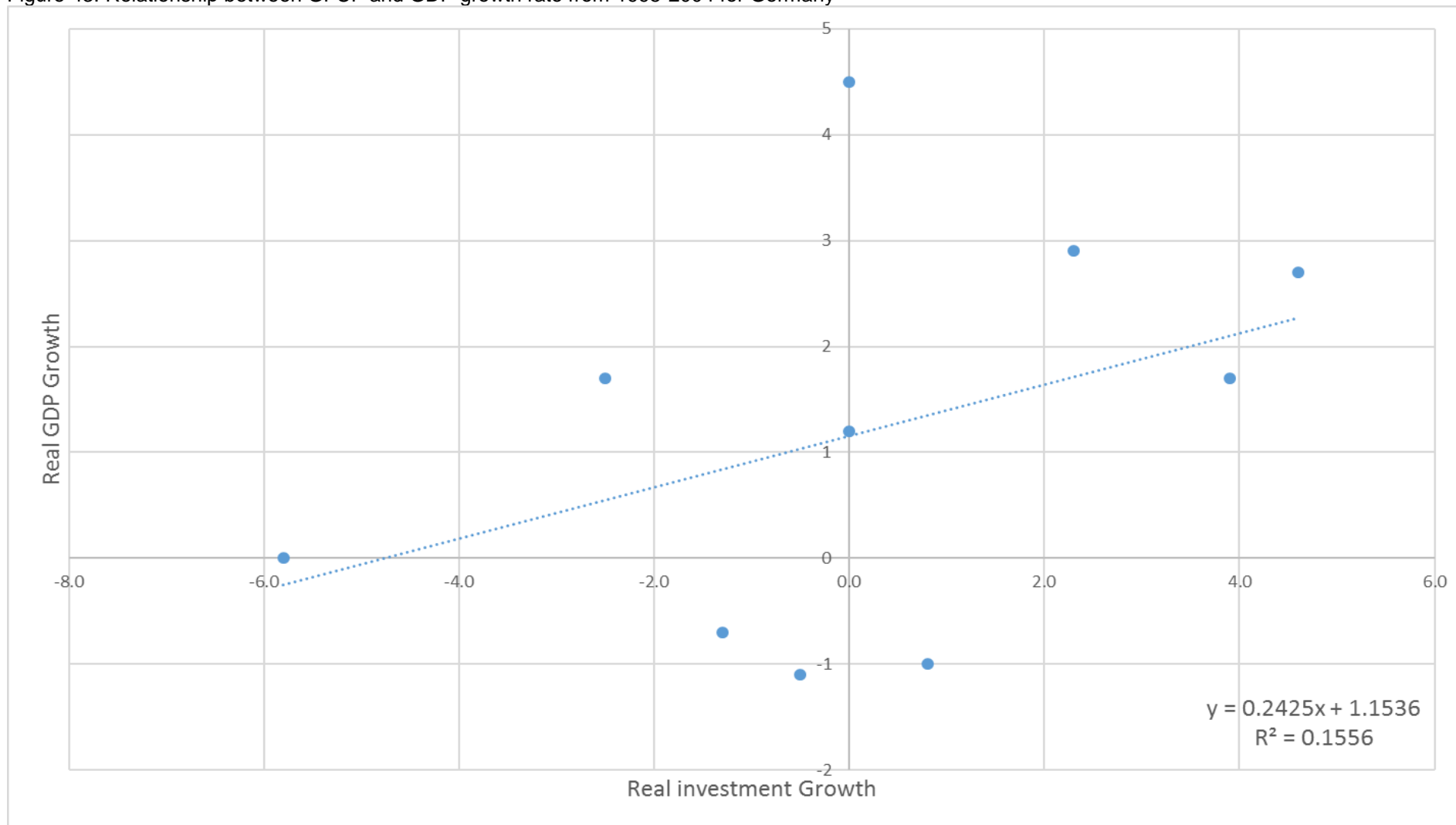
Data: Table 8&10

Figure 42: Relationship between GFCF and GDP growth rate from 2005-2014 for Belgium



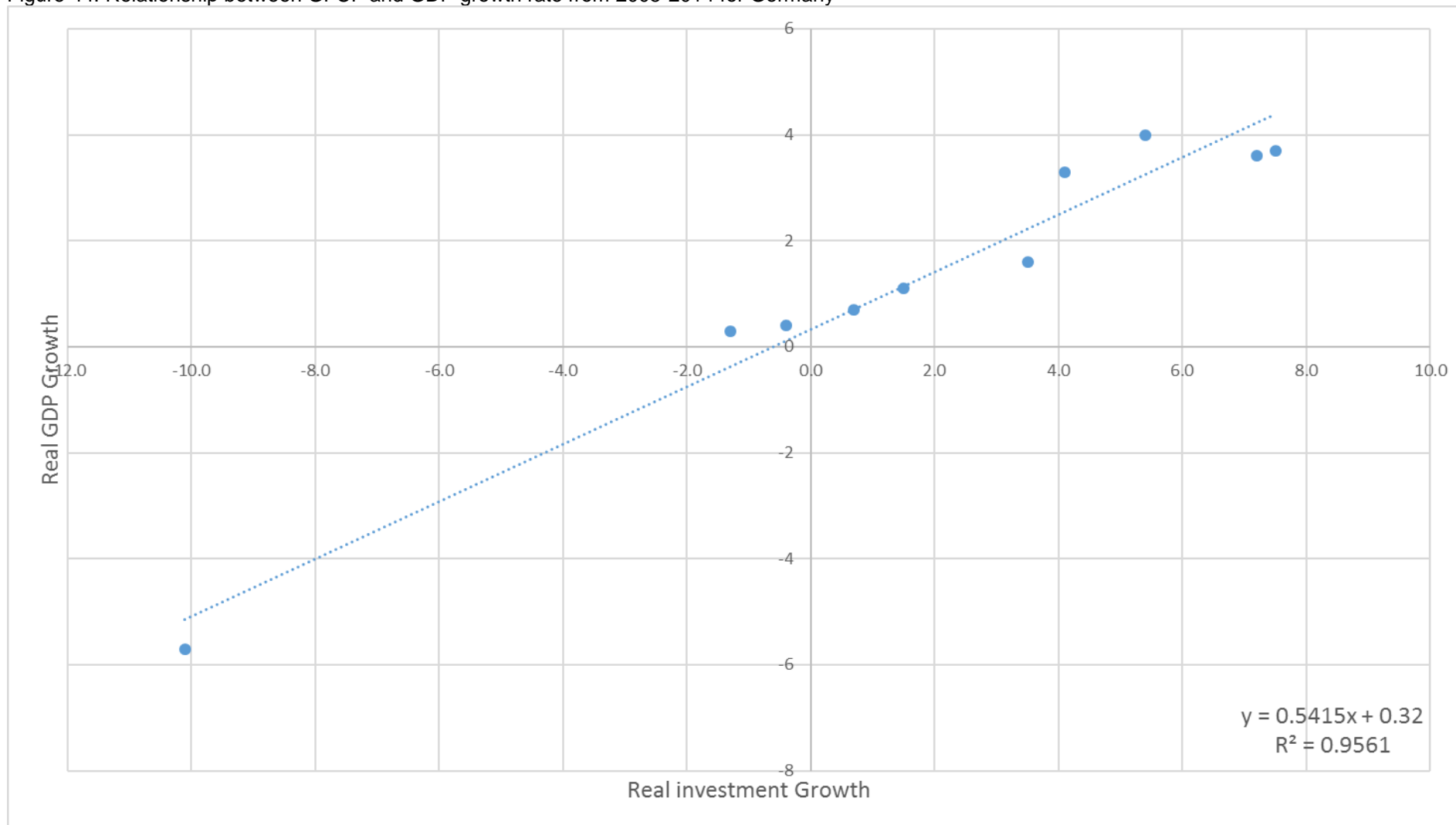
Data: Table 8&10

Figure 43: Relationship between GFCF and GDP growth rate from 1995-2004 for Germany



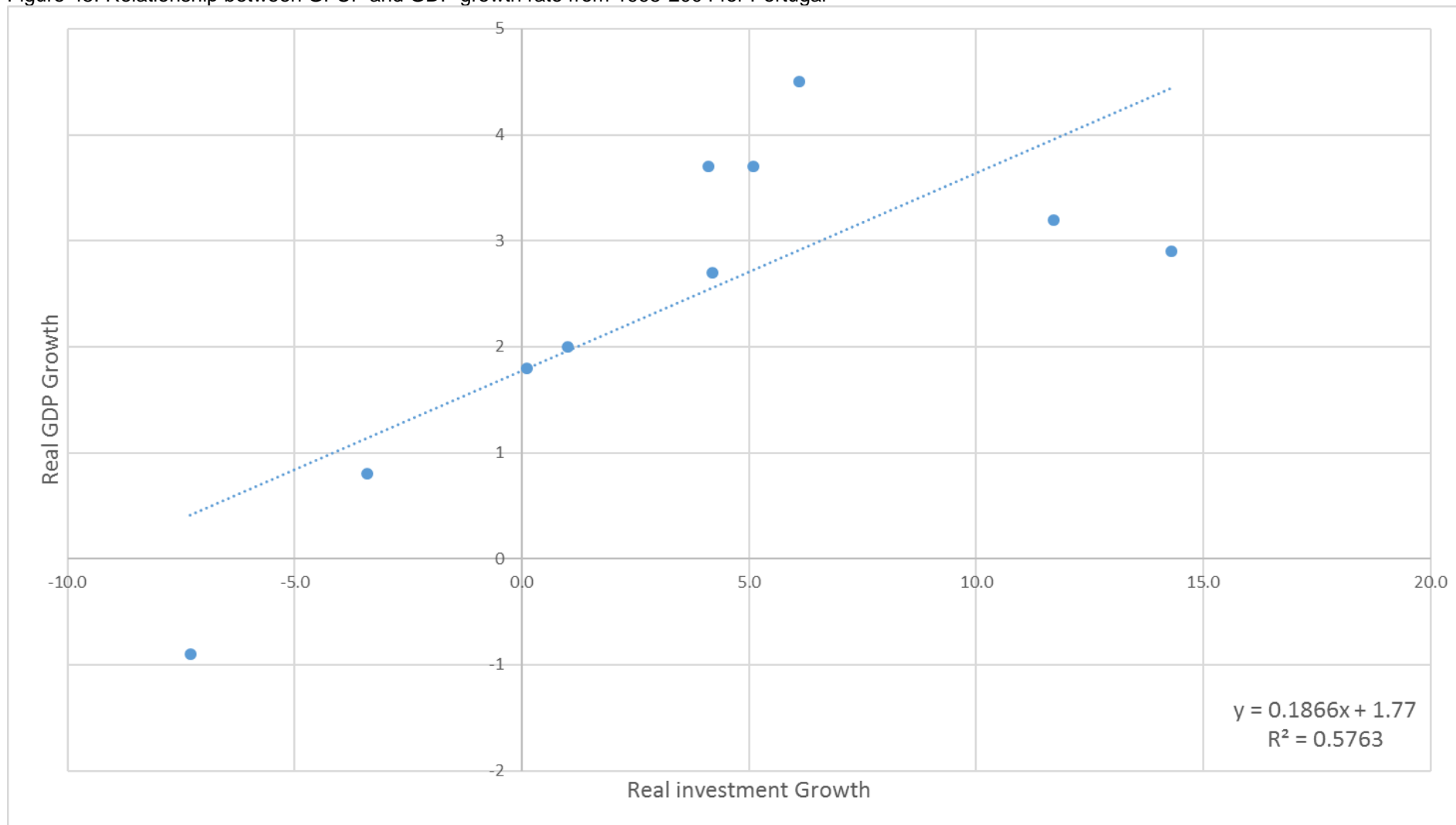
Data: Table 8&10

Figure 44: Relationship between GFCF and GDP growth rate from 2005-2014 for Germany



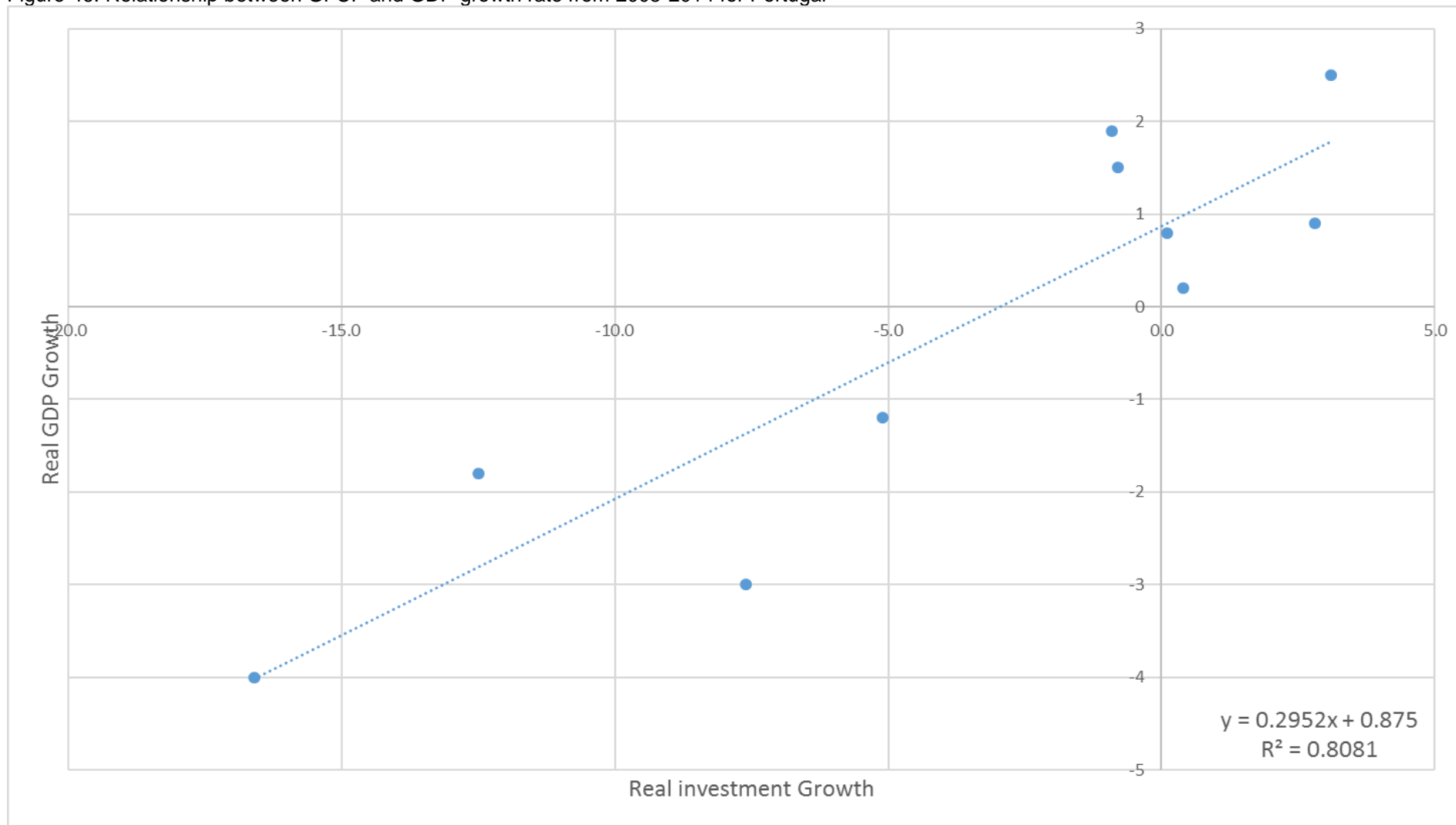
Data: Table 8&10

Figure 45: Relationship between GFCF and GDP growth rate from 1995-2004 for Portugal



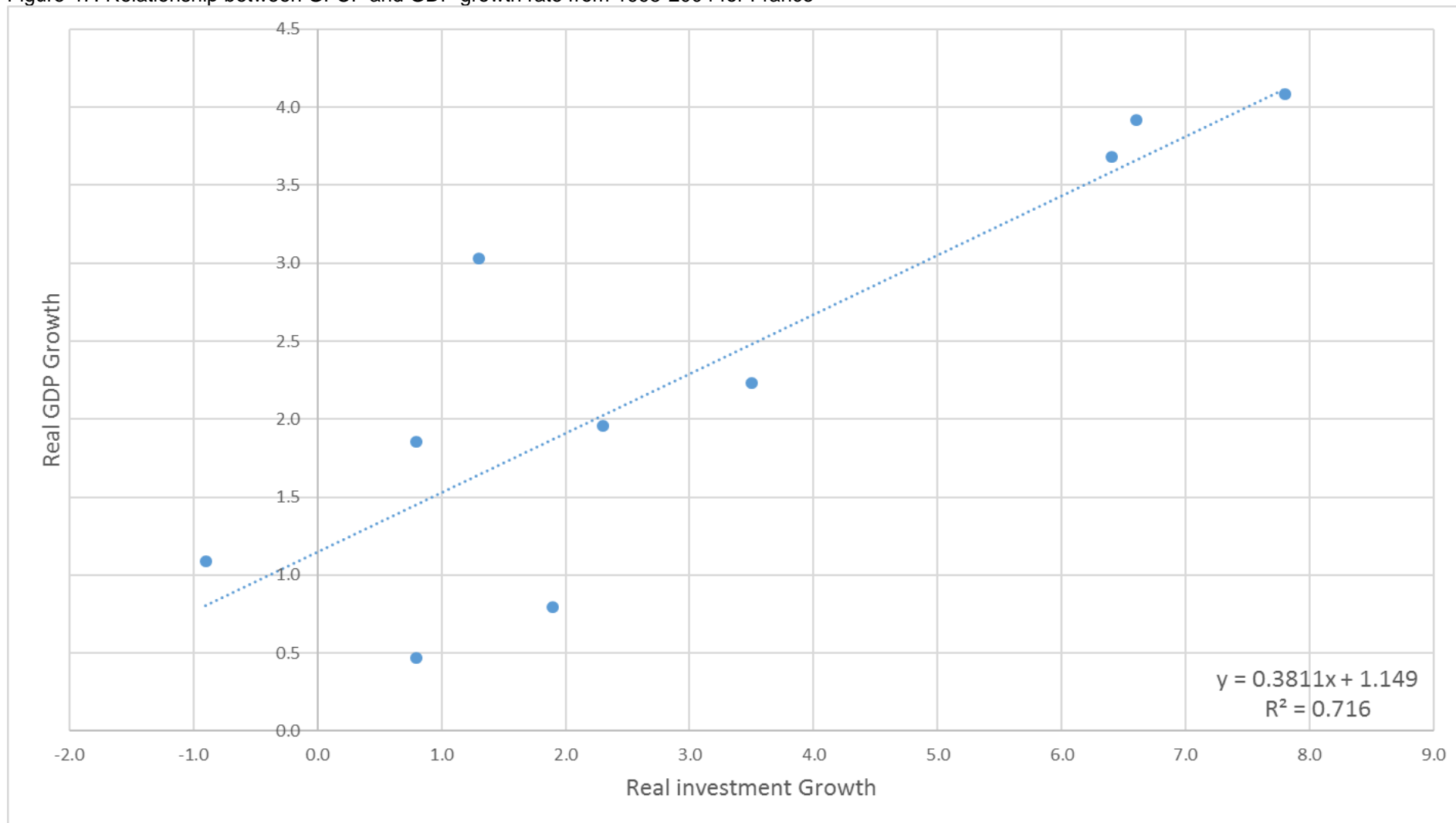
Data: Table 8&10

Figure 46: Relationship between GFCF and GDP growth rate from 2005-2014 for Portugal



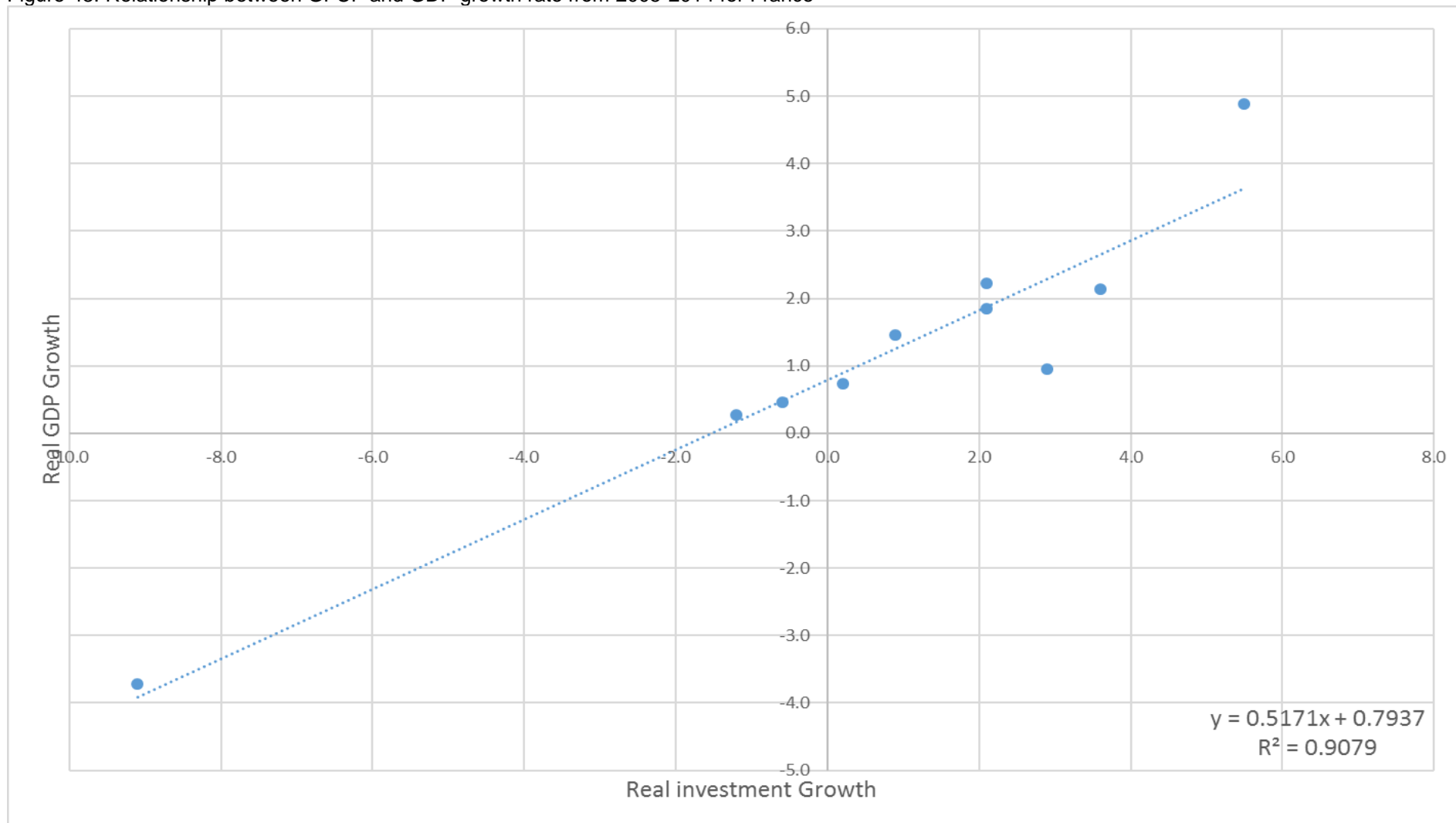
Data: Table 8&10

Figure 47: Relationship between GFCF and GDP growth rate from 1995-2004 for France



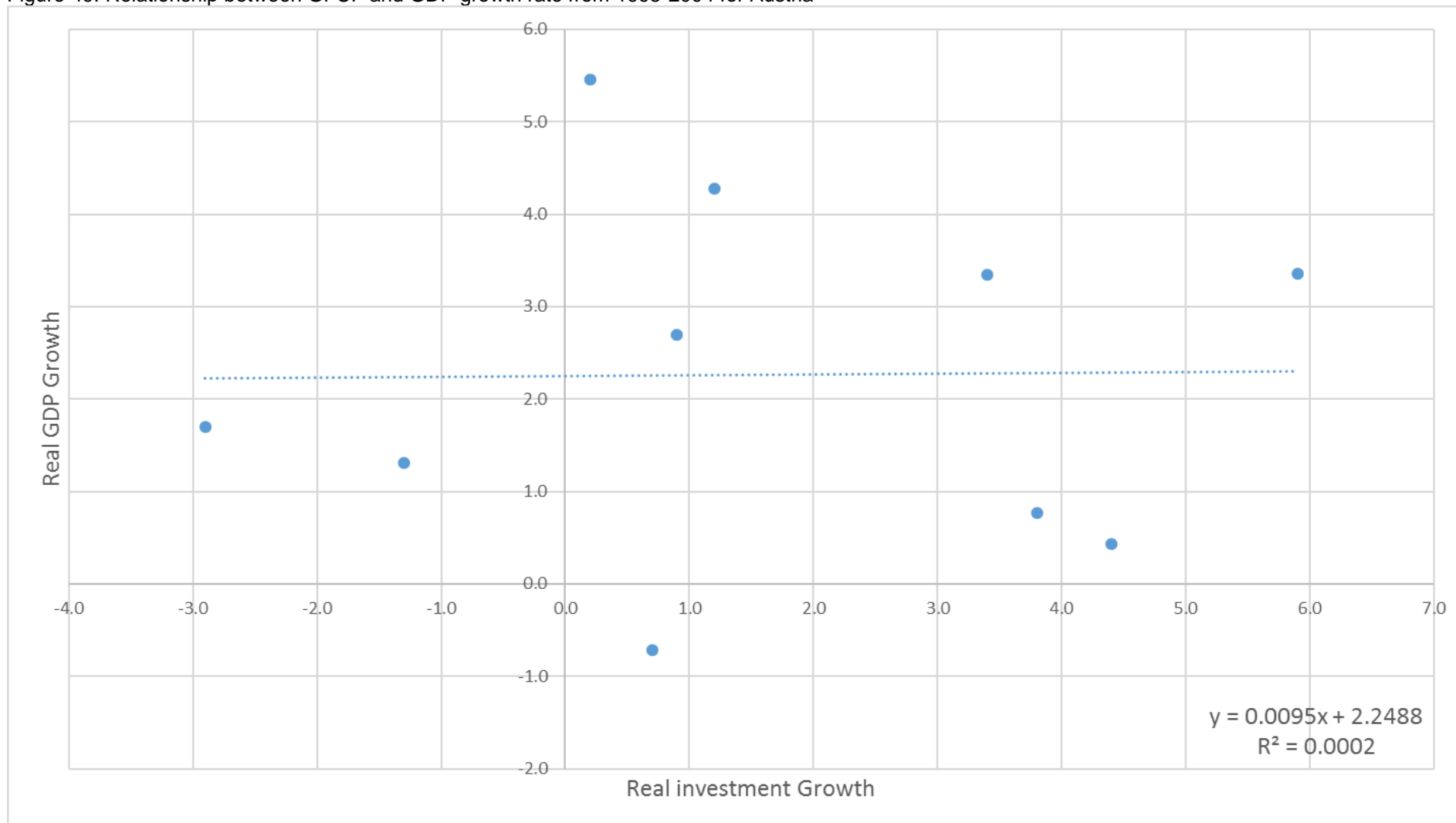
Data: Table 8&10

Figure 48: Relationship between GFCF and GDP growth rate from 2005-2014 for France



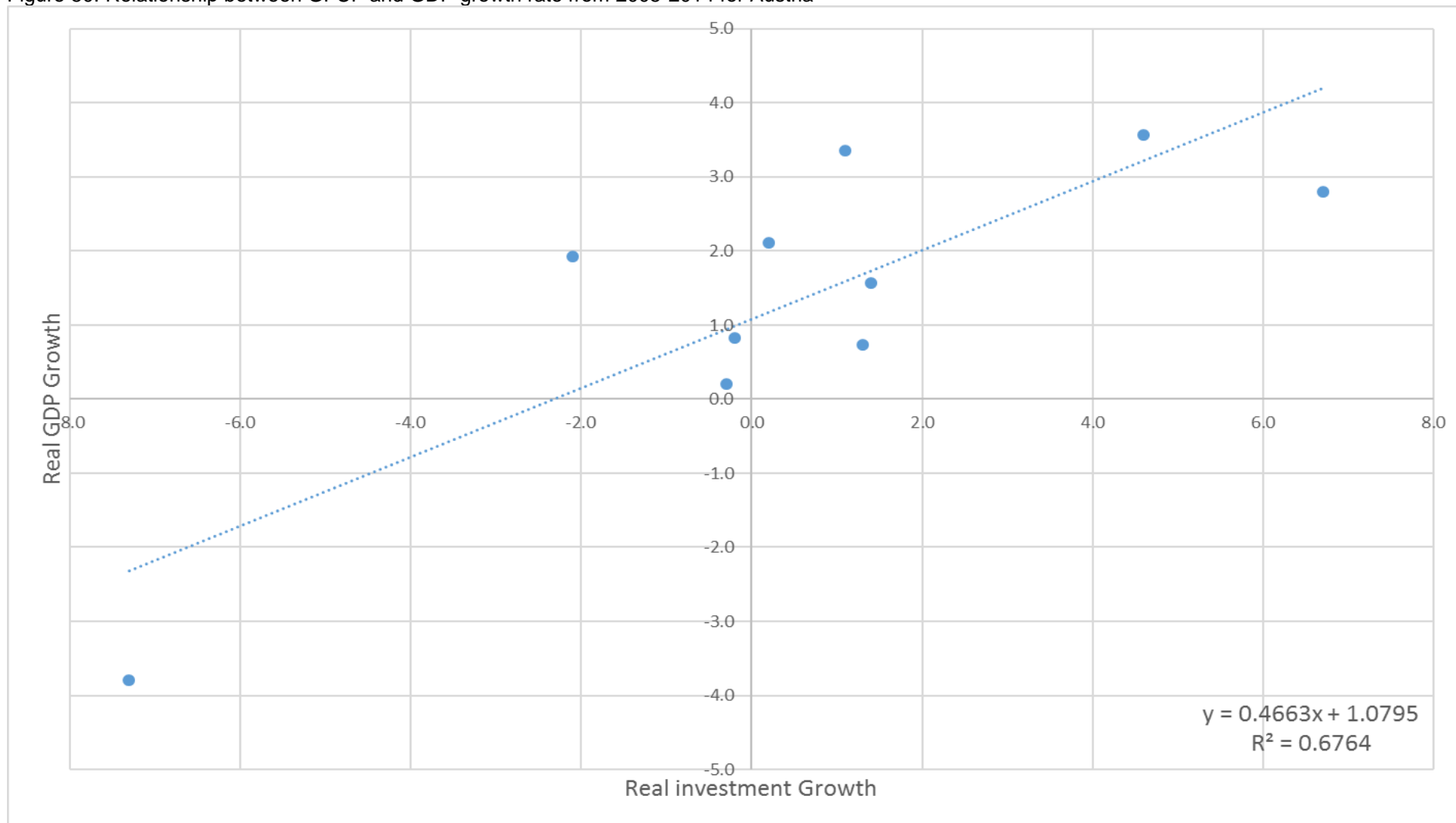
Data: Table 8&10

Figure 49: Relationship between GFCF and GDP growth rate from 1995-2004 for Austria



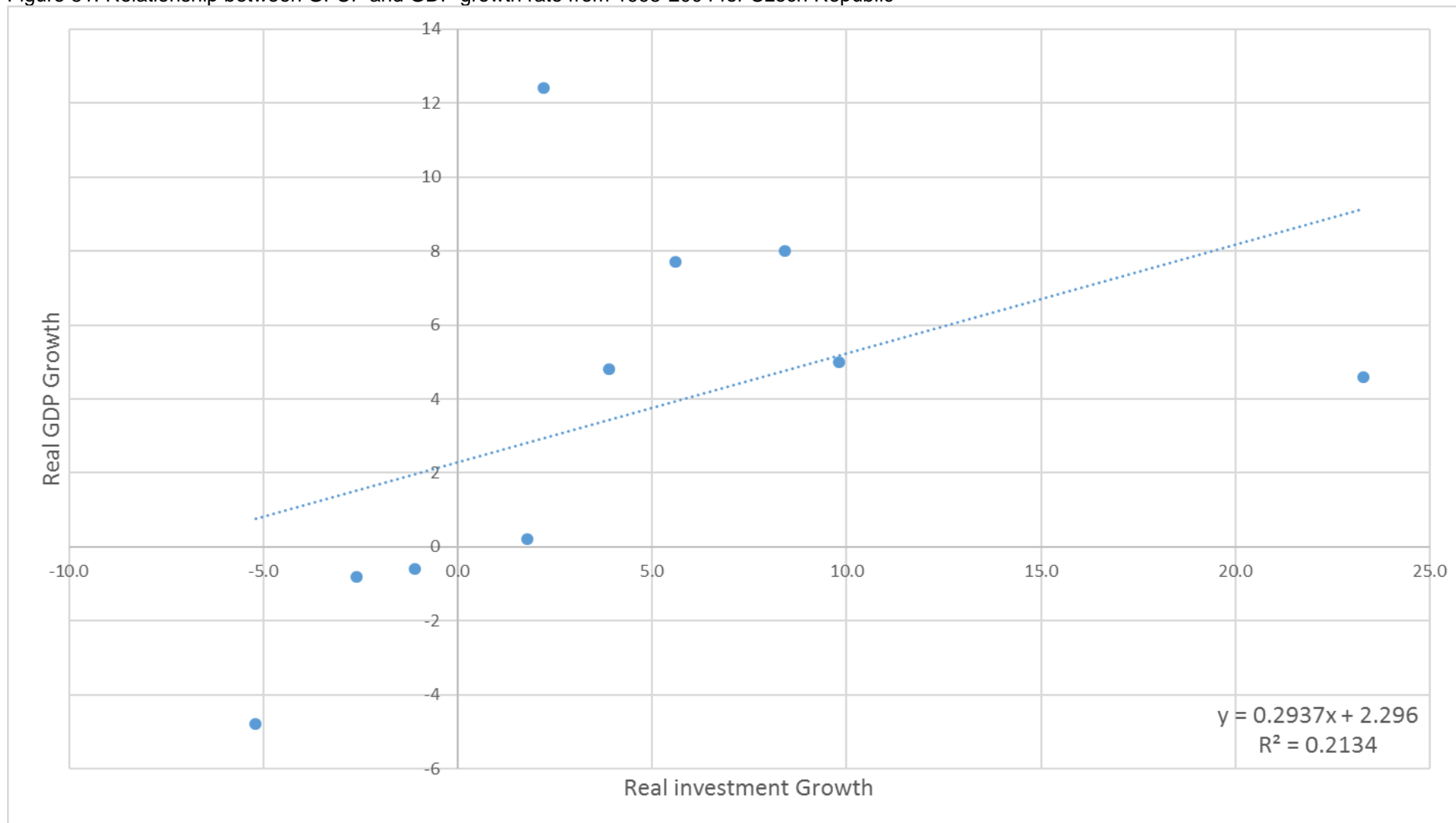
Data: Table 8&10

Figure 50: Relationship between GFCF and GDP growth rate from 2005-2014 for Austria



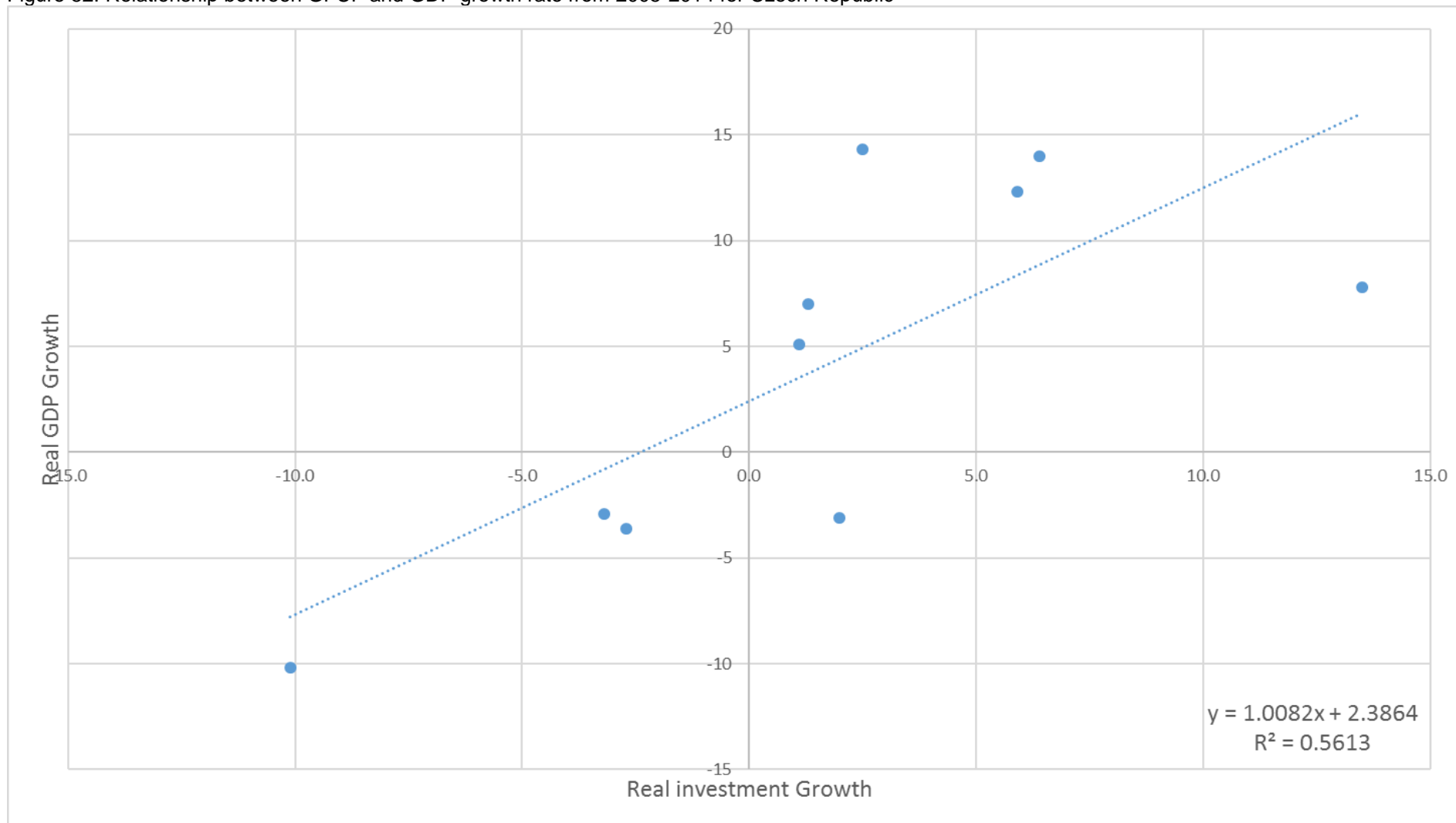
Data: Table 8&10

Figure 51: Relationship between GFCF and GDP growth rate from 1995-2004 for Czech Republic



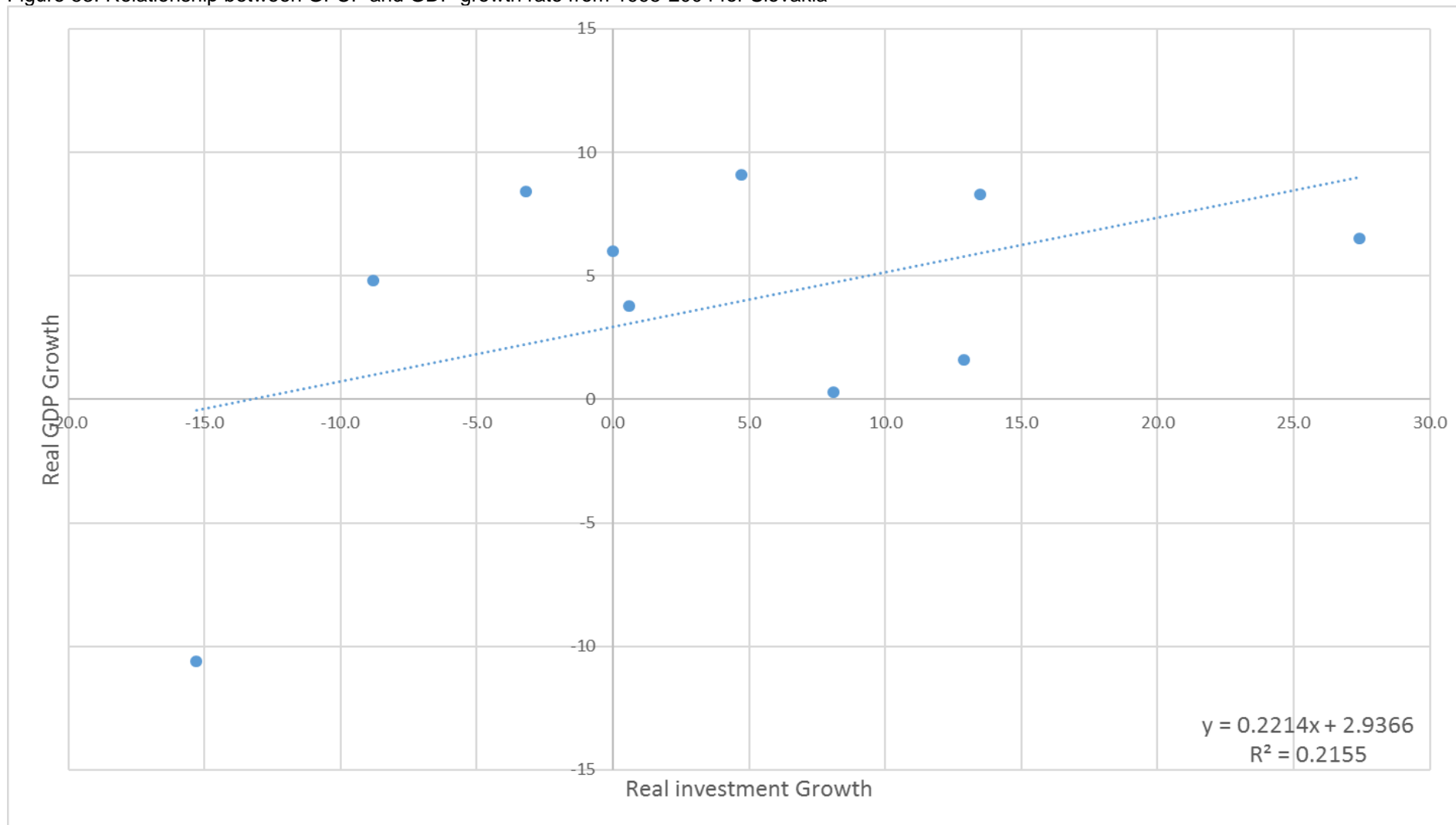
Data: Table 8&10

Figure 52: Relationship between GFCF and GDP growth rate from 2005-2014 for Czech Republic



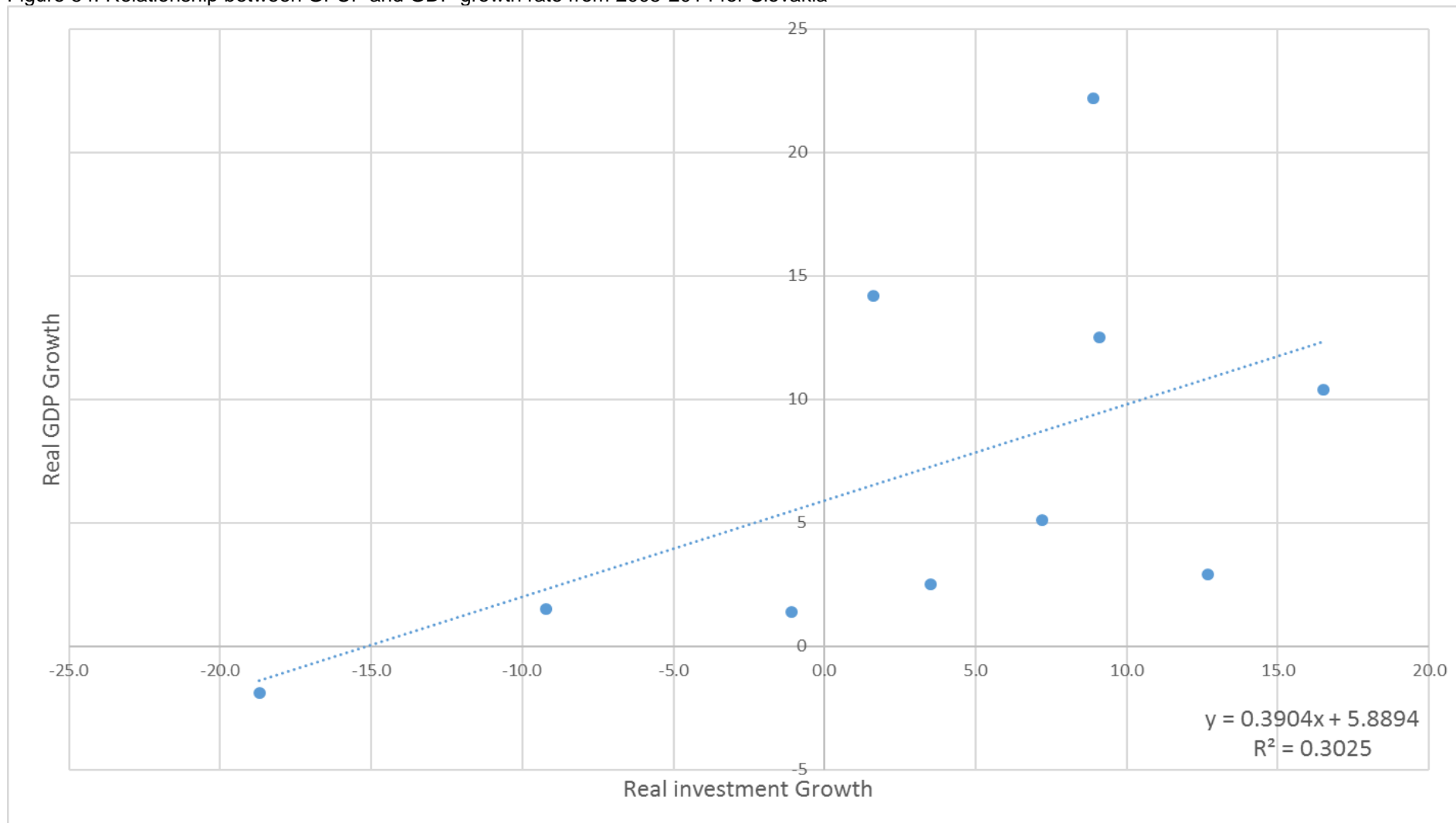
Data: Table 8&10

Figure 53: Relationship between GFCF and GDP growth rate from 1995-2004 for Slovakia



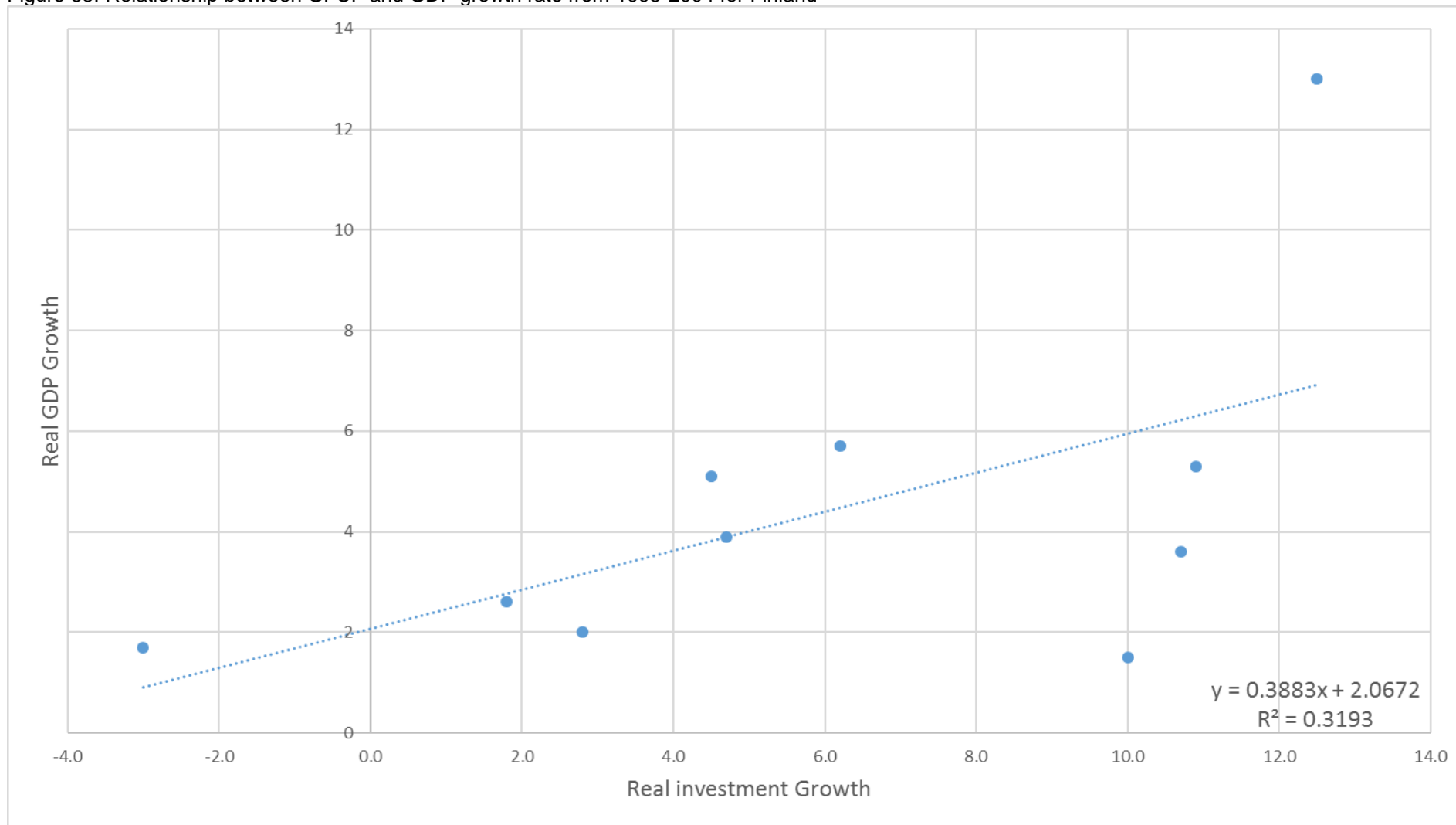
Data: Table 8&10

Figure 54: Relationship between GFCF and GDP growth rate from 2005-2014 for Slovakia



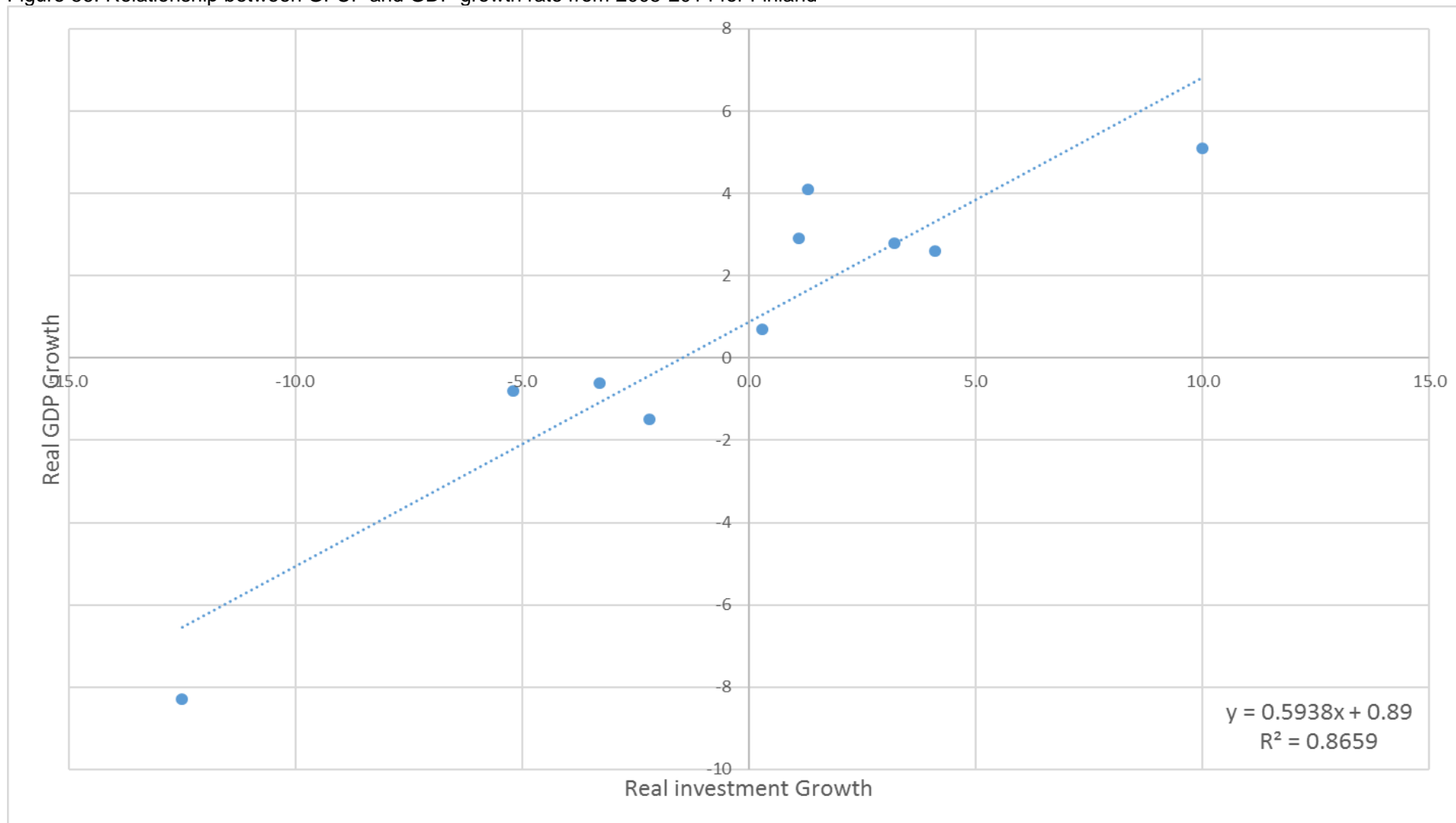
Data: Table 8&10

Figure 55: Relationship between GFCF and GDP growth rate from 1995-2004 for Finland



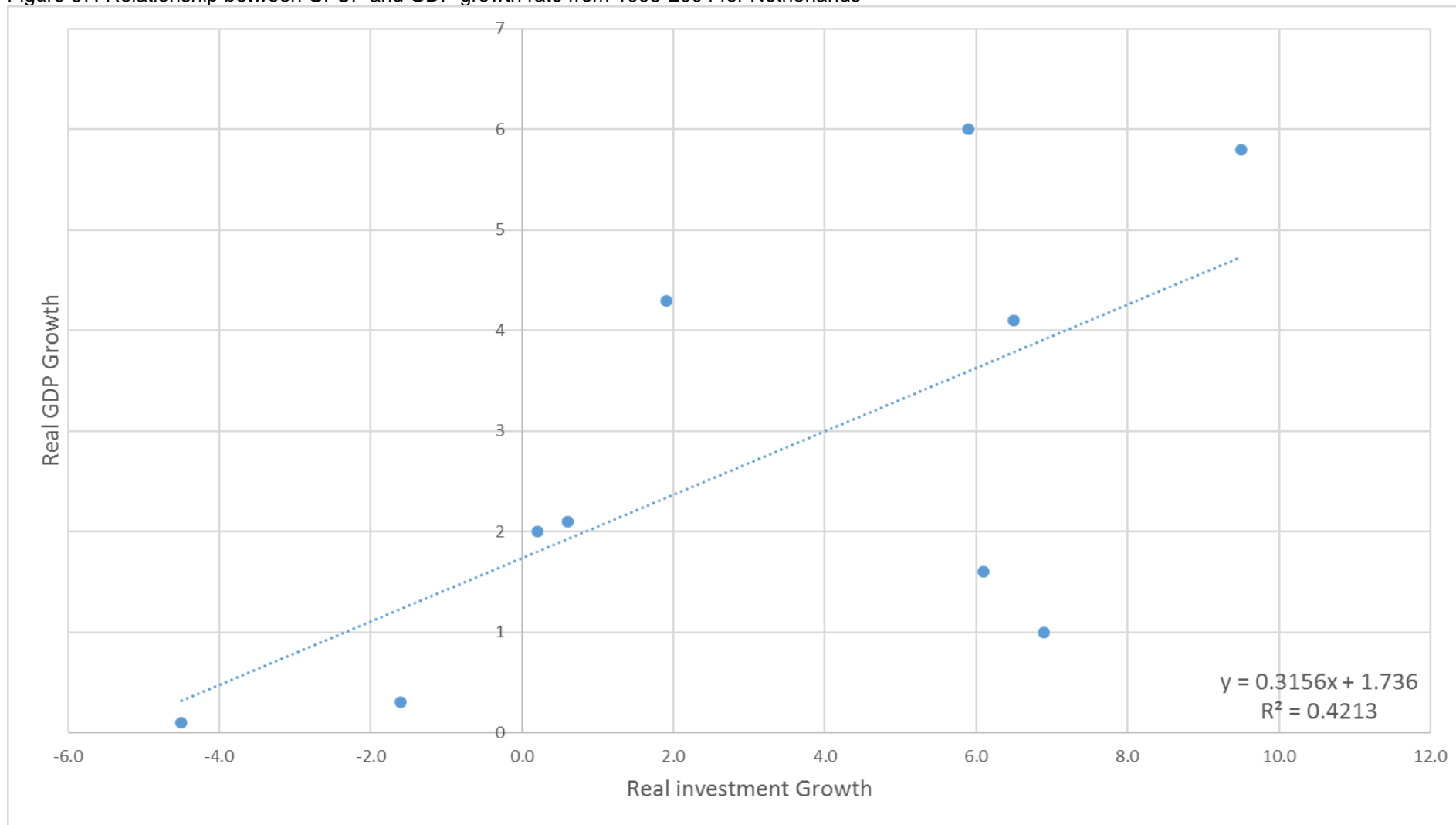
Data: Table 8&10

Figure 56: Relationship between GFCF and GDP growth rate from 2005-2014 for Finland



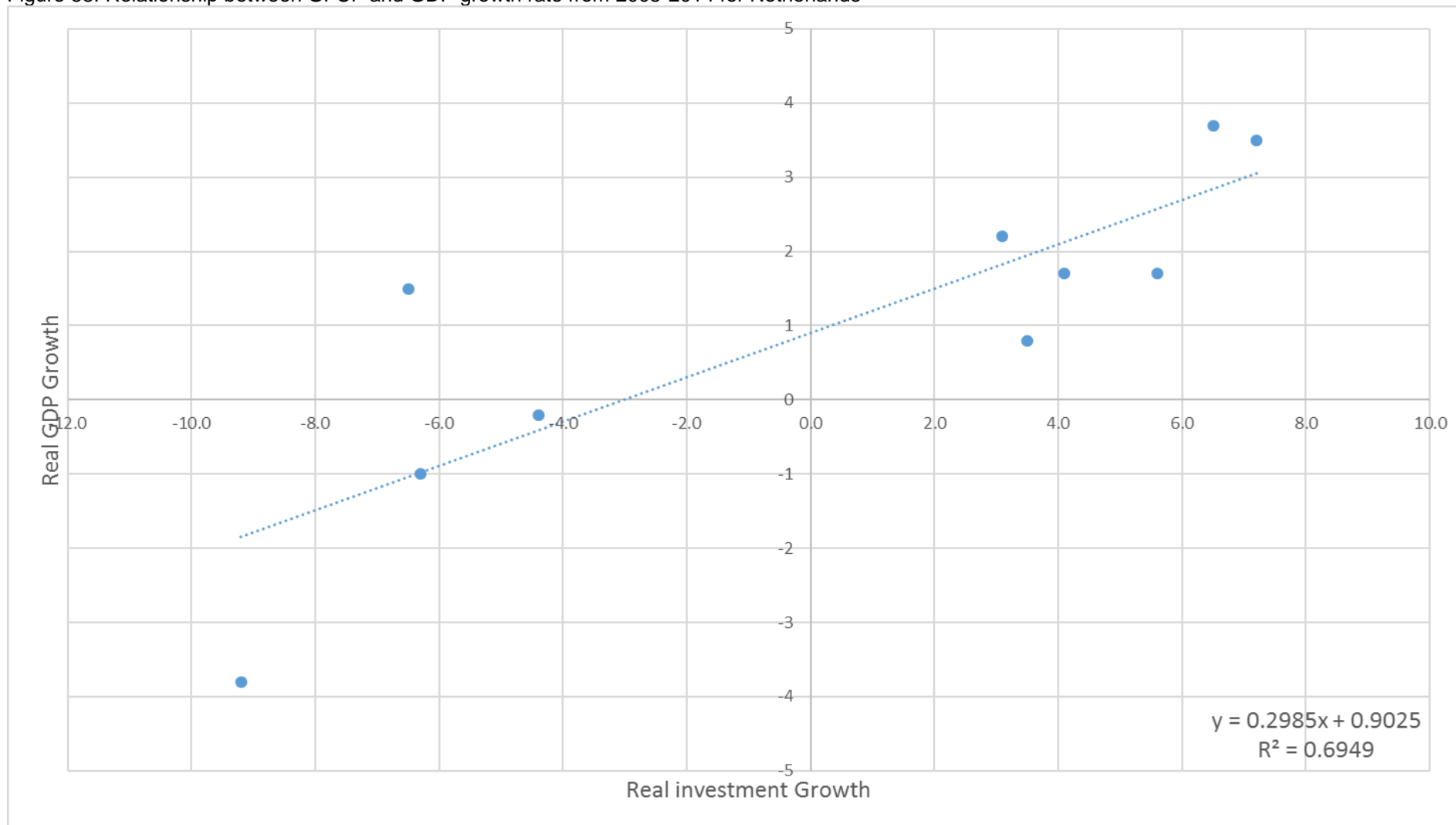
Data: Table 8&10

Figure 57: Relationship between GFCF and GDP growth rate from 1995-2004 for Netherlands



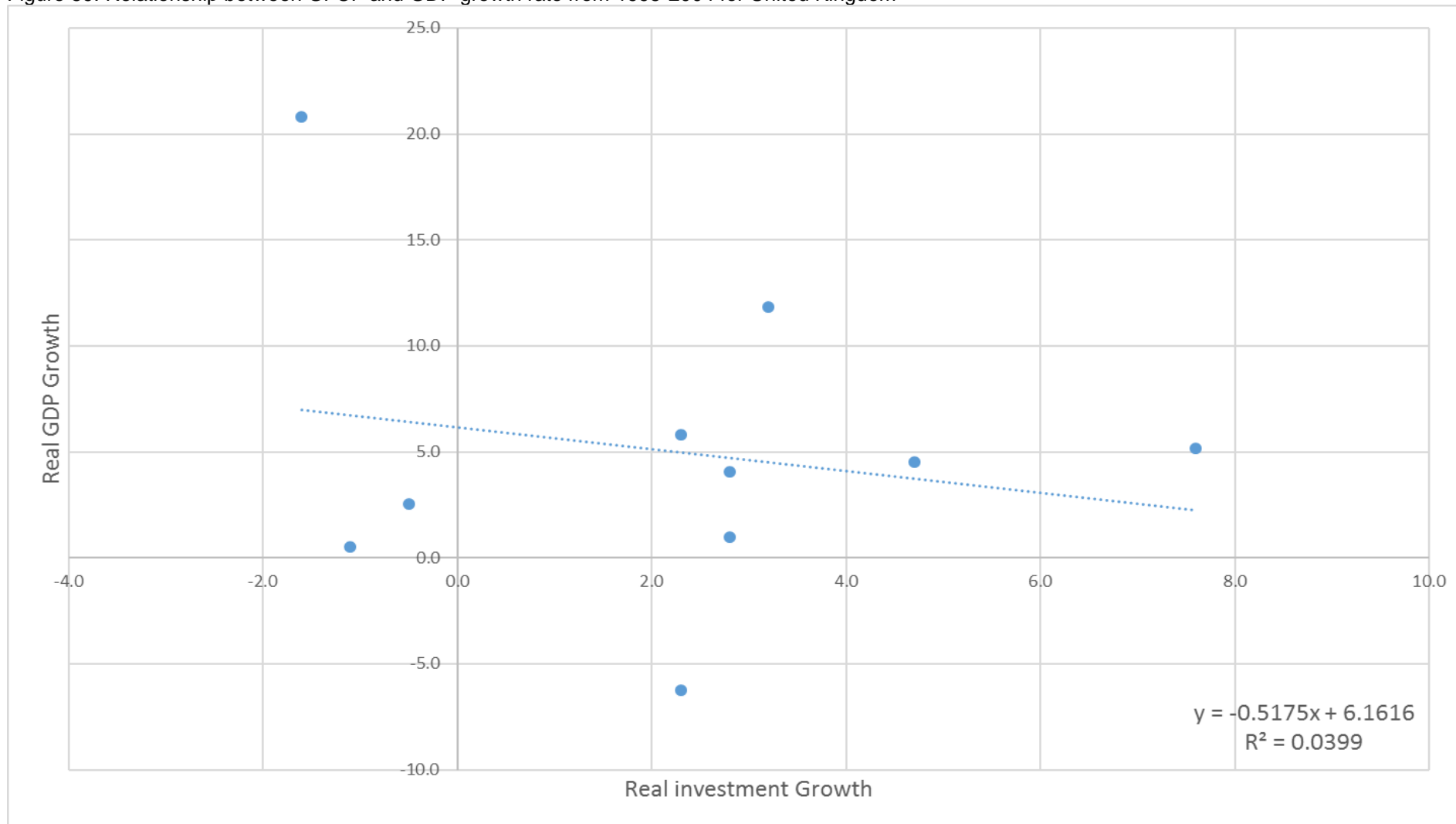
Data: Table 8&10

Figure 58: Relationship between GFCF and GDP growth rate from 2005-2014 for Netherlands



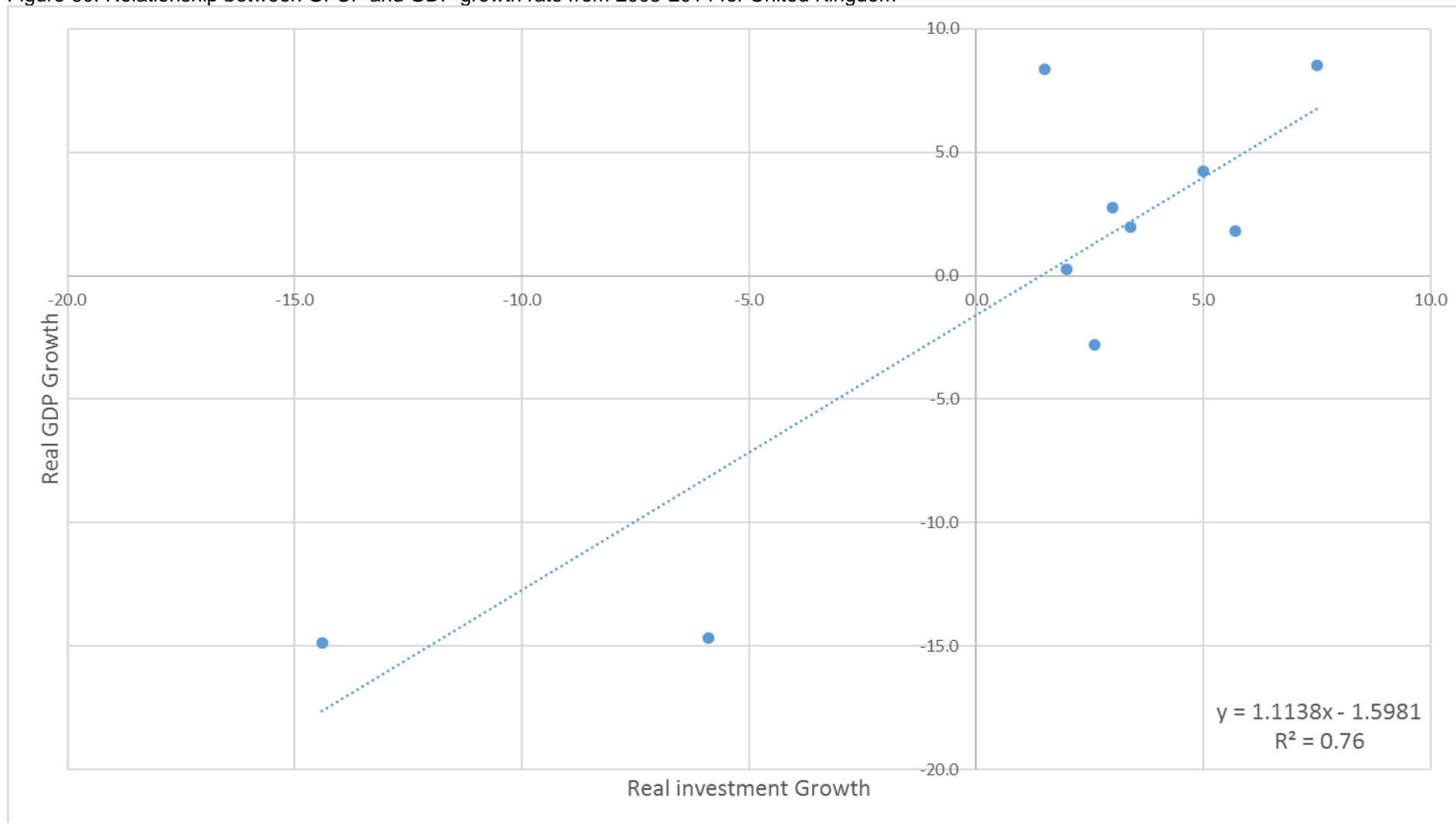
Data: Table 8&10

Figure 59: Relationship between GFCF and GDP growth rate from 1995-2004 for United Kingdom



Data: Table 8&10

Figure 60: Relationship between GFCF and GDP growth rate from 2005-2014 for United Kingdom



Data: Table 8&10

6.8 Appendix H: Scatter Plot for ZRESID and ZPRED

Figure 61: ZRESID and ZPRED scatter plot for high debt countries

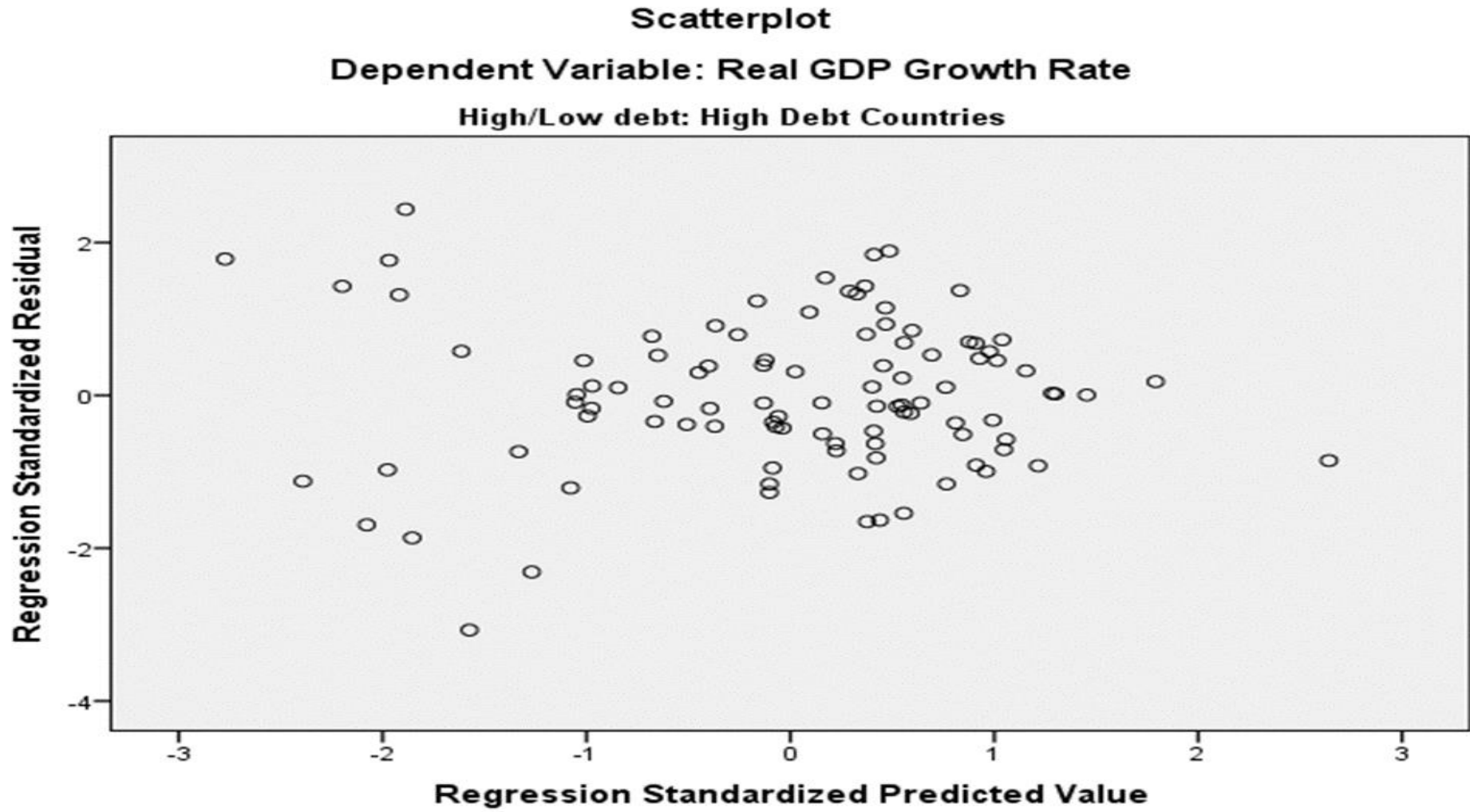


Figure 62: ZRESID and ZPRED scatter plot for high debt countries

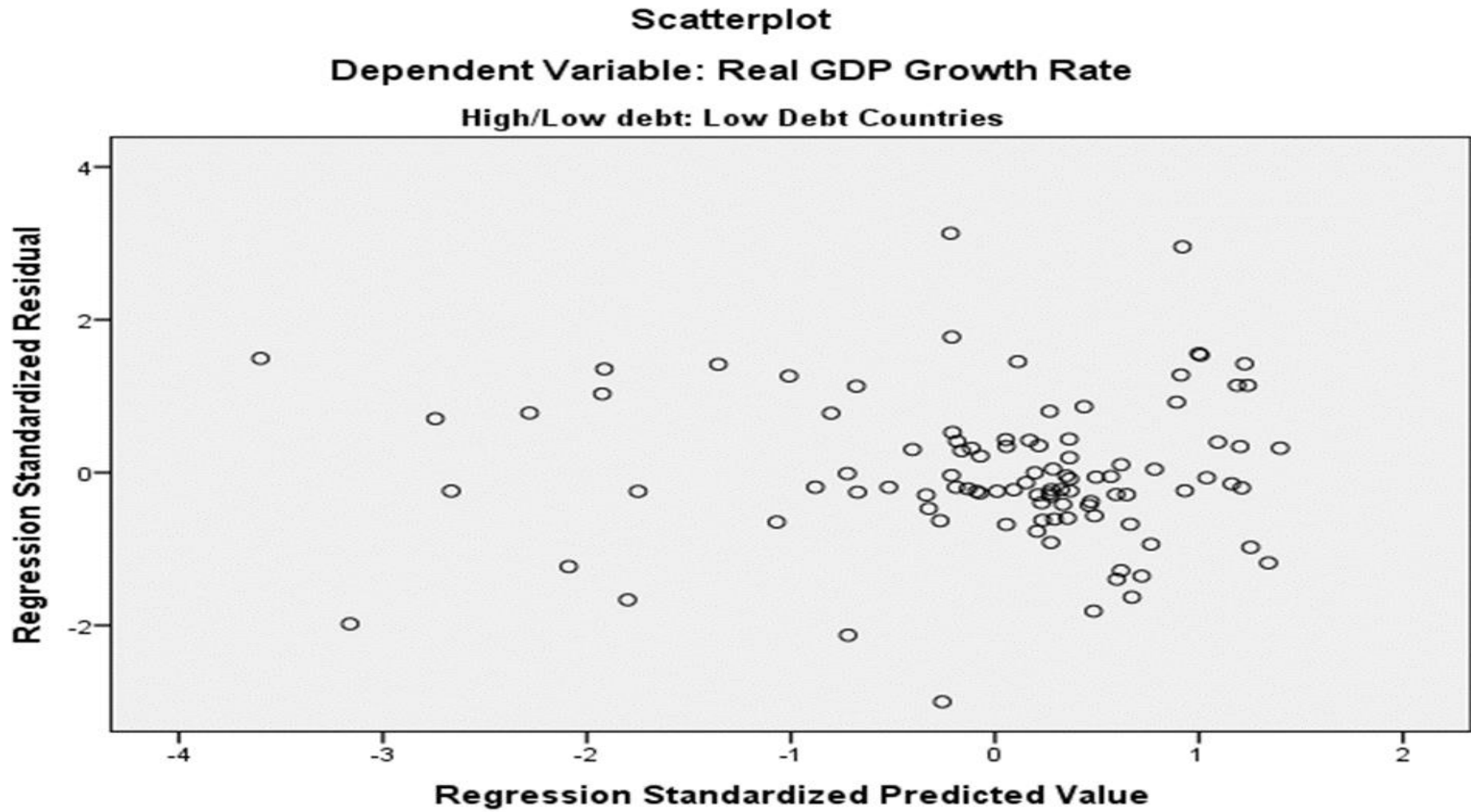


Figure 63: ZRESID and ZPRED scatter plot for pre-recession period (1995-2004)

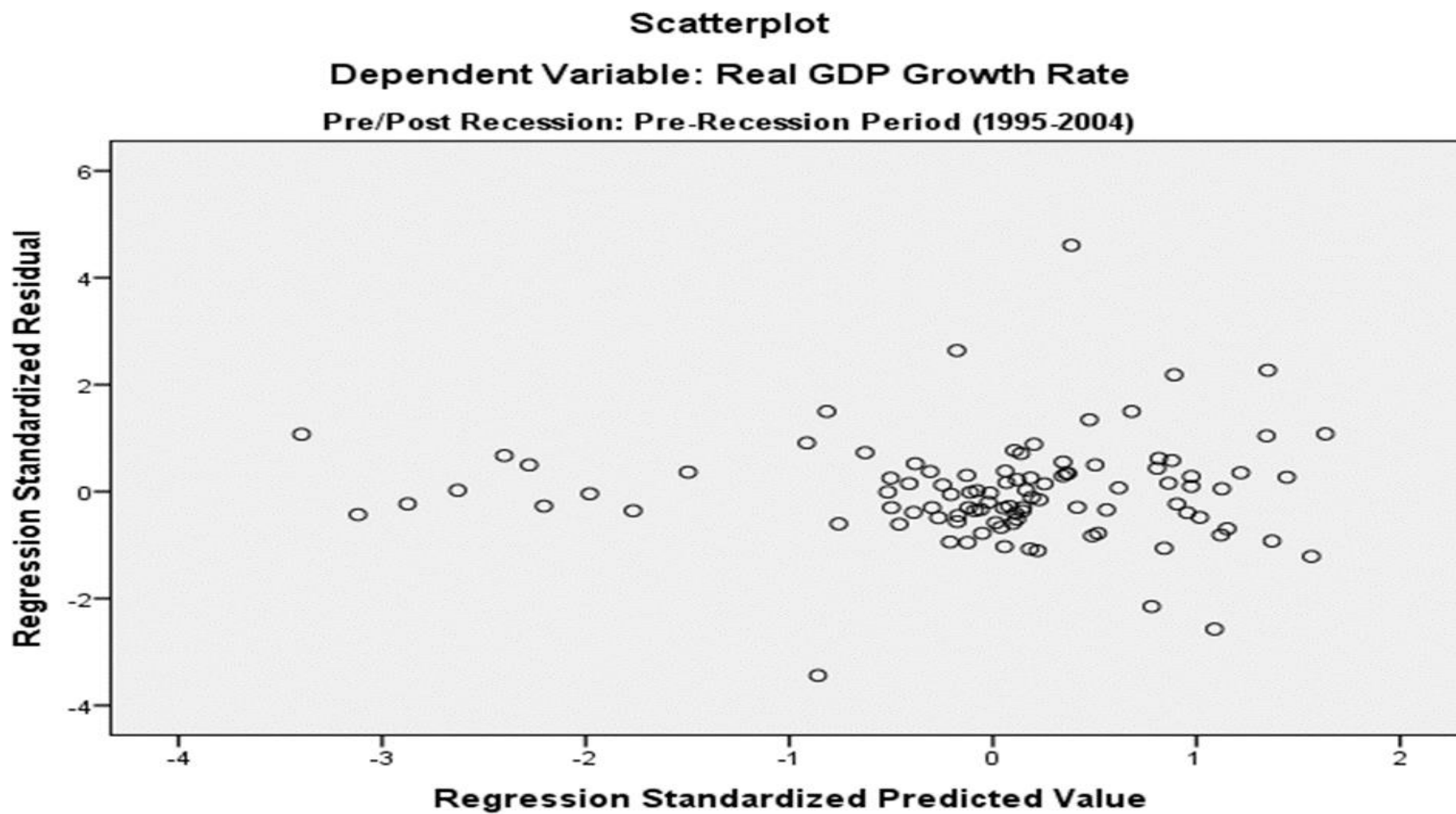
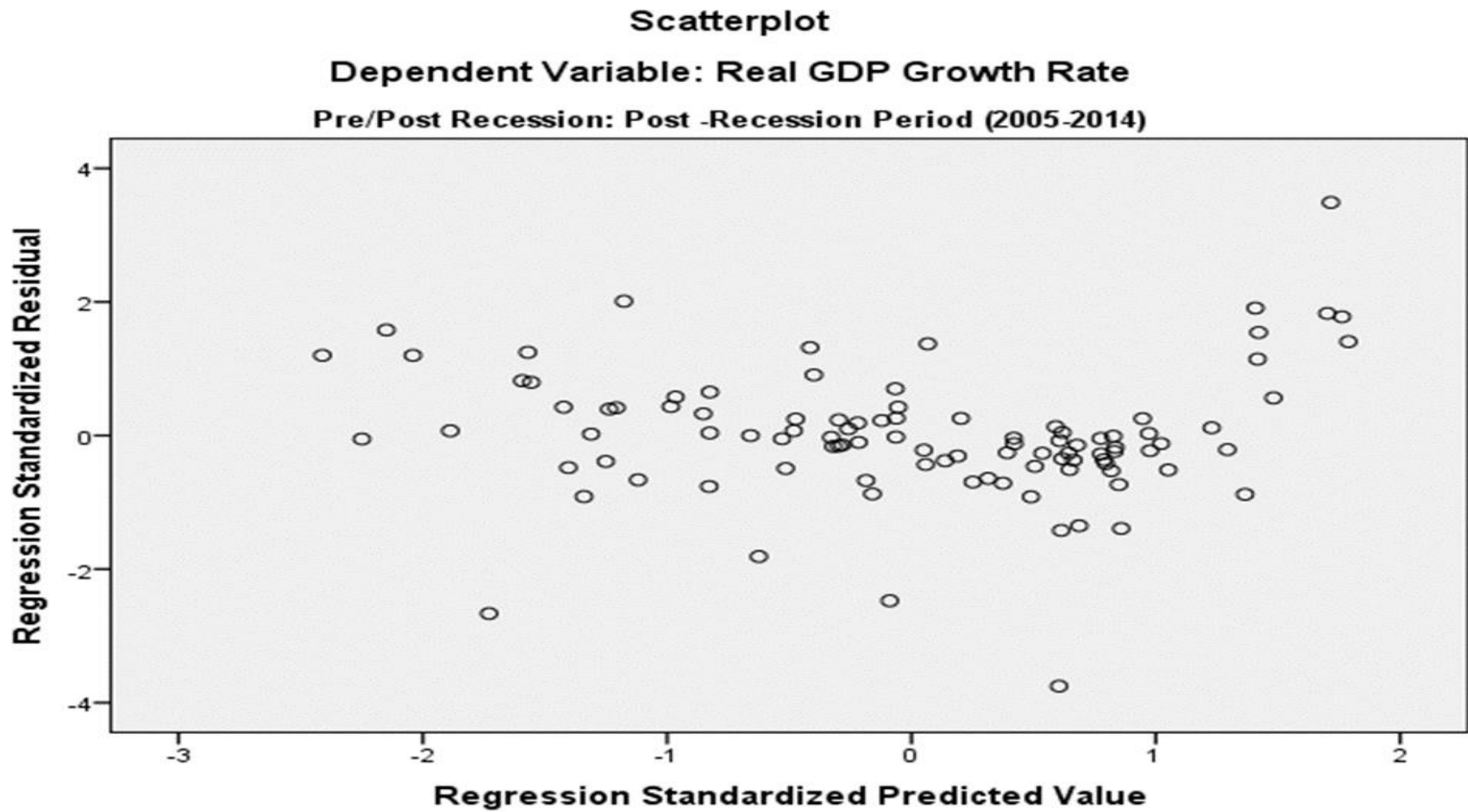


Figure 64: ZRESID and ZPRED scatter plot for post-recession period (2005-2014)



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