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Abstract

The debt-to-GDP ratio is the most reported debt index by institutional, and the predominantly quantitative literature on sovereign debt relies heavily on the GDP-ratio, as it allows for cross-country analysis and generalisation of theoretical conclusions, regardless of differences in the size of economies and currency denominations of debt. However, these aspects are unlikely to be valuable for national policy-makers. Economies with the same debt-to-GDP ratio levels can have very different underlying economic and fiscal dynamics that impact repayment capacity and debt sustainability, due to distinctive combinations of economic structures, fiscal balances, taxation rates, government assets and qualitative debt portfolio features. Ultimately, some economies can sustain a much higher debt-ratio levels compared to others. Therefore, the research problem explored here is how universal the debt-to-GDP ratio really is, and how can it effectively assist policy-makers and promote sustainable fiscal and debt policies if it is not universal? By answering these two questions: what are the limitations of the GDP-ratio; and how influential is the GDP-ratio within policy-making, this research addresses two gaps in the literature. Firstly, the lack of critical investigation of the debt-to-GDP ratio; and secondly, highlighting the level of influence and value of the measurement within governmental policy-making and institutional analysis and assistance. Overall, the two questions allow this research to highlight how economic, fiscal and qualitative debt portfolio features decreases the measurement’s universal nature, and to answer the overarching question: how accurate and valuable is the debt-to-GDP ratio from a policy-making perspective?

This research is pragmatic and uses a mixed-method case-study approach to combine quantitative macroeconomic data between 1995 and 2015 and qualitative interview data to investigate the debt-to-GDP ratio measurement in Greece, Ireland, Norway and Australia. Additionally, the research investigates the perceptions and use of the measurement within the IMF, the World Bank and the UN. The research uses qualitative analysis methods, including analytical comparisons, pattern matching, and parallel demonstrations, as well as fundamental mathematical calculations, to disclose a combination of quantitative and qualitative limitations and inaccuracies of the debt-to-GDP ratio measurement. The interview data collected from governmental and institutional representatives supports and supplements the quantitative data findings,
while determining the level of influence and value the measurement within policy-making.

The key findings show that four areas produce limitations in the debt-to-GDP ratio, that challenge the accuracy and value of the GDP-ratio measurement for policy-making. Firstly, there are inaccuracies in the debt-to-GDP ratio’s ability to portray monetary debt trends, due to comparative growth rates in the nominal GDP and debt, and fluctuations in commodity prices and demand. Secondly, different objectives underlying government borrowing impacts the sustainability of GDP-ratio levels in different economies. Thirdly, the debt-to-GDP ratio inaccurately portrays debt relative to repayment capacities, due to variations in budget balances and total and taxation revenue-ratio levels; disparities in the governments’ non-taxation revenue flows demonstrating different reliance on taxation revenues within their total revenues; and different growth rates in taxation revenues compared to nominal GDP among the case-study economies. Fourthly, the GDP-ratio lack insight into the maturity, interest-rate and external debt compositions of economies’ debt portfolios, which greatly impacts the repayment capacity and the insightfulness of the debt-to-GDP ratio in relation to debt sustainability. Combined, the limitations and inaccuracies and the different economic, fiscal and qualitative debt portfolio dynamics demonstrates that the measurement is not universal across countries nor static over time.

In general, the interview data show that the debt-to-GDP ratio can be valuable to assess long-term debt trends and projections in comparison to economic growth trends; however, it is not valuable for short-term, budget and debt policy formulations. This is due to the country-specific and general limitations of the measurements, that decreases the usefulness and reliance on the measurement as a policy and analysis tool.

The key practical implications of this research are that the GDP-ratio measurement needs to be assessed in combination with a range of measurements to be able to effectively ensure sustainable fiscal and debt policies. The key theoretical implication establishes that research using the GDP-ratio needs to take into account country-specific economic and fiscal features and qualitative debt portfolio aspects. By grouping together countries with similar quantitative and qualitative features, regional institutions can develop more appropriate guidelines to promote increased economic and fiscal security, while theories can develop more accurate debt-to-GDP ratio denominated conclusions.
for different country groups. Additionally, this research finds that the GDP-ratio may not be the optimal measurement to determine the impact of high debt on economic growth.
Originality Statement

“This work has not previously been submitted for a degree or diploma at any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself”
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List of Abbreviations

AFC – Asian Financial Crisis
CSO – Central Statics Office (Ireland)
DSA – Debt Sustainability Analysis
EC – European Commission
ECB – European Central Bank
EMU – European Monetary Union
ESM – European Stability Mechanism
EU – European Union
Eurostat - the statistical office of the European Union
GDP – Gross Domestic Product
GFC – Global Financial Crisis
GFN – Gross Financing Needs
GGB – Greek Government Bond
GNI* - Gross National Income Star (Irish measurement)
GNP – Gross National Product
IFAC – Irish Financial Advisory Council
IMF – International Monetary Fund
IP – Intellectual Property
MNC – Multinational Corporations
MTDS – Medium-Term Debt Strategy
NOK – Norwegian Kroners
NTMA – National Treasury Management Agency (Ireland)
OECD – Organisation of Economic Cooperation and Development
PSI – Private Sector Involvement
R&D – Research and Development
SGP – Stability and Growth Pact
SBA – Stand-By Arrangement
The Fund - The Government Pension Fund (Norway)
UN – United Nations
US – United States
WB – World Bank
Glossary

**Austerity measures** – are actions by governments aiming to decrease expenditures and/or increase taxation revenue flows. Government initiated austerity measures to lower budget deficits and avoid or counteract economic recession and debt crises (Cambridge Dictionary, n.d.).

**Budget Constraint** – refers to the flows of income and expenditure. The government budget constraint is an accounting concept that considers the connection between the monetary authority’s nominal interest rate and capital growth policies, and the fiscal authority’s budget balance including expenditure, taxation revenue and borrowing (Oxford Dictionary, n.d.).

**Budget Deficit** – refers to the situation where the government’s expenditures exceed revenues in a fiscal year. The governments’ budget deficits are usually presented as a GDP-ratio (Cambridge Dictionary, n.d.).

**Budget surplus** – refers to the situation where governmental income exceeds expenditure, usually expressed as a GDP-ratio (Cambridge Dictionary, n.d.).

**Consolidation** – is a technique of expressing statistics for a set of units (or entities) as a single unit (entity) (Oxford Dictionary, n.d.).

**Financial assets** – consist of financial claims plus gold reserves held by monetary authorities. A financial asset is a claim that typically provides the creditor financial funds or other resources from the debtor through a contractual agreement on the borrowed liability (IMF, 2013, p. 198).

**Fiscal buffer** – Fiscal space created by saving budgetary resources and reducing public debt in good times (IMF Glossary, Fiscal Monitor, 2018).

**Fiscal space** – Extent to which a government can generate and allocate resources for a given purpose without prejudicing liquidity or long-term public debt sustainability (IMF Glossary, Fiscal Monitor, 2018).

**Fiscal Surplus** – see budget surplus.

**Fiscal Sustainability** – is the capability of governments to preserve credible and functional budget balances over the long term. This requires governments to strategically forecast future revenue and expenditure flows, as well as consider socio-economic and environmental factors and trends to adjust financial planning correspondently. Escalating debt levels can put pressure on governments’ fiscal positions, and reduce the potential of economic growth, as capital is redirected away from productive investments when financial claims are repaid (OECD, 2013, p. 50).

**General Government** – The general government sector comprises all government units and all non-profit institutions that are controlled by government institutions/authorities. According to the Government Finance Statistics Manual and System of National Accounts 2008, there are three divisions included in the general government sector: central or federal; state, provincial, or regional; and local government units. In contrast, public debt includes all financial and nonfinancial public corporations in combination with the general government sector (IMF, 2013, pp. 8, 199). For more information on each of the divisions within the general government sector, see IMF, “Public Sector Debt Statistics: Guide for Compilers and Users, 2013”, p. 10-12.

**Gross Financing Needs (GFN)** - the annual GFN is the amortisation of the old debt and its interest rate payments, the primary deficit, and privatization proceeding expressed as a GDP-ratio, as according to Interviewee G2 in Chapter 4, page 68.

**Gross Debt** – is defined as the total debt liabilities held by governments. These liabilities can also be called financial claims, and include “loans, debt securities; currency and deposits; insurance, pension and standardised guarantee schemes; and other
accounts payable” as outlined in Table 2 below Net-debt (IMF, 2013, pp. 3, 199).

**Gross Domestic Product** (GDP) – represent the monetary value of total output, including goods and services, produced within a country over a specified period of time. “…the GDP is the broadest quantitative measure of a nation’s total economic activity” (Callen, 2012).

**Gross National Income* (GNI*) – “is a measure of Irish economic activity that was recommended by the Economic Statistics Review Group (a group established following the publication of the 26 per cent growth rate for 2015, and chaired by the Governor of the Central Bank). It is a better measure of domestic economic trends as it excludes: Profits of re-domiciled companies; Depreciation on R&D-related intellectual property imports; Depreciation on aircraft leasing” (Department of Finance, 2018).

**Haircut –** is “a reduction applied to the value of an asset. It is expressed as a percentage. For example, if an asset – such as holdings of a particular government bond – is worth €1 million but is given a haircut of 20%, it means it is treated as though it has a value of only €0.8 million”, as according to the European Central Bank’s website [https://www.ecb.europa.eu/explainers/tell-me-more/html/haircuts.en.html](https://www.ecb.europa.eu/explainers/tell-me-more/html/haircuts.en.html)

**Intertemporal budget constraint** – is a concept that refers to how the governments are requires considering both current and future budget constraints (see budget constraint on previous page). In other words, the current and future taxation revenues must meet current and future expenditures as well as governmental debt repayments. In this way, the intertemporal budget constraint reflects the notion that governments do not have to be restricted by current wealth when borrowing capital but do need to consider future repayments to ensure long-term budget balance (Oxford Dictionary, 2016).

**Market value/pricing** – refers to the market prices on debt securities/financial claims and represents the value as if they were acquired in market transactions on the reported date on the balance sheet (IMF, 2013, p. 200). Market value can also refer to the total amount a government need to repay in the case of buying back financial claims before due date, however, the government is not obliged to do so (Balassone & Franco, 2000, pp. 31-32).

**Maturity** – refers to the date in which the financial claim is to be repaid and terminated according to contracts and agreements made between debtor and creditor (IMF, 2013, p. 200).

**Net debt** – is a measurement that is calculated as total liabilities (gross debt) minus financial assets (IMF, 2013, p. 200). Also see financial assets.
According to Eurostat, net-debt is defined as: “financial liabilities minus all financial assets … it is however, at the government’s discretion whether to list monetary gold and special drawing rights, and financial assets for which there is no counterpart liability (Eurostat, 2017, Glossary: Public Debt).

**Nominal value** – The face value of a debt instrument is the undiscounted amount of principal to be repaid at maturity. The nominal value of a debt instrument is a measure of value from the viewpoint of the debtor: at any moment in time it is the amount that the debtor owes to the creditor (IMF, 2013, p. 201).

**Non-lump sum taxation** – a lump sum tax is defined as a fixed amount payable by every person or entity, regardless of income level, and additional income does not incur additional taxation. Non-lump sum taxation therefore refers to the notion that there is not a fixed amount of tax payable by every person or entity, and that taxation depends on the level of income (Oxford Dictionary, 2016).
Principal and interest – The principal debt liability is the agreed amount that debtor initially receives from creditor. Interest is the value or percentage rate payable by debtor on the outstanding principal. Interest is an investment income that the creditor of a financial asset receives from the debtor (IMF, 2013, p.4).

Primary surplus or deficit – is the component of the fiscal surplus or deficit that is comprised of current government spending less current income from taxes, and excludes interest paid on government debt.

Redemption value – is defined as the amount for which a financial asset could be exchanged, or a liability settled, between parties in an arm’s length transaction (Cambridge Dictionary, n.d.).

Sovereign debt – refers to the amount borrowed by the government. Debt is defined as a financial claim “that requires payment(s) of interest and/or principal by the debtor to the creditor at a date, or dates, in the future” (IMF, 2013, p. 3). Also see Gross debt.

Sovereign debt-to-GDP ratio: compares sovereign debt levels to the total economic activity of the country (Callen, 2012).

Structural non-oil budget deficit - Structural non-oil budget deficit is defined as the budget deficit arising from the ‘ordinary’ revenues and expenditures and does not include the petroleum revenue (Aamodt, 2012).
Acknowledgement

It is truly rewarding to have come to this point, to write my acknowledgement and to attempt to put into words the gratitude I have for all the people that have been invaluable in my life over the last three years. But it is also daunting, as no words can perfectly describe how thankful I am for all the immense support I have received from people during this challenging and rewarding journey. The following paragraphs are my simple words of appreciation and do not come close to portray how supportive, dedicated and incredible these people have been. The essential example of this is the unlimited gratitude I have to my supervisors, Daniel Ringuet, Peter Woods and Heidi Schnetzinger. Without their positive reinforcement and instrumental assistance, this work would not be possible.

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Chapter 1 – Introduction

1.0 – Background

As a result of the Global Financial Crisis (GFC) in 2008 and the succeeding European Sovereign Debt Crisis, also termed the ‘Great Recession’ (Collard et al, 2014, p. 382), sovereign debt has become an increasingly hot topic in economic and policy-making discussions. Sovereign debt, or government debt, refers to debt liabilities incurred by governments through the issuance of government bonds to domestic and foreign investors (IMF, 2013, p. 3). Rather than focusing on the monetary value of sovereign debt, many of the major regional and international institutions, like the International Monetary Fund (IMF) and the Organisation for Economic Co-operation and Development (OECD), mainly report and analyse total debt liabilities (gross debt) as a percentage of the economy’s Gross Domestic Product (GDP) (see Glossary, p. xi) (IMF, 2018). The GDP-ratio of sovereign debt indicates the government’s debt burden relative to the size of the economy in terms of production, income or consumption, and it is argued that a larger and more advanced economy can sustain a higher monetary debt burden, compared to a smaller economy (Nelson, 2013, p. 5). Although not elaborated on within the literature, the argument could be exemplified as a government in a large economy is expected to have higher income tax revenues facilitated by higher levels of employment, a larger amount of revenue from Goods and Services Taxes (GST) arising from higher consumption levels, and elevated levels of corporate tax levels reflected through the larger proportions of output. The debt-to-GDP ratio, therefore, allows international financial institutions to assess relative debt levels across economies of different sizes and currencies.

After the onset of the ‘Great Recession’, sovereign debt levels in advanced economies have risen to new heights that were potentially not considered imaginable in the pre-crisis era (Collard et al., 2014, p. 382). The crisis revealed the vulnerabilities of debt levels in several advanced economies due to the legacy of gradually elevating debt-to-GDP ratio levels since the 1980s (Barrett, 2018, p. 1), and the explosive trends after 2009 (Collard et al, 2014, p. 382), which has resulted in many economies’ debt-to-GDP ratio levels reaching, or close to reaching, a peak in the post-war period (Barrett, 2018, p. 1). According to the International Monetary Fund’s (IMF) 2018 Fiscal Monitor report, the average debt-to-GDP ratio level in advanced economies has been close to 105 percent
since 2012, which is the second highest debt-level in history, and only 15-percentage points below the World War II debt-ratio peak. The trend is not expected to improve significantly between 2018 and 2020, as the IMF projections only highlight a marginal decline in debt (IMF, 2018\(^4\), pp. 1-2).

While the average debt level among the advanced economies as a group is high, the debt-ratio levels in the most troubled European Union (EU) economies are even more worrying. As demonstrated in Figure 1.1, Greece has had high levels of debt at around 100 percent of GDP since 1995, and by 2015, their debt-to-GDP ratio exceeded 181 percent (OECD Database, 2017). The most dramatic debt-ratio trend was experienced in Ireland, where the debt-ratio escalated by over 105-percentage points, from 27.4 percent in 2007 to a peak of 132.6 percent of GDP in 2013 (OECD Database, 2017).

Figure 1.1 – General Government Debt-to-GDP Ratio Trends, 1995-2015

The surge in sovereign debt levels in Greece and Ireland, among other economies, was so significant that their respective governments were faced with amplified market pressure during the GFC (Argyrou & Kontonikas, 2012, p. 659). This resulted in increased risk premiums, interest rates and creditor uncertainty of governments’ ability to service debt repayments, which caused restricted access to additional capital. Consequently, the first financial assistance programs were distributed to advanced economies (Argyrou & Kontonikas, 2012, p. 659), provided by EU institutions in collaboration with the IMF (IMF, 2014; European Parliament, April 2016). Greece obtained their first assistance program consisting of €110 billion in May 2010, a second program totalling €164.5 billion in March 2012, and most recently in August 2015, they
were granted a further €86 billion. Ireland, on the other hand, received a €85 billion assistance program in December 2011 (DG ECFIN, 2014; Eurostat, 2016A; European Parliament, April 2016). Not only did these efforts represent the first assistance programs to advanced economies, they also represent the largest programs in terms of the countries’ respective GDP in the IMF’s history (Pisani-Ferry et al., 2013, p. 27, 78) and resulted in changes in the IMF’s lending activities and policies (Edwards & Hsieh, 2010). The objectives for these large financial assistance programs were to allow the troubled governments to maintain debt repayments and avoid debt defaults, and improve their ability to restore credit market confidence, while addressing necessary economic reforms to recover from the crisis (Edwards & Hsieh, 2013, pp. 79-80). Another related objective was to minimise the contagion effects of the crisis within the EU, as exceptionally high levels of cross-country banking-sector exposure increase the regional vulnerabilities for further financial turmoil if economies defaulted on their debt liabilities (Blundell-Wignall & Slovik, 2010, p. 2; Lane, 2013, p. 556).

Due to the severity of advanced economies’ debt-ratio levels, a large number of empirical research efforts on debt and fiscal sustainability focusing on advanced economies have emerged, where many rely on the debt-to-GDP ratio measurement. Several research efforts focus on the negative impact of high debt on economic growth, with the purpose of determining the debt-to-GDP ratio threshold between “good” and “bad” debt, based on the theory of the relationship between debt and growth highlighted as an inverted U-shaped curve (Pattillo et al., 2013, p. 2; Cottarelli et al., 2014, p. 117). Reinhart and Rogoff (2010) argued that debt above 90 percent of GDP resulted in decreases in economic growth rates, while Checherita and Rother (2010) suggested that the threshold was between 90 and 100 percent of GDP (2010, p. 5), Cecchetti et al. (2011) highlighted a threshold of 85 percent of GDP (2011, p. 18), and Baum et al. (2013) argued for a threshold at 95 percent of GDP (2013, pp. 810-811).

Moreover, research has investigated the impact of high debt on fiscal sustainability and the primary surplus responsiveness. Ghosh, Kim, Mendoza, Ostry and Qureshi (2011) found that primary surplus growth started to diminish when debt levels were around 90 to 100 percent of GDP, while debt exceeding 150 percent of GDP resulted in negative primary surplus growth (2011, p. 22). Mendoza and Ostry (2007) also found that debt levels impact fiscal responsiveness in high-debt economies and argue that governments
should be cautious about allowing debt to exceed 50 to 60 percent of GDP, to ensure fiscal solvency (2007, p. 18). Additionally, Checherita-Westphal et al. (2014) highlights that the optimal debt-to-GDP ratio to ensure fiscal flexibility and sustainability was 50 percent among economies within the euro-area (2014, p. 639), which is 10-percentage points lower than the EU’s Stability and Growth Pact (SGP) debt ceiling of 60 percent of GDP (European Commission, 2018).

In light of the research cited above, the debt-to-GDP ratio levels among advanced economies, and especially the highly indebted EU economies, are very alarming and could have significant consequences on economic growth rates and the ability to generate primary surplus (see Glossary, p. xii) to repay debt liabilities. Due to the combination of high debt levels, the lack of improvement in fiscal balances since 2015 and the low economic growth rates, the IMF has advised advanced economies to take advantage of the favourable economic conditions evident after 2016 to pursue structural reforms and growth-enhancing fiscal policies, as well as to ensure sustainable debt-to-GDP ratio projections for the future (IMF, 2017a, pp. 1-2). Additionally, the IMF (2017) urges economies to build a fiscal buffer and adequate fiscal space to safeguard governments’ abilities to weather “bad times” in the future (IMF, 2017a, p. 5). This is particularly important for advanced economies, as ageing populations will potentially elevate pressures within a government’s fiscal balance, as government expenditures are likely to increase due to for example rising pension payouts (Leeper & Walker, 2011, p. 2), in combination with declining income taxation revenues (Goudswaard & Van Der Kar, 1994, p. 52), that will reduce fiscal space and potentially result in increasing sovereign debt levels in the future.

For these reasons, it is crucial to investigate how valuable the debt-to-GDP measurement is to effectively assist policy-making. By examining the underlying dynamics of the ratio measurement, research can enhance knowledge on how to most successfully support governments in measuring and evaluating debt levels to ensure necessary debt-policy actions to decrease the currently high debt levels. Additionally, it is important to ensure that policy-makers make well-informed debt policies and strategies during economic booms to achieve and maintain sustainable debt levels in the future. This research will, therefore, place emphasis on critically examining the debt-to-GDP ratio measurement and its influence within policy-making to ultimately explore the measurement’s
informative nature and ability to promote effective debt reducing policies and sustainable debt strategies.

1.1 – Problem Statement and Argument
The debt-to-GDP ratio is an important debt index of regional and international institutional databases, and is widely used within institutional analysis reports, such as the IMF’s Fiscal Monitor and the World Economic Outlook. It is also the most prominent measurement used within the literature, including research on the relationship between debt and growth (Reinhart and Rogoff, 2010; Cecchetti et al., 2011 and Baum et al., 2013, among others), the impact of high debt on primary surplus responsiveness (Mendoza and Ostry, 2007 and Ghosh et al., 2011), and research efforts aiming to determine optimal debt levels (Mendoza and Ostry, 2007 and Checherita-Westphal et al., 2014). The reliance on the debt-to-GDP ratio can be due to its capacity to make cross-country comparisons of debt levels, regardless of different sizes of economies and currencies. Moreover, the GDP-ratio providing research and theories with the ability to standardise statistical frameworks and theoretical conclusions. However, these characteristics and features are unlikely to be highly valuable from a national policy-making perspective.

While the debt-to-GDP ratio portrays the debt burden relative to the size of an economy, economies have different economic growth rates, economic structures, industry compositions and taxation rates, which may result in variations in government revenue flows underlying a debt-to-GDP ratio level. Additionally, the measurement does not provide insight into a government’s expenditure levels, that determines the budget balance and the extent a government needs to borrow capital to finance their budgetary objectives. The relationship between government revenues and expenditure also determines the ability of the government to ensure sufficient capital needed to repay debt liabilities. The combination of potential differences in fiscal features within economies, such as revenue flows, government assets and expenditure levels, suggests that the debt-to-GDP ratio may not provide valuable or accurate information on the government’s repayment capacity. Moreover, debt portfolio features, such as maturity and interest-rate compositions, are not revealed by the debt-to-GDP ratio; nonetheless, these features might impact the GDP-ratio level a government could potentially sustain, and therefore, may be important aspects for policy-making. Lastly, as the debt-to-GDP ratio portrays debt relative to the size of the economy, fluctuations in economies’ nominal economic
growth may impact the debt-ratio trends and the perception of the underlying monetary debt level trends.

This research ultimately questions if the debt-to-GDP ratio can effectively portray debt-level trends, repayment issues and debt sustainability across economies, and if the measurement has the ability to indicate different debt burden implications within two economies with the same GDP ratio level. The potential importance of budget balance and debt portfolio features could significantly reduce the valuable aspect of the GDP-ratio for policy-making and have an impact on how successful standardised GDP-ratio denominated threshold strategies may be for governments and within regional fiscal and debt policy guidelines.

A major proposal of this research is that the GDP-ratio is not a universal measurement across economies with varying economic and fiscal conditions and debt portfolio features. Additionally, fluctuations in the nominal economic growth rate may distort the understanding of monetary debt trends, and changes within economic, fiscal and debt features may result in fluctuating debt-ratio levels that would be sustainable for different economies over time. The key problem is, therefore, how can the debt-to-GDP ratio measurement effectively assist policy-makers and be used by research, if it is not a universal measurement or static over time? In more detail, this research explores a few problem areas. Firstly, the GDP-ratio could be limited in its ability to be used successfully by governmental policy-makers and institutional analysts without including additional country-specific economic and fiscal information to formulate budget and debt policies and to accurately analyse debt sustainability. Secondly, regional fiscal and debt guidelines, such as the EU’s SGP, could potentially have different implications for different EU economies. Thirdly, research may not be able to rely solely on the measurement within their theoretical and statistical frameworks and related conclusions, as different countries and time samples would potentially change the research finding. Finally, the use of the GDP-ratio by research may decrease their ability to efficiently assist policy-making, if the measurement is less important than other economic, fiscal and debt features within governments’ policy-making and debt strategy development.
1.2 – Objectives and Purpose

The purpose of this research is to critically examine the limitations and accuracy of the GDP-ratio and identify quantitative variables and qualitative factors that distort the perception of debt level trends, and which impact the debt-to-GDP ratio level a government can sustain. More specifically, the objective is to assess how differences in economic variables impact the accuracy of the measurement and how variations in fiscal features impact a government’s repayment capacities. This research will explore quantitative data including economic variables, such as the debt-to-GDP ratio, economic growth rates, and nominal debt and GDP data. This research will also explore the fiscal features, including the net-borrowing levels, total and taxation revenue-ratios, the expenditure-ratio and nominal taxation revenues. Moreover, the research aims to determine how influential the measurement is within political decision-making and debt strategy development, by collecting qualitative data through interviews with government and institutional representatives to analyse how limitations impact the value of the measurement from a policy-making perspective. The objective is not to argue that the debt-to-GDP ratio is redundant, however, but to promote how to use the measurement more carefully and successfully. The purpose is to provide a new area of knowledge within the literature, spark new debate on the accuracy and appropriateness of the debt-to-GDP ratio, and to minimise discrepancies related to the potential use of the GDP-ratio between conclusions reached by theories and decisions by policy-makers. Consequently, the overarching rationale of this research is to empower politicians, economists and researchers by providing new information on how to most successfully use the measurement within national and regional policy-making and theory building, to increase the accuracy of theoretical conclusions and to improve the understanding on how to assist policy-making effectively.

1.3 – Relevance

Research has been focusing on investigating specific areas of sovereign debt, including the beneficial ways governments can use debt to maintain stable taxation levels (Barro, 1979), to supplement private investment (Keynes, 1980), and to boost consumption levels (Cecchetti et al., 2011). Other areas of the literature concentrate on the implications of high debt levels, such as through determining the specific threshold where high debt has a negative impact on economic growth (Reinhart and Rogoff, 2010; Cecchetti et al., 2011; Baum et al., 2013, among others), the impact of high debt on primary surplus
responsiveness (Mendoza and Ostry, 2007; Ghosh et al., 2011) and defining optimal debt levels for fiscal flexibility and sustainability (Mendoza and Ostry, 2007; Checherita-Westphal et al., 2014).

However, there is a very undeveloped area in the literature on what measurement is best to use within research and policy-making, with a very limited amount of research investigating the impact on different valuation approaches of debt on debt levels (Balassone & Franco, 2000; Dipplesman, 2012). This research, therefore, contributes to the existing literature by filling two important gaps: the lack of critical examination of the limitations and accuracy of the debt-to-GDP ratio; and the levels of influence the GDP-ratio measurement has within policy-making. This is important in order to determine how to assist regional and international institutions, as well as ascertaining how theories and research can most successfully use the measurement index.

The research also supplements the predominantly quantitative and positivist literature on sovereign debt with qualitative methods and a pragmatic research perspective through the mixed-method research design. By combining quantitative and qualitative data and analysis methods, examining the relationships between economic and fiscal variables and the GDP-ratio, as well as highlighting the context of debt-to-GDP measurement, this research will contribute knowledge on how universal the GDP-ratio is, and its limitations within cross-country analysis and national policy-making. In this way, the research will increase the scope within the literature on the benefits and disadvantages of the debt-to-GDP ratio measurement. This research aims to highlight new strategies in regard to which economic and fiscal variables to use, and qualitative debt portfolio features to consider, when utilising the GDP-ratio measurement, to increase researchers' ability to ensure accurate and appropriate use of the measurement in debt analysis and theory building. This will potentially improve the appeal of these theories for more specific country groups and increase their ability to assist policy-making, as governments may recognise the increased relevance for their specific situations.

In practical terms, the research aims to contribute to knowledge to assist national and regional policy-making by discovering the limitations and accuracy of the measurement from a policy-making perspective. By exploring and proposing more comprehensive knowledge on the debt-to-GDP ratio, this research aspires to empower national policy-
makers and institutional analysts by highlighting the need to take into account country-specific features and qualitative debt portfolio characteristics to develop specific debt-to-GDP ratio threshold strategies by governments, and different debt ceilings and fiscal guidelines for the different country groups within the EU’s SGP, to promote increased fiscal and debt sustainability.

The structure of the thesis is as follows: Chapter 2 undertakes a review of relevant literature to highlight the gaps in the literature and explains how this research will fill these gaps. Chapter 3 clarifies the methodology of this research by elaborating on paradigms, data collection and analysis techniques, and outlining the research design. Chapter 4 is the first country case-study chapter, where the research analyses quantitative and qualitative data on Greece, while Chapter 5 focuses on Ireland, Chapter 6 addresses Norway, and Chapter 7 investigates Australia. To supplement the country-based analyses, Chapter 8 addresses qualitative interview data collected from international financial institutions, including the IMF, the World Bank and the UN. Chapter 9 facilitates cross-country analysis to highlight similarities and differences, while presenting the key data collected from the international institutions to provide an in-depth discussion. Chapter 9 also addresses the implications of the findings in relation to key areas within the literature. Finally, Chapter 10 concludes the research’s implications, while confirming the significance and impact of the research and highlighting important areas of future research.
Chapter 2 – Literature Review

2.0 – Introduction to Sovereign Debt Measurements, Objectives, and Environment

Advanced and developing economies borrow capital by issuing government bonds to domestic and foreign investors. The term general government (see Glossary, p. xi) includes all divisions, including central or federal; state, provincial or regional; and local government levels, as well as social security reserves and non-profit organisations funded by the government (IMF, 2013, pp. 6-7; Eurostat, 2016B, pp. 2-4). Most major international institutions, such as the International Monetary Fund (IMF), the World Bank and the Organisation of Economic Cooperation and Development (OECD) that report analyse debt data, mainly focus on total debt liabilities (gross debt) of the general government (IMF, 2016). This is due to the fact that not all countries have all three levels of government, and by reporting general government debt, the institutions allow for comparisons across countries regardless of the structure of government divisions (IMF, 2013, p. 8).

Sovereign debt can be reported through two principal measurements, gross debt and net debt. Gross debt refers to the total liabilities held by the government, while net debt refers to the government’s total liabilities minus corresponding financial assets (IMF, 2013, p. 5; Dipplesman et al, 2012, p.7). These measurements can also be divided into domestic and external debt, where gross and net external debt refers to debt borrowed from investors outside the economy (Eurostat, 2016B; Dias, 2010, p. 3). Both gross and net debt measurements can be represented in monetary terms or as a GDP-ratio. The net debt measurement enables a more in-depth analysis of government solvency and sustainability, as governments can sell assets to repay financial claims. Therefore, Panizza and Presbitero (2013) stated that the net-debt measurement might be a more accurate measure of governments’ indebtedness, however, the net-debt measurement needs precise valuations of liabilities and assets, which is a very complex process and have several practical and conceptual problems. Data on governmental assets are often considered unreliable due to their complexity in valuation, and potential currency conversion and transparency issues regarding the value of assets are present. Additionally, Eurostat’s (2018) definition of net-debt (see Glossary, p. xi) underlines that the governments decide what types of assets to include, which result in the net-debt
measurement being more heterogeneous compared to the most standardised gross debt measurement. When utilising the net debt measurement, the assets and liabilities must be valued with the same valuation approach and foreign exchange rate. Consequently, problems arise due to the complexity of consolidation (see Glossary, p. xi) of external and domestic debt liabilities and financial assets (Balassone & Franco, 2000, pp. 31, 35).

There are minimal empirical research on what measurement of debt is optimal, or most accurate to use within analysis and theories, and challenging questions such as should researchers focus on gross debt and net debt, whether to include implicit liabilities of governments or not, and to what extent should government’s contingency liabilities be incorporated into standard debt measures are still largely unanswered (Panizza & Presbitero, 2013, p. 193). As the definition of gross debt is more homogeneous across countries compared to the net-debt measurement, while it avoids issues of consolidation of valuation, and the availability and reliability of data on government assets, gross debt is the more practical measurement of debt for researchers (Panizza & Presbitero, 2013, p. 197) and the major financial institutions, such as the IMF, World Bank, OECD and Eurostat (Balassone & Franco, 2000, pp. 31, 35).

In terms of the valuation of debt, there are several valuation approaches, including market value, nominal value (also called face value) and redemption value (for definitions of the valuation approaches: see Glossary, pp. xii-xiii) (Balassone & Franco, 2000, p. 31; Dipplesman, 2012, p. 12). From a government perspective, the market value is not the optimal valuation of debt, as governments would not repay debt obligations before maturity (repayment date). Therefore, governments consider the nominal value of debt as representing the outstanding value of a debt liability at any specific moment in time. Investors regard the redemption value in their analysis of government solvency, which refers to the value of debt liabilities at maturity, and market value would only be beneficial if the investors intended to sell the liabilities (Balassone & Franco, 2000, p. 32). Another important factor to take into account when considering the monetary value of debt is the high volatility of the market valuation of debt (Balassone & Franco, 2000, p. 35). The valuation of debt is another problematic area within the literature that has not been investigated substantially by empirical research. Nonetheless, one study by Dippelsman, Dziobek and Gutierrez Mangas (2012) is important to highlight. The research asked the question “Did Greece’s debt rise by approximately 10 percent
between 2009 and 2010 or did it fall by 10 percent?” (2012, p. 15). Interestingly, both statements were found to be correct, which connects to what valuation approach. More specifically, the evidence showed that the nominal value, or face value, of Greek debt increased, while the market value of the debt decreased (Dippelsman et al., 2012, p. 15).

A country’s debt expressed is primarily conveyed as a percentage of Gross Domestic Product (GDP), which is the value of all goods and services produced within a country within a given period of time (IMF, 2011, p. 9; Callen, 2012, p. 1). The debt-to-GDP ratio hence indicates the government’s debt burden relative to the overall size of the economy. It can be argued that a larger and more advanced economy could endure a higher monetary debt burden compared to a smaller economy (Nelson, 2013, p. 3). Although not explicitly outlined within the literature, this assumption could be illustrated through the notion that a larger economy would have larger tax revenue flows due to higher levels of employment, consumption and production compared to a smaller economy’s government. More specifically, a government in a large economy would have more tax revenues due to higher levels of employment relating to the size of the population and/or higher income levels, larger proportion of consumption resulting in elevated Goods and Services Tax (GST) revenues, as well as more corporate taxes due to a larger corporate sector and production output reflected through the size of the GDP. In this way, the GDP-ratio of debt can give an indication of the taxation revenue in relation to the debt burden.

While the gross debt as a GDP-ratio is frequently reported by international institutions, and used within empirical research efforts, there is currently no empirical research critically investigating or discussing the debt-to-GDP measurement’s accuracy or appropriateness for theoretical or policy-making purposes.

Governments borrow capital to achieve a variety of aims and objectives, for example to facilitate large long-term investment projects within infrastructure, health and education, to increase the technological level within an economy through acquiring or facilitating Research and Development (R&D) projects, or to build defence (Nelson, 2013, p. 3). Other objectives can be expansionary fiscal policies, such as increasing government spending (Keynes, 1980) or boost economic activity and consumption (Baum et al., 2013, p. 809; Cecchetti et al., 2011, p. 3). Expansionary fiscal policies are mainly used during
unforeseen crises, such as natural disasters and economic turmoil, which can result in an economic recession. The research by Keynes (1980), Cecchetti et al. (2011) Baum et al. (2013), among others, argue that sovereign debt can have a productive role under certain conditions, especially if borrowed capital stabilises the economy or finances investments that produce improved economic growth in the future. Nonetheless, governments can use debt imprudently and with fewer future benefits, such as financing budget deficits arising from elevated governmental operational costs or non-expansionary fiscal policies (Keynes, 1980).

Moreover, there are some arguments relating to the potential reluctance of governments to increase tax levels and decrease spending during economic booms to effectively decrease debt levels, which then leads to accumulating debt levels over time (Nelson, 2013, p. 3). If sovereign debt is exploited imprudently and escalates over time, it can lead to a deterioration of market and creditor confidence and, therefore, counteract the potential objective of increasing economic activity (Cecchetti et al., 2011, p. 3). Accumulating debt levels can have a significant impact on the confidence of credit markets, which can cause higher interest rates (Krugman, 1988, p. 254) due to the increased risks of default and can result in loss of access to additional credit (Cecchetti et al., 2011, p. 4). If the economy is experiencing economic turmoil, or a natural disaster, high debt levels can quickly result in declining investments and negatively impact consumption and employment levels (Cecchetti et al., 2011, p. 4), which can result in have negative implications for government budgets, as consumption, investment and employment levels can reduce the taxation revenue of governments. Consequently, high debt can prolong economic recessions, which negatively impact government tax revenues and decrease the ability to maintain repayments of accumulated debt liabilities (Nelson, 2012, p. 11).

For businesses and individuals, over-borrowing can lead to bankruptcy; however, the conditions of bankruptcy are very different and much more complex in the case of countries. One of the key features discussed in the literature, is the area of enforceability of sovereign debt. The conventional view is that sovereign borrowers are basically resistant to legal action by foreign creditors. The research by Eaton and Gersovitz (1981) and Arellano (2008) assumed that governments are “above the law”, and as there is no suprnational legal authority to impose debt repayments, government debt is not
enforceable. Similarly, Panizza, Sturzenegger and Zettlemeyer’s (2009) survey highlighted that the defining feature of sovereign debt was its limited enforceability (2009, p. 652). Nonetheless, the research stressed the interest of governments to uphold debt repayment obligations as to remain a good reputation on the international credit market and to not lose market access to new capital as key incentives for governments to avoid defaults (Eaton & Gersovitz, 1981, p. 290; Eaton, 1993, p. 154; Arellano, 2008, p. 691). Moreover, research by Burlow and Rogoff (1989) highlighted that governments ensure debt repayments due to the potential of sanctions. Loss of credit market access can also impact international trade, as restricted access to short-term credit will affect a government’s ability to raise foreign currency to facilitate the import of foreign products (1989, p.44). Additionally, a creditor may also want to send a signal to other debtors by punishing the defaulting country by decreasing trade to deter future defaults (Rose, 2002, p. 3).

In contrast to the conventional view on enforceability, the most recent research by Schumacher, Trebesch and Enderlein (2018), showed that the credit market has gone through essential changes since the early 1990s, which has increased the number of legal actions against sovereign debt defaults (2018, p. 2). More specifically, Schumacher et al. (2018) into lawsuits filed against defaulting governments between 1976 and 2010 in the US and UK, found that the development of a small group of “specialised distressed debt funds” that purchase discounted debt liabilities, while suing for full repayment, have increased significantly has increased lawsuits significantly (2018, p. 2). Hedge funds were found to account for two-thirds of new lawsuits, and are characterised by more aggressive legal strategies, larger lawsuits, and increasingly pressuring governments to settle outside court (Schumacher et al., 2018, p. 2). The research also highlighted increased attempts to nominate government assets abroad as collateral, which increases the creditors’ ability to potentially seize assets upon defaults (Schumacher et al, 2018, p. 5). These aspects indicate that sovereign debt is increasingly becoming enforceable, and that litigation is becoming a more prominent cost of default, providing additional incentives for governments to service debt obligations.

Furthermore, the court’s ability to enforce embargos on the access on new capital links Schumacher et al. (2018) research conclusions to the research by Eaton and Gersovitz (1981) and Arellano (2008) that focus on the loss of capital market access and reputation
as the key incentives behind government repayment, as well as the research by Bulow and Rogoff (1989) concentrating on the repayment incentive connected to the threat of sanctions (Schumacher et al., 2018, p. 53).

Another incentive to maintain debt payments relate to the highly globalised world economy and the high level of financial integration, elevated external debt levels and economic interdependency, which have increased the risks of cross-country contagion of financial crises, especially within a monetary union (De Santis, 2012, p. 3; Argyrou & Kontonikas, 2012, p. 659). This was evident within the EU during the GFC, as Greece, Portugal and Ireland experienced sharply increasing sovereign debt levels due to the crisis (Lane, 2013, p. 56). The credit rating downgrade of Greece quickly spread to Ireland, Portugal and Italy, Spain, among others, with weak fiscal conditions (De Santis, 2012, p. 3). The elevated debt levels and budget deficits were so significant that the credit market reactions resulted in increased bond spreads within the EU (De Santis, 2012, p. 26) and restricted governments’ access to additional capital due to the elevated uncertainty of their ability to service debt repayments (Argyrou & Kontonikas, 2012, p. 659). These conditions resulted in the first, and historically largest, financial assistance programs to advanced economies (Argyrou & Kontonikas, 2012, p. 659) provided by IMF and EU institutions (Pisani-Ferry et al., 2013, p. 27). The objectives were to allow the troubled governments to maintain debt repayments and ultimately avoid debt defaults. This also allowed governments to provide fiscal policies to recover from the crisis, address economic reforms, restore credit market confidence and limit the contagion effects (Edwards & Hsieh, 2013, pp. 79-80).

Overall, there are several measurements of debt, where the international financial institutions mostly report the general government gross debt-to-GDP ratio, which standardises debt levels across different countries with different currencies. Nonetheless, to what extent does the debt-to-GDP ratio play a role in theoretical contributions? And how useful and explanatory is the debt-to-GDP ratio as a measurement to assist debt analysis and policy-making by governments? This literature review focuses on reviewing the theoretical efforts on several aspects with connections to sovereign debt and fiscal sustainability.
The chapter is structured as follows: firstly, section 2.1 outlines the literature focusing on explanations of why governments borrow and the positive aspects of debt within budget policies, investment, consumption and overall economic growth. Secondly, section 2.2 investigates the theories on the threshold between “good” and “bad” debt levels, and the potential negative implications of high debt on economic growth. Thirdly, section 2.3 covers the literature on government budget constraints (see Glossary, p. xi) and fiscal sustainability and their relationship to sovereign debt levels and policies. Fourthly, section 2.4 investigates the theoretical contributions on the impact of government structures on governments’ decision-making regarding budget deficit and debt policy. Finally, section 2.5 highlights the identified gaps in the literature, provides the research questions and explains how these questions aim to fill the gaps.

2.1 – Sovereign Debt as a Policy Tool to Facilitate Economic Growth

The literature and policy debates are highly focused on the risks associated with escalated sovereign debt, especially after the GFC, which resulted in the European Debt Crisis. Research efforts have found several economic benefits of sovereign debt for governments and national economies, providing justifications for governments’ objectives and decisions to acquire modest levels of sovereign debt.

Barro (1979) described the “optimal” budget policy as ensuring constant taxation rates over the business cycle. The intertemporal budget constraint (see Glossary, p. xii) implied that expenditures should equal taxation revenues; therefore, the budget surplus and deficit were linked to fluctuating expenditure levels. Government expenditure was expected to increase during the economic recession producing budget deficits, and debt levels were expected to rise. On the other hand, governments would have a budget surplus during economic expansion as expenditure levels decreased and, therefore, debt levels were expected to decline. Therefore, Barro’s (1979) taxation-smoothing theory suggested that sovereign debt would be used to finance the increased short-term expenditures producing budget deficits to sustain a stable taxation rate. Barro (1979) implied that budget deficit levels, consequently directly influence the sovereign debt trend. Two studies test Barro’s (1979) taxation smoothing theory through the assessment of fiscal policies and the use of sovereign debt in India (Cashin, Olekalns & Sahay, 1998, p. 19), Pakistan and Sri Lanka (Cashin, Haque & Olekalns, 1999 p. 3). The conclusions showed support for the taxation-smoothing theory. Nonetheless, the outcomes varied among the case-study economies, reflecting the differences within the respective
countries’ fiscal policies and fluctuations of economic variables, such as inflation. These studies underlined that the non-lump sum taxation (see Glossary, p. xii) distorted tax revenue over time, as taxation was not a fixed amount. Consequently, governments found it desirable to smooth the taxation revenue over time by financing amplified short-term government expenditures with sovereign debt, rather than temporarily increasing taxation rates.

An opposing theoretical argument on the cause for budget deficits was highlighted by John Maynard Keynes, who claimed that budget deficits were a consequence of reduced revenues due to lowered economic activity and decreased private investment levels (Keynes, 1980; Brown-Collier & Collier, 1995, p. 344). Therefore, Keynes (1980) stressed that economic stabilisation and full employment were achieved through deficit spending by the government, with the aim to supplement private investment through social investment (see Glossary, p. xiii). However, he argued that it was inappropriate to have recurring deficits and to increase debt to finance government operational expenditures. Government investments should provide returns over time, either cash returns or increased flow of services through the investments toward, for example, port facilities, electric utility plants or university or public school buildings or equipment, among other suggestions. Keynes (1980) argued that the cost expenditures financed with debt should match the benefits the investments generate and be proportional to national income growth. Additionally, Keynes (1980) stressed that, rather than repaying debt, the government should aim to replace unproductive debt with productive debt that financed investments with returns. Consequently, he stated, “I should expect for a long time to come that the government debt or government guaranteed debt would continuing increasing in grand total” (Keynes, 1980, p. 278; Brown-Collier & Collier, 1995, p. 349).

Eaton (1993) and Cecchetti, Mohanty and Zampolli (2011) emphasised that sovereign debt could assist positive consumption and investment levels within an economy (pp.141-142; p. 3). Eaton (1993) highlighted two objectives of why countries borrow for consumption purposes. Firstly, governments could increase sovereign debt to facilitate higher consumption levels compared to the rate of factor endowments within the economy. Secondly, governments could smooth short-term consumption trends when factor endowment rates are shifting. Based on these assumptions, Eaton (1993) stressed that governments increased sovereign debt levels after financial shocks, such as financial
crises and natural disasters, to counteract contractions in output and GDP growth by maintaining or increase consumption (1993, p. 137). Furthermore, Cecchetti et al. (2011) argued that governments could use sovereign debt to transfer future wealth to the present time to fund governmental budget deficits relating to increased spending, investment or social welfare (2011, p. 3). This concept is also referred to as ‘backward intergenerational transfer’ of capital, as a future generation’s wealth is transferred through the use of borrowed capital today, while repayments occurred in the future (Cecchetti et al., 2011, p. 4). Future wealth in this context relates to Eaton’s (1993) argument of fluctuating factor endowment rates, as governments could take advantage of anticipated increased factor endowments of labour, capital and technological efficiency in the future. Governments could, therefore, pursue fiscal stimulus policies and increase government investment to positively influence consumption levels during an economic recession, such as the GFC, while avoiding elevating taxation rates to increase taxation revenues (Eaton, 1993, p. 138).

While indirectly supporting the concept of ‘backward intergenerational capital transfer’ highlighted by Cecchetti et al. (2011), Cukierman & Meltzer (1989) concurred with Keynes’ argument on productive debt, as they stressed that the positive aspects of additional sovereign debt would be more prominent when the debt financed investments that benefited future generations (Cukierman & Meltzer, 1989, p. 730). Furthermore, Elmendorf and Mankiw (1999) emphasised that the beneficial effects of sovereign debt by an economy were highly dependent on the amount, composition and duration of the additional debt. The main argument was that the positive effects of sovereign debt were more prominent in the short-term compared to if debt accumulates in the long-term. The argument emphasised on the greater uncertainty within markets and increased volatility of savings and investment rates due to increased interest rates. These features can, ultimately, decrease income and consumption levels, which again were important variables determining economic growth rates and government revenue flows (Elmendorf and Mankiw, 1999, pp. 1-2, 70, 74).

Moreover, Baum, Checherita-Westphal and Rother (2013) investigated the relationship between short- and long-term economic benefits and accumulating debt levels, and asserted that sovereign debt may have beneficial effects on an economy when initial debt levels were low. However, as indebtedness increases, ‘growth-enhancing’ debt could
potentially become growth reducing after a certain threshold. This is exemplified through an inverted U-shaped relationship, which has been supported by several research efforts (Checherita and Rother, 2010, p. 5; Pattillo et al., 2013, p. 2; Cottarelli et al., 2014, p. 117). Consequently, Baum et al. (2013) argued that if debt levels were low, the benefits of additional debt could have a greater positive effect on the economy, compared to decreasing the sovereign debt level. On the other hand, when debt levels were high, the economic benefits from decreasing the debt burden may outweigh the positive effects of the additional debt (Baum et al., 2013, p. 819).

Overall, numerous research efforts argue that sovereign debt can play a productive role under certain conditions, especially, if debt levels are low and finance investments producing increased economic growth or enable increasing consumption levels. However, governments can use debt imprudently and excessively, for example to finance operational expenditures, which can deter future economic growth and revenue levels (Elmendorf and Mankiw, 1999, pp. 1-2, 70, 74). Based on the inverted U-shaped curve illustrating the relationship between debt and beneficial economic effects, multiple studies have attempted to determine the exact level where debt starts having negative effects on economic growth and becomes a burden on the economy.

2.2 – High Sovereign Debt and the Impact on Economic Growth

As a result of the external debt levels among the Latin American economies during the Latin American Debt Crisis in the 1980s, Krugman (1988) and Sachs (1989) developed the hypothesis of debt-overhang. The theory highlighted the negative effects of large external debt on domestic investment and economic growth. Krugman (1988) explained how creditors of heavily indebted economies increasingly lack confidence in governments’ capability to fully repay their debt obligations (Krugman, 1988, p. 254), which decreases market confidence and the interest rates and risk premiums on sovereign debt bonds increased. Krugman (1988) and Sachs (1989) argued that an economy’s external debt liabilities could become increasingly heavy on governmental budget balances, as accumulated proportions of capital were transferred to the foreign creditors through debt repayments. Ultimately, this discouraged investment incentives and reduced economic growth prospects (Krugman, 1988, p. 257-258; Sachs, 1989, p 2). More specifically, this related to how large government debt repayments intensify private sector uncertainty about future taxation rates, as governments needed to increase taxation revenue to repay debt liabilities. Another reasoning was that governments would
have less capital to undertake public investments due to the increased debt repayment expenditures. The combination of these two factors influence market confidence and decreased investment incentives, and therefore, decreased the economic growth rate of an economy (Krugman, 1988, p. 258). While not explicitly focusing on developing economies, more recent empirical research showed a nonlinear impact of external debt on economic growth and GDP per capita, with an intensifying effect when external debt levels exceeded 60 percent of GDP (Reinhart and Rogoff, 2010, p. 6; Pattillo et al., 2011, p. 3).

Reinhart and Rogoff’s (2010) quantitative research is a key theoretical contribution that has been widely cited within the literature and prominently featured within the international institution’s policy debates. The research determined the debt-to-GDP threshold level where debt negatively impacted economic growth, as well as the significance of the impact. The research categorised 20 advanced economies in four groups depending on their debt-to-GDP ratio levels: (i) Low debt level, below 30 percent; (ii) Low-medium level, between 30 and 60 percent; (iii) Medium-high level, between 60 and 90 percent; and finally, (iv) High debt level above 90 percent of GDP (Reinhart & Rogoff, 2010, p. 574). By calculating average and median economic growth rates within each category, Reinhart and Rogoff (2010) argued that evidence showed a relationship between debt levels and economic growth fluctuations among the four categories. Their research discovered a decline of almost 1-percentage point in the median economic growth, and approximately 4-percentage points decrease in the average economic growth rates within the high debt level category compared to the three lower debt categories (Reinhart & Rogoff, 2010, pp. 576-577). Consequently, they concluded that 90 percent debt-to-GDP was the tipping point before sovereign debt deters economic growth.

Following Reinhart and Rogoff’s (2010) research, several studies focused on the sovereign debt threshold resulting in declining economic growth were initiated. Checherita and Rother (2010) highlighted a threshold range between 90 to 100 percent of GDP (2010, p. 5), Cecchetti et al. (2011) highlighted a threshold at 85 percent of GDP (2011, p. 18) and Baum et al. (2013) found a threshold around 95 percent of GDP (pp. 810-811). Furceri and Zdzienicka (2012) also revealed a negative relationship between sovereign debt levels and output performance within an economy. They found evidence
that a debt-to-GDP ratio above 70 percent reduces output by 1.8 percentage points, while a debt-ratio around 80 to 90 percent results in declines in output exceeding 2-percentage points. When there was a large proportion of external debt, the research asserted that output performance deteriorated further, and an external debt-to-GDP ratio above 80 percent was shown to reduce output performance by 2.4-percentage points (Furceri and Zdzenicka, 2012, p. 736). Moreover, Kumar and Woo (2010) discovered that as sovereign debt-to-GDP increase by 10-percentage points, per capita GDP growth decrease by 0.2-percentage point annually among developing economies, while results indicated a slightly lesser decrease in advanced economies (2010, pp. 4, 21).

Minea and Parent (2012) utilised a regression model to test the relationship between debt and economic growth and the debt threshold more statistically (2012, p. 2). The main findings supported Reinhart and Rogoff’s (2010) conclusion to some extent, as there was relationship evident in the debt-ratio levels between 90 and 115 percent of GDP. Nonetheless, the findings contradicted the conclusion by Reinhart and Rogoff, as debt levels above 115 percent showed a positive correlation between debt and growth (Minea and Parent, 2012, p. 11). Minea and Parent (2012) also highlighted potential problems with Reinhart and Rogoff’s research, emphasising the need for critical assessment of their robustness tests. By utilising other data sources, Minea and Parent (2012) demonstrated that both the average and median economic growth between Reinhart and Rogoff’s first three and the fourth category was actually very small and not statistically significant (Minea and Parent, 2012, p. 5). Another study by Egert (2012) also investigated Reinhart and Rogoff’s (2010) arguments by extending the sample period to as early as 1790. The research only found a weak negative correlation between debt and growth and highlighted evidence of a threshold much lower than 90 percent debt-to-GDP (Egert, 2012, p. 6). Moreover, Egert (2012) supported the findings of Minea and Parent (2012) emphasising that the threshold found by Reinhart and Rogoff (2010) was not robust enough due to sensitivity to changing sample countries and time period, data sources and underlying assumptions influencing the interpretation of the observations (Egert, 2012, p. 7).

Herndon, Ash and Pollin (2014) highlighted a combination of factors challenging the conclusions by Reinhart and Rogoff (2010). Firstly, they found that Reinhart and Rogoff had excluded available data, especially in relation to certain country observations (2014,
p. 262). Secondly, the research identified coding errors, including the exclusion of five sample countries in the analysis (2014, p. 263). Thirdly, there was an incorrect statistical weighting of country observations within the statistical summary, as specific country observations overpower other observations within the analysis. These three discoveries directly impacted the results of the average and median economic growth rates among the different debt level categories (Herndon, et al., 2014, p. 265). Finally, it was argued that there were several issues with Reinhart and Rogoff’s research methodology that overall undermined their research findings and related conclusions. When reassessing and recalculating Reinhart and Rogoff’s research while adjusting for the errors highlighted, Herndon et al. (2014) discovered that real median growth within the high debt category with above 90 percent debt was positive 2.2 percent, rather than the negative 0.1 percent initially revealed by Reinhart and Rogoff (2014, p. 259). Due to the findings, Herndon et al. (2014) strongly disagreed with the conclusion made by Reinhart and Rogoff, as no evidence indicated a strong negative relationship between debt and economic growth above 90 percent of GDP.

While the debt-threshold theories highlighted the concept of the inverted U-shaped curve to demonstrate the relationship between high sovereign debt and economic growth, Greiner (2012) claimed that the concept was irrelevant. He rejected the hypothesis and argued that the level of rigidity of the economy and its taxation level influence the non-linear relationship between sovereign debt and economic growth (2012, p. 6). Therefore, fluctuations in economic growth rate were not simply determined by the level of sovereign debt (Greiner, 2012, p. 6). Panizza and Presberito (2013) also stressed that the lack of consensus within the literature could be a result of other underlying factors impacting the overall relationship between debt and growth (2013, p. 4).

Reinhart and Rogoff’s (2010) research received considerable attention within the literature and sparked a wide debate within research on sovereign debt. The substantial numbers in threshold theories since 2010 could be argued to highlight the significance of the research area; however, there were also several criticisms of the validity of research assumptions and conclusions, as well as their impact on policy-making. Fundamentally, this research questions three key aspects of this area of the literature: firstly, the assumption that debt is the main factor impacting economic growth rates; secondly, the
rely on the GDP-ratio within analysis and conclusions and the notion that it is a universal measurement independent of different fiscal and economic circumstances; and thirdly, the level of influence of the research on policy-making, as several advanced economies have debt-levels above the thresholds highlighted as problematic. More specifically, while acknowledging the potential impact of high debt levels on economic growth, this research questions if a specific GDP-ratio threshold has the same implications in economies with different economic structures, investment levels and fiscal balances among other features. The significant lack of agreement on the GDP-ratio threshold levels and the degree of impact on economic growth evident among research efforts support the problem this research investigates.

These aspects, in combination with currently high debt levels above the threshold values portrayed in theory, prompts this research to question the practical impact of theory on policy-making. Additionally, the reliance on the GDP-ratio also highlights the confidence with which the measurement is used within governmental policy-making for theories to have a practical impact, however, this has not been established through research. As this area of the literature does not estimate the “optimal levels” of debt, rather the level where debt increasingly cause economic activity to deteriorate, it may not assist policy-makers effectively. Moreover, the debt-to-GDP ratio level can deteriorate rapidly during financial crises, due to the combination of increased government expenditure and economic recession.

2.3 – Budget Constraints and Fiscal Sustainability

A key notion is that governments need to produce a budget surplus to be able to effectively repay sovereign debt. Governments can facilitate austerity measures (see Glossary, p. xi) by decreasing spending or increasing revenues, or a combination of both, to eliminate budget deficits to be able to decrease debt levels. The intertemporal budget constraint (see Glossary, p. xi) refers to the need to consider present and future spending and revenue dynamics, to ensure long-term budget balance. In other words, budgetary decision-making must ensure a sufficient balance between spending and revenue over time, to avoid large budget deficits and accumulating debt levels.

Bohn (1991) argued that the intertemporal budget constraint forced governments to react to high budget deficits through either an increase in taxation to elevate revenues or by lowering government expenditures (1991, p. 333). Through an empirical analysis of
the long-term deficits, debt fluctuations and policy adjustments in the US, he argued that evidence supported the tax-spend hypothesis (Bohn, 1991, p. 334). In detail, the hypothesis was evident as approximately 30-35 percent of all permanent increases in government spending lead to an increase in taxation, to raise the necessary capital to counteract the increasing budget deficit. Further, about 50 percent of tax increases were found to be permanent (Bohn, 1991, p. 358). Moreover, the research indicated that on average 50-65 percent of US deficits, produced by decreases in taxation, resulted in decreasing government spending. This points to a political compromise to respond to budget deficit trends, by combining decreases in taxation with decreases in spending. Specifically, Bohn (1991) found evidence illustrating the dynamic compromise, as 50 to 70 percent of adjustments occurred on the expenditure side, while 30 to 50 percent of adjustments were evident on the revenue side (1991, pp. 357-358). Further, Bohn’s 1998 and 2005 research of the US deficit and debt fluctuations between 1916 and 1995, and 1792 to 2003 respectively, reconfirmed the evidence of a positive relationship between the primary surplus and debt-to-GDP ratios fluctuations.

As some advanced economies have experienced prolonged budget deficits and increases in sovereign debt, research questions the capacity of these economies to effectively use fiscal policy to adjust the economy following the GFC, without further increasing their debt burdens. Ghosh, Kim, Mendoza, Ostry and Qureshi (2011) highlighted that the primary surpluses cannot steadily increase infinitely, but that, at some point, the increase in primary surplus would deteriorate in comparison with progressive interest rate payments. This would then increase governments’ exposure to potential default (2011, p. 4). The authors referred to this situation as “fiscal fatigue”, due to the restriction on governments’ ability to adjust fiscal policies (Ghosh et al., 2011, pp. 5-6). When an economy experienced an increased risk to default, it was likely that risk premiums would increase, which again puts negative pressures on the level of primary surplus needed to keep pace with interest rate payments. As a result, the likelihood and risk of default increased further, and economies could lose market access to additional credit (Ghosh et al., 2011, p. 4).

The research by Ghosh et al. (2011) introduced a new theoretical framework, based on the concepts of “fiscal space” and “debt limit”, to examine the room for increasing fiscal expenditures and a country’s ability to obtain credit (Ghosh et al., 2011, p. 3). The “debt
“The "limit" threshold was the point where countries were forced to default due to larger and increasing interest rate payments and the inability to obtain additional credit to avoid default. Or in other words, the debt limit represented the point where fiscal solvency was questioned, and market confidence decreased substantially (Ghosh et al., 2011, p. 4). The authors applied the framework to a sample of 23 advanced economies between 1790 and 2007 and tested the hypothesis empirically by calculating country-specific debt limits, which enabled the research to estimate countries’ fiscal space (see Glossary, p. xi) by subtracting the current sovereign debt level from the debt limit (Ghosh et al., 2011, p. 3).

The research reached two complementary conclusions: firstly, there was robust evidence of a non-linear relationship between the fluctuations of primary surplus and sovereign debt, which indicated the existence of “fiscal fatigue”. This was evident as escalating sovereign debt levels eventually lead to a deterioration of primary surplus growth, and at a certain point, the trends could become negative as primary surplus eventually decreased (Ghosh et al., 2011, p. 6). Secondly, the research found that the marginal response of primary surplus started to diminish at sovereign debt levels ranging between 90 and 100 percent of GDP, while debt levels above 150 percent yielded negative growth rates in primary surplus (Ghosh et al., 2011, p. 22).

Regardless of the strong argument made by Ghosh et al. (2011), this research highlights two important points that need to be addressed to ensure favourable policy-making decisions in relation to the literature. Firstly, the debt limit is not a “desired” or “optimal” level of sovereign debt, rather an estimated threshold where additional credit may be restricted due to perceptions of sustainability. Therefore, the debt limit served as a concept to allow governments to calculate and monitor future fiscal space, not preferred levels of debt. Secondly, the research did not include contingent liabilities and guarantees, such as unfunded pension obligations or potential financial sector bailouts during financial crises, which in theory would have substantial impacts on the understanding of future fiscal space (2011, p. 32). Thus, Ghosh et al. (2011) highlighted the need to incorporate these notions within policy-making to ensure sufficient fiscal space for effective adjustment of fiscal policy during adverse shocks, such as financial crises. Additionally, this research argues that this may be increasingly important due to the ageing population issue in many advanced economies, which may change the fiscal space in the future. Therefore, it can be argued that there is an increased necessity for advanced economies to be cautious in regard to exhausting fiscal spaces. Although not
elaborated extensively by the research, this also relates to the differences in current and future economic growth rates of economies, which is the driving force behind increasing primary surpluses.

On a similar note, Mendoza and Ostry’s (2007) research of 34 developing and 21 advanced economies found a strong relationship between the responsiveness of primary surplus (see Glossary, p. xiii) and debt. They investigated the responsiveness of fiscal surplus at different debt-to-GDP ratios, as their statistical frameworks rejected fiscal solvency among the high-debt economies (Mendoza & Ostry, 2007, p. 4). More specifically, the research argued that the relationship was stronger among developing countries compared to advanced economies. Nonetheless, the research argued that the main policy suggestion was for governments to not increase debt above 50 to 60 percent of GDP to ensure that fiscal primary balance was managed responsibly (Mendoza & Ostry, 2007, p. 18).

The research by Checherita-Westphal, Hallett & Rother (2014) also estimated the preferred sovereign debt levels to ensure the beneficial growth maximising aspects of debt, while emphasising on fiscal sustainability objectives (2014, p. 639). By assessing the sovereign debt targets that governments should maintain, the research asserted that economies within the euro area should aim for around 50 percent debt-to-GDP ratios as a common target. This is 15-percentage points below the growth-maximising target of the OECD group of economies, and about 10-percentage points lower than the 60 percent debt ceiling for EU members outlined in the Stability and Growth Pact (SGP) within the Maastricht Treaty (European Commission, 2018). Checherita-Westphal et al. (2014) maintained that this threshold allowed for safety precautions and flexibility to ensure fiscal stability and sustainability (2014, p. 646). Nonetheless, the debt-to-GDP ratios among several European economies have been persistently above the 50 percent ratio. As a result, this research questions the extent to which the theory impacts policymaking, as debt levels are significantly above the suggested sustainability thresholds within the literature.

Overall, the budget balance is the key indicator of debt level trends, as the relative fluctuations in government expenditure and revenue determine the level of government borrowing. The intertemporal budget constraint implies that governments are forced to
adjust revenue flows and expenditure levels, or a combination of both, to deal with budget deficits and avoid accumulating debt levels. The importance of determining the governmental budget in relation to preferred policy paths highlights that fiscal accounts may greatly influence debt strategies, especially within economies with low levels of debt and greater fiscal flexibility. This may result in a lower reliance on the debt-to-GDP ratio within policy-making, as low debt levels may influence the perceived importance governments give to monitoring debt due to the focus on the budget balance over time. Additionally, as both the expenditure and revenue sides of the budget play an important role within policy-making, and the budget balance is key in order to assess repayment capacity of debt and portray government solvency, the GDP-ratio’s sole focus on portraying debt in relation to national income may be problematic. The GDP-ratio’s exclusion of the expenditure side of the budget may reduce the use of the measurement as to indicate the government’s ability to service debt liabilities within policy-making.

The research by Ghosh et al. (2011) and Mendoza and Ostry (2007) that argue that high debt impacts primary surplus responsiveness and fiscal sustainability highlight that debt can have a significant impact on government’s repayment capacity of debt. This research agrees with the theories highlighting the importance of ensuring fiscal space and flexibility, especially as economic growth rates have declined in several advanced economies following the GFC, and due to the potential future implications of an ageing population on a government’s budget balance. Nonetheless, this research questions if the use of the GDP-denominated debt threshold to determine when debt reduced primary surplus growth is appropriate. More specifically, this research questions if debt could have different implications for primary surplus growth and fiscal sustainability depending on what debt finances and the extent of positive effects in terms of economic growth and consumption that could impact government revenue flows. Additionally, primary surplus growth and fiscal flexibility at a specific debt-to-GDP threshold level vary among different economies.

2.4 – Political Decision-Making and Government Structures: Implications for Sovereign Debt Trends and Sustainability

Although Bohn (1991; 1998; 2005) found encouraging evidence on the responsiveness of the US budget surplus to debt fluctuations, the occurrence of persistently large budget deficits in Greece questions the validity of Bohn’s research findings’ as a general
assumption. In particular when considering the increasingly heavy interest rates payments as a result of escalating debt levels.

Buchanan and Wagner (1977) discussed the excessive deficits within democracies and highlighted the concept of “fiscal illusion”. The concept explained how votes do not comprehend the government’s intertemporal budget constraints, and tends to overvalue the positive effects of deficit spending while undervaluing the future taxation burden. Therefore, Buchanan and Wagner (1977) argued that the Keynesian policy suggestion of deficit spending was asymmetric and may result in abandoning the intertemporal budget constraint rule, as voters would not discipline politicians who ran deficits during economic growth periods. With a similar argument, the literature on the political business cycle highlighted that governments were more likely to undertake expansionary policies during election years, and voters rewarded policy-makers based on the lack of consideration of how these policies have to be financed by recessions after the elections (Alesina and Perotti, 1995, pp. 8-9). Although this area of the literature clarified short-term fluctuations in budget deficits through increased expenditures and decreased taxation revenues, the research by Alesina, Cohan and Roubini (1993) did not find evidence explaining the debt-to-GDP trends when investigating electoral budget cycles within OECD economies (1993, p. 20).

Research efforts also investigate the potential impacts from government structures on budget deficits, government expenditure and taxation levels, such as among majority and minority coalitions. Alesina and Drazen (1991) broadly studied the influence of political disagreements within the “decision-making process”, and argued that the greater the level of disagreement between political parties and representatives within a government, the greater the challenge of addressing budget deficits (1991, p. 1171). This political conflict within policy-making was further emphasised to be more prominent in countries with coalition governments (De Haan & Sturm, 1997, p. 740), rather than within one-party governments, due to the increased need for cooperation across different policy preferences and party constituencies. This notion could be illustrated through Game Theory, where the theory would broadly argue that the greater the number of participants, the more difficult it was to achieve agreement and cooperation between all parties (De Haan & Sturm, 1997, p. 740). Accordingly, coalition governments faced increased difficulty in addressing budget deficit reductions after adverse shocks, such as
financial crises, as the different parties within the coalition government might have different opinions on taxation and expenditure adjustments, relating to the interests of their respective constituencies (De Haan & Sturm, 1997, p. 740).

More detailed research by Roubini and Sachs (1989) and Corsetti and Roubini (1991) utilised a political power dispersion index to categorise and explain the impact of different compositions of governments on budget deficits and accumulations of sovereign debt in 14 OECD economies. Their research showed that coalition governments have in general higher and more persistent budget deficits, compared to one-party governments (Roubini and Sachs, 1989, p. 102; Corsetti and Roubini, 1991, p. 358). Edin and Ohlsson (1991) disputed these findings and highlighted that these studies neglected to distinguish between minority and majority coalitions. Their main argument was that the research by Roubini and Sachs (1989) and Corsetti and Roubini (1991) only reflected the influences and power struggles within minority coalitions, rather than recognising the potential differences between these two coalition types (Edin and Ohlsson, 1991, p. 1601-1602). Moreover, De Haan and Sturm (1994) found support for neither the Roubini and Sachs (1989) hypothesis nor the argument of increased government spending relating to coalition governments (De Haan and Sturm, 1994, p. 49).

In 1997, De Haan and Sturm evaluated the political power index by Roubini and Sachs in detail, and argued there were errors within the index, which distorted the findings and conclusions. Consequently, their research replicated the Roubini-Sachs analysis to examine if a revised, error-free version of the political power dispersion index would explain the differences in evidence. Their main conclusion was that the escalation of government expenditure and sovereign debt levels were not relevant to the Roubini-Sachs political power dispersion index and, therefore, they correspondingly discarded the relating research conclusions by Edin and Ohlsson (1991) (De Haan and Sturm, 1997, p. 740). Nevertheless, there are three aspects of the De Haan and Sturm (1997) research that need to be considered. Firstly, De Haan and Sturm covered a different countries-sample; secondly, the two studies focused on different time-samples; and finally, the adjustments made in an attempt to correct the Roubini-Sachs political power dispersion index would change the evidence and, therefore, change the subsequent conclusions (De Haan and Sturm, 1997, p. 746).
In general, this area of the literature focusing on the asymmetry of information and understanding, the impact of expansionary policies within the electoral cycles, and governmental structures are fascinating; however, there are limited connections to this research as it is not directly relevant for the research problem on the debt-to-GDP measurement’s limitations. What has become evident, however, is that there is a gap, as no research investigates the influence of the GDP-ratio and other debt measurements within governmental decision-making on debt strategies. The level of influence of the GDP-ratio within the policy-making may contribute to the asymmetry in information between politicians and voters, if distortion effects due to high economic growth result in a misrepresentation of the nominal debt trend. This gap within the literature also highlights the lack of qualitative research, although qualitative factors could influence policy-making decisions. Hence, the research argues that the predominantly quantitative literature would benefit from research illustrating the use of different debt measurements and how these assist sovereign debt policy in different economies.

2.5 – The Gaps in the Literature and the Research Questions
The gross debt-to-GDP ratio is the most reported measurement of debt by the institutions and the most prominent measurement used within theories on sovereign debt. The GDP-ratio has advantages over monetary value of debt due to its ability to facilitate comparisons of debt levels across countries of different sizes and with different currencies. Debt in monetary value does not provide information beyond the nominal value of debt liabilities, and do not provide a theory with the ability to generalise theoretical conclusions in a similar way as the GDP-ratio. Although the debt-to-GDP ratio indicates debt levels in relation to the size of the economy, and a larger economy has larger proportions of government taxation revenues, this research questions the measurement’s ability to accurately portray debt in relation to government taxation revenues, as it depends on the taxation rates of different economies. Additionally, theories highlighted budget deficits as the key indicator of rising debt levels; however, the GDP-ratio exclude valuable information on expenditure levels, which is important to understand the ability of government to service debt repayments.

Previous research described in this chapter has established that there are several beneficial aspects of debt as a policy tool, including the government’s ability to maintain stable taxation rates during fluctuating expenditure levels, and to boost investment and
consumption levels by transferring future wealth to the present. Debt can be especially beneficial and productive when it finances investments that increase economic growth and provides investment returns to the government. Nonetheless, long-term budget deficits can result in highly unproductive debt increasing significantly over time, and research efforts argue that, at some point, high debt deteriorates the initial positive objectives behind borrowing.

As outlined in this chapter, previous research efforts have thoroughly investigated a range of specific negative effects and implications of sovereign debt on the economy, including the impact on economic growth rates and fiscal sustainability. A large number of research efforts focus on the relationship between sovereign debt and economic growth and in determining the debt-to-GDP threshold between “good” and “bad” debt, which has resulted in a jungle of different GDP denominated thresholds. On the other hand, other research efforts have rejected the validity of these threshold conclusions, arguing that the many different thresholds indicate that not only high debt levels impact economic growth rates, and that country-specific economic and fiscal features play an important role.

The intertemporal budget constraint has been argued to force governments to react to budget deficits through decreasing expenditure or increasing revenue levels. Furthermore, research highlights that primary surplus cannot increase infinitely and has established that debt levels negatively impact fiscal surplus through increasing interest rate payment pressures. The theories argue that high debt impacts the responsiveness of primary surplus and decreases fiscal sustainability, which impacts a government’s capacity to repay debt. This research agrees with the theories highlighting the importance of ensuring fiscal flexibility, especially due to the declining economic growth in several advanced economies after the GFC, and with the issue of the ageing populations pressuring future governments’ budget balances. Nonetheless, this research questions if the use of the GDP denominated debt thresholds to determine when debt reduced primary surplus growth is accurate. More specifically, this research questions if the implications of debt on primary surplus growth and fiscal sustainability depend on what debt is used for and its impact on economic growth, consumption and investment return resulting in rising government revenues. Therefore, primary surplus growth and fiscal flexibility at a specific debt-to-GDP threshold level vary among different economies.
While previous research has investigated the asymmetry of information and understanding of the intertemporal budget constraints, the impact of expansionary policies within electoral cycles, and the implications of governmental structures on fiscal policies, there is no research investigating the influence of the GDP-ratio and other debt measurements within governmental decision-making and debt strategies. The level of influence of the GDP-ratio within policy-making may contribute to the asymmetry in information between politicians and voters, if distortion effects due to high economic growth result in a misrepresentation of the nominal debt trend. Although this research does not aim to determine the use of the GDP-ratio as a tool to potentially influence public perceptions, for example during election years, the research will have the ability to develop a new area of the literature that can encourage future research by determining the influence of the GDP-ratio.

An area that is significantly lacking empirical research is on what measurement of debt is optimal, or most accurate to use within analysis and theories, and most influential or valuable for policy-making purposes. More specifically, there is a clear gap in the literature as no research has critically investigated the debt-to-GDP ratio to determine how accurate the measurement is, and if there are limitations in its ability to portray nominal debt trends, the level of government taxation revenues and governments’ repayment capacity. Ultimately, this research questions how universal the GDP-ratio is to portray debt levels, as countries have different economic and fiscal features and conditions potentially influencing debt sustainability at a certain debt-to-GDP threshold.

Finally, due to the highly quantitative and positivist nature of the literature on debt and fiscal sustainability, this research will supplement the literature by including qualitative data and analysis techniques to embrace a wide range of potential limitations that impact the accuracy and influence of the GDP-ratio from a policy-making perspective.

The Overarching Research Question is: how accurate and valuable is the debt-to-GDP ratio for debt analysis and for policy-making by governments and international financial institutions? To facilitate thorough research of the complex Overarching Research Question, the research builds on two sequential Research Questions. These two questions have been formulated to ensure that the different aspects and data are
addressed effectively. Research Question 1 is: what are the limitations or distortion effects of the debt-to-GDP? And Research Question 2 is: how influential is the GDP-ratio within debt analysis and policy-making by governments and institutions?

Research Question 1 is an open-ended question that aims to facilitate exploratory research and fill the first gap in the literature by critically examining the debt-to-GDP ratio. By addressing this question, the research will contribute a detailed account of the accuracy and limitations of the measurement by investigating quantitative data on economic variables and fiscal accounts. More specifically, Research Question 1 incorporates the analysis of economic variables, including the debt-to-GDP ratio, economic growth rates and nominal debt and GDP data. The fiscal accounts comprise the net-borrowing levels, government expenditure, total revenue and taxation revenue data. Combined, the data will enable this research’s aim to assess the accuracy in an economic context, as well as the limitations of the GDP-ratio to portray repayment capacity. Additionally, Research Question 1 will supplement the quantitative data with qualitative data to incorporate governmental and institutional perspectives on the limitations of the measurement.

Research Question 2 is also an open-ended question, although taking a different approach by focusing on exploratory research to fill the second gap in the literature, which is the level of influence the GDP-ratio has within policy-making compared to other measurements of debt. Research Question 2 will focus on the qualitative data, while the quantitative data analysis will support and validate the interview data obtained from governmental and institutional representatives. The objective is to determine if potential limitations and inaccuracies impact the use of the measurement and the perceived value of the debt-to-GDP ratio to assist debt policy strategies by policymakers.

The two Research Questions are interconnected and contribute different aspects of data and analyses to answer the Overarching Research Question. Research Question 1 will provide a critical analysis of how and why the GDP can provide limitations within the policy-making environment, and thus contributes to the Overarching Research Question by illustrating the accuracies from both quantitative and qualitative perspectives. Research Question 2 will contribute to the Overarching Research Question by providing
qualitative information on the use of different measurements within policy-making, to determine if the GDP-ratio is a valuable measurement for policy-making.

The following chapter will outline in greater detail the methodology of this research and elaborate on the data collection, analysis techniques and research design in relation to the research questions.
Chapter 3 – Methodology

3.0 – Introduction

Current literature and theory on debt and fiscal sustainability, including Reinhart and Rogoff (2010), Cecchetti et al. (2011), Bohn (1991; 1998; 2005) and Ghosh et al. (2011) among others, are predominantly derived from quantitative data and analysis techniques, which has resulted in heavy reliance on the debt-to-GDP ratio. This research, however, argues that it is important combining quantitative and qualitative data and analysis techniques to effectively examine the limitations and distortive aspects of the GDP-ratio and its level of influence and value within policy-making. For example, the GDP-ratio of sovereign debt does not portray budget deficit levels, total revenue flows or taxation revenue within different economies. As government accounts are directly related to sovereign debt fluctuations, one could assume these country-specific features are vital within policy-making decisions. So a question arises, to what extent do governments use the GDP-ratio within their sovereign debt analysis for policy-making? The aim of this descriptive, mixed method study is, therefore, to critically assess the GDP-ratio measurement of sovereign debt in relation to economic and fiscal variables portraying governments’ ability to service sovereign debt obligations, while supplementing qualitative data to determine the GDP-ratio’s influence and value for policy-making. This research argues that it is important to address the two gaps in the literature on the limitations and accuracy of the measurement, and the influence of the GDP-ratio within policy-making, as the theories rely on the ratio within their frameworks and conclusions. Therefore, this research aims to assist policy-making and theories by supplementing a new area to the current body of literature, to ultimately develop strategies for optimal use of the measurement for national, regional and theoretical purposes.

To effectively address the complex topic, and include quantitative and qualitative methods, this research takes a case-study approach and investigates data through detailed studies of four economies, as well as key international financial institutions, namely the IMF, the World Bank and the UN. The countries have been selected based on their respective debt-levels, and consist of Greece, Ireland, Norway and Australia. The research focuses on the time sample between 1995 and 2015, to sufficiently analyse the period before the GFC, and the most recent data at the time of the quantitative data collection. The quantitative data include a wide range of variables and analyse their
movements in relation to the GDP-ratio. The research utilises the quantitative, nonreactive data collection techniques, with the main focus on existing statistical to collect empirical data on economic and fiscal variables. These variables include the GDP-ratio, economic growth rates, nominal debt and GDP data, net-borrowing levels, total revenue and expenditure ratios, and taxation revenues. Ultimately, the wide range of variables will enable this research to determine a wide range of limitations and inaccuracies on both a country perspective and across countries. Moreover, the research investigates qualitative data to revel factors influencing the political perception and use of the GDP-ratio and its impact on governmental policy-making and institutional debt analysis. The main qualitative data collection technique the research will undertake is research interviews of national politicians and economists within the international institutions. The qualitative methods aim to gain additional contextual insight to the limitations of the GDP-ratio measurement. Undertaking interviews introduce several limitations and potential problems, such as time, availability of participants, as well as ensuring the research is conducted in agreement to ethical clearance in accordance to the Australian National Statement of Ethical Guidelines in Human Research and the Griffith University policy guidelines.

This chapter is structured as following; firstly, section 3.1 outlines of the philosophical knowledge claim of the research and its relevance; secondly, section 3.2 identifies different research methods, both data collection and analysis techniques, and highlights the decisions behind methods for each research question within the research design. Thirdly, section 3.3 explains the research design and provides descriptions of the research process of data collection and analysis by specifying the research questions and research methods through the different step-to-step outlines. Fourthly, section 3.4 addresses qualitative and quantitative data limitations of the research; and finally, section 3.5 highlights the potential ethics issues the research could encounter and evaluates the necessary measures to eliminate these ethical problems. Additionally, section 3.5 clarifies how the research complies with the National Statement on Ethical Conduct 2007 and the Griffith University Research Ethics Manual (GUREM) guidelines.

3.1 – Research Knowledge Claim and Rationale
This research is inductive in nature, as it starts by analysing empirical evidence to illustrate the context and extent of the problem to determine the practical and theoretical implications. This differs from deductive research, which originates from a theoretical
standpoint before analysing the empirical evidence to test the specific theory or hypothesis (Neuman, 2011, p. 70; Schutt, 2012, pp. 40, 44).

Neuman (2011) highlighted three social science paradigms; positivist, interpretive and critical social science. Each paradigm highlights and explains the research’s basic assumptions, key problems and perspectives, and important methods (2011, pp. 95-115). This research identifies with the critical social science perspective, which focuses on discovering hidden conditions that lead to surface-level distortions, with the goal to facilitate human empowerment and change (Neuman, 2011, p. 108). The paradigm’s critical realist ontological perspectives are evident through the interpretation of the world as a complex multi-level reality, constituting “the empirical, the real and the actual” (Neuman, 2011, p. 109). This research argues that there is a separation between the highly GDP-ratio focused quantitative theory on sovereign debt and fiscal sustainability and the actual value and use of the measurement within the political decision-making environment. The research questions reflect critical perspectives, as the primary aim is to reveal the limitations and accuracy of the GDP-ratio measurement from a policy-making perspective. By critically investigating the limitations and accuracy of the measurement, this may impact the use of the GDP-ratio as a tool to assist fiscal and debt policies by governments, and the purpose is to provide a solution to improve the understanding of the measurement for political decision-making. The overarching objective is, therefore, to empower politicians, economists and researchers by providing new knowledge on the GDP-ratio measurement, and develop guidelines on how to interpret the GDP-ratio more accurately on a national level or within cross-country analyses to optimise policy decisions by governments and institutions for increased economic and fiscal security.

Creswell (2003) highlighted four categories of knowledge claims: post-positivism, constructivism, advocacy/participatory claims and pragmatism (2003, p. 6). When considering these paradigms, this research identifies with the pragmatic perspectives, due to the ontological perspectives and critical position of the research problem and argument, and the five rationales relating to methodology choices. Firstly, this research concurs with the pragmatic paradigm, as it is not concerned with determining only one system of philosophy and reality. Secondly, the paradigm emphasises on the freedom to select from quantitative and qualitative methods to develop the most suitable approaches to ensure successful conclusions and outcomes to the research problem (Creswell, 2003,
p. 6; Greene et al., 2005, p. 275). This is especially important if qualitative and qualitative research methods alone are believed to be inadequate to sufficiently uncover findings to address the research problem (Johnson et al., 2007, p. 112). Therefore, mixed-method approaches are usually preferred by pragmatic research, compared to the purely quantitative focus of positivist research (Rallis & Rossman, 2003, p. 511; Dencombe, 2008, p. 273). This research argues that the complexity of the problem and the importance of contexts demonstrate the need to include both quantitative and qualitative data collection and analysis techniques, a freedom that a mixed-methods research design enables. Thirdly, pragmatism does not see the world as one unit (Creswell, 2003, p. 15). This research agrees with this assumption through the notion that each country has different realities in terms of economic and fiscal features and conditions, variations in ability to service sovereign debt due to government accounts, and different debt policy objectives and strategies, political influences and the policy-making environment. From this perspective this research argues that the general nature of the debt-to-GDP measurement does not relate to the different realities in different economies. The fourth and fifth point made by the paradigm further strengthens the pragmatic standpoint of this research. These two points relate to the emphasis on open-ended ‘what’ and ‘how’ questions, and the attention to the social, historical or political context of the research problem (Creswell, 2003, p. 16).

In conclusion, the methodological perspectives of the pragmatic paradigm, including the mixed-method approach to enhance this research’s ability to combine quantitative and qualitative methods to successfully answer the ‘what’ or ‘how’ questions, are key justifications behind the paradigm choice of this research. Additionally, due to the assumption that the world is not consisting of a one-unit reality and the attention to the political contexts, the research falls naturally identifies as pragmatic, as the research problem is directly linked to the political decision-making on sovereign debt, and governments’ use of debt measurements.

3.2 – Research Methods: Data Collection Techniques and Analysis Approaches
Quantitative research is defined as primarily used by positivist knowledge claims (Dencombe, 2008, p. 273), aiming to address close-ended and highly specified and theoretical questions, such as ‘do’ and ‘why’ questions, by analysing objective data,
including performance, observational and census data (Creswell, 2003, pp. 13-14, 18). With an explicit focus on a few variables and their inter-relationship, quantitative research does not normally evaluate contextual aspects and factors surrounding the research question (Neuman, 2011, pp. 17, 47). While this research does not conform to the narrow aspects of quantitative research, the research does analysis the inter-relationship between quantitative data variables; however, the research emphasises the need to include contextual data and analysis to address the research problem sufficiently.

Qualitative research usually makes knowledge claims based on critical perspectives, with the purpose of discovering a pattern and creating a theory by answering open-ended questions using a wide range of data, such as interview, text and/or image material (Creswell, 2003, p. 14-15, 18). By including qualitative methods, this research can also place great attention on the context or environment surrounding the research problem (Johnson & Onwuehbuzie, 2004, p. 20; Neuman, 2011, p. 47). Qualitative research also allows this research to examine a limited number of cases in depth, and create detailed accounts of cross-case comparisons and analysis of specific and general contexts (Johnson & Onwuehbuzie, 2004, p. 20). Finally, mixed-method approaches usually take a pragmatic approach to knowledge claims, as the research is highly “consequential-oriented [and] problem-centred” (Creswell, 2003, p. 18).

This research argues that undertaking mixed-method research allows for the collection and analysis of both qualitative and quantitative data, which is vital to effectively address the research problem. The aim is to gain detailed interpretations of inter-relationships and conditions to address a combination of predetermined and emerging questions and data. In this way, mixed-method approaches take advantage of both quantitative performance and census data analysis and qualitative text and interview data analysis, (Creswell, 2003, p. 18), to ensure a knowledge contribution that cannot be developed by using a singular method (Johnson & Onwuehbuzie, 2004, p. 20), to build a comprehensive and complete conclusion and solution to the research problem necessary to inform practice and theory (Johnson & Onwuehbuzie, 2004, p. 20; Creswell, 2003, p. 18).

This research agrees with Usunier’s (1998) argument that quantitative and qualitative research methods are complementary, rather than competing approaches, and
researchers undertaking mixed-method research can address both “the meaning as differences in nature and differences in degree” (Usunier, 1998, p. 134). Mixed-method research can use a combination of predetermined and emerging methods, as well as both statistical and text-based data analysis techniques, to address a range of open- and close-ended questions (Neuman, 2011, p. 17). Each method has its own sets of advantages and limitations, and by utilising a mixed-method approach, researchers can select and use a wider range of methods in a complementary manner (Johnson & Onwuegbuzie, 2004, p. 20; Neuman, 2011, p. 17). Consequently, this research can benefit from multiple advantages across approaches to neutralise or minimise limitations and biases arising from each respective method. The concept of triangulation is a process where the researcher collects data through different techniques and multiple data sources, and is an important analysis concept for qualitative and mixed-method approaches to provide validity to the research findings (Creswell, 2003, p. 196). This research emphasises that the combination of methods ensures accuracy and validity by enhancing the data and findings within each method, and produces a broader and more detailed conclusion (Neuman, 2011, p. 115).

Denzin (1978) identified four approaches to triangulation: method triangulation, which incorporates multiple data collection methods; investigator triangulation that is achieved by involving two or more researchers; theory triangulation, which focuses on using different theories in the analysis and interpretation process; and finally, data source triangulation that includes a range of data sources (Carter et al. 2014, p. 545). Moreover, there are two time orientation processes of triangulation that the research can adopt: the sequential and concurrent triangulation strategies. The sequential strategy uses methods consecutively, by elaborating and expanding on the initial findings of one method with another. The concurrent strategy, however, undertakes both qualitative and quantitative data collection simultaneously, and merges the data to provide a comprehensive analysis using both quantitative and qualitative analysis techniques (Creswell, 2003, p. 16; Johnson & Onwuegbuzie, 2004, p. 22).

To address Research Questions 1, this research utilises two triangulation methods highlighted by Denzin (1978), namely the data source triangulation and method triangulation methods. The research will achieve this by including both quantitative and qualitative data sources within the data collection process and combine different
methods within the data analysis process. Moreover, Research Question 1 uses the sequential strategy to ultimately combine quantitative and qualitative data collection and analysis techniques. By starting with quantitative methods, the qualitative methods aim to support, supplement and provide context to further develop the initial findings and to increase the reliability the conclusions on the problem and the research questions.

3.2.1 – Data Collection Techniques

In general, numerical data is quantitative, while data obtained through words are categorised as qualitative in nature (Merriam, 2009, p. 85). Qualitative data comprises quotes from people based on experience, opinions and knowledge, usually are obtained through interviews or various types of documents (Patton, 2002, p. 4). Quantitative data can be collected using three overarching techniques: experiments, surveys and nonreactive research data collection. The nonreactive research techniques include four types: unobtrusive research, existing statistical databases, content analysis and secondary data analysis (Neuman, 2011, p. 47). This research will rely on existing statistical data to address Research Question 1, by collecting empirical data from regional and international institutions. Existing statistical databases will be the most crucial to collect data on GDP-ratio debt levels, nominal debt and GDP, net-borrowing levels, taxation revenues, and revenue and expenditure-ratios. The commonly used databases within literature and policy-making include Eurostat, OECD and the World Bank, which allows this research to collect openly available quantitative data. The research aims to increase validity and reliability by facilitating triangulation of various data sources by collecting and comparing existing statistical data from selected databases.

Research Question 2 includes qualitative data collection by undertaking research interviews (Neuman, 2011, p. 51). Research interviews usually start with a loosely defined research question with the aim to refine the question towards a narrower and specific question during the research process (Neuman, 2011, p. 449). There are three types of interview structures, highly structured, semi-structured and unstructured interviews, and qualitative interviews are usually more open-ended and less structured (Merriam, 2009, pp. 89-90). This research aim is to facilitate semi-structured interviews by combining open- and closed-ended questions to collect specified and potential unknown information, while still guiding the interview topic to ensure that the appropriate data is collected (Sample Questions are in Appendix 4, p. 215) (Merriam, 2009, pp. 89-90).
There are several types of interviews, including formal interviews, conversational interviews, and group interviews (Patton, 2002, p. 10). Through the semi-structured interview, this research aims to facilitate a combination of formal and conversation based interviews, depending on the interview participant’s approach to the interview and the flow of the interview conversation.

The aim of this research is to undertake interviews with national politicians, such as chief financial officers, sworn or unsworn public officials and financial policy-makers in Australia, Norway, Ireland, and Greece. Moreover, the research interviews will include economists and fiscal analysis within the countries, and representatives within large international financial institutions, including the IMF, the World Bank and the UN. The purpose of the interviews are to produce qualitative data that highlights identified country-specific limitations of the GDP-ratio from a policy-maker’s perspective to supplement the quantitative data to investigate Research Question 1, as well as to reveal the use of the GDP-ratio to answer Research Question 2. The research focused on interviewing a minimum of eleven participants, two from each economy and one from each of the institutions.

Undertaking research interviews have certain advantages and disadvantages, where the main advantages include the accessibility to participants’ first-hand experiences and the discovery of potential unknown information. This advantage is crucial to be able to effectively and accurately address Research Question 2. Disadvantages, on the other hand, include the unknown accuracy of the interview participant’s information or biases linked to the interviewee’s or interviewer’s points of view (Creswell, 2003, p. 186; Merriam, 2009, p. 109). This research aims to control this to some extent, through comparing and triangulating quantitative and qualitative data findings and controlling the level of expertise and involvement in debt related policy-making of participants. In this way, the research will increase the reliability of the interview data by validating information through the use of difference data and sources of information (Neuman, 2011, p. 455; Carter et al. 2014, p. 545). Additionally, by combining the qualitative and quantitative data and analysis methods within the case-study approach, the research strengthens the method triangulation approach (Denzin, 1978; Carter et al. 2014, p. 545). Further, the literature highlights potential biases occurring due the presence of the interviewer or the location of the interview (Creswell, 2003, p. 186). The interviews were
conducted over the phone, and took place during working hours on work related phone numbers, to ensure a professional location.

The screening process for participants will use publicly available websites, such as governmental and institutional websites and organisation charts, where the researcher can determine the professional positions of potential participants, which is important to ensure quality data from the interviews. The selection of interviewees is highly dependent on the availability of candidates and the time constraints. Ethical clearance procedures, including the recruitment and informed consent process of participants will be planned out in detail before the research interviews commence, in accordance with the Australian National Statement of Ethical Guidelines in Human Research and Griffith University policy guidelines. Further details on the ethical clearance procedures and approval, potential limitations and ethical issues of the research are addressed in section 3.5 of this chapter.

3.2.2 – Data Analysis Techniques

Quantitative and qualitative data analysis techniques have several overarching parallels, as both methods make comparisons identifying similarities and/or differences and relationships between variables by analysing empirical data to create abstract assumptions, conclusions and theories. Nonetheless, there is a range of available analysis techniques, and fundamental differences in the explanations derived from the analysis various methods. Quantitative data analysis is mainly focused on a few predetermined, instrumental and standardised techniques, such as the statistical analysis of correlation, covariance and cause-and-effect analysis (Bryman & Bell, 2003, p. 348). In contrast, qualitative analysis techniques include a large range of non-standardised analysis methods, with the ability to adopt or change analysis techniques as the research progresses to address emerging data (Neuman, 2011, p. 78). While the quantitative research makes conclusions based on highly standardised concepts arising from the statistical analysis techniques (Bryman & Bell, 2003, p.349), the qualitative analysis is much more reliant on the researcher’s interpretations and observations which can result in increased biases and potentially misleading conclusions (Neuman, 2011, p. 517).

Another difference between quantitative and qualitative analysis techniques is related to the differences in the analysis process, which links to the dissimilarities in the quantitative
and qualitative data. While quantitative data is highly compact, specific and abstract, qualitative data is more diffuse, imprecise and relative due to the interpretations made by the researcher during the data collection (Bryman & Bell, 2003, p. 425-426; Creswell, 2014, p. 20). This distinction between the data results in differences in the required procedures of analysing collected data. Quantitative methods focus on collecting all necessary data before initiating the analysis, as statistically analysing parts of the data before completing the data collection, will cause assumption errors and incomplete results, and the analysis would have to be replicated when all data is gathered. In contrast, qualitative data analysis is an ongoing process that occurs while the data collection process (Bryman & Bell, 2003, p. 406; Creswell, 2014, p. 20). This allows qualitative research to investigating unknown or hidden data during the research process, and adapt analysis techniques if required (Creswell, 2014, p. 20). Due to the complexity of this research’s problem and questions, it is beneficial to have the flexibility of the qualitative data collection and analysis process, to ensure the ability to adapt to potential hidden or unknown variables and factors.

Although the economic and fiscal data is quantitative in nature, this research aims to combine analysis techniques across the disciplines, using basic calculations of ratios and percentages to examine trends and relationships between variables, as well as qualitative analysis techniques to further develop the analysis of relationships with focus on the context of the problem. This research will focus on two qualitative analysis methods, namely illustrative methods and analytic comparisons. The objective of the illustrative analysis is to identify and explain a situation or condition by collecting and analysing empirical data to build a theory by providing examples to prove the argument (Neuman, 2011, p. 519). There are three types of illustrative methods: Case Clarification, which aims to clarify a specific case; Parallel Demonstration, which focuses on multiple cases to illustrate the argument or theory across cases; and Pattern Matching, which matches observations across cases, and allows the researcher to narrow down the collection of variables, and analysis of patterns to provide explanations (Neuman, 2011, p. 520; Marschan-Piekkari & Welch, 2004, p. 118). Illustrative analysis will be utilised when addressing Research Question 1, to demonstrate the fluctuations and inter-relationship between economic variables through figures to illustrate the problem, the context, and the limitations of the debt-to-GDP ratio measurement. More specifically, analysis to address Research Question 1 will use pattern matching and parallel demonstration to
analyse combinations of economic and fiscal variables within each case-study economy. Additionally, these two techniques will be used to develop comparative discussions on key findings between the case-study economies and the international institutions.

John Stuart Mill (1806-1873) developed the method of agreement and method of difference, which is the basis for analytic comparisons. Analytic comparison is an analysis technique that focuses on in-depth comparisons of a small number of cases, and normally generates interpretive explanations on complex conditions within cases with qualitative differences (Neuman, 2011, p. 493). The method of agreement or the method of difference examine and determine the similar of different factors across cases that experiencing the same conditions or problem, and the method of difference can either be used by itself, or in combination with the method of agreement. (Neuman, 2011, pp. 493-494). This research uses both the method of agreement and the method of difference when comparing specific economic variables and financial accounts, to be able to highlight similarities and differences that produce limitations and inaccuracies of the GDP-ratio of debt within and across the cases.

Because qualitative data is used to address Research Question 2, it is important to narrow down the data to ensure a strong relevance to the research questions and objective, while excluding data that are irrelevant (Gueste, MacQueen & Namey, 2012, pp. 132-133). Thematic coding refers to the process of organising and categorising information under a limited number of well-defined and logical themes, normally ranging from approximately five to seven (Creswell, 2014, p. 245). There are three strategies for thematic code development; firstly, the research can develop the themes after the data collection process; the second option is to use predetermined categories and codes, with the aim to fit the data into these codes; and finally, the research can combine predetermined and emerging codes during the research process (Creswell, 2014, pp. 247-248). This research will use the third strategy by use predetermined labels while also developing codes during the process of organising and reading through the data (Creswell, 2014, p. 248). The aim is to ensure relevant data is collected, while developing thematic codes evident within the data samples. This decision also relates to the inductive nature of the research, as this research does not test a theory, the reliance on predominately predetermined codes with a specific theoretical perspective is not essential. The thematic codes will assist this research in the analysis of recurring perceptions of the GDP-ratio among policy-makers,
as well as similarities and differences in limitations of the GDP-ratio and important measurements used by policy-makers within the transcribed interview data (Bryman & Bell, 2003, p. 600).

3.3 – Research Design: Case-Study Approach

A case study is defined as a comprehensive research of one or more variables, factors or situations with the aim to produce a detailed account of the context and implications of the research problem (Hartley, 1994, pp. 208-209; Marschan-Piekkari & Welch, 2004, p. 126). Walton (1992) argued that case studies have a distinct ability to assist the development of theory (1992, p. 129), which Neuman (2011) highlighted as to be related to four underlying advantages. Firstly, Neuman (2011) asserted that case studies provide conceptual validity through the in-depth detailed examination of the cases, which assists in the creation of new theory or the adjustment of existing theory. Secondly, case studies have a heuristic impact, which refers to the ability of the approach to allow the researcher to discover the cause-and-effect mechanism, and provide more comprehensive explanations and evidence to build or adjust theory. Thirdly, case studies allow for holistic elaborations by identifying and illustrating the overall implications of a situation or problem through vigorous examination and contextualisation of complex multi-layered realities over time and space. In other words, case studies allow the study to investigate internal factors of the problem and the external environment relating to the problems or event over time. Finally, case studies are highlighted to facilitate calibration, as they allow the researcher to adjust measures of abstract concepts to correct standards (Neuman, 2011, p. 42). Moreover, comparative case studies aim to collect data across cases to compare or contrast the information systematically, to examine similarities or differences among the research variables or cases. To ensure that each selected case is appropriate for the purpose of the research, it is important to justify each selection by examining specific conditions, subjects or variables (Marschan-Piekkari & Welch, 2004, p. 114).

Due to the multifaceted and complex nature of the research problem, the importance of various quantitative economic variables and their relationship to the debt-to-GDP ratio, and the qualitative data on measurement indexes used within the sovereign debt policy environment, this research argues that a case-study approach is very appropriate. The nature and context surrounding the problem also requires flexibility to combine
qualitative and quantitative data collection and analysis methods seamlessly, which can be accomplished through the case-study approach. By initially analysing each case-study economy separately, the research develops in-depth knowledge of country-specific limitations of the GDP-ratio, the impacts of economic and fiscal variables on the accuracy of the measurement, as well as the level of influence and perceived value of the measurement by each government, to answer the research questions. Based on the country-specific findings, the research will then undertake comparative discussions to develop more comprehensive answers across the case-study countries to answer the research question again from a comparative perspective to strengthen the final conclusions.

Most classifications of case studies relate to Lijphart’s (1971) six categories, namely the atheoretical, interpretative, hypothesis-generating, theory confirming, theory-infirmiting and deviant case studies (1971, p. 691). The most relevant type of case study for this research is the hypothesis-generating case study, which aims to develop theoretical generalisation in areas with no theoretical discussion (Lijphart, 1971, p. 692) and to develop more generalised theoretical propositions to be tested through other methods (Levy, 2008, p.3), by suggesting explanatory variables, interaction effects, scoped conditions or causal mechanisms (Collier, 1999, p. 2). The hypothesis-generation case study approach is suitable as there is no current theory or critical empirical research that focus on explaining the limitations of the debt-to-GDP ratio, and the influence of the measurement on policy-making. Additionally, the research aims to highlight explanatory variables and features resulting in limitations and inaccuracies within the debt-to-GDP.

The basic composition of the case studies focuses on time-series data on economic and fiscal variables in Greece, Ireland, Norway, and Australia between 1995 to 2015, collected from the OECD Database, the OECD Statistic and the Eurostat Statistics. The timeframe has been selected to allow sufficient analysis of variables before the GFC and to include the most recent data after the GFC at the time of the data collection. The limitation of available data can impact the timeframe, which this research will need to adapt to if discovered during the data collection stage.

The countries selection has been made based on the differences in current and historic debt levels and different net-borrowing levels. The research considers Reinhart and
Rogoff’s (2010) very influential research on sovereign debt threshold and the impact on economic growth, to connect the research to previously used parameters within the literature. The research by Reinhart and Rogoff highlights ‘low-debt’ economies with sovereign debt levels of less 30 percent, ‘low-medium debt’ economies with debt levels between 30 and 60 percent, ‘medium-high’ economies with debt between 60-90 percent of GDP, ‘high debt’ economies with debt levels above 90 percent. As debt levels fluctuate over the time period, the research selected Greece as the debt levels fall within the high-debt category throughout the time sample. Ireland was selected due the debt level increasing the most dramatically from the ‘low’ to the ‘high’ category due to the GFC, while Norway and Australia was selected based on their low to medium debt levels. With this country selection, the research aims to assess economies with different debt levels to examine potential similarities and differences in the limitations and accuracy of the GDP-ratio measurement. Moreover, Greece has had a history of large net-borrowing levels, while Ireland and Australia have had relatively neutral budget balances across the time sample. Norway, on the other hand, has had large budget surpluses and large government assets. This allows the research to assess differences and similarities in repayment capacities of the case-study economies in relation to the GDP-ratio of debt. Additionally, the research has selected two EU and countries with no EU memberships, to be able to investigate variations in the reliance on the GDP-ratio within policy-making due to the EU’s fiscal and debt guidelines outlined in the SGP. Ensuring differences in the selected case studies assist in greater generalisation of the research findings and conclusions.

Rossmann & Rallis (1998) and Creswell (2003) highlight three basic stages in the case-study process. During the first stage, the research focuses on organising and preparing the collected data for analysis. During the second stage, the research read through the material to gain a general understanding of the information, while during the third stage the in-depth analysis is initiated (Rossmann & Rallis, 1998, p. 171; Creswell, 2003, p. 191). Although these basic stages in the case-study process are relevant, the complexity of the research problem and questions require a more in-depth analysis process outline. This research has therefore developed a more detailed and comprehensive analysis process linked to the structure and nature of the research questions and their respective methods.
To address Research Question 1, the research has developed a five-step research and data analysis process. The first step is to collect the quantitative data from selected databases, including the sovereign debt-to-GDP ratios, economic growth rates, nominal debt and GDP data, net-borrowing levels, GDP-ratios of total expenditures and total revenues, as well as taxation revenues. As the data is quantitative, the research needs to collect all the needed data before undertaking any analysis. The time-series data of respective countries’ variables are raw material collected from the OECD Database and Eurostat. The nature of the data requires systematic organisation and preparation within step two, where combinations of variables are selected, before the research creates figures to visualise the information. The research creates country-specific figures for the country-based analysis chapters, while cross-country figures for the comparative discussion chapter. By combining variables that complement each other, the research will be able to analyse variables in relation to each other effectively, and to create a logical flow within the analysis process and the conclusions. Step three will undertake initial interpretations and reflections on the trends evident within the figures, while calculating basic percentages and averages for selected variables and time frames to assist in the in-depth analysis in step four. In this way, the research will have an increased ability to facilitate the illustrative analysis technique of pattern matching and analytic comparisons during the final step of the data analysis process. Step four, therefore, develops detailed elaborations and descriptions on patterns and relationships between the variables to make initial country-specific conclusions for Research Question 1. The fifth step is to combine key qualitative data collected through interviews with governmental representatives and representatives from fiscal advisory agencies of each economy to strengthen and finalise the conclusions for Research Question 1.

As Research Question 2 purely relies on qualitative data, including interviews, government policy statements and institutional research papers, the research has constructed a four-step research and coding analysis process, based on the model provided by Creswell (2014, p. 247). The first step is to organise and prepare the raw data, including the research interview transcripts. Step two focuses on reading through the data, including transcripts and relevant documents, develop codes and themes, and conducting coding process. Step three concentrates on developing descriptions and elaborate on the connection between the interview participants’ explanations for the perceived value based on findings in Research Question 1. And finally, step four
concludes Research Question 2, to highlighting the key findings on the level of influence and value of the debt-to-GDP ratio by governments and international financial institutions. To answer the Overarching Research Question on how accurate and valuable the debt-to-GDP ratio measurement is for policy-making, the findings and conclusions based on both Research Questions 1 and 2 is combined for each country, and to develop a comprehensive, comparative discussion on the cross-country findings.

3.4 – Limitations

This research recognises a set of potential limitations that needs to be considered before and during the research process. The first main limitation that the research faces is the availability of relevant participants for the research interviews. Limitation can be encountered within three aspects, either the difficulty of identifying or establish communication with relevant participants, lack of interested by relevant participants, or the potential time constraint of participants. The research aims to initiate the preliminary recruitment process once the ethical clearance application is approved to allow sufficient time to ensure that the research interviews can meet the time constraints of participants. At the same time, this allows for the consideration of the time constraint of the research project, as recruiting a sufficient amount of governmental and institutional interview participants can take time.

The second potential limitation relates to the quantitative data, and more specifically, the availability of necessary data on economic and fiscal variables within the selected time sample. To minimize the potential limitations, this research has assessed the various potential international and regional institutions’ data coverage and has concluded that the OECD Database is the best alternative for compiling public debt (general government) and national financial account data sets. This decision was made based on the extent of coverage including the selected countries and the time sample (1995 to 2015) of this research. The Global Debt Database: Methodology and Sources by Mbaye, Badia and Chae (2018), which defines the different institutions’ database coverage, supports this decision (2018, p. 7). If potential limitations in the data coverage emerge during the data collection, this research will check other databases, such as World Bank and Eurostat.

If other databases do not fill the data gaps, the research are prepared undertake calculations in order to develop the needed data, depending on the combination of
economic variables that are not reported by the international statistical databases. This research has developed a few calculation approaches to fill the potential data gaps that are more likely to be encountered. For example, if there are limitations in the nominal debt data, the research can calculate the basic debt levels in monetary terms, if nominal GDP in national currency and the debt-to-GDP ratio is reported. This can be achieved by, firstly, dividing the debt-ratio by 100 to remove the percentage value, before using the Excel formula, \(=A*B\). In the formula, \(A\) represents the nominal GDP, which is multiplied with the non-percent value of debt in terms of GDP (\(B\)). This would therefore assist in the development of the needed data.

The final potential limitation of the quantitative data the research expects to encounter is the lack of GDP-denominated taxation revenue for the case study economies. Nonetheless, if the research can collect nominal GDP and taxation revenues in local currencies for each country across the time sample, the research can develop the taxation-to-GDP ratio data by using Excel. The formula would be: \(C/A*100\), where \(C\) represents the taxation revenue and \(A\) represents the nominal GDP of the respective years. Each year’s taxation-ratio was then calculated for the four case-study economies systematically.

3.5 – Ethics
As the data collection of the research includes research interviews, it has considered ethical implications and identified strategies to address potential ethical issues appropriately. The key ethical implications the research addressed relate to the respect of persons, recruitment and informed consent procedures, confidentiality and privacy, and the use of telecommunication technology and audio recording during the interviews.

The research adhered to the guidelines of the National Statement on Ethical Conduct in Human Research 2007 and the Griffith University Research Ethics Manual (GUREM) throughout the human research aspects of the research project. The Office of Research at Griffith University (GU Ref. No: 2016/919) awarded full approval on the ethics clearance application on the 14th January 2017 and was valid until 1. June 2018 (the Ethics Clearance document is attached in Appendix 1, p. 209). The research interviews were conducted in accordance to the approved clearance and the data collection was finalised on the 20th February 2018.
3.5.1 – Recruitment and Informed Consent

Respect for persons will be advocated through the process and strategies of recruitment and informed consent of participants. The utilised recruitment strategies were written correspondence over email and phone requirement. Due to the nature of the potential participants and the need for participants with jobs related to the research topic, the research emphasises the need to initiate informed consent during the recruitment process. This research argues this is an important aspect, as the participants need to be able to make a well-informed decision during the recruitment process. This research uses publicly available websites to find email addresses and work-related phone number of potential participants. These governmental or institutional websites are a part of the screening process for participants, as the research aims to contact people on the basis of their work positions and influence within sovereign debt related policy-making. Although there are potential ethical implications of email correspondence, emails are not a more secure method of communication compared to “hard copy” communications such as letters (GUREM, Book 37, p. 14). This research also argues that email correspondence may be the most effective media of communication, due to the work positions of potential participants. Where email addresses are not available on official websites, phone recruitment will be used to establish the initial communication with participants.

This research will provide the participants with research information and informed consent material over email before the interviews take place (the research information and consent form are attached in Appendices 3 and 4, pp. 213-215).

This research provide participants with an informed consent form that includes the research title, the details of the research team, a brief summary of the research project, the role of the participants and why the research is interested in their participation in the project. Furthermore, the consent form highlights the expected risks and benefits, confidentiality and privacy aspects, and how the data is stored, retained and distributed after the data collection and analysis process. Finally, the consent form outlines the voluntary nature of the research participation, and that participants will be able to withdraw from the interview at any time, with no penalty.

The research uses audio recording during the interviews. This creates a few potential ethical issues that the research has to address during the consent process. To enable informed consent regarding the recoding of interviews, the research will elaborate on
how the recording will take place, whether people outside the research team will be able to access the recordings, and in what way the recordings will handled after the transcriptions have been made. Cultural considerations may have to be included, for example if participants refuse recording based on cultural views, norms and/or cultural-related taboos, the research interviews will not undertake the recording. The participants decide whether they will allow audio recordings by ticking off the recording box within the consent form, or not, which will be returned over email to the researcher before the interview takes place. The research aims to not undertake interviews in public spaces, to avoid additional ethical issues related to recordings, as well as to ensure the professional aspects of the interviews.

3.5.2 – Confidentiality and Privacy
Confidentiality can produce ethical issues that the research needs to consider, address and actively pursue to eliminate. The research considers the data collected through the interview as a low risk for participants. Nonetheless, due to their professional position within politics, there might be confidentiality issues arising in relation to the ability of third parties, such as colleagues and the public, to identify the participants due to their professional status and role. Although the research considers the data collected not sensitive, the research needs to accommodate the potential desire of participants to remain anonymous. In this case, the research will need to consider re-identification, which relates to efforts by the research to code the participant’s identity. The research will give the option of protected anonymity to participants within the consent form. This research will use a process to protected anonymity, where the researcher will know the identity of participants, but will facilitate coding of personal information so that a third party cannot link specific data to participants (GUREM, Book 23, p. 14). The personal details that would need to be potentially coded include name, work position, country, and institution. The research will allow participants that do not want to remain anonymous to review potential quotes and descriptions before publication of any output developed based on this research, if they prefer this.

3.5.3 – Data Access, Retention, Storage and Distribution
In terms of who has access to the recordings, this research emphasises that the recordings are made for transcription and data analysis purposes only, and as a result, access will be limited to the research team. The research does not identify any wider
users of recordings and transcription data collected at this stage; however, if there are wider users emerging after the initial consent, the research team will instigate a new consent from participants before other users can be authorised to access the data.

Privacy and the storage of data can produce a number of ethical issues, such as where the data is stored and the security of data storage during and after the research has been conducted. The recordings will be destroyed after their content have been transcribed, which is a standard requirement of the Human Research Ethics Committees’ research code (GUREM, Book 22, p. 21). Following this guideline avoids additional ethical issues and the need for specific consent for the retention and further use of the recordings obtained. In terms of storage of the transcript data, the research will have to be retained over a minimal period of five years from the release of findings, unless contractual agreements state otherwise (GUREM, Book 22, p. 21).

The transcripts will be stored for the duration of the research on university property in a locked filing cabinet to ensure compliance with ethical guidelines. The research will also store data electronically on a password-protected computer in password-protected files. The transcription files for participants requesting to be anonymous will also not have interviewee names within the file name and the document, and the research will use interviewee codes to identify participants.

Regarding the distribution of results to participants, the participants will be offered an electronic version of the finalised research when the research has been finalised and approved. The distribution will occur over email and within a timely manner.
Chapter 4 – Greece

4.0 – Introduction

Greece has suffered from underdevelopment of the tradeable goods sector, limited competitiveness, structural weaknesses within their economy and economic institutions (Pelagidis, 2010 pp. 1), as well as high levels of corruption and tax evasion (Litina & Palivos, 2015, p. 1). In terms of the composition of the Greek GDP, the service sector is the main contributor accounting for about 80 percent of GDP, of which 18 percent is from tourism, while industry contributes 16 percent and agriculture 4 percent (CIA, 2018). While enjoying relatively high economic growth rates that at an average 10.4 percent between 1996 and 1998, economic growth trends decreased to an average of 7.2 percent between 1998 and 2007 (OECD Statistics, 2017). Nonetheless, they suffered the most persistent economic recession during and after the GFC compared to other EA economies. Between 2009 and 2015, Greece had an average economic contraction of -4.4 percent, with the largest negative growth rates in 2011 and 2012 of -8.6 percent and -7.6 percent respectively (OECD Statistics, 2017).

Additionally, Greece has operated with large budget deficits since 1995, and net-borrowing needs averaged at -7.9 percent of GDP between 1995 and 2015 (OECD Database, 2017). This underlines the poor governance of public funds, which has fuelled the consumption expansions since the mid-1990s (Pelagidis, 2010, p. 3). The budget deficit escalated dramatically during the GFC, and the average between 2008 and 2012 was a high -11.5 percent, with the largest deficit of -15.1 percent occurring in 2009 (OECD Database, 2017). As a result of persistently high budget deficits, the Greek debt-ratio has been high since 1995, ranging between 93.8 percent of GDP in 1998 and 117.5 percent of GDP in 2008, as illustrated in Figure 4.1. In 2001, when Greece entered the EMU, their debt-ratio was already 55.8-percentage points above the Stability and Growth Pact (SGP) guideline of maximum 60 percent debt in terms of GDP (European Commission, 2018). These debt-ratio levels also highlight that Greece was well above the 85 to 95 debt-to-GDP thresholds highlighted by research including Reinhart & Rogoff (2010; 2012), Cecchetti et al. (2011) and Baum et al. (2013) among others, who argue that the debt level could have problematic impacts on economic growth. Based on these theories, it is interesting to notice that the average economic growth rate decreased by about 3-percentage points from the levels between 1996 and 1998, when debt was below
100 percent of GDP, to the period between 1999 and 2011 when the debt-ratio was on average 113.6 percent of GDP (OECD Database, 2017).

As budget deficits escalated quickly due to the crisis, the debt-ratio increased significantly after 2008, and Greece found itself at the heart of the European Sovereign Debt Crisis. Consequently, Greece received its first financial assistance program in 2010, but as the negative economic conditions continued, a second program was organised in 2012. By 2015, Greece’s debt-ratio had escalated to over 181 percent of GDP (OECD Database, 2017), which is close to double the thresholds highlighted within the theories of Reinhart & Rogoff (2010; 2012), Cecchetti et al. (2011) and Baum et al. (2013), and Greece was the most indebted economy in Europe.

The combination of the highest debt-ratio in Europe, persistently high net-borrowing needs and severe economic recession since 2009 makes Greece a very important case study in regard to investigating the potential limitations of the GDP-ratio measurement of sovereign debt. More specifically, it is important to gain knowledge of how the economic recession could distort the debt-to-GDP ratio due to the negative impact on the denominator of the measurement after 2009, how the long-term net-borrowing levels have impacted monetary debt-level trends over time, and if the economic recession has resulted in negative government revenue flows. Moreover, Greece is an interesting case study to investigate how influential the GDP-ratio is within policy-making, to address the Overarching Research Question: how valuable and informative the debt-to-GDP ratio is for policy-makers within an economy that needs to address severe debt sustainability issues, and to investigate whether there are other more important measures more important to ensure effective and successful policy-making.

4.1 – The Quantitative Limitations of the Debt-to-GDP Ratio

Section 4.1 examines the trends and fluctuations in macroeconomic variables and government financial accounts in relation to the sovereign debt-to-GDP ratio to answer the Research Question 1: what are the limitations of the GDP-ratio measurement of sovereign debt? The section has three subsections; section 4.1.1 outlines the debt-to-GDP ratio trends in relation to net-borrowing and nominal economic growth rates to investigate how the consistently large budget deficits and negative economic growth trends correspond with Greece’s debt-ratio fluctuations over time. Section 4.1.2 assesses
movements in the monetary value of debt and the nominal GDP to examine the potential distortion arising from negative economic growth on the debt-ratio. And finally, section 4.1.3 investigates the fluctuations in government revenues and expenditure levels to highlight potential limitations of the debt-to-GDP ratio in terms of the ratio’s ability to portray the government’s capability to pay debt obligations. Collectively, these three sections will enable this research to determine different potential limitations of the Greek GDP-ratio based on quantitative data. Most importantly, these potential limitations include the correspondence between large net-borrowing levels and the debt-ratio trend, and the ability of the debt-ratio to provide a correct understanding of the monetary debt trends in periods of Greece’s economic growth and economic recession. Furthermore, they include the Greek government’s ability to serve debt liabilities through the capacity to generate government revenue as the economy grows, and the significance of government expenditures during times of escalating debt levels.

4.1.1 – Sovereign Debt-to-GDP Trends, Net-Borrowing Levels and Nominal Economic Growth Rates

This section outlines the debt-to-GDP ratio trends in relation to net-borrowing and economic growth levels to investigate how the budget deficit and nominal economic growth rates correspond with Greece’s debt-ratio fluctuations over time. This highlights how the government’s budget deficit impacts the debt-ratio, as well as providing a foundation for additional analysis of the impact of the economic recession has had on the debt-ratio after the GFC, compared to the high growth in the pre-GFC period. The statistical data analysed in this section, including the on the debt-to-GDP ratio and net-borrowing levels have been collected from the OECD Database (2017), while the nominal economic growth rates has been collected from OECD Statistics (2016). The percentage-point change in the debt-to-GDP ratio has been calculated by the researcher based on the GDP-ratio data from OECD Database (2017).

Due to the history of high net-borrowing needs, the Greek economy has had a high sovereign debt-to-GDP ratio since 1995. As demonstrated in Figure 4.1, Greece’s debt-ratio was 97.8 percent of GDP in 1995, and while it decreased to 93.8 percent of GDP in 1998, it increased quickly to 113 percent of GDP in 2000 and reached 115.8 percent of GDP in 2001, when Greece entered the EMU. Consequently, Greece had a debt-ratio that was 55.8-percentage points higher than the SGP threshold of 60 percent the year
they entered the EMU, which demonstrates how high their debt level was in terms of GDP when they became an EMU member.

Between 1995 and 1998, debt-ratio was decreasing, and net-borrowing needs lowered from 9.7 percent to 6.3 percent, as demonstrated in Figure 4.2. While the government’s large budget deficits decreased between 1995 and 1998, they still incurred a relatively high need for additional capital to finance the budget deficits, which do not correspond with the debt-ratio trend during this period. While there was no data reported by the OECD Database on economic growth in 1995, it was at a high 10.6 percent in 1996 and peaked at 11.3 percent the following year. Nonetheless, economic growth decreased to 9.3 percent in 1998. In terms of the debt-ratio trend, economic growth was at a high between 1996 and 1998 and peaked in 1997 when the debt-ratio decreased by -3.5 percentage points, as illustrated in Figure 4.2. The high economic growth may, therefore, have impacted the debt-ratio resulting in a decreasing effect.

**Figure 4.1 – Sovereign Debt-to-GDP Ratio, 1995-2015**

![Figure 4.1](Source: OECD Database, 2017)

When the debt-ratio increased leading up to the EMU entry in 2001, net-borrowing needs first decreased down to a relatively low 4.1 percent in 2000, before increasing to 5.6 percent in 2001, as illustrated in Figure 4.2. Again, this does not correspond with the debt-ratio trend, as the debt-ratio increased quickly by 16.2-percentage-points in 2000 when net-borrowing was at its lowest. On the other hand, the debt-ratio only increased by 2.8-percentage points in 2001, when the budget deficit was higher. The economic growth decreased to 5.8 percent by 2000 before increasing to 7.6 percent in 2001. Therefore, the decreased economic growth in 2000 could have influenced the debt-ratio
increase in this year. Moreover, the increased economic growth in 2001 as shown in Figure 4.2, may have counteracted the increased budget deficit and resulted in only a small increase in the debt-ratio.

Between 2001 and 2008, the debt-ratio was relatively stable as shown in Figure 4.1, as it averaged at 113.7 percent of GDP. More specifically, the debt-to-GDP ratio fluctuated from 115.8 percent in 2001 to 109.2 percent of GDP in 2003, before increasing to 117.5 percent of GDP in 2008, except for a small decline to 112.8 percent of GDP in 2007. In comparison, Figure 4.2 demonstrates that the budget deficit increased steadily from 5.5 percent in 2001 to 8.8 percent in 2004 before decreasing to 5.9 percent in 2006. The budget deficit escalated quickly due to the GFC from 6.7 percent in 2007 to 10.2 percent in 2008, and although the debt-ratio increased in 2008, it did not increase to the same extent as the deterioration of the net-borrowing needs the same year.

On the other hand, Figure 4.2. shows that the economic growth trend corresponds with the decreasing debt-ratio between 2001 and 2003, as economic growth increased from 7.6 percent in 2001 to 9.4 percent in 2003, which therefore can be an underlying reason for the decreasing debt-ratio while Greece was experiencing elevated budget deficits. Between 2004 and 2008, economic growth was volatile, as it decreased from 8.4 percent in 2004 down to a low 2.9 percent in 2005 before jumping up to a high 9.3 percent in 2006. Over the next two years, economic growth decreased steadily down to 3.9 percent in 2008. In terms of the debt-ratio trend, it increased by 2.3-percentage points during low economic growth in 2005, while it increased by a low 1.9-percentage point when economic growth was high in 2006. Moreover, the combination of decreased economic growth and soaring net-borrowing needs resulted in a larger debt-ratio increase by 4.8-percentage points in 2008.

While the debt-ratio was relatively stable between 2001 and 2008, this research questions how stable the monetary debt level was, as high net-borrowing needs signalled that the government had large budget deficits to finance. The fact that the budget deficit appeared not to have had a direct impact on the debt-ratio could highlight that growth rates in both monetary debt and nominal GDP were very similar during this timeframe. The similar growth in both variables could result in the perception of a stable debt level,
while the government still had to borrow capital to finance the budget deficit leading up to the GFC.

As the GFC significantly impacted Greece, budget deficits soared and the economy suffered economic recession from 2009 onwards, as highlighted in Figure 4.2. More specifically, the budget deficit peaked at 15.1 percent of GDP in 2009, while economic growth was -1.6 percent. As a result of the very high budget deficit and the economic contraction, Greece’s debt-to-GDP escalated by 17.4-percentage points between 2008 and 2009 to 134.9 percent of GDP.

**Figure 4.2 – Net-Borrowing Levels, Nominal Economic Growth Rates and Percentage Point Change in Debt-to-GDP Ratio, 1995-2015**

![Net-Borrowing Levels, Nominal Economic Growth Rates and Percentage Point Change in Debt-to-GDP Ratio, 1995-2015](image)

(Source: OECD Database, 2017; OECD Statistics, 2016; and author’s own calculations)

Figure 4.2 illustrates how the budget deficits persisted at 11.2 percent in 2010 and the economic growth deteriorated further to -4.6 percent. With looming debt sustainability issues on the high debt burden, and increased credit market uncertainty, Greece received the first 3-year financial assistance program among the EMU members in May 2010 of €110 billion (Pisani-Ferry et al, 2013, p.40). The IMF provided €30 billion though non-concessional loans provided through the Stand-By Arrangements, while the EU’s Greek Loan Facility provided €80 billion (DG ECFIN, 2016; Eurostat, 2016As a GDP-ratio, this financial assistance program translated into 49.5 percent of GDP according to the 2010 nominal GDP level (author’s own calculation), which should signal a significant increase in the debt-ratio. Nonetheless, the sovereign debt-ratio actually decreased from 127.1 percent in 2010 to 109.2 percent of GDP in 2011 as revealed in Figure 4.1, which
was contradictory to the net-borrowing levels that averaged at 12.2 percent between 2009 and 2011 illustrated in Figure 4.2. Additionally, the economic growth rate reached a low-point of -8.6 percent in 2011. The combination of high budget deficits and significant economic contraction should result in large increases in the debt-ratio between 2010 and 2011. The decrease in the debt-to-GDP ratio may be connected to restructuring of the Greek debt, repayments of debt liabilities and undistributed funds from the financial assistance program. This will be investigated further through the fluctuations in the monetary debt and nominal GDP levels in section 4.1.2.

While the largest economic contraction occurred in 2011 and 2012, of -8.6 percent and -7.6 percent respectively, net-borrowing needs were high and volatile, as the budget deficit decreased from 10.3 percent in 2011 to 8.8 percent in 2012, as demonstrated in Figure 4.2. Due to these economic and budgetary trends, Greece received the second financial assistance program of €164.5 billion in March 2012, which included €130 billion in new capital plus €34.5 billion of undistributed capital from the 2010 financial assistance program (Pisani-Ferry et al., 2013, p. 41). In terms of a GDP-ratio this second program was a staggering 84.9 percent of GDP in accordance with the deflated 2012 nominal GDP level. As a result, Figure 4.1 demonstrates how the sovereign debt-ratio escalated by over 55-percentage points to 164.5 percent of GDP in 2012, and it continued to increase to a GDP-ratio close to 180 percent of GDP between 2013 and 2015. During this period, economic growth improved from -5.9 percent in 2013 to -1.6 percent in 2014 and -0.9 percent in 2015. Figure 4.2 also demonstrates that net-borrowing levels decreased after 2013 from 13.5 percent to 3.6 percent of GDP in 2014; however, it increased again in 2015 to 7.5 percent. The fluctuating, but large, budget deficits indicate that the debt level could still increase between 2013 and 2015, although the debt-ratio remained stable. This GDP-ratio trend may have been caused by the improvement of the economic growth rate during this period, which reached a low -0.9 percent in 2015, and therefore, could compensate for slight increase in the debt level.

Overall, Greece has had a significantly high debt-ratio across the time sample, with three main periods where the debt-ratio was stable, namely between 1995 and 1999, 2001 and 2008 and finally between 2013 and 2015. Nonetheless, the debt-ratio almost doubled between 1998 and 2015, from about 93 percent to 181 percent of GDP, where the highest percentage point increase by 55-percentage points, occurred in 2012. The high
and increasing debt-ratio was connected to large budget deficit levels; however, the economic recession may also have had a significant impact on the debt-ratio after 2009.

Additionally, there was an interesting debt-ratio fluctuation that does not show clear links to net-borrowing and economic growth trends in 2011. More specifically, the debt-ratio decreased, although Greece had received the first financial assistance program the year before, net-borrowing levels were high and there was negative economic growth. On the other hand, the debt-ratio increased significantly in 2012, when Greece received the second financial assistance program. Therefore, this research questions how accurately the debt-ratio portrays the debt levels during the stable periods due to economic growth or contraction, and the monetary debt-level fluctuations during the years of the financial assistance. These aspects will be investigated in section 4.1.2 below, to assess the ability of the debt-ratio to portray actual monetary debt-level fluctuations during increased or contracting economic growth levels.

4.1.2 – Monetary Level of Sovereign Debt and the Nominal GDP

This section examines the movements in the monetary value of debt and the nominal GDP, and investigates how Greece’s debt level in monetary value corresponds with the fluctuations of the debt-to-GDP ratio trends. The aim is to evaluate how the debt-ratio trends potentially distort the perception of the actual trend in debt levels. Additionally, it examines how Greece’s economic recession since 2009 has impacted the debt-ratio to gain a deeper understanding of the distortion effect arising from unfavourable economic conditions that may jeopardise debt sustainability analysis. The statistics, including the nominal debt and GDP data, has been collected from OECD Statistics (2016).

As discussed in section 4.1.1, the debt-to-GDP ratio was relatively stable between 1995 and 1999, ranging between 93 and 99 percent of GDP, before stabilising at an increased level, with an average of 113.5 percent of GDP between 2000 and 2008. In contrast, Figure 4.3 shows that sovereign debt in monetary terms increased steadily from €92,124 million in 1995 to €264,775 million in 2008. The increase in debt level moved closely to the increase in nominal GDP, which can be understood as the nominal GDP increased from €93,063.6 million in 1995 to a peak of €241,990.4 million in 2008.
More specifically, Figure 4.3 show that while there was a declining ratio trend between 1996 and 1998, the monetary debt level increased by 16.9 percent from €104,413 million to €122,037 million. On the other hand, the nominal GDP increased by 21.5 percent from €103,036.6 million to €125,262.6 million. As the nominal GDP grew at a faster pace than the monetary debt, the debt-ratio decreased during this period. Between 1998 and 2000, the debt-ratio increased by 19.1-percentage points up to 113 percent of GDP. During this period, the monetary debt level increased by 21.4 percent, from €122,037 million to €148,217 million, which was a substantially faster rate compared to the 12.8 percent increase in the nominal GDP from €125,262.6 million to €141,247.3 million. Therefore, the debt-ratio increased as the growth in debt exceeded the increase in nominal GDP.

**Figure 4.3 – Nominal GDP and Sovereign Debt, Million Euro, 1995-2015**

![Nominal GDP and Sovereign Debt, Million Euro, 1995-2015](Source: OECD Statistics, 2016)

In general, the debt-ratio was relatively stable between 2000 and 2008, as it only increased from 113 percent to 117.5 percent of GDP, as highlighted in Figure 4.1. Nonetheless, in 2003 the debt-ratio decreased by almost 5-percentage points to 109.2 percent of GDP. In Figure 4.3, it is revealed that this was related to the nominal GDP increasing by 9.4 percent from €163,460.8 million to €178,904.9 million, while the debt level increased by 5.9 percent from €171,410 million to €181,510 million. In 2004, however, debt increased by 9.8 percent to €199,242.3 million, compared to the 8.3 percent growth in the GDP to €193,715.8 million. Therefore, it appears the government
adjusted the level of borrowing to match the previous year’s GDP growth, however, as the GDP growth rate declined and the debt-ratio increased.

Overall, while the debt-ratio was relatively stable between 2000 and 2008, the monetary debt level increased by 78.6 percent while the nominal GDP increased by 71.3 percent. The similar increases in both variables resulted in a stable debt-ratio; however, in monetary terms the increase was pretty significant leading up to the GFC. In this way, the debt-ratio does not highlight the real increases in sovereign debt levels, as the growth in the GDP denominator compensated for a large proportion of the increase in debt. Nonetheless, the Greek government faced growing interest-rate payments as the debt level increased, which put further pressure on the government’s already large budget deficit levels.

From 2008, the GFC resulted in economic contractions and Greece’s GDP decreased from €241,990.4 million in 2008 to €207,028.9 million in 2011, as portrayed in Figure 4.3. At the same time, Figure 4.2 illustrated how the Greek government’s net-borrowing level increased from 10.2 percent in 2008 to a peak of 15.1 percent in 2009. As a result of the increased budget deficit, the government was forced to increase borrowing and Figure 4.1 illustrated that the debt-ratio increased from 117.5 percent of GDP to 135 percent of GDP between 2008 and 2009. Figure 4.3 demonstrates that the increase in the ratio was a result of the combination of a debt increase by 13.7 percent, from €264,775 million in 2008 to €301,062 million, in 2009 and a decrease in nominal GDP by -1.8 percent from €241,990.4 million to €237,534.2 million.

The high budget deficit continued in 2010 at 11.2 percent and the unfavourable economic and budgetary features resulted in the first financial assistance program in May 2010. Consequently, the sovereign debt level escalated at an accelerated rate leading up to 2011, peaking at €356,289 million as shown in Figure 4.3. More specifically, the debt level increased by 18.3 percent between 2009 and 2011, while on the other hand, the economic recession resulted in a decline in nominal GDP by -12.8 percent to €207,028.9 million. In contrast, Figure 4.1 revealed that the debt-ratio decreased from 135 percent in 2009 to 109.2 percent of GDP in 2011, with the largest decrease by -17.9-percentage points in the ratio occurring in 2011. This trend contradicted the nominal trends significantly, as debt increased by 7.8 percent between 2010 and 2011, while the nominal
GDP declined by -8.4 percent. Additionally, the decrease in the debt-ratio was inconsistent when considering the budget deficit of 10.2 percent of GDP in 2011 as shown in Figure 4.2. Ultimately, this research finds no good explanation for the debt-ratio decrease when assessing the nominal levels in combination with features in government accounts, which could be a clear indicator of the limitation of the ratio as a reliable measurement of the debt burden during this period.

The Greek economy continued to struggle with a large budget deficit of 8.8 percent and a negative economic growth of -7.6 percent in 2012. As a result, Greece received the second financial assistance program in March 2012, and the debt-ratio increased significantly by 55.3-percentage points between 2011 and 2012, reaching 164.5 percent of GDP as illustrated in Figure 4.1. Nonetheless, Figure 4.3 shows the debt in monetary terms actually decreased by -14.4 percent, or by €51,195 million, from €356,289 million in 2011 to €305,094 million in 2012. On the other hand, the GDP declined by -7.6 percent, or by €15,825 million, from €207,028.9 million to €191,203.9 million. Again, these nominal trends contradict the debt-ratio trend, as debt level was reducing by almost twice the size compared to the GDP contraction, which should improve the debt-to-GDP ratio. Consequently, this research again questions the reliability of the debt-ratio to portray the actual trends in the monetary debt level and potentially jeopardise debt sustainability perceptions.

Between 2012 and 2015, Figure 4.1 demonstrated how the debt-ratio increased from 164.5 percent of GDP to 181.2 percent of GDP; however, Figure 4.3 displays that the monetary debt level decreased by -2.8 percent from €320,510 million in 2012 to €311,452 million in 2015. In comparison, nominal GDP decreased by -2.7 percent from €180,654.3 million to €175,697.4 million. The similar decrease in both variables would suggest a very slight increase in the debt-ratio, as the debt increased by slightly more than nominal GDP. Nonetheless, the debt-ratio increased more significantly between 2012 and 2013, before showing a smaller increase between 2013 and 2015 from 178.8 percent to 181.2 percent of GDP.

Overall, the monetary debt level increased dramatically between 1995 and 2015 by 238.1 percent on top of already high debt level in 1995, and reached €311.4 billion in 2015. In comparison, the nominal GDP increased by only 88.8 percent across the time sample,
which demonstrates how debt increases exceeded GDP growth significantly. These
trends in nominal debt and GDP, therefore, explain why the debt-ratio has increased
severely since 1995. Nonetheless, there are conflicting findings in the pre- and post-GFC
trends in the debt-ratio and nominal debt and GDP. Comparing the two 7-year periods,
2001–2008 and 2008–2015, shows that the debt accumulated by 62.5 percent between
2001 and 2008 while the debt-ratio remained stable at an average of 113.6 percent of
GDP. This sharply contrasts the 17.6 percent increase in debt between 2008 and 2015
when the debt-ratio increased by 63.7-percentage points. In contrast, the nominal GDP
between 2001 and 2008 increased by 59 percent, while the GDP contracted by -27.4
percent between 2008 and 2015. This underlines the extent to which economic growth or
contraction impacted the debt-ratio and how the ratio measurement masked increasing
debt sustainability issues during periods of high growth, while accelerating debt
vulnerabilities during negative economic growth periods.

Another finding is made by comparing the debt-ratio and net-borrowing trends in
section 4.1.1 with the movements of the monetary debt levels. While there was no clear
relationship between the high net-borrowing levels and the stable debt-to-GDP ratio
trend between 1995 and 1998, and 2000 to 2008, monetary debt level shows a stronger
relationship with the net-borrowing levels, as debt increased steadily during this period.
Moreover, as Greece’s budget deficit peaked at 15.1 percent of GDP in 2009, while
declined to 11.2 percent in 2010 and 10.3 percent in 2011, the debt-ratio did not increase
by the largest amount in 2011, and actually decreased in 2010 and 2011, with the largest
decrease occurring in 2011, although deficits were high. This highlights an inconsistent
movement of the budget deficit level trend and the debt-ratio. In contrast, monetary debt
increased by the largest amount when the net-borrowing level peaked in 2009, while the
increasing trend reduced slightly in 2010 and 2011, reflecting the lowered budget deficit
levels. This illustrates that net-borrowing levels show a stronger relationship with
monetary debt trends compared to the debt-ratio. Moreover, the debt-ratio increased
dramatically by 55.3-percentage points when the net-borrowing level decreased to 8.8
percent of GDP in 2012, while monetary debt decreased by over €51,000 million.
Although the net-borrowing level appears to not correspond with the large decrease in
monetary debt, Greece had a €105 billion reduced debt in this year, which indicates that
the budget deficit was financed with debt.
4.1.3 – Total General Government Revenue, Expenditure, and Taxation Revenue Ratios (% of GDP), and Taxation Revenue in Monetary Values

This section investigates the fluctuations in general government revenues and expenditure levels to further examine the budget deficit to gain a better understanding of the underlying budget dynamics on debt fluctuations. The aim is to firstly, assess the underlying features of the budget deficits and the impact on debt level. Secondly, to highlight potential limitations of the debt-ratio in regard to the government’s ability to generate revenues during growth period and the extent of the impact of economic recession on revenue flows. Finally, this research will assess the ratio’s overall ability to portray the government’s capability for debt repayments.

The data analysed in this section has been collected from both the OECD Database (2017) and OECD Statistics (2017). More specifically, the total revenue- and expenditure-ratios was collected from the OECD Database (2017), while the total taxation revenue was collected from the OECD Statistics (2017). As there was no taxation revenue-ratio reported by the international databases, the research has calculated the data set by using the formula highlighted in Chapter 3, section 3.4 on page 51, by using the taxation revenue and nominal GDP data in Euro, collected from OECD Statistics (2017).

Greece has been operating with substantial net-borrowing needs since 1995, which means that the general government expenditure-ratio exceed the total revenue-ratio to a large degree. Although there were data limitations for general government expenditure, as the expenditure-ratio was not reported between 1995 and 2005 by the OECD Database, the net-borrowing trends in Figure 4.2 highlight that expenditure levels remained higher than the revenue-ratio across the time sample. Figure 4.4 shows in more detail that Greece’s total revenue-ratio increased from 36.2 percent in 1995 to 42.4 percent of GDP in 2000, before increasing from 38.8 percent in 2004 to 40.7 percent of GDP in 2008. The taxation-ratio, on the other hand, peaked in 1996 at 34.2 percent of GDP before decreasing to 29.9 percent in 2004 and recovering to 31 percent in 2008. In contrast to the ratio-trends, Figure 4.5 the monetary value of taxation revenue increased quickly by 189.8 percent between 1995 and 2008, from €25,860.2 million in 1995 to a peak in 2008 of €74,960.0 million. In comparison, the nominal GDP increased by 160
percent over the same time period as discussed in section 4.1.2, which highlights how the taxation revenue actually increased at a faster pace than the nominal GDP up to 2008.

Figure 4.4 – Total General Government Revenue, Expenditure and Taxation Trends (% of GDP), 1995-2015

Although the taxation revenue trend was positive, the government incurred large net-borrowing needs during this period as shown in Figure 4.2, and the expenditure-ratio would be expected to be higher than the total revenue-ratio. A more detailed examination show that, as the net-borrowing trend was decreasing from 9.7 percent in 1995 to 4.1 percent in 2000, it could be expected that the total expenditure-ratio was either stable or decreasing up to 2000, as the total revenue-ratio was elevated during this period as demonstrated in Figure 4.4.

Between 2000 and 2008, the expenditure-ratio was then either stable or increasing, as the total revenue-ratio decreased before increasing up to 2006. However, as the expenditure-ratio increased from 45.1 percent in 2006 to 50.8 percent of GDP in 2008, the net-borrowing needs increased to 10.2 percent in 2008, as the increase of the revenue-ratio was much smaller by only 1.5 percentage point. In relation to debt fluctuations, the debt-ratio increased by a larger amount in 2000, which is contradictory when considering the elevated revenue-ratio and the lower net-borrowing trend. Additionally, the increase in the expenditure-ratio compared to the revenue-ratio significantly contrasted the stable debt-to-GDP ratio between 2006 and 2008, especially in 2008 when the expenditure-
ratio was over 10-percentage points higher than the revenue-ratio, which would highlight that the government needed to borrow significantly to cover the large budget deficit.

After 2008, Figure 4.4 reveals that the expenditure-ratio continued to increase by 12.2 percent from 50.8 percent in 2008 to a peak of 60.7 percent of GDP in 2013. In comparison, the revenue-ratio first decreased from 40.7 percent in 2008 to 38.9 percent of GDP in 2009, before increasing to a peak of 49.1 percent of GDP in 2013. In other words, the total revenue-ratio increased by 26.2 percent between 2009 and 2013. The taxation-ratio, on the other hand, increased by 15 percent, from 30.9 percent in 2009 to 35.3 percent of GDP in 2013. Nonetheless, the monetary levels of taxation revenues portrayed in Figure 4.5 tells a very different story, as taxation revenue decreased significantly by -14.3 percent from the peak of €74,960.0 million in 2008 to €64,184.0 million in 2013. Nominal GDP, which also peaked in 2008, decreased by -25.3 percent by 2013 as discussed in section 4.1.2, and the larger decrease in the nominal GDP compared to the taxation revenue may, therefore, be the underlying reason the taxation-ratio increased between 2008 and 2013, as the GDP denominator contracted to a larger degree than the taxation revenue variable in the measurement. And while the revenue-ratio increased by a smaller percent compared to expenditure during the GFC, it can be expected that the expenditure in monetary value escalated much more rapidly than portrayed by the ratio measurement between 2008 and 2013.

Figure 4.5 – Government Taxation Revenue in Million Euro, 1995-2015

(Source: OECD Statistics, 2017)
As the debt-ratio portrayed in Figure 4.1 was highly volatile between 2008 and 2013, it is difficult to highlight any clear relationship to the expenditure- and revenue-ratios. Nevertheless, the debt-escalations were due to a combination of increased expenditures and decreased revenue flows during the crisis, which was reflected within the elevated net-borrowing levels highlighted in Figure 4.2.

During the last two years, Figure 4.4 illustrates that total revenue-ratio first decreased by 2.1-percentage points to 47 percent in 2014 before increasing slightly again to 47.9 percent of GDP in 2015. In comparison, the taxation-ratio was stable ranging between 35.5 percent in 2012 and 35.7 percent in 2014, before increasing in 2015 to 36.8 percent of GDP. However, in monetary terms the taxation revenue had not recovered to the same extent, as it continued to decrease by €670 million between 2013 and 2014 to €63,514 million, before slightly increasing to €64,741.6 million in 2015, as demonstrated in Figure 4.5. The expenditure-ratio shows a more positive trend between 2013 and 2014 as it decreased by 10.8-percentage points to 49.8 percent of GDP. While there were no data reported in 2015 at the time of the data collection, it can be assumed that the expenditure-ratio increased slightly again in 2015, as the net-borrowing level increased by 3.9-percentage points.

In general, the data collected on the expenditure-ratio show that it ranged between 45.1 and 60.7 percent of GDP between 2006 and 2014, and averaged at a high 52.2 percent of GDP. In comparison, the revenue-ratio averaged at 43 percent of GDP within the same timeframe, which demonstrates the significant net-borrowing needs of the Greek government. Across the time sample, the total revenue-ratio fluctuated between 36.3 and 49.1 percent of GDP, averaging at 41.2 percent of GDP, while the taxation-ratio fluctuated between 27.8 and 37.8 percent of GDP between 1995 and 2015. These figures show that Greece had relatively high revenues in terms of GDP compared to the other case-study economies; only Norway had higher revenue-ratio levels. Nonetheless, having the highest expenditure levels by far resulted in net-borrowing needs across the time sample.

In average terms, the taxation-ratio was -21.9 percent smaller than the total revenue; however, the difference was larger in 2013 at -27.7 percent. Across the time sample, the total revenue-ratio increased by 32 percent, while the taxation-ratio increased by 32.6
percent, which highlights the relatively similar increases in both revenue-ratios. One of the positive findings is the overall increase in taxation by 150.4 percent between 1995 and 2017, which greatly exceeds the percentage growth in nominal GDP of 88.8 percent. Nonetheless, due to the high budget deficits, debt increased by 238.1 percent and greatly outweighed the taxation revenue growth across the time sample. The significant decrease in taxation revenues due to the economic recession is worrisome and demonstrates the need to recover growth rates to improve revenue flows. This can be understood by comparing the pre- and post-GFC eras. Between 1995 and 2008, the taxation revenue increased by 189.8 percent, which was higher than the nominal GDP’s increase of 160 percent. Between 2008 and 2014, however, the taxation revenue decreased by -15.3 percent, while the GDP contracted by -26.5 percent. So while the revenue-ratios increased after 2009, this did not reflect an actual increase in revenues, rather a decrease in the GDP denominator. In terms of the debt-to-GDP ratio’s ability to indicate debt serviceability, the significantly increased debt-ratio occurred as revenue flows decreased, and therefore, indicates the declining ability of the government to service debt repayments. Taxation revenue grew in 2015, although the GDP continued to slightly decrease, which is positive for the government’s ability to stabilise net-borrowing levels and service debt repayments.

4.2 – The Qualitative Limitations of the Debt-to-GDP Ratio – Is the GDP-Ratio Valuable for Governmental Policy-Making?

Section 4.2 analyses the policy-maker’s use and interpretation of the debt-to-GDP ratio through interviews and questionnaires of government officials and economic advisors. The aim is to answer Research Question 2: how valuable and informative is the GDP-ratio of sovereign debt for policy-making? The purpose is to determine the limitations of the ratio arising within Greece’s economic environment from a political perspective, and how this may result in limitations of the government’s use the measurement for effective policy-making, and to supplement the quantitative data findings in section 4.1.

4.2.1 – Economic Recession, Debt Maturity Profile and the Debt-To-GDP Ratio Measurements Influence in Policy-Making

At the start of the data collections, I ask the participants about what measurement of sovereign debt is important for debt analysis and policy-making, and the participants highlight that Greece monitors and analyses a wide range of measurements to assess debt
sustainability. Participant G1 highlights “the debt-to-GDP ratio, the monetary level of
debt in Euros and the Gross Financing Needs (GFN)” as key measurements from an
advisory agency perspective. Interviewee G2 elaborates further by stating:

First of all, [we monitor and report] the outstanding amount [in] nominal
value … before and after swaps, … the debt-to-GDP ratio and a new
index, the GFN as a percentage of GDP. [We also assess the] floating or fix
[interest] rate proportions of our debt portfolio, [and] the annual interest
rate payments both in cash terms and accrual terms as a percentage of GDP
and in absolute terms.

Both participants also highlight the aspect of the maturity of debt, which is asserted as a
key limitation of the debt-to-GDP ratio from a Greek perspective. Participant G1 states
“without any doubt, [the maturity of] the Greek debt … play a major role in the debt
strategy”. Interviewee G2 elaborates further by asserting “[to assess] risk parameters of
our debt, we use … the average maturity of the debt portfolio … and [duration
categories] as a percentage of total debt”.

To explain the connection between the maturity aspect of debt and the GFN,
Interviewee G2 asserts “this is [an index] that was established a couple of years ago [after
a lot of] convincing of … the IMF, European Commission (EC), the European Central
Bank (EBC) and the European Stability Mechanism (ESM), … that the debt-to-GDP
ratio, in the case of Greece, is a totally irrelevant [as to] define [Greek] debt and deficit
sustainability. [This is because] the debt-to-GDP ratio plays a crucial role [only] if the
debt of a country … has a short maturity or medium maturity”.

This brings the interview conversation towards the private sector involvement (PSI)
operations that occurred in Greece in 2012, which impacted the informative nature of
the debt-to-GDP ratio. Interviewee G2 first explains:

The PSI [procedure occurring in 2012] was … [a voluntary decision by the
private investors] to exchange their old Greek government bonds (GGB)
with new ones, [while also] accept[ing] a haircut (see Glossary, p. xii) of 53.5
percent. That means that the private investors’ GGBs of approximately €198
billion [was reduced by] about €105 billion. [Therefore], after the PSI we changed the whole picture of the Greek debt. [So] before the PSI we had an
outstanding amount of debt of approximately €365 billion, with 6.5 years weighted average maturity, 80 percent of this debt belonged to the private sector investors and [with an] approximately 4.7 percent weighted average nominal [interest rate]. After the PSI, the haircut and the bailout loans given by EU institutions, we now have an outstanding amount of €325 billion with a weighted average maturity of 18 years with an average coupon of 1.7 to 1.8 percent, and 80 percent of the debt portfolio [is] bilateral loans [by] the EU institutions … and the IMF, [which is] non tradable.

To illustrate the argument that the debt-to-GDP ratio has become increasingly irrelevant due to the new debt portfolio characteristics, Interviewee G2 provides a relatable example:

Assuming that [we] have an annual net-income of €100,000 [with] 0 cash reserves in the bank. I have borrowed €500,000 Euro, so I am approximately 500 percent [indebted] in terms of GDP being the annual income. You owe the lender €50,000, so you owe 50 percent of GDP. But the maturity of my loans is 50 years … and your maturity is tomorrow. Who is going to go bankrupt?

The answer seems bluntly obvious, and Interviewee G2 said, “this is a very clear example [how] … the debt-to-GDP ratio in the case of Greece after the PSI is totally irrelevant … and we convinced [the institutions] to adopt the new index, the GFN as a GDP ratio”. To explain the GFN index in more detail Interviewee G2 highlights that:

The annual GFN is the amortisation of the old debt and its interest rate payments, the primary deficit, and privatization proceeding. So, for a healthy economy … the weighted annual average of GFN [in terms of] GDP for the EU countries is approximately 20 percent, [which] is a rule of thumb [globally]. In the case of Greece, right now … the percentage is close to 10 percent and the target we have put [in collaboration with] the institutions is 15 percent for the next 20 years, and 20 percent … thereafter. [So] due to this index, the Greek debt could be considered as sustainable … [and] we think … in the case of Greece, this index is the most crucial in order to [assess] if the Greek debt is sustainable.
Participant G1 supports the argument against the debt-to-GDP ratio by stating:

[The] debt-to-GDP ratio is one of the main indicators for public debt sustainability analysis. However, in the case of Greece it does not fully capture the situation … due to the extremely favourable profile of Greece’s public debt [including] the low interest rates, extended maturities, grace periods etc. Given [these characteristics], the present value of the public debt and GFNs could be better and more representative tools for analysis.

Consequently, the combination of the PSI haircut and the extension of the debt maturity of 11.5 years had a great impact on debt sustainability for Greece, and significantly influenced the value of the debt-to-GDP ratio, as maturity and interest rate change are not portrayed by the debt-to-GDP ratio. Additionally, the decrease in the debt through the large PSI haircut contrasts with the quantitative findings in section 4.1.1, as the debt-ratio actually increased substantially by 55.3-percentage points between 2011 and 2012, rather than decreasing significantly. Therefore, there are indications of both qualitative and quantitative limitations of the ratio measurement.

While the new GFN index is highlighted as important for Greek debt analysis, it would not replace the debt-to-GDP ratio, but supplement it within analysis. G2 stresses that:

We should add the GFN … [as] the debt-to-GDP is a crucial measurement … As a Eurozone country, we [are a part of] the Stability and Growth Pact [which highlights countries] should keep or retain debt at around 60 percent [of GDP]. If you exceed this percentage, you have the responsibility to reduce it in linearly over 20 years, by a percentage equal to 1/20th of the difference between current percentage of [the] debt and the 60 percent [threshold]. The 60 percent of GDP [threshold] is … a corner stone of the EU … and we make continuous efforts to reach this target. So, the debt-to-GDP ratio plays an important role and … [the government should aim to] keep this measurement continuously decreasing. We cannot abolish the [GDP-ratio], we can only change the importance of it compared to the GFN.

This demonstrates that the debt-to-GDP ratio is still an important measurement for the EU countries with debt-ratios well above the SPG threshold of 60 percent, due to the
legal commitments. However, in assessing debt sustainability from a Greek perspective, the GFN is increasingly important to gain a more accurate evaluation of the situation.

Another limitation of the debt-to-GDP ratio highlighted from a Greek economic perspective is the negative impact that the economic recession can have on the debt-ratio due to the decrease in the GDP denominator. Interviewee G2 explains:

We had an increase in the debt-to-GDP ratio index due to the reductions in GDP [during] the economic downturn. [2008 was] the last year of prosperity in Greece, [and GDP] in nominal terms [was around] €295 billion. Right now [the GDP] is less than €180 billion, so … the denominator decreased [significantly].

This distortion of the debt-ratio through the GDP denominator was evident in the analysis in sections 4.1.1 and 4.1.2, as the debt-ratio continued to rise although the monetary debt level decreased. This was due to a larger decrease in the nominal GDP compared to the monetary debt between 2013 and 2015. Therefore, while debt and interest rate payments are decreasing, the increase in the debt-ratio could signal an opposite trend is occurring and potentially deteriorate the perception of debt sustainability further.

On the other hand, the GDP-ratio can also move in a favourable direction during a positive economic growth period. Interviewee G2 asserts:

If we have 4 percent real GDP growth and 2 percent inflation, the annual nominal increase in GDP is 6 percent. Then we can have say a €5 billion increase in the nominal value [of the GDP denominator] annually. … [which should] be fixed for the next couple of years. We have agreed with the institutions [to aim for] a primary fiscal surplus of approximately 3.5 percent of GDP for the next 5 years. The annual interest rate payments are approximately 3-3.2 percent of GDP, so … about €5.5-6 billion. So, with the target of 3.5 percent [primary surplus] … that covers the … interest rate payments. And if we … have the debt in nominal terms fixed the next couple of years, despite the lack of GDP growth, we will have reductions in the debt-to-GDP ratio … [if the primary surplus goal is reached. Moreover]
if we have 1 percent real GDP growth, then we will have [larger] debt-to-GDP ratio reductions.

This dynamic of the GDP-ratio is evident in sections 4.1.1 and 4.1.2, as the debt-ratio remained stable regardless of the net-borrowing needs by the government, especially between 2000 and 2008, when the average budget deficit and economic growth rate were very similar as shown in Figure 4.2. Moreover, the statement made by Interviewee G2 highlights the importance of the recovery of economic growth in Greece to assist in decreasing the debt-ratio and as a tool to increase the perception of debt sustainability through the debt-to-GDP ratio.

4.3 – Summary

Greece operated with large budget deficits averaging at almost 8 percent across the time sample, which has resulted in a significant debt accumulation since 1995. By 2015, the economy had the highest debt-ratio within the EMU at 181.2 percent of GDP or €311.5 billion. Between 1995 and 2015, Greece’s monetary debt level escalated by 238.1 percent while the nominal GDP only increased by 88.8 percent. As Greece already had high levels of debt since 1995, and debt escalated dramatically compared to the GDP, it was no surprise that Greece was at the centre of the European Sovereign Debt Crisis.

More specifically, the debt-ratio increased from 93 to 99 percent of GDP between 1996 and 1999, while stabilising at an average of 113.5 percent of GDP between 2000 and 2008. While the debt-ratio increased by about 20-percentage points between 1996 and 2008, monetary debt increased by 187.4 percent and the GDP by 160 percent between 1995 and 2008. The larger percentage increase in debt compared to the nominal GDP resulted in a relatively small increase in the debt-ratio; however, debt accumulated dramatically in monetary terms. Between 2008 and 2011, the debt-ratio first increased from 117.5 percent to 134.5 percent of GDP in 2009, before decreasing to 109.2 percent of GDP in 2011. This contradicted the combination of debt increasing by 34.5 percent and the -14.4 percent decrease in nominal GDP between 2008 and 2011, as the opposite movements in the variables should increase the debt-ratio over this time period. The largest debt-ratio increase occurred in 2012, when it escalated by 55.3-percentage points to 164.5 percent of GDP. Again, the debt-ratio trends contradict the trends in monetary terms, as debt actually decreased by -14.4 percent, or almost €52,000 million. While
Interviewee G2 highlighted the PSI haircut of €105,000 million in 2012, the smaller decrease in debt may point to the government borrowing approximately €53,000 million in 2012. Nonetheless, as the GDP decreased by -15.1 percent, the similar decrease in both variables should only result in a relatively small increase in the debt-ratio level, not a 55.3-percentage point increase. The debt-ratio was stable around 178 percent in 2013 and 2014, before reaching 181.2 percent of GDP in 2015. In comparison, the debt level reduced by -2.8 percent while the GDP decreased by -8.1 percent between 2013 and 2015. Although debt decreased, the GDP decreased by a larger amount and the ratio decreased slightly up to 2015.

Greece had the second highest revenue-ratio among the case-study economies. However, the expenditure-ratio was the highest, which is reflected through the net-borrowing levels. Overall, taxation revenue increased by 150.4 percent compared to the much lower GDP growth of 88.8 percent across the time sample, and Greece was the only economy where taxation growth was larger than the GDP increase. More specifically, the taxation revenue increased by 189.8 percent between 1995 and 2008, which was a higher growth rate than the nominal GDP’s increase of 160 percent; however, the taxation revenue decreased by -15.3 percent, while the GDP contracted by -26.5 percent, between 2008 and 2014. So although the revenue-ratios increased after 2009, this did not reflect an actual increase in revenue flows. In terms of the debt-to-GDP ratio ability to indicate debt serviceability, the significantly increased debt-ratio occurred as revenue flows decreased, and therefore portrays the declining ability of the government to service debt repayments, especially in combination with the elevated expenditures after the GFC, which produced large budget deficits.

In concluding Research Question 1 focusing on the limitations of the debt-to-GDP ratio, this research reveals three key limitations through the analysis of the quantitative data. Firstly, the similar growth in debt and GDP, especially between 2000 and 2008, resulted in a stable debt-ratio, and the debt ratio did not portray the debt accumulation that occurred leading up to the GFC, while distorting the perception of debt trends after 2008. This became clear when comparing the periods between 2001 and 2008 with 2008 to 2015, where this research found that debt accumulated by 62.5 percent between 2001 and 2008 while the debt-ratio remained stable at an average of 113.6 percent of GDP. On the other hand, debt increased by 17.6 percent between 2008 and 2015 when the
debt-ratio increased by 63.7-percentage points. This was related to the difference in
growth of the nominal GDP, which increased by 59 percent between 2001 and 2008,
while contracting by -27.4 percent between 2008 and 2015. This expresses the extent to
which economic growth or contraction impacts the debt-ratio, and how it can mask
increasing debt sustainability issues during period of high growth, while accelerating debt
risks during negative economic growth periods.

Secondly, this research has found two periods where the quantitative data on nominal
debt and GDP do not correspond with the debt-ratio trends. The first period was
between 2009 and 2011, where monetary debt increased while the debt-ratio decreased,
which could not be explained by trends in the nominal GDP. The second period was
between 2011 and 2012 where, although the debt-ratio increased by 55.3-percentage
points, the debt level actually decreased by almost €52,000 million and a larger
proportion than the nominal GDP. Therefore, debt-ratio failed to portray the decrease
in debt in 2012 that related to the PSI procedure where a significant haircut on private
sector bonds was achieved, as highlighted in the interview by G2.

Thirdly, although the revenue-ratios appeared to increase after 2009, the economic
recession had a severe impact on the taxation revenue flow, as taxation revenue
decreased by a significant amount. In this way, the increase in the debt-ratio could be
argued as portraying the declining ability of the economy to repay debt obligations.
Nonetheless, Greece’s taxation revenue increased to a larger extent than GDP up to
2008, which could signify that, when the economic growth recovers, the state can
recover revenue flows as well. Therefore, it is important for the government to ensure
effective decreases in expenditure to be able to tackle budget deficits.

To answer Research Question 2 addressing how influential and valuable the GDP-ratio is
within policy-making in Greece, it is clear that the GDP-ratio is an important
measurement due to the SGP guidelines. However, two key limitations are found
through the qualitative data, which signify a decrease in the level of influence the
measurement has in policy-making. Firstly, and most prominently, is the lack of ability of
the ratio measurement to portray the maturity profile of sovereign debt, which impacts
the sustainability of debt to a large degree. From a policy-making standpoint, it is clear
that the maturity of the debt portfolio impacts the ability of the government to repay
debt liabilities, and therefore, impacts debt policies. Therefore, the participants highlight a new index measurement, the GFN as a more important index to assess debt sustainability. Secondly, the participants highlight the decrease in nominal GDP after the GFC has had significant impact on the debt-ratio, which has jeopardised debt sustainability.

Ultimately, in regard to the Overarching Research Question this research concludes that there are both quantitative and qualitative limitations of the debt-to-GDP ratio measurement, which results in a lack of accuracy and decreased informative value of the measurement for policy-making purposes in Greece.
Chapter 5 – Ireland

5.0 – Introduction

Ireland performed above the regional averages on several macroeconomic indicators when joining the EMU in 1999 (European Union, 2014); this was due to rapid increases in employment, productivity and economic growth between 1995 and 2007 (Lane, 2011, p. 3; OECD database, 2017). In sharp contrast to Greece, Ireland has had a budget surplus averaging at 1.1 percent of GDP between 1995 and 2007, and high economic growth averaging at 11.4 percent within the same time frame (OECD Database, 2017). Due to these favourable economic conditions, the sovereign debt-to-GDP ratio in Ireland was decreasing from about 80 percent in 1995 to 38.7 percent in 1999 (OECD Database, 2017), when Ireland joined the EMU.

The debt-ratio continued to decrease to a low-point of 27.4 percent of GDP in 2007 (OECD Database, 2017), which was the lowest debt-ratio recorded among all the case-study economies. This debt-ratio level highlights that Ireland’s debt was well within the 60 percent of GDP guidelines within the EU’s Stability and Growth Pact (SGP). It was, therefore, also considered low and healthy within the theory by Reinhart and Rogoff (2010) as the debt-ratio was below 30 percent of GDP, while substantially below the 85 to 95-percentage threshold emphasised by Cecchetti et al. (2012) and Baum et al. (2013). Nonetheless, the current account deficit was increasing from -0.2 percent in 2002 to 6.5 percent of GDP in 2007 (OECD Database, 2017), which highlighted increasing external debt levels within the corporate sector. And when the GFC dramatically impacted the increasingly vulnerable financial sector, the Irish government was forced to provide extraordinary financial bailouts to prevent large-scale insolvencies (Laeven & Valencia, 2013, p. 247). This caused explosive increases in government expenditure levels between 2009 and 2012. Additionally, there were significant decreases in the total and taxation revenue-ratios, due to the economic recession and decreasing nominal GDP levels (OECD Statistics, 2017). The taxation-ratio was on average only -15.8 percent smaller than the total revenue-ratio across the time sample, which is the lowest difference to the total revenue-ratio among the case-study economies. This demonstrates the reliance on taxation revenue flows within the total revenue levels and budget balance, and as the GFC significantly impacted the taxation revenue flow, it translated to a large budget deficit.
Consequently, corporate debt became sovereign debt and the debt-ratio escalated rapidly to 132.7 percent of GDP in 2013 (OECD Database, 2017). In other words, Ireland’s debt-ratio increased by 105.3-percentage points between 2007 and 2013, which was the most significant increase in debt among the European economies (Department of Finance, 2017, p. 9). Accordingly, in the space of only six years, Ireland found itself in the high-risk debt level categories by theoretical contributions, as the debt level was well above 85 to 95 percent of GDP (Reinhart & Rogoff, 2010; Cecchetti et al., 2011; Baum et al., 2013) as well as over double the SGP debt guideline.

Ireland is, therefore, a very interesting case study for this research, due to three main reasons, firstly; the fact that they had one of the lowest levels of debt in the EU leading up to the GFC at 27.4 percent of GDP, well below the 60 percent SGP debt threshold; secondly, because Ireland had the most dramatic increase in net-borrowing and debt-ratio, which resulted in financial assistance in December 2010; and finally, due to the extraordinarily high economic growth rate, especially in 2015. These three features allow this research to analyse data to discover what quantitative limitations are evident in the debt-to-GDP ratio within an economy with historically preferential fiscal and economic conditions. Additionally, this allows the assessment of the level of influence the ratio measurement has in an economy with a history of a low level of debt. Ultimately, these areas of analysis will answer the Overarching Research Question of how accurate and valuable the debt-to-GDP ratio is for effective policy-making in Ireland.

5.1 – The Quantitative Limitations of the Debt-to-GDP Ratio

Section 5.1 examines the trends and fluctuations in macroeconomic variables and government financial accounts in relation to the sovereign debt-to-GDP ratio to answer Research Question 1: what are the limitations of the GDP-ratio measurement of sovereign debt? The section has three subsections. Section 5.1.1 outlines the debt-to-GDP ratio trends in relation to net-borrowing and nominal economic growth rates to investigate how the budget balances and economic growth trends correspond with Ireland’s debt-ratio fluctuations over time. Section 5.1.2 assesses movements in the monetary value of debt and the nominal GDP to examine the potential distortion arising from high economic growth on the debt-ratio. And finally, section 5.1.3 investigates the fluctuations in government revenues and expenditure levels to highlight the ratio’s potential lack of ability to portray the government’s capability to pay debt obligations.
Collectively, these three sections will enable this research to determine the different potential limitations of the GDP-ratio based on quantitative data. Most importantly, these potential limitations include the ability of the debt-ratio to act as a measurement to provide a correct understanding of the debt trends in periods of high economic growth and economic recession, the government’s ability to service debt liabilities through the capacity to generate government revenue as the economy grows, and the significance of government expenditures during times of escalating debt levels.

5.1.1 – Sovereign Debt-to-GDP Trends, Net-Borrowing Levels and Nominal Economic Growth Rates

This section outlines the debt-to-GDP ratio trends in relation to net-borrowing and economic growth levels to investigate how the budget surplus and nominal economic growth rates correspond to Ireland’s debt-ratio fluctuations over time. This will highlight the significance of the relationship between the government’s budget balances and the debt-ratio, as well as provide a foundation for additional analysis of the impact of high economic growth on the debt-ratio. The statistical data analysed in this section, including the on the debt-to-GDP ratio and net-borrowing levels have been collected from the OECD Database (2017), while the nominal economic growth rates have been collected from OECD Statistics (2016). The percentage-point change in the debt-to-GDP ratio has been calculated by the researcher based on the GDP-ratio data from OECD Database (2017).

Overall, Ireland has had a significant decreasing trend in the debt-to-GDP between 1995 and 2007, as the debt-ratio declined by 52.7-percentage points from 80.1 percent to a low-point of 27.4 percent, as illustrated in Figure 5.1. At the same time, Figure 5.2 demonstrates that the budget surplus averaged at 1.1 percent and the high economic growth averaged at 11.4 percent within the same time period. Economic growth was high at 15.3 percent in 1999 and 17 percent in 2000, while the budget surplus peaked at 4.8 percent of GDP the same year. Therefore, Figure 5.2 shows one of the largest percentage-point reductions in the debt-ratio by almost 12-percentage points also occurred in 2000, when the ratio decreased from 50.4 percent 1999 to 38.7 percent of GDP in 2000, as illustrated in Figure 5.1. While the budget surplus could be a key factor behind the decreasing debt-ratio, as it signals the government’s ability to repay debt liabilities, the debt-ratio decreases are much larger than the budget surpluses over this
period. Consequently, the high economic growth could have had a larger impact on the ratio measurement as the average economic growth greatly outweighs the average budget surplus, which may result in the debt-ratio being diluted due to the high growth rate of the economy.

After 2007, Figure 5.2 demonstrates that economic growth quickly diminished due to the GFC, decreasing from 6.5 percent in 2007 to -4.8 percent in 2008 and -9.7 percent in 2009. At the same time, the domestic financial sector was encountering increasing difficulties and the Irish government quickly realised the need for large-scale financial bailouts to prevent extensive insolvencies within the industry (Laeven & Valencia, 2013, p. 246).

Figure 5.1 – Sovereign Debt-to-GDP Ratio, 1998-2015

(Source: OECD Database, 2016)

In response, the Irish government introduced two two-year bailout programs, namely the Credit Institution Financial Support Scheme in 2009 and the Eligible Liabilities Guarantee Scheme in 2010 (Pisani-Ferry et al, 2013, p. 79), the combined cost of which has been reported at about 41 percent of GDP (Laeven and Valencia, 2013, p. 247). Due to the large unforeseen government expenses, Figure 5.2 reveal that the budget deficit escalated rapidly to 7 percent of GDP in 2008, and 13.8 percent in 2009. Consequently, the sovereign debt-ratio increased by an overwhelming 20-percentage points from 27.4 percent in 2007 to 47.4 percent of GDP in 2008, the same year as economic growth decreased and net-borrowing needs increased. Not surprisingly, Figure 5.1 displays how
the debt-ratio continued to increase by 20.4-percentage points to 67.7 percent of GDP in 2009, as economic growth and net-borrowing levels deteriorated further.

While economic growth improved to -1.9 percent in 2010, as according to Figure 5.2, net-borrowing needs peaked at a staggering 32.1 percent of GDP, and in December the Irish government received a €85 billion financial assistance program with a duration of three years, provided by the IMF in collaboration with various EU mechanisms and members (Pisani-Ferry et al, 2013, p. 40; DG ECFIN, 2014). In terms of the nominal GDP level in 2010, the €85 billion financial assistance program has been calculated by this research to be equivalent to 50 percent of GDP; therefore, the debt-ratio continued to increase significantly over the next three years, reaching a peak of 132.7 percent of GDP by 2013 as illustrated in Figure 5.1. In more detail, Ireland’s debt-ratio increased by 16.4-percentage points in 2010, while escalating by 25.6-percentage points in 2011 and 19.4-percentage points in 2012. However, the growth rate of the debt-ratio slowed to 3.5-percentage points in 2013, as demonstrated in Figure 5.2. In total, this represented an increase in the debt-ratio by 48.5-percentage points between 2010 and 2013, which is slightly less than the calculated debt-to-GDP ratio increase of 50 percent in terms of the 2010 nominal GDP level. The difference could be a result of economic growth improving from 2012 onwards.

Figure 5.2 – Net-Borrowing Levels, Nominal Economic Growth Rates and Percentage Point Change in Debt-Ratio, 1995 to 2015

(Source: OECD Database, 2017; OECD Statistics, 2016; and author’s own calculations)
More specifically, although volatile, economic growth returned, increasing firstly to 4.7 percent in 2011, dropping to 0.5 percent in 2012 before increasing again to 2.6 percent in 2013, as illustrated in Figure 5.2, and economic growth averaged at 2.6 percent between 2011 and 2013. This signifies that the improving economic growth rate could have impacted the debt-to-GDP ratio, as the GDP denominator growth could decline increases in the debt-ratio. In terms of the net-borrowing levels, Figure 5.2 shows that the budget balance recovered in a more stable manner, from the peak of 32.1 percent in 2010 to 5.7 percent by 2013. Nonetheless, the net-borrowing needs averaged at 8.7 percent over the three years, which still highlights the need for the financial assistance program to finance the budget deficits during these years. These trends show that the negative net-borrowing levels do have a relationship with the debt-ratio levels, although the debt-ratio escalates at a much more severe rate compared to portrayed budget deficits.

After 2013, there was a clear shift in the debt-ratio trend in Ireland as the debt-ratio reduced quickly between 2013 and 2015, as demonstrated in Figures 5.1 and 5.2. The first reduction of 9.8-percentage points was recorded in 2014, while the debt-ratio continued to decrease by 31.3-percentage points in 2015 when it was reported at 91 percent of GDP. While a positive recovery trend was evident in the budget deficit level in Figure 5.2, as the budget deficit was lowered to 1.8 percent of GDP in 2015, Ireland still encountered net-borrowing needs between 2014 and 2015, which means the debt levels could be expected to increase as the government still needed to finance a small budget deficit. On the other hand, economic growth had recovered extraordinary to 34.7 percent (25.6 percent real economic growth) in 2015, as shown in Figure 5.2, which may be the key factor behind the debt-to-GDP ratio decrease, as the GDP denominator could have grown at a faster pace than the debt level and therefore diluted the debt-ratio measurement.

Overall, Ireland had a positive debt-ratio trend leading up to the GFC, which show a relationship to the budget surplus trends; however, the budget deficits were much smaller than the decreases that occurred in the debt-ratio during this period of time. This signals that other factors may have decreased the debt-ratio. As the GFC hit the Irish economy, there were substantial increases in the debt-to-GDP ratio, which corresponded with elevated net borrowing needs between 2008 and 2013. Nonetheless, the debt-ratio
increased at a much greater extent compared to the budget deficit, which may be a result of the combination of the large budget deficits, the negative economic growth that was evident between 2008 and 2009, and the financial assistance programs between 2010 and 2013. During the last two years of the time sample, Ireland’s debt-ratio decreased, although the government still had budget deficits. This research, therefore, questions the underlying reason for the substantial decrease in the debt-ratio by 31.3-percentage points in 2015, which may be a result of the recovery of the economic growth rate, as the economy grew by an overwhelming 34.7 percent. Therefore, section 5.1.2 investigates in more detail the impact of Ireland’s economic growth on the debt-to-GDP ratio, especially between 1995 and 2007 and in 2015, to assess the ability of the debt-ratio to portray actual nominal debt trends.

5.1.2 – Monetary Level of Sovereign Debt and the Nominal GDP
This section assesses the movements in the monetary value of debt and the nominal GDP, and examines how Ireland’s debt level in monetary value corresponds with the fluctuations of the debt-to-GDP ratio trends. The aim is to evaluate how the debt-ratio trends potentially distort the perception of the actual trend in debt levels. Additionally, it examines how Ireland’s high economic growth has impacted the debt-ratio to gain a deeper understanding of the distortion effect arising from economic growth over time. The statistics, including the nominal debt and GDP data, has been collected from OECD Statistics (2016).

As discussed in section 5.1.1, Ireland had a significantly decreasing sovereign debt-to-GDP ratio between 1995 and 2007, which portrayed a very positive debt trend leading up to the GFC. Nevertheless, the monetary value of sovereign debt indicates a different trend, as shown in Figure 5.3. The monetary debt level was relatively stable and slightly increasing from a low-point of €39,094 million in 2000 to €47,148 million in 2007, and averaged at €42,801 million between 1995 and 2007. On the other hand, Figure 5.3 illustrates Ireland’s exceptional economic growth during this period, resulting in a substantial increase in the nominal GDP, which increased from €54,812.9 million in 1995 to a peak of €197,293.4 million in 2007. In other words, the nominal GDP increased by 260 percent between 1995 and 2007, while sovereign debt increased by only 9.5 percent during the same time period. The overwhelming percentage growth in the nominal GDP compared to the monetary level of sovereign debt explains the large decreases in the debt-ratio between 1995 and 2007, as the GDP denominator in the ratio-measurement
grew over 27 times faster than debt leading up to the GFC and effectively reduced the debt-ratio regardless of the decreasing trend in monetary debt. In this way, the debt-ratio trend did not portray the actual monetary debt trend, as high economic growth diluted the ratio measurement, which could influence the understanding of debt-level trends leading up to the GFC.

As the GFC produced negative economic growth rates, as evident in Figure 5.1, the ratio escalated dramatically after the onset of the GFC, as the GDP denominator was significantly deflated from 2008 onwards. Figure 5.3 illustrates the impact on the nominal GDP due to the financial crisis, which contracted by -15.3 percent, from €197,293.4 million in 2007 to €167,124.3 million in 2010. However, the nominal GDP improved by 7.8 percent between 2010 and 2013 to €180,209.3 million. Overall, the nominal GDP contracted by -8.7 percent between 2007 and 2013. At the same time, Ireland's budget deficit increased at an extraordinary rate due to the two large two-year financial sector bailout programs initiated in 2009 and 2010, and sovereign debt increased rapidly.

**Figure 5.3 – Nominal GDP and Sovereign Debt in Million Euro, 1995-2015**

![Nominal GDP and Sovereign Debt in Million Euro, 1995-2015](source: OECD Statistics, 2016)

Between 2007 and 2013, the monetary value of debt increased by an overwhelming 356.6 percent, from €47,148 million to a peak of €215,298 million, as demonstrated in Figure 5.3. The debt-ratio trend in Figure 5.1 was relatively similar to the debt levels as it increased significantly, and the ratio was at its highest point of 132.7 percent of GDP in the same year as the monetary debt levels peaked in 2013, as illustrated in Figure 5.3. As the monetary debt level increased by 356.6 percent, while the nominal GDP contracted
by -8.7 percent between 2007 and 2013, the debt-ratio escalated dramatically by 105.3-
percentage points, or 384.1 percent, due to the opposite movements in the two variables.
This demonstrates the effect of the economic recession on the debt-ratio, as well as the severe impact of the financial crisis resulting in an extraordinarily large budget deficit, which again increased debt levels dramatically.

After 2013, both economic growth and net-borrowing levels have improved, and Figure 5.3 demonstrated that the nominal GDP reached €193,159 million in 2014, which was only shy about €4,000 million from the previous peak in 2007. As economic growth increased to 34.7 percent in 2015, the nominal GDP reached new heights at €255,815 million. In other words, the nominal GDP had improved by 53 percent from the low-point in 2010 to 2015, which highlights a substantial recovery in economic growth after 2010. The recovery was especially evident after 2013, when the nominal GDP increased by almost 42 percent between 2013 and 2015. At the same time, Figure 5.3 reveals that Ireland experienced the first decrease in the monetary debt level of €12,002 million in 2014 from its peak in 2013 at €215,298 million, and overall, the monetary debt level decreased by -6.5 percent between 2013 and 2015 to €201,266 million. In comparison, the debt-ratio decreased by -31 percent between 2013 and 2015, which demonstrates the significant impact of the improvement of the nominal GDP in combination with the reduced monetary debt level. However, the increase in the nominal GDP had a greater impact on the debt-ratio compared to the actual decrease in debt in monetary value, which was evident through the relatively greater percentage increase of the GDP of 42 percent compared to the -6.5 percent reduction of debt levels in monetary value. Therefore, it may appear that debt levels are decreasing to a larger extent through the debt-ratio than the actual decrease in monetary value. This highlights the need for policymakers to monitor the monetary value to ensure that sovereign debt is effectively reduced during periods of high economic growth, and that the reductions in the debt-ratio were mainly caused by increases in the nominal GDP over time. This is especially important in relation to the MNC’s impact on growth. Additionally, it is important in regard to the potential impact of an ageing population, which may result in significant increases in government expenditure as well as decreases in government income taxation revenue, on which Ireland is highly reliant to be able to sustain a balanced budget.
Overall, the debt-ratio trend in Ireland appeared to be greatly affected by the high economic growth of the economy, which significantly decreased the debt-ratio between 1995 and 2007, as debt grew at a much slower rate than the nominal GDP leading up to the GFC. Across the time sample, Ireland’s nominal GDP has grown by 366.7 percent, while the monetary debt level has increased by 367.4 percent, which is a relatively similar growth in the two variables. Nonetheless, it is interesting to note that the GDP has only grown by almost 30 percent between 2007 and 2015, while the monetary debt level has dramatically increased by 326.9 percent during the same time period. This is in sharp contrast to the percentage growth trends leading up to the GFC, where the nominal GDP increased by 259.9 percent while debt only increased by 9.5 percent.

In terms of the limitation of the debt-to-GDP ratio, it becomes clear that in Ireland, due to high economic growth, especially in 2015, the debt-ratio was distorted and did not portray the true debt burden and related vulnerabilities that are evident in the monetary debt level and trend.

5.1.3 – Total General Government Revenue, Expenditure, and Taxation Revenue Ratios (% of GDP), and Taxation Revenue in Monetary Values

This section investigates the fluctuations in general government revenues and expenditure levels to further examine the net-borrowing level trends to gain a better understanding of the underlying budget dynamics on debt fluctuations. The aim is, firstly, to determine the impact of escalations of expenditure on debt levels, secondly, to highlight potential limitations of the debt-to-GDP ratio in regard to the government’s ability to generate revenues during economic growth periods, and finally, to assess the ratio’s overall ability to portray the government’s capability for debt repayments.

The data analysed in this section has been collected from both the OECD Database (2017) and OECD Statistics (2017). More specifically, the total revenue- and expenditure-ratios was collected from the OECD Database (2017), while the total taxation revenue was collected from the OECD Statistics (2017). As there was no taxation revenue-ratio reported by the international databases, the research has calculated the data set by using the formula highlighted in Chapter 3, section 3.4 on page 51, by using the taxation revenue and nominal GDP data in Euro, collected from OCED Statistics (2017).
At first glance, Ireland operated with a relatively balanced budget between 1995 and 2007, with an average budget surplus of 1.1 percent of GDP, as highlighted in Figure 5.2. This is also evident in Figure 5.4, as the general government total revenue-ratio exceeded the expenditure-ratio between 1997 and 2001. More specifically, Figure 5.4 shows that the expenditure-ratio decreased from 40.8 percent of GDP in 1995 to 30.8 percent in 2000 before slowly increasing again to 35.8 percent of GDP in 2007. In comparison, the revenue-ratio moved from 38.7 percent of GDP in 1995 down to 32.7 percent in 2002 before increasing to 36.1 percent of GDP in 2007. Overall, the total revenue-ratio decreased by -6.6 percent, while the expenditure-ratio was lowered by -12.2 percent between 1995 and 2007 and, in other words, the decrease in expenditure was larger than the revenue which produced increased budget surplus. Further, there was a clear relationship between total revenue- and taxation-ratios as their movements were relatively synchronised, and the taxation-ratio was on average 16.1 percent smaller than the total revenue-ratio between 1995 and 2007.

**Figure 5.4 – Total General Government Revenue, Expenditure and Taxation Trends (% of GDP), 1995-2015**

(Source: OECD Database, 2017; author’s own calculations)

An interesting feature to notice is that, although the ratios were decreasing in Figure 5.4, this does not represent an actual decrease in revenue flows, but rather highlights the impact of high economic growth during this period. This can be understood when assessing the trend in the monetary taxation revenue level, as shown in Figure 5.5, where
the taxation revenue increased continuously from €17,397.5 million in 1995 to €59,920.8 million in 2007. This represents an increase of 244.4 percent, which was slightly less than the increase of 259.9 percent in the nominal GDP within the same time frame. Therefore, as the nominal GDP increased at a slightly faster rate compared to the taxation revenue, the revenue-ratios appear to be decreasing over time. This finding also shows that the Irish government’s revenue flow does not increase to an equal extent as the nominal GDP, as the nominal GDP grew 6.3 percent faster than the taxation revenue flow between 1995 and 2007.

During the period between 2007 and 2010, when Ireland was experiencing a dramatic budget deficit and debt increases, Figure 5.4 demonstrates that the government expenditure-ratio escalated dramatically by almost 30-percentage points from 35.8 percent in 2007 to an extraordinary peak of 65.3 percent of GDP in 2010. On the other hand, the revenue-ratio decreased by 3-percentage points, from 36.1 percent to 33.1 percent of GDP during the same time period. The trend in the revenue-ratio represents an overall decrease by -8.2 percent, which is in sharp contrast to the increase in the government expenditure-ratio of 82.1 percent between 2007 and 2010. These trends highlight the importance of the escalation of government expenditure in comparison to contractions in revenue flows as the underlying factor behind the escalated budget deficits and sovereign debt levels. Nonetheless, the actual impact of the GFC on revenue flows can be better appreciated when examining the taxation revenue trends through the taxation-ratio and the taxation revenue.

**Figure 5.5 – Government Taxation Revenue in Million Euro, 1995-2015**

(Source: OECD Statistics, 2016)
Firstly, the taxation-ratio decreased to a larger extent than the total revenue-ratio, as the taxation ratio decreased by 3.3-percentage points from 30.4 percent in 2007 to 27.1 percent of GDP in 2010. In other words, the taxation-ratio decreased by 10.8 percent, which was 2.6-percentage points larger than the decrease in the total-revenue ratio. As a result, the taxation-ratio was -17.5 percent smaller than the total revenue-ratio, which indicates the amplified negative pressure on the taxation revenue flows during the financial crisis.

Secondly, while the taxation-ratio in Figure 5.4 decreased by 10.8 percent between 2007 and 2010, while Figure 5.5. shows that the taxation revenue in monetary value decreased by -24.4 percent, from €59,920.8 million in 2007 to €45,288.2 million in 2010. This provides a greater understanding of the actual severity of the impact of the financial crisis on monetary revenue flows, compared to the perception of a relatively smaller decrease in the revenue-to-GDP ratios. Additionally, this underlines the distortion effect of the GDP-denominated ratios of revenues and expenditure due to the contraction of the nominal GDP by -8.7 percent during the crisis, as discussed in section 5.1.2. Therefore, it can be assumed that the expenditure ratio’s dramatic increase was in reality much larger in monetary value than portrayed by the ratio, due to the opposite movements of the variables in the ratio measurement. Thus, at the same time as the expenditure level in monetary value increased, and GDP denominator decreased, which resulted in a lower the expenditure-ratio than if economic growth had been constant during the crisis.

Between 2010 and 2014, Figure 5.4 demonstrates that the revenue-ratio increased slightly by 2.8 percent, from 33.2 percent to 34.1 percent of GDP, while the taxation-ratio increased by 5.9 percent from 27.1 percent to 28.7 percent of GDP. In monetary terms, Figure 5.5. show the tax revenue increasing by 22.4 percent, from €45,288.2 million in 2010 to €55,452.8 million in 2014, and the growth rate in taxation recovered to pre-crisis levels. In addition, Figure 5.4 show that the expenditure-ratio decreased by -41 percent, from the peak of 65.3 percent of GDP in 2010 to 37.4 percent of GDP in 2014, as the short-term expenditures related to the financial sector bailout schemes between 2009 and 2012 were decreasing and were discontinued. As the expenditure-ratio decreased by a much larger degree than the total revenue-ratio, the overall budget-balance improved, and Ireland’s budget deficit significantly reduced, as highlighted in section 5.1.1.
A very interesting development occurred in 2015, as the total revenue-ratio decreased substantially by almost -6.5-percentage points to 27.5 percent of GDP, which was the lowest level of government revenue in terms of GDP across the time sample. In comparison, the taxation ratio decreased by 5.1-percentage points to a new low-point of 23.6 percent of GDP, as illustrated in Figure 5.4, and the difference between the total revenue-ratio and the taxation-ratio is at its lowest across the time sample, as in 2015 the taxation-ratio was only -14.4 percent lower than the total revenue-ratio. While there was no data reported on government expenditure in 2015 at the time of the data collection, the net-borrowing needs were almost eliminated in 2015, as highlighted in section 5.1.1. Consequently, the expenditure-ratio is expected to have decreased to a somewhat larger degree than the revenue-ratio. These considerable decreases in the expenditure- and revenue-ratios ultimately can be related to the significant GDP growth recovery in 2015 of 13.8 percent. This argument can be further appreciated by assessing the trend of the taxation revenues in Figure 5.5, as the taxation revenue increased by 8.8 percent from €55,542.8 million in 2014 to €60,356.5 million in 2015, and slightly surpassed the taxation level in 2007.

Overall, this section discovers firstly that the Irish debt accumulation was mainly due to the extraordinary increase in the expenditure-ratio, as the total revenue-ratio decreased by much less compared to the increase in the expenditure-ratio during the period where debt escalated. In terms of the limitations of the GDP-ratio measurement of debt, this is problematic, as the ratio does not provide insight into the expenditure side of the government budget balance. Therefore, there is a key limitation on the measurement in portraying the government’s debt serviceability. Secondly, it is found that the growth in taxation revenue of 246.9 percent across the time sample was significantly lower than the 366.7 percent growth of the nominal GDP, which challenges the argument that the GDP-ratio of debt portrays the government debt serviceability from a revenue flow standpoint.

Additionally, the taxation-ratio in Ireland was on average only -15.8 percent smaller than the total revenue-ratio between 1995 and 2015, which was the smallest difference between total revenue- and taxation-ratios compared to the other case-study economies. This reveals that the Irish government was to a large degree relying on the taxation revenue flows in the budget balance and had low levels of fiscal flexibility arising from
other revenue streams. This makes the fiscal position of the Irish government extra vulnerable to financial crisis, especially as the GFC decreased the taxation revenues by -24.4 percent between 2007 and 2010, compared to the -8.7 percent decrease in nominal GDP. The large differences in growth rates are concerning when considering the dramatic debt increase by 367.4 percent, which mostly occurred between 2010 and 2013. Although taxation grew by 33.3 percent between 2010 and 2015, the taxation revenue was only 2.5-percentage points higher in 2007 compared to the 2015 level. Additionally, the growth in taxation was much lower than nominal GDP increase of 53.1 percent between 2010 and 2015. Overall, while Ireland was one of the economies with the lowest debt-to-GDP ratios among the EU members leading up to the GFC, the combination of escalating expenditure levels, the decreased revenues and the significant contraction in the GDP resulted in severe debt-to-GDP escalation, which challenges the GDP-ratio’s ability to portray debt sustainability, especially in an economy that is very vulnerable to external economic shocks.

5.2 – The Qualitative Limitations of the Debt-to-GDP Ratio - Is the GDP-Ratio Valuable for Governmental Policy-Making?

The Irish government moved from one of the lowest debt-ratio level economies among EU members, namely below half the 60 percent debt-ratio threshold within the SGP, to be an economy faced with one of the most severe debt issues after the GFC. In this context, it is interesting to examine the level of influence the GDP-ratio has within the Irish policy environment. The following section will, therefore, analyse the policy-maker’s use and interpretation of the debt-to-GDP ratio through interviews and published press conferences of government officials and economic advisors. The aim is to answer Research Question 2: how valuable and informative is the GDP-ratio of sovereign debt for policy-making? The purpose is to determine the limitations of the ratio arising within Ireland’s economic environment from a political perspective, and how this may result in difficulties for the government to use the measurement for effective policy-making.

5.2.1 – The Impact of High Economic Growth and the MNC sector on the GDP-Ratio, and the Influence of the GDP-Ratio for Policy-Making

On the question relating to the use of the debt-to-GDP ratio within policy-making and advice, the interviewees agree that it does play a role within Ireland. Firstly, Interviewee
I1 emphasises the importance of the debt-to-GDP ratio in relation to the fiscal and debt rules of the European Union by stating: “the Ministry of Finance … look at the numerical amount [of] outstanding [debt], but the debt-to-GDP ratio is the main focus because of the fiscal and stability rules”. This was also highlighted by Interviewee I2, who asserts: “the key measurement from an EU perspective is the debt-to-GDP ratio, in accordance to European statistical standards, [which] is linked to the rules of the Stability and Growth Pact”.

This highlights that, from a regional institutional standpoint, the debt-to-GDP ratio is important, as the measurement has the ability to provide guidelines for multiple countries of different sizes. Nonetheless, both interviewees underline that there are limitations of the GDP-ratio arising from Ireland’s unique economic composition and features. Interviewee I2 stresses:

Ireland is one of the most globally integrated economies in the world, with a large multinational corporation (MNC) sector, [which] produces significant [GDP] growth. The growth [has been] driven by a small number of MNCs relocating [their] headquarters and balance sheets to Ireland, [which] lead to significant increases in the capital stock, with a large proportion connected to intellectual property (IP) assets. A side effect was that the GDP and the GDP per capita [exaggerate] the living standard in Ireland, which is problematic from a policy-making perspective.

The importance of the MNC sector and the related IP assets’ impact on the Irish economy is confirmed by Interviewee I1 who states: “there are limitations of the GDP-ratio as a measurement of living standards … because of the [large] MNC sector”. Moreover, Interviewee I1 highlights the impact of the GDP growth rate by asserting: “[the debt-to-GDP ratio] is becoming increasingly limited; it is not just a static problematic, [as] it is more problematic over time because of the importance of for example IP”. Interviewee I2 also emphasises on this issue by elaborating:

The debt-ratio has decreased quickly over the last few years, [which] has been a concern from a policy-making perspective. The very high [real] growth rate of 26 percent in 2015 (34.7 percent nominal economic growth) had a major impact on fiscal indicators and distorted for example the debt-ratio. [Due to the] high growth, we saw a merely mechanical decline in the debt-to-GDP.
[For example], the debt level [in 2015] would be [significantly higher] if there was much lower growth.

This mechanistic decline in the debt-ratio was evident through analysis in section 5.1.2, where the quantitative data showed that the main contribution to the decrease in the debt-ratio was not decreased debt, but rather a significant increase in the GDP denominator. So, while the debt-ratio indicated a substantial decrease in debt, this was not the actual reality of the situation, which shows one aspect where the accuracy of the GDP-ratio of debt is questionable. Consequently, the level of influence of the measurement as a tool to inform and guide policy-making is impacted, as confirmed by Interviewee I2 who asserts: “the 26 percent yearly growth rate in 2015 makes the debt-to-GDP ratio not necessarily the best measure of debt at the moment”. Moreover, the “Irish Economy and Public Finances” released on the National Treasury Management Agency’s website in February 2018 states: “from 2015 onwards, Ireland’s national accounts are distorted by the reclassification of multinational companies and their assets [to] Ireland. Given the presence of such large distortions, GDP and GNP have little information content in regards to Ireland’s economic activity”.

During the press conference in 2017 for the 4th Quarterly Bulletin by the Irish Central Bank, economist John Flynn explains the problematic high growth linked to MNCs and IP assets, and its impact on the accuracy of the GDP:

We recognise that there is a problem with the interpretation of the national accounts … you cannot simply rely on … measures of GDP and GNP. We are looking at … a broader range of indicators … for example the pace of activity in the domestic economy. The important thing to stress about the 26 percent [real economic growth] figure is that it is correct[ly] … calculated based on international statistical methodology. What I suppose the figure reflects is [how] the statistical framework now treats globalisation. [There was] two changes [made to] the statistical framework … in 2014 … one was the move to the concept of economic ownership. So … if goods [are] produced outside of a country but owned by an entity in the country … they become part of the country’s exports. [This] bring[s] the effects of globalisation more into the national accounts. The issue for us … is to interpret that and try to develop measures, which helps us to make sense of what’s happening in terms of domestic incomes and production … [to
understand] what is being generated and earned within the economy (pp.12-13).

As the GDP is distorted due to the prominent forces of globalisation in Ireland, and does not effectively reflect the level of economic activity taking place within the economy, the debt-to-GDP ratio loses some of its informative nature. The realisation of limitations and distortions of the GDP and its ratios has prompted the need to find an alternative or supplementary index to assist policy-making. This is highlighted in the press conference by the Central Bank’s Chief Economist Gabriel Fagan, who stated: “we know that GDP and debt-to-GDP is distorted, [and therefore] the Central Statistics Office (CSO) [and] the Irish Financial Advisory Council (IFAC) is developing alternative metrics for fiscal analysis” (2016, pp.12-13).

Both the interview participants supported the statements by John Flynn and Gabriel Fagan, where Interviewee I1 stresses that:

Because of [the 26 percent real economic] growth in 2015, our statistical office (CSO) places great focus on a new measurement, that is published for the first time tomorrow [24th July 2017], called the Gross National Income* (GNI*) (see Glossary, p. xii), which tries to strip out some of the impacts of the MNC sector … while recognising that our legal obligations [connected to the EU and the SPG] are in terms of GDP.

Moreover, Interviewee I2 also affirms:

There have been discussions on how appropriate the GDP-ratio of debt is for Ireland [since 2015] and … last summer [24th July 2017], the CSO therefore, released a new measurement called the GNI*, which takes out some of the impacts of the MNC sector, to better reflect the living standard and to minimise distortions.

The National Treasury Management Agency’s online report “Irish Economy and Public Finances” (2016) outlined debt-to-GNI* figures and explanations:

[The] Debt-to-GNI* (106% for 2016) is a useful metric for evaluating Ireland’s debt sustainability even if it understates the ability of Ireland to repay debt. GNI* excludes certain activities that the Irish State could possibly
tax and hence excludes some part of its ability to repay. This means that the Debt-to-GNI* ratio is likely too high. With debt-to-GDP too low, it is fair to say the reality of Ireland’s 'proper' debt ratio is somewhere in the middle.

Although the GNI* can counteract some of the impact of the MNC sector and IP asset transfers, it does have its own limitations; however, these differ from those of the debt-to-GDP ratio. Therefore, Irish policy-makers and advisors highlight the need to utilise a range of measurements to effectively assess the situation. Interviewee I1 highlights: “…we look at indicators, such as [the] interest payments [as a ratio of] total government revenue or [other indicators] in those lines, that does not have the same shortcomings or limitations as the GDP [ratio] does”. Correspondingly, Interviewee I2 says:

It is important to assess a range of measures to be able to assess the [burden of] debt and the sustainability of Irish debt. [These measures include] the debt-to-revenue ratio and the interest rate to revenue ratio, [which assist] to analyse the repayment capability of the government, rather than purely the nominal and GDP-ratio [debt indicators].

Therefore, the accuracy of the GDP-ratio has decreased over time in Ireland, which has lessened its influence and value as a tool for policy-makers. As a result, the Irish government and related advisory agencies realise the need to use a wide range of debt measurements, including the Irish specific GNI*, to be able to assess the debt level and to counteract the limitations of the debt-to-GDP ratio to ensure effective policy-making.

The distortions of the debt-to-GDP ratio also impacted the government’s use of debt-threshold targets and increased the focus on sustainable fiscal policies. The Central Bank’s Chief economist Gabriel Fagan asserted at the press conference in 2016:

The standard EU fiscal rules, for example, the 60% debt ratio, are ceilings. These ceilings have been developed and calibrated for a range of European economies like Germany, France, the larger economies… [but the] Irish economy is different. It is much more vulnerable, much more volatile, [and] we have seen that in the rules, which are appropriate for Germany, [may be] in some sense … inappropriate for Ireland. I think the aim should be to have a medium-term debt target … below 60% level, [this] has been accepted by the government [and] incorporated into policy. Because [of the] high level of
debt the economy … the public finances are extremely vulnerable to adverse shocks. We have seen [what can transpire] … even [with a] low level of debt initially at 20% of GDP, when you had adverse shocks on the economy. So prudence would require that we build up these buffers … to be able to better withstand those shocks. When you build up buffers you are in a position to allow some increase in deficits in the face of adverse shocks, so it is a more stabilising fiscal policy (Quarterly Bulletin 4 2016 Press Conference, 2016, p.8).

In the “Annual Report on Public Finances” released by the Department of Finance in June 2017, it is reported: “the Minister of Finance announced in Budget 2017 that the Government has adopted a lower national debt target of 45 percent of GDP, [with the aim] to enhance the resilience of the public finances” to increase the ability of the economy to “absorb adverse shocks that will inevitably emerge from time-to-time” (Department of Finance, 2017, p.20).

The statement by Gabriel Fagan on the impact of Irish economic features on the applicability of the 60 percent of GDP debt target of the SGP has had clear policy implications, as the Minister of Finance adopted a debt-threshold 15-percentage points below the SGP guideline. The argument that this will increase the fiscal sustainability, as it allows the government to run budget deficits without jeopardising debt sustainability during financial crises, is greatly justified based on the dramatic debt escalation experienced by Ireland. Additionally, this highlights that a specific debt-to-GDP ratio threshold can have differing sustainability implications for economies with different economic and fiscal features. Consequently, it could be argued that the GDP-ratio does not have the ability to portray debt sustainability equally across countries and regions, and should be used cautiously and only as part of a wider range of indicators. This decreases the level of value the measurement has as a tool to assist policy-makers, as its accuracy is questionable in guiding fiscal policy and debt strategies, especially, in promoting a threshold across countries with no further assessment of economic features.

5.3 – Summary

Leading up to the GFC, Ireland in 2007 had one of the lowest debt-to-GDP ratios among the European economies at 27.4 percent of GDP, which was more than half of
the SGP debt-threshold. Nonetheless, they experienced the largest increase of over 105-percentage points leading to the debt-ratio peaking at 132 percent of GDP in 2013. Across the 20-year time sample, while Ireland’s GDP increased by a significant 366.7 percent, debt increased by 367.4 percent, with the major increase occurring between 2008 and 2013.

More specifically, Ireland enjoyed an average budget surplus of 1.1 percent between 1995 and 2007, and debt-ratio decreased from 80.1 percent to 27.4 percent of GDP. However, this did not mean that debt levels in monetary terms were decreasing, as debt actually increased by 9.5 percent, and the decreasing ratio was due to the nominal GDP increasing by 240 percent. Therefore, the debt-ratio appeared to be decreasing although monetary debt increased. Between 2008 and 2013, debt levels escalated dramatically by 356.6 percent, while the nominal GDP decreased by -8.7 percent. The opposite movements in debt and GDP, therefore, intensified the escalation of the debt-ratio. The increases in debt were due to the escalating government expenditure-ratio, which peaked of 65.3 percent of GDP in 2010, the same year as the debt-ratio increased by 25.6-percentage points. Between 2013 and 2015, the debt-ratio decreased by 40.5-percentage points to 91.5 percent of GDP, with the largest decrease of -31.3-percentage points occurring in 2015. However, the decrease in the monetary debt levels was only -6.5 percent between 2013 and 2015. In nominal terms, the GDP increased by 53 percent between 2010 and 2015; however, most of the increase occurred between 2014 and 2015, where the nominal GDP increased by 32.4 percent, which highlights the impact of the extraordinary economic growth in 2015 that effectively diluted the debt-ratio measurement. Overall, there is a relatively clear relationship between net-borrowing levels and the fluctuations in sovereign debt across the time sample.

In section 5.2, it becomes clear that the governmental policy-makers and advisory agencies discussed distortions arising from high economic growth on the debt-to-GDP ratio, which are the same findings made by comparing of the debt-ratio and the percentage growth differences in monetary debt levels and nominal GDP, as outlined in section 5.1. Due to the identified distortions linked to the high economic growth and the impact of the MNC sector on the Irish economy, government officials and economists stress that because of these limitations, the debt-to-GDP ratio is not the most appropriate measurement to guide fiscal- and debt-policies. Consequently, the CSO and
IFAC worked on developing the GNI*, which was released on the 24th July 2017 to strengthen the debt assessment of Ireland’s debt burden. Additionally, it is highlighted that additional measures, including the debt-to-revenue ratio and the interest payments as a percentage of revenue are important to incorporate into assessments of the debt serviceability. Ultimately, it has been recognised by the Central Bank and the Department of Finance that it is vital to ensure a fiscal buffer by increasing financial assets, to be better placed to face economic shocks, as the economy is particularly vulnerable due to its large MNC sector. Finally, the Department of Finance has adopted a policy aiming for a debt-to-GDP ratio of 45 percent as an additional strategy to ensure fiscal sustainability.

To answer Research Question 1, there are three limitations of the debt-to-GDP ratio found through the analysis of quantitative data in Ireland. Firstly, the debt-to-GDP ratio can be distorted by high economic growth rates. This was evident in the period between 1995 and 2007, as the debt-ratio decreased while the monetary value of debt increased. More importantly, it was evident in 2015 due to Ireland’s extraordinary 34.7 percent economic growth. While the debt-ratio decreased by -31.3-percentage points, the monetary debt level decreased by just 6.5 percent. Therefore, one of the key limitations of the debt-ratio is the distortion of the perception of debt-level trends based on the GDP-ratio in an economy experiencing high economic growth.

Secondly, the debt-to-GDP ratio does not portray the debt serviceability of the government. This is linked to the comparison of growth rates in taxation revenue, debt and the nominal GDP, where the taxation revenue increased by 246.9 percent across the time sample compared to much larger increases in debt by 367.4 percent and the 366.7 percent increase in nominal GDP. In Ireland, the taxation revenue was the key source behind the government’s total revenue, as the taxation was on average only -15.8 percent less than total revenues across the time sample. And as the nominal GDP grew to a much larger extent than taxation revenue, this challenges the assumption that a larger economy can service a larger debt burden, as taxation and GDP did not grow to an equal extent, and therefore the debt-to-GDP ratio is limited as a measurement to indicate the ability of the government to generate revenues and, subsequently, to repay debt liabilities.

Thirdly, there is a limitation of the GDP-ratio in terms of its ability to indicate the debt serviceability due to the importance of escalating expenditure on debt levels. This
research finds that one of the key underlying factors for the increased debt level in Ireland was the substantial increase in expenditure levels during the GFC, and the debt-ratio does not have the ability to indicate the importance of this government account, which is a crucial component of the government’s ability to repay debt liabilities.

In terms of Research Question 2: how valuable and informative is the debt-to-GDP ratio to assist policy-making, it becomes very clear through the conducted interviews and the published media conferences that economic advisors and policy-makers in Ireland have identified similar limitations of the ratio measurement to those found in the quantitative sections of this research. Overall, while the government officials recognise the importance of the GDP-ratio in relation to its legal obligations of the SGP’s fiscal and debt thresholds, it is clearly expressed that, due to the Irish economic environment and features, this is not the most appropriate measurement. Additionally, the qualitative data highlight that the government officials and economists in Ireland argue that it is necessary to target a debt threshold of 45 percent of GDP, to ensure fiscal sustainability, which much lower than the SGP guideline of 60 percent.

When answering the Overarching Research Question of whether the GDP-ratio is accurate and valuable for policy-makers in Ireland, this research concludes that the GDP-ratio of debt is not very accurate or valuable, as it is not able to provide sufficient and suitable information to policy-makers to make effective and successful policy-making in Ireland.
Chapter 6 – Norway

6.0 – Introduction

Although Norway is a relatively small country in terms of population and GDP levels, the Norwegian government has had a history of high levels of fiscal surplus averaging at 10.7 percent of GDP and economic growth averaging at 6.2 percent between 1995 and 2015. The Norwegian economy has grown substantially due to the petroleum industry, which was discovered in the 1970s. The petroleum industry has also enabled the government to accumulate extraordinary wealth in the Government Pension Fund (the Fund) since its establishment in 1998, reaching over NOK 8 trillion in September 2017 (or about US$1 trillion). The size of the Fund makes it the largest sovereign wealth fund in the world, and the Central Bank of Norway (Norges Bank) reports that it owns 1.3 percent of listed companies globally, and 2.3 percent of European companies (Norges Bank, 2017). The purpose of the Fund is to invest the large government revenues generated through petroleum taxation and licensing to take advantage of interest returns to supplement the government budgets, while maintaining the capital base in the Fund for future generations. The transfer of interest returns to the government budget is tightly regulated through the Fiscal Framework, where the Fiscal Rule aims to align the structural non-oil budget deficits (see Glossary, p. xiii) to correspond with the real return on the Fund over time. Between 1998 and 2017, the average real return on the Fund’s investment portfolio was reported to be 4 percent after deducting management and administrative costs and adjusting for inflation (Norges Bank, 2017). Due to the large size of the Fund, this translates into large monetary values, and the government transferred NOK 212.5 billion in 2016, or approximately US$26.5 billion, to cover the non-oil budget deficit and boost the economy (Norges Bank, 2017). In 2017, the percentage of the total value of the Fund the government can withdraw decreased from 4 to 3 percent (Regjeringen, 2017; Norges Bank, 2017).

Due to the fiscal flexibility as a result of the Fund, the government has had the ability to maintain a balanced budget while avoiding sovereign debt to finance the budget deficits. Accordingly, the Norwegian government has a very low reliance on sovereign debt and the risks of sovereign debt level escalating of time are minimal. Nonetheless, Norway still engages in governmental borrowing for capital transaction purposes, and the sovereign debt-ratio ranged between 27.6 percent and 57.8 percent of GDP between 1995 and
2015, averaging at 40.2 percent OECD Database, 2017). These debt levels are considered healthy within the research that stipulates the thresholds between low- and high-risk levels of debt. More specifically, within the theory on debt’s impact on economic growth, Norway falls in the low-medium category of 30 to 60 percent debt-to-GDP in terms of Reinhart and Rogoff’s research (2010; 2012), and significantly below the 85 to 95 percent of GDP threshold highlighted by Cecchetti et al. (2011) and Baum et al. (2013). Across the time sample, Norway has also had debt levels viewed as positive in terms of the theory of fiscal sustainability (Ghosh et. al., 2011), and as debt-ratio has not surpassed 60 percent of GDP, there should be minimal impact from debt resulting in decreased responsiveness of fiscal surplus (Ghosh et al., 2011; Mendoza and Ostry, 2007).

The fiscal dynamics and the relatively low level of sovereign debt after the GFC make the Norwegian economy distinctively different from the other case study economies, which have had increasing debt levels after the crisis. Therefore, it is a very interesting case to examine in terms of Research Questions 1 regarding the limitations of the GDP-ratio measurement of debt, and to address the level of influence the measurement has within Norwegian policy-making. Ultimately, these aspects will allow this research to answer the Overarching Research Question of how accurate and valuable the GDP-ratio measurement is from the perspective of Norwegian policy-makers in relation to the economic and fiscal conditions present in the country.

6.1 – The Quantitative Limitations of the Debt-to-GDP Ratio

This section examines the trends in key macroeconomic variables and government financial accounts in relation to the sovereign debt-to-GDP ratio to address Research Question 1: what are the limitations of the GDP-ratio measurement of sovereign debt? The section has three subsections, where section 6.1.1 outlines the debt-to-GDP ratio trends and compares these trends with the fluctuations in budget surplus and nominal economic growth rates to investigate if the budget surplus and economic growth trends influence the debt-ratio levels over time. Section 6.1.2 examines the trends of the debt-ratio in relation to the nominal debt and GDP levels to highlight potential distortion from economic growth on the debt-to-GDP ratio. And finally, section 6.1.3 investigates the fluctuations in government revenues and expenditure levels to indicate the potential limitation of the debt-to-GDP ratio’s ability to portray the government’s debt serviceability. Collectively, these three sections will enable this research to determine
potential limitations of the debt-to-GDP ratio based on quantitative data within the Norwegian context of low debt levels, high government surplus and significant fiscal flexibility due to large government assets.

6.1.1 – Sovereign Debt-to-GDP Trends, Net-Borrowing Levels and Nominal Economic Growth Rates

This section outlines the debt-to-GDP ratio trends in Norway, as well as highlighting net-borrowing and economic growth levels, to investigate how Norway’s debt-ratio fluctuates in relation to high budget surplus and nominal economic growth rates. This will determine if the debt-ratio measurement provides any significant insight into the potential relationship between the government’s budget balances and the debt-ratio, it will reveal the underlying reasons for government borrowing, as well as provide a foundation for additional analysis of the impact of economic growth on the debt-ratio.

The statistical data analysed in this section, including the on the debt-to-GDP ratio and net-borrowing levels have been collected from the OECD Database (2017), while the nominal economic growth rates have been collected from OECD Statistics (2016). The percentage-point change in the debt-to-GDP ratio has been calculated by the researcher based on the GDP-ratio data from OECD Database (2017).

Norway has had a relatively low sovereign debt-ratio across the time sample and operated with a decreasing debt-ratio between 1995 and 1997 from 37.5 percent to 29.2 percent of GDP, as illustrated in Figure 6.1. During this period, the government enjoyed increasing budget surpluses, as the net-borrowing level improved from -3.1 percent in 1995 to -7.5 percent of GDP in 1997, as highlighted in Figure 6.2. Additionally, economic growth averaged at 8.4 percent between 1995 and 1997. These positive trends indicate that the government incurred increasing revenue flows due to economic growth in combination with decreased need to borrow capital to finance budget deficits.

In 1998, Figure 6.2 illustrates that the economic growth rate contracted substantially to 1.9 percent, while the budget surplus decreased from 7.5 percent in 1997 down to 3.3 percent of GDP. Nonetheless, as the Norwegian government still operated with a budget surplus, the debt-ratio decreased, although to a smaller degree compared to between 1996 and 1997. Figure 6.2 shows that, as the debt-ratio decreased by 4.3-percentage
points in 1996 and 3.8-percentage points in 1997, while only decreasing by 1.6-percentage points in 1998, down to 27.6 percent of GDP, as demonstrated in Figure 6.1. Over the next seven years, the debt-ratio started to increase, from 27.6 percent in 1998 to 49.9 percent of GDP in 2003. At the same time, the budget surplus increased as the net-borrowing needs were lowered from -3.3 percent in 1998 to -15.1 percent of GDP in 2000, before reaching -7.3 percent of GDP in 2003, as shown in Figure 6.2. The economic growth rate also improved from a low 1.9 percent in 1997 to 19.1 percent in 2000. This indicates how the government budget surplus was greatly impacted by the increasing economic growth rate, as both variables peaked significantly in 2000 as demonstrated in Figure 6.2.

**Figure 6.1 – Sovereign Debt-to-GDP Ratio Trends, 1995-2015**

![Graph showing Sovereign Debt-to-GDP Ratio Trends, 1995-2015](Norway)

(Source: OECD Database, 2017; Eurostat, 2017)

However, economic growth decreased from 3.8 percent in 2001 to -0.3 percent in 2002, before increasing again to 3.8 percent of GDP in 2003, as according to Figure 6.2. While the debt-ratio increased overall between 1998 and 2003 and reached 49.8 percent of GDP showed in Figure 6.1, there is an exception in 2000 of a small decrease of 0.9-percentage point, when both economic growth and fiscal surplus peaked. Figure 6.2 reveals the largest percentage point increase in the debt-ratio of almost 10-percentage points occurred in 2002, from 38.7 percent to 48.8 percent of GDP as portrayed in Figure 6.1. The same year, as indicated in Figure 6.2, economic growth and budget surplus were lowered. In general, the debt-ratio trend moved in a contradictory manner, as there were positive trends in both net-borrowing and economic growth, which should
result in decreased need for government borrowing. Nonetheless, this may be a result of increased government cash transactions being financed by sovereign debt, which did is not highlighted through the net-borrowing level.

Figure 6.1 reveals that the debt-ratio was elevated further between 2002 and 2009, fluctuating between 46.9 percent in 2005 and 57.8 percent of GDP in 2009. In comparison, the budget surplus increased from 10.9 percent in 2004 to 18.7 percent of GDP in 2008 and averaged at 17.2 percent of GDP, as shown in Figure 6.2. This contradicts the increase in the debt-ratio, especially as the economic growth trend was also high, ranging between 6.1 percent in 2007 and 11.4 percent in 2005. In average terms the Norwegian economy grew by 10 percent annually between 2004 and 2008. Nevertheless, the high economic growth diminished quickly due to the GFC, and Norway experienced a large economic contraction from 10.9 percent growth in 2008 down to -6.7 percent in 2009, as shown in Figure 6.2. Additionally, the budget surplus decreased by 8.2-percentage points, from 18.7 percent in 2008 to 10.5 percent of GDP in 2009. Although these economic indicators fluctuate significantly, the debt-ratio remained stable and only increased by 0.4-percentage point in 2009. This was the smallest increase in the sovereign debt-ratio among all the case-study economies during the GFC, which can be linked to the fact that the Norwegian government still operated with a budget surplus during the crisis.

Figure 6.2 – Net-Borrowing Levels, Nominal Economic Growth Rates and Percentage Point Change in the Debt-Ratio, 1995-2015

(Source: OECD Database, 2017; OECD Statistics, 2016; and author’s own calculations)
Figure 6.2 reveals that the economic growth recovered quickly to an average of 6.9 percent between 2010 and 2012, and the net-borrowing level improved from -11 percent in 2010 to -13.8 percent in 2012. As economic growth returned, and the budget surplus increased, the debt-ratio reduced by -14.6-percentage points from 48.4 percent in 2009 to 33.8 percent in 2011, as shown in Figure 6.1. However, while the budget surplus and economic growth rates decreased in 2012, Figure 6.2 illustrates the debt-ratio increased by almost 1-percentage point, before increasing further by 0.6 percentage point in 2013 to 35.6 percent of GDP. While budget surplus and economic growth had a decreasing trend, the government still operated with a surplus and strong revenue flows, and there was no need to finance budget deficits with debt. Even so, the debt-ratio increased. The debt fluctuations may therefore be related to increased demands for government lending through state banks, which was funded by borrowing by the Norwegian government.

Figure 6.1 demonstrates the unstable fluctuations in the debt-ratio between 2013 and 2015, as the ratio first decreased from 35.4 percent in 2013 to 32.9 percent of GDP in 2014, before increasing again to 38.8 percent of GDP in 2015. In contrast, the budget surplus declined, as the net-borrowing need increased from -10 percent in 2013 to -6.5 percent of GDP in 2015, as demonstrated in Figure 6.2. On the other hand, the economic growth rate slowed from 3.8 percent in 2013 to 2.7 percent in 2014, before becoming negative in 2015 at -0.7 percent. The economic growth can, therefore, explain the decrease in the debt-ratio in 2015, as the GDP level contracted, indirectly increasing the debt-ratio level. In the following section, the research will investigate in more detail the extent of the impact of economic growth on the debt-ratio and assess how the monetary value of the sovereign debt fluctuate in relation to the nominal GDP trends.

Overall, Norway had a decreasing debt-ratio between 1995 and 1998, before increasing to a peak in 2006. Between 1998 and 2006, the debt-ratio increased by 30.2-percentage points, from 27.6 percent to 57.8 percent of GDP, with the largest increases occurring in 2000, 2002, 2003 and 2006. During these years, economic growth was high in 2000, while it decreased to -0.2 percent in 2002 before improving to 11.4 percent in 2006, and the budget surplus decreased to 7.2 percent in 2002 before increasing again to 18 percent by 2006. This highlights that the debt-ratio increased by large amounts when there were decreased levels of budget surplus and economic contraction in 2002 and 2003, but the largest increase in 2000 and 2006 occurred during high surplus and economic growth.
levels. From 2007 to 2011, the debt-to-GDP ratio decreased although the budget surplus was lowered, but most interestingly, in 2009 the debt-ratio decreased, although the economy contracted. Although this could be highlighted as contradictory, the government still had a relatively high budget surplus, which could be the underlying cause for the decrease in the debt-ratio. Between 2011 and 2014, the debt-ratio fluctuated around a low-to-mid 30 percent although the economic growth slowed and budget surpluses weakened further. In 2015, nonetheless, the debt-ratio increased to almost 40 percent of GDP, as the budget surplus decreased relatively significantly and the economy contracted by -0.7 percent.

In general, these trends highlight that the debt-ratio increased mostly during periods of lowered budget surplus and economic growth, especially between 2002 and 2003 and in 2015. Nevertheless, there was no clear relationship between the net-borrowing, economic growth and the debt-ratio fluctuations, as the debt-ratio also increased significantly in 2000 and 2006 when there were elevated economic growth and budget surplus evident. Additionally, in 2009 the debt-ratio continued to decrease while the economy contracted and budget surplus levels had decreased significantly. These findings highlight the limitations of debt-ratio trends in portraying the need for governments to borrow money as in the case of Norway, government borrowing appears to have minimal relations with debt-to-GDP ratio fluctuations. Therefore, section 6.1.2 investigates the trends in nominal debt and GDP to assess the fluctuations in more detail in relation to the debt-to-GDP ratio trends. This will provide information on the ability of the debt-ratio to portray actual monetary debt-level fluctuations during increased or contracting economic growth levels.

6.1.2 – Monetary Level of Sovereign Debt and the Nominal GDP

This section assesses the movements in the monetary value of debt and the nominal GDP to examine how Norway’s debt level in monetary value corresponds with the fluctuations of the debt-to-GDP ratio trends. The purpose is to evaluate how the debt-ratio trends potentially distort the perception of the actual trend in debt levels. Additionally, it will examine how economic growth fluctuations have potentially impacted the debt-ratio to gain a deeper understanding of the potential limitation of the distortion effect the high economic growth rates or economic contractions have on the
debt-ratio levels over time. The nominal GDP statistics analysed in this section has been collected from OECD Statistics (2016)

There were limitations in the available data on the Norwegian Kroner (NOK) value of sovereign debt, as the OECD Statistics (2016) only reported monetary debt between 2011 and 2015 at the time of the data collection, while other databases only report the debt-ratio. However, data on both the nominal GDP in NOK and the debt-to-GDP ratio are reported for the entire time sample between 1995 and 2015. Therefore, the research calculated the debt level in monetary terms, by reversing the debt-to-GDP ratio calculation.

To uncover the needed data, the research undertook several calculations using Excel. The formula can be viewed in Chapter 3 in section 3.5, on page 51. Through the calculations of the basic nominal debt levels, this research found that there was a relatively large difference in the debt levels generated compared to the reported debt levels by the OECD database between 2011 and 2015. The OECD Statistics (2016) reported debt-level data averaged at NOK 879,476 million, while the average in the basic nominal debt calculation was NOK 1,066,666.6 million over the same time period. To determine the percentage difference between the reported and calculated debt levels, the research calculated the percentage difference between the two averages using the Excel formula: \[ \text{Percentage Difference} = \left( \frac{\text{C} - \text{D}}{\text{D}} \right) \times 100 \], where \( \text{C} \) was the average of the reported debt levels, and \( \text{D} \) represented the average of the calculated debt levels. The result showed that the reported debt levels were -17.0826708 percent lower than the calculated debt levels. Due to the percentage difference found between the two data sets, the research calculated new nominal debt data by subtracting the percentage value (-17.08) from the calculated debt levels \( \text{C} \) for each year across the time sample. The Excel formula used was: \[ \text{Adjusted Debt Levels} = \text{C} - (\text{C} \times \text{E}) \], where the \( \text{E} \) is the percentage value to be deducted. Consequently, the average debt levels between 2011 and 2015 of both the reported debt data and the calculated debt data are identical. Figure 6.3 shows the debt levels in monetary value, as adjusted by -17.08 percent, the unadjusted levels, as well as the nominal GDP data in NOK.

As highlighted in Figure 6.2, the debt-ratio decreased by almost 10-percentage points between 1995 and 1998, and Figure 6.3 shows the calculated debt in monetary value decreasing by 10.8 percent from NOK 297,850.7 million in 1995 to a low-point of NOK
265,842.9 million in 1998. At the same time, the nominal GDP increased by 20.8 percent from NOK 963,124.0 million in 1995 to NOK 1,163,192.0 million in 1998. The combination of the 10.8 percent decrease in debt and the 20.8 percent increase in nominal GDP corresponds with the large decrease evident in the debt-ratio, as the GDP denominator increased while the debt variable lowered, effectively pushing the ratio measurement down.

**Figure 6.3 – Nominal GDP and Calculated Sovereign Debt in Million NOK, 1995-2015**

The monetary debt level increased at a relatively fast pace from 1998 to a peak in 2008, as demonstrated in Figure 6.3, with a lower increase between 2000 and 2001, when the percentage increase was only 0.8 percent, while in 2005 debt increased by 5 percent. Nonetheless, sovereign debt overall increased from NOK 265,842.9 million in 1998 to NOK 1,171,450.8 million in 2008, which means the debt level had over-tripled in size, by 340.6 percent. In comparison, the debt-ratio in Figure 6.1 fluctuated with an overall upward trend between 1998 and 2008 between 27.6 percent and 54.2 percent of GDP, with a peak at 57.8 percent of GDP in 2006. In more detail, the debt-ratio increased by 4.6-percentage points between 1998 and 2000, while a decrease in 2001 by 0.9-percentage point was evident, before it escalated quickly 49.9 percent of GDP between 2002 and 2004. While there was a decrease in the debt-ratio to 46.9 percent of GDP in 2005, it jumped to a peak of 57.8 percent of GDP in 2006, before decreasing again to 54.2 percent of GDP in 2008.
In general, Figure 6.3 demonstrates the nominal GDP increased from NOK 1,163,192 million in 1998 to NOK 2,605,380 million in 2008, which was an increase of 124 percent over the decade, that is a much lower increase compared to the 340.6 percent increase in debt. When assessing the fluctuations in the nominal GDP in more detail, the movements of the debt-to-GDP ratio in relation to the monetary debt explain the movement in the debt-ratio. Between 1998 and 2000, the growth in the nominal GDP level was 29.6 percent from NOK 1,163,192 million to NOK 1,507,886 million compared to the 51.5 percent growth in monetary debt in the same period, which caused the debt-ratio increase. Moreover, the nominal GDP grew marginally between 2000 and 2003, by only 7.4 percent. The growth in the GDP was lowered to only 3.8 percent between 2000 and 2001, from NOK 1,507,886 million and NOK 1,564,585 million, but this was still a higher increase compared to the low growth of 0.8 percent in debt, which resulted in a decrease in the debt-ratio. Similarly, between 2002 and 2004 the monetary debt increased by 49.9 percent while the GDP grew by 14.2 percent, from NOK 1,560,181 million to NOK 1,782,981 million, which pushed the ratio upwards.

The debt-ratio was decreasing in 2005, as monetary debt grew by only 5 percent compared to the growth of the GDP of 11.6 percent, resulting in a decreased ratio level. Nonetheless, Figure 6.1 show that the debt-ratio increased by 10.9 percentage points in 2006 to 57.8 percent of GDP, when debt increased significantly by 37.2 percent to NOK 1,061,954.6 million, while the nominal GDP increased by only 11.4 percent from NOK 1,988,942 million in 2005 to NOK 2,215,312 million in 2006, as illustrated in Figure 6.3. Between 2006 and 2008, growth in the nominal GDP increased again, outweighing the increases in the monetary debt, and the debt-ratio slightly decreased leading up to the GFC. The fluctuations in growth rates of nominal GDP and debt explain the volatility in the debt-ratio during this period, with the overall growth in debt accumulating to 340.1 percent while the nominal GDP only grew 124 percent, clarifying the overall increasing trend in the debt-ratio. In other words, as the monetary debt level increased 2.7 times faster than the nominal GDP, the debt-ratio almost doubles as it increased by 96.7 percent.

Between 2009 and 2011, Figure 6.3 reveals that monetary debt fluctuated quite significantly, as it decreased for the first time by -17.3 percent in 2009 to NOK 968,338.4
million, before increasing in 2010 to NOK 1,039,870.4 million. In 2011, debt levels declined again by -24.7 percent to NOK 782,717.2 million, which was the largest reduction in the debt level across the time sample. The nominal GDP levels, on the other hand, decreased in 2009 from NOK 2,605,380 million in 2008 to NOK 2,429,698 million in 2009, before growing at an accelerating trend up to 2011 to NOK 2,791,973 million. These trends explain how the debt-ratio decreased from 54.2 percent to 48.1 percent of GDP in 2009, as both the debt level and the GDP decreased at the same time; however, debt increased by -17.3 percent compared to the GDP decrease of -6.7 percent.

Meanwhile, the debt-ratio increased in 2010, as the debt level increased by 7.4 percent, which was more than the 6.6 percent increase in the GDP. The return of high GDP growth was evident in 2011, when debt levels were lowered significantly. Therefore, due to the opposite movements in the GDP and debt levels, the debt-ratio decreased by the largest amount in 2011, to a low-point of 33.8 percent of GDP.

The debt level continued to fluctuate between 2013 and 2015, as Figure 6.3 demonstrates that it grew to NOK 900,415.7 million by 2013, decreasing by NOK -44,767.6 million in 2014, and increasing to NOK 1,003,195.9 million in 2015. In comparison, the trend in the nominal GDP showed a continuous increase up to 2014, with, however, a small decrease in 2015, from NOK 3,140,371.0 million in 2014 to NOK 3,117,433.0 million in 2015. In terms of the debt-ratio highlighted in Figure 6.1, it showed a similar pattern as the monetary levels of debt, as it increased between 2012 and 2013, before decreasing in 2014. As the debt levels in monetary terms increased in 2015 in combination with a decrease in the GDP, the debt-ratio increased in 2015. In percentage terms, the monetary debt level increased by 11.4 percent and the nominal GDP grew by only 1.5 percent between 2013 and 2015, which explains the higher debt-ratio level in 2015.

Overall, while the debt-ratio was only 1.6-percentage point higher in 2015 compared to 1995, the trend in monetary value increased by 236.8 percent over the time sample. In comparison, the nominal GDP increased by 223.7 percent, and the similar increases in both variables explain how the debt-ratio was at very similar levels in 1995 and 2015, as both debt levels and the GDP showed very synchronised increases, and therefore, not appreciably changing the debt-ratio over time. This may, therefore, limit the understanding of the actual debt-level trends. When the debt-ratio decreased it was as a
result of lower growth in nominal GDP, with exceptions occurring in 2009, 2011 and 2014, where the monetary debt levels actually decreased.

6.1.3 – Total General Government Revenue, Expenditure, and Taxation Revenue Ratios (% of GDP), and Taxation Revenue in Monetary Values

This section investigates the fluctuations in general government revenues and expenditure levels to further examine the budget surplus trends to gain a better understanding of the underlying budget dynamics on debt fluctuations. The aim is firstly, to determine the differences in total and taxation revenues to highlight the impact on government assets on the budget balance; secondly, to highlight potential limitations of the debt-to-GDP ratio in regard to the government’s ability to generate revenues during fluctuating economic growth; and finally, to determine the ratio’s overall ability to portray government’s capability to ensure debt repayments.

The data analysed in this section has been collected from both the OECD Database (2017) and OECD Statistics (2017). More specifically, the total revenue- and expenditure-ratios was collected from the OECD Database (2017), while the total taxation revenue was collected from the OECD Statistics (2017). As there was no taxation revenue-ratio reported by the international databases, the research has calculated the data set by using the formula highlighted in Chapter 3, section 3.4 on page 51, by using the taxation revenue and nominal GDP data in NOK, collected from OECD Statistics (2017).

Norway was the only economy among the case-study countries with the total government revenue-ratio consistently above the government expenditure-ratio across the time sample, as highlighted by the persistently large budget surpluses outlined in section 6.1.1 and Figure 6.2. Figure 6.4 shows that the total revenue-ratio fluctuated between 50 and 60 percent of GDP across the time sample, with a slightly increasing trend up to a peak in 2006 and 2007. Due to the petroleum industry contributing large taxation revenues, the taxation revenue-ratio was relatively high compared to the other case-study economies, and as shown in Figure 6.4, it slightly increased from 40 percent in 1995 to a peak in 2006 at 42.8 percent of GDP, before decreasing to a low-point of 38.2 percent of GDP in 2015. The difference between the total revenue and taxation-ratios was the largest among the case-study economies, as the taxation-ratio was -25.9 percent.
smaller than the total revenue-ratio. This demonstrates the significant non-taxation revenues arising from supplemented interest returns from the Fund within the Norwegian government’s total revenue composition.

In comparison to the revenue-ratios, Figure 6.4 illustrates how the expenditure-ratio fluctuated between 40.2 and 48.4 percent of GDP, and in 2005 and 2007 the expenditure-ratio decreased to a lower level than the taxation revenue-ratio, before it increased in 2008 and again in 2013. Consequently, the Norwegian government has had a taxation-ratio that has fluctuated closely to its expenditure-ratio, which highlights the budget surplus.

**Figure 6.4 – Total General Government Revenue and Expenditure, and Taxation Revenue (% of GDP), 1995-2015**

Between 1995 and 2007, the total revenue-ratio overall increased from a low-point of 51.7 percent in 1999 to 58.6 percent of GDP in 2007, although it decreased in 1998 and in 2003. On the other hand, the taxation-ratio was relatively stable, increasing from 40 percent in 1995 to a peak at 42.8 percent of GDP in 2006, before decreasing to 42.1 percent of GDP in 2007. In monetary terms, however, Figure 6.5 illustrates how the taxation revenue increased by 154.7 from NOK 385,606 million in 1995 to NOK 989,915 million in 2007. Nonetheless, the growth in taxation was only 6.8 percent between 2000 and 2003, from NOK 632,582 million to 674,784 million. In contrast, Figure 6.4 shows that the expenditure-ratio was much more volatile with a significant decrease to 42.1 percent of GDP in 1999 from 47.9 percent of GDP in 1995. The
expenditure-ratio was again elevated between 2001 and 2003, reaching 47.9 percent of GDP in 2002, before returning to about 40 percent of GDP between 2005 and 2007, where the expenditure-ratio was actually at lower levels than the taxation-ratio.

From 1995 to 2007, the sovereign debt-ratio was fluctuating significantly as highlighted in section 6.1.1. Figure 6.2 illustrates how it decreased by almost 10-percentage points between 1995 and 1998 before increasing by about 30-percentage points to a peak in 2006, with the exception of small decreases in 2001 and 2005. From 2006 onwards, the debt-ratio started to decrease considerably. Although Figure 6.4 shows that the total revenue-ratio was well above total expenditure levels, these debt-ratio decreases can be explained by the increased expenditure-ratio between 1996 and 1998. Additionally, when the growth in the taxation revenue in monetary value was very low between 2000 and 2003, the debt-ratio fluctuated significantly, while it increased between 2002 and 2003 when the total revenue-ratio decreased and the expenditure-ratio was elevated. The most interesting period was between 2005 and 2007, as the debt-ratio decreased in 2005 before increasing by over 10-percentage points in 2006 as illustrated in Figure 6.2, although the expenditure-ratio was below the taxation-ratio. The increase in 2006 is contradictory to the assumption that decreased expenditure would require less governmental borrowing, especially as it is below the taxation-ratio; nonetheless, this may be connected to increased investment or demand for state lending that increased borrowing for cash transactions during this period.

As the GFC impacted the Norwegian economy, although not to the same extent as the other case-study economies, the total revenue-ratio decreased from 58.9 percent in 2008 to 56 percent of GDP in 2010, before increasing again to 57.3 percent in 2011. On the other hand, the taxation-ratio increased from 41.4 percent in 2008 to 42.1 percent of GDP in 2011 as shown in Figure 6.4. Moreover, the expenditure-ratio jumped up 4-percentage points to 46.1 percent in 2008, before starting steadily decreasing to 42.9 percent of GDP in 2011. In monetary terms, as shown in Figure 6.5, taxation revenue decreased for the first time in 2009 by NOK 78,300 million, or -7.3 percent. This was relatively similar to the contraction in the nominal GDP, which decreased by -6.7 percent between 2008 and 2009, which illustrates the potential relationship between taxation revenue and nominal growth.
Between 2012 and 2015, the total revenue-ratio decreased from 56.8 percent in 2012 to 54.6 percent in 2014, before increasing to 55.2 percent of GDP in 2015, as shown in Figure 6.4. In contrast, the taxation-ratio decreased continuously from 41.5 percent in 2012 to the lowest point across the time sample at 38 percent in 2015. This trend was also evident in the monetary value of taxation revenue, as Figure 6.5 illustrates that taxation revenue decreased from NOK 1,230,742 million in 2012 to NOK 1,191,966 million in 2015. While the expenditure-ratio increased from 42.1 percent in 2012 to 45.8 percent in 2015, there were no data reported on the expenditure-ratio in 2014 and 2015. Nevertheless, decreases in the budget surplus were evident as the net-borrowing level moved from -10.8 percent in 2013 to -6.4 percent of GDP in 2015 in Figure 6.2, while the revenue-ratio was only 1.6-percentage point lower in 2015 compared to 2012, as shown in Figure 6.4. Therefore, it can be assumed that the expenditure-ratio continued to slightly increase.

Sovereign debt-ratio in Figure 6.1 was volatile between 2010 and 2015, with an overall increasing trend by 5-percentage points, from 33.8 percent in 2011 to 38.8 percent of GDP in 2015. This can be related to the decrease in the budget surplus between 2012 and 2015 due to decreasing revenues and increasing expenditures, as well as the decrease in the taxation revenue after 2012.

Overall, Norway has illustrated strong budget surpluses across the time sample, as the revenue-ratio has been consistently above the expenditure ratio, while the taxation-ratio...
has been in average terms close to the expenditure-ratio. In average terms, the taxation-ratio comes to 41.3 percent, while the expenditure-ratio averaged at 44.6 percent of GDP. In comparison, the total revenue-ratio averaged at 55.8 percent of GDP, and on average the taxation revenue was -25.9 percent smaller than total revenue, which highlights the large fiscal flexibility the Norwegian government enjoyed. Moreover, taxation revenue increased by 209.1 percent across the time sample, which is relatively close to the increase in the nominal GDP of 223.7 percent between 1995 and 2015. Nevertheless, the taxation revenue growth has decreased significantly after the GFC, as it increased by 156.7 percent between 1995 and 2007, but only 20.4 percent between 2007 and 2015, with a large reduction occurring in 2009 and a decreasing trend after 2012. More specifically, taxation revenues decreased by -3.2 percent between 2012 and 2015, although the nominal GDP increased by 51 percent, which is a concerning trend; nonetheless, the total revenue-ratio increased slightly, which could be a result of the negative economic growth rate, increased investment returns from the Fund, or a mixture of both.

The Norwegian debt level increases occurred during periods where the expenditure-ratio increased more rapidly, while the revenue-ratio decreased. But ultimately, the large fiscal surplus enabled the government to avoid increases in debt during the GFC, and the debt-ratio actually decreased significantly after 2007. Another important finding is that increases in the debt-ratio in 2001 and between 2013 and 2015 were accompanied with stagnation or decreasing taxation revenue flows, as well as lowered revenue-ratio levels.

This section, therefore, finds that the Norwegian government’s substantial fiscal flexibility through the difference between taxation and total revenue, impacts the serviceability of debt. The budget surplus and fiscal flexibility would mean that Norway would be able to sustain a higher debt-ratio level compared to another country with less preferential fiscal conditions. This is an important feature that the debt-to-GDP ratio does not portray.

6.2 – The Qualitative Limitations of the Debt-to-GDP Ratio:
Is the GDP-Ratio Valuable for Governmental Policy-Making?
As Norway has many favourable economic conditions, such as low debt levels, high budget surplus and fiscal flexibility due to the Government Pension Fund (the Fund), it
is interesting to investigate how these economic conditions influence the use of the GDP-ratio within policy-making.

The following section will, therefore, analyse the policy-makers’ use and interpretation of the debt-to-GDP ratio through interviews of government officials and economic advisors. The aim is to answer Research Question 2: how influential is the GDP-ratio of sovereign debt for policy-making? Furthermore, it seeks to determine if the GDP-ratio is considered a valuable measurement of sovereign debt by policy-makers in an economy with low levels of debt, large budget surplus and substantial government assets.


At the start of the interview with the Norwegian government officials and economists, the first topic highlighted was the large government asset, the Government Pension Fund, and its significant impact on government revenues, fiscal flexibility and low sovereign debt levels.

Interviewee N2 explains that the Fund, which was established in 1996, plays an important part in the Norwegian government budget and fiscal policy, by stating:

A very large share of the petroleum revenues goes to the Norwegian state, [and] rather than spending these revenues, they are transferred as a whole to the Fund, and only the real returns of the Fund is used to cover non-oil budget deficits. [This means] the Norwegian government’s budget is always balanced as the interest returns from the Fund finance the non-oil budget deficits. Due to the large asset held by the Norwegian government, the Fiscal Framework Rule was established in 2001 to regulate and control the use of the Fund’s capital.

Interviewee N2 elaborates further on the Norwegian Fiscal Framework Rule by highlighting that “the strategy is that the non-oil budget deficits should be equal to the real return of the Fund over time”. Moreover, Interviewee N2 highlighted that the aim is to “save the real capital of the Fund for future generations and [only] spend the [interest] returns”. According to the government’s website, the percentage of the Fund that can be used to supplement the government budget was adjusted from 4 to 3 percent in 2017 (Regjeringen, 2017). This explains the large difference between the taxation and total
revenue-ratios found in section 6.1.3, as well as highlighting the large fiscal flexibility the government enjoys.

Moreover, Interviewee N2 explains that “the Norwegian government never [borrows] sovereign debt to cover budget deficit“. Interviewee N3 expands further by stating:

While other countries may borrow to finance their budget deficits, we do not do that [due to the transfers from the Fund], but we do have debt. We borrow to finance capital transactions [to facilitate] state lending, which is managed through state banks. We have several state banks, including the bank for student loans [Lånekassen], as well as housing banks for government employees among others. So, when the government borrows, it puts this capital into assets you can say.

This explains the lack of a relationship between the budget balance fluctuations and the debt-ratio movements highlighted in section 7.1.1, as the government's decisions on borrowing are not related to the need to finance budgetary fluctuations, as there is no real relationship between net-borrowing levels and debt fluctuations. Consequently, the government has the ability to decrease the debt level during periods of lowered budget surplus.

On the interview questions addressing the use of the debt-to-GDP ratio within policy-making and potentially positive or negative aspects of the measurement, it becomes clear that the measurement is not very influential within the Norwegian government. Due to the combination of the government budget always being balanced through the interaction with the Fund, as well as the low levels of debt, Interviewee N2 states, “the debt-to-GDP is not valuable as a measurement to formulate budget and debt policy in Norway”.

Moreover, Interviewee N3 highlights that the factors relating to the reasoning to borrow and investment returns from the Fund result in a “different debt-to-GDP dynamic [in Norway] than in other countries, [which means] the use or interpretation of the GDP-ratio number is quite different”. When asked to confirm that the GDP-ratio, in other words, is not influential or considered as a measurement that provides valuable information for governmental policy-makers in Norway, all three interviewees agree by stating, “that is correct”. Additionally, the three interviewees did not have any positive
and/or negative aspects to highlight on the GDP-ratio, as Interviewee N1 states that “we [the group] discussed it [before the interview] and the best answer we came up with is that it is not really applicable to Norway”.

Therefore, there are minimal doubts that the GDP-ratio is not being used as a key measurement in Norwegian policy-making, and that the fiscal features result in the perception that the GDP-ratio of debt has no real value for policy-making. Subsequently, there are no significant discussions around limitations and benefits of the measurement among policy-makers.

To investigate what measurement of debt is of more importance, I ask the interviewees what measurement of sovereign debt is monitored and reported for policy-making purposes. Interviewee N1 highlighted that “we [the Ministry of Finance] report the outstanding volume in nominal value in our annual state budget reports [in combination with] the composition of government debt, as well as on the bond issuance made in the previous year”. While the Ministry of Finance is responsible for sovereign debt, Interviewee N3 explains that “we have transferred the operational responsibilities to the [Norwegian] Central Bank, [which] means that the Central Bank is responsible for arranging bond auctions, as well as the type and size of the bonds for the auctions”. Interviewee N1 elaborates by underscoring that “those reports are detailed, but the most important reporting we [Ministry of Finance] do is to the Parliament (Stortinget), and is mostly concentrated on the outstanding volume”.

While the nominal value of debt is the key measurement of debt monitored and reported in Norway, fiscal indicators play an important role in policy-making. Interviewee N3 emphasises that “we do have fiscal indicators we use in policy-making”, before Interviewee N2 explains that “the size of the structural non-oil budget deficit is the most important one. As we discussed earlier, the non-oil deficit should equal the estimated real return of the Fund over time, and therefore, this needs to be monitored”. Interviewee N1 adds that “it may not be relevant as to replace the GDP-ratio, but the structural budget is an annual number for each budget, whereas the GDP-ratio is the volume over time”.
As the Norwegian government is faced with low levels of sovereign debt in combination with extraordinary government assets producing high additional revenue flows and significant fiscal flexibility, it is logical that policy-makers focus on the fiscal indicator to ensure the current fiscal situation is maintained. Indirectly, by ensuring that the Norwegian government structural non-oil deficit is monitored and managed, the sovereign debt level is very unlikely to escalate dramatically over the years to come.

6.3 – Summary

Across the time sample, Norway’s monetary debt level actually increased by 236.8 percent, while the nominal GDP level increased by 223.7 percent. The similar increases in both variables, where debt levels slightly exceed growth in the GDP, explains the similar debt-ratios in 1995 and 2015. However, assessing the debt-ratio across the time sample, Norway has operated with an average debt-ratio of 40.1 percent of GDP, which is the lowest average among the case-study economies, and is considered as low-risk from a theoretical standpoint. Therefore, the analysis of the quantitative data on macroeconomic variables demonstrates that the debt-to-GDP ratio can produce distortion of information on the monetary debt-level trends as the debt-ratio is only 1.6 percentage points higher in 2015 compared to 1995, when it was 37.8 percent of GDP. Nonetheless, this does not mean debt levels are at similar levels.

Norway has had large budget surpluses across the time sample, which has been highlighted through the analysis of the net-borrowing trends in combination with government revenues and expenditure ratios. Overall, the Norwegian economy has a budget surplus averaging at 10.7 percent of GDP, and was the only case-study economy that did not suffer from budget deficits arising during the GFC. Analysing the revenue and expenditure ratios in more detail, it becomes clear that the government has a combination of large taxation revenues in comparison to expenditures, as well as sizeable non-taxation revenue flows. More specifically, the average expenditure ratio was 44.6 percent of GDP between 1995 and 2015, while the taxation revenue ratio averaged at 41.3 and the average total revenue ratio was 55.8 percent. The fact that on average the taxation revenue was only 3.2 percentage points lower than the average expenditure ratio, as well as the total revenue was 11.2 percentage points higher than expenditure, highlights that the government has great fiscal flexibility. In terms of the growth rate, the taxation revenue in monetary value increased by 209.1 percent between 1995 and 2015,
which is also relatively close to the 223.7 percent growth in the nominal GDP, and therefore demonstrating the connection between taxation income and economic growth. The taxation revenue also grew relatively closely to the 236.8 percent growth monetary debt, which is preferential from the perspective of debt serviceability. Moreover, the Norwegian government has the largest non-taxation revenues among the case-study economics, as the taxation ratio was on average -25.9 percent smaller than the total government revenue ratio across the time sample. This provides insight into the importance of the transfers of the real returns of the Fund within the Norwegian fiscal flexibility and ability to avoid debt borrowing to finance non-oil budget deficits.

While Norway has enjoyed budget surpluses throughout the time sample, the government has borrowed capital, although not relying on debt to finance budget deficits. Throughout the interviews with the government officials, it becomes clear that the government borrows to facilitate capital transactions through state-owned banks, such as the student loan and housing lending schemes. The key findings derived through the interviews highlight a combination of factors resulting in limited use and minimal value of the GDP-ratio as a measurement to inform and assist for policy-makers in Norway, as well as limitations in regard to qualitative aspects of debt composition and government assets. The interviewees’ highlight that the GDP-ratio is not used in policymaking in Norway and is not considered a valuable measurement or a good indicator for fiscal and debt policy decisions, due to a combination of low debt level and high government asset returns. Instead, the outstanding volume in nominal value, the composition and details about the issuance of bonds are more important indicators. Moreover, the government rather focuses on monitoring of the structural non-oil budget deficits to ensure that fiscal balance is maintained over time, and therefore, ensuring low demands for government borrowing to finance budget deficits.

To address Research Question 1, the research found two key limitations of the debt-to-GDP ratio found through the analysis of quantitative data in Norway. Firstly, the debt-to-GDP ratio can be distorted by economic growth rates, as the debt-ratio is at similar levels in 1995 and 2015, whereas the monetary value grew by 236.8 percent. Therefore, one of the key limitations of the debt-ratio is the distortion of the perception of debt-level trends based on the GDP-ratio in an economy experiencing high economic growth.
Secondly, the debt-to-GDP ratio does not portray the debt serviceability of the government, which in the case of Norway, is closely linked to the budget surplus level, the relatively close growth rate between taxation and GDP, and the large and growing Pension Fund. These three fiscal features have significant implications for the informative aspect and limitations of the debt-to-GDP ratio. While the debt-to-GDP ratio was a very similar level in 2015 as in 1995, it is important to take the growth rate of the Fund into account when assessing the debt-ratio in the case of Norway, as the Fund’s value has grown substantially since 1995, which has a significant impact on the additional revenue flows. The growth in the Fund, which reached US$1 trillion in September 2017, greatly impacts the debt-to-GDP ratio threshold that would be considered sustainable for the Norwegian government compared to other economies with limited government assets and additional revenues beyond taxation. Therefore, the GDP-ratio has important limitations in the ability to portray the debt serviceability and sustainability in terms of debt-ratio threshold levels, as it does not highlight features of the government’s budget balance, assets and additional revenue sources.

To answer the Research Question 2: how influential and valuable the GDP-ratio is within policy-making in Norway, the interview data leave little doubt that the measurement is neither influential nor valuable to assist policy-making, which is clearly linked to the limitations of the GDP-ratio to provide important information as highlighted above. In particular, the lack of ability to portray information about the Norwegian government’s budget balance and large assets in the Fund has great implications for the use and perception of the measurement, as these features impact both the ability of the government to avoid accumulating sovereign debt as well as their ability to repay debt obligations due to great fiscal flexibility. Therefore, the fiscal indicator of the non-oil deficit is highlighted as a much more important and informative tool to assist policy-making. Another qualitative aspect of debt that was highlighted was the importance of the composition of debt, including the maturity or currency denomination. The GDP-ratio does not provide any information on features of the composition, which plays an important role in bond issuance and debt decision-making.

When answering the Overarching Research Question of whether the GDP-ratio is accurate and valuable for policy-makers in Norway, there are both quantitative and qualitative limitations of the GDP-ratio as a measurement of debt, resulting in policy-
makers not considering the measurement valuable for the Norwegian government’s decision-making on fiscal and debt policy strategies.
Chapter 7 – Australia

7.0 – Introduction

Australia has a history of high economic growth rates, increasing from 5.5 percent in 1997 to 9.2 percent in 2008. The strong economic growth trends are related to the strong service, mining and construction industries, which have produced high growth in government taxation revenue levels. Overall, the Australian government operated with net-borrowing levels averaging at -1.1 percent of GDP between 1995 and 2015. This demonstrates how the Australian government enjoyed an average fiscal surplus over the 20 years covered in this research. However, the fiscal surplus increasingly deteriorated after the GFC in 2008, as the economic growth rate declined resulting in decreasing revenue trends. At the same time, the Australian government provided extensive fiscal stimulus policies to counteract the decreased economic growth, resulting in increased government expenditure also having a downward impact on the budget surplus. Nonetheless, the Australian economy was the only case-study economy that did not experience an economic recession due to the GFC. As the economic conditions were favourable between 1995 and 2007, the debt-ratio decreased steadily from 59.6 percent to 33.3 percent of GDP. However, a shift in net-borrowing needs occurred in 2008 as the government’s expenditure increased while the revenue decreased. These fluctuations impacted the debt-ratio level, and the ratio increased by just short of 10 percentage points to 68.1 percent of GDP by 2015.

Although Australia’s debt-ratio doubled between 2007 and 2015, the debt-ratio range is considered to be healthy within the literature. Reinhart and Rogoff (2010; 2012) describe the debt-ratio range as low-to-medium, as it falls in the 30 to 60 percent of GDP bracket during a large proportion of the time sample, however, Australia’s debt-ratio increased and was located in the high-medium category in 2015. Research by Cecchetti et al. (2011) and Baum et al. (2013) still argue that Australia’s debt level as not producing high vulnerabilities for a debt default, as it has been well below the 85 to 95 percent threshold. Nonetheless, the average debt-ratio across the time sample was 47.1 percent of GDP, which is not alarming, if the increasing budget deficits and debt trend evident in the post-GFC period is dealt with by policy-makers. On the other hand, research by Mendoza and Ostry (2007) focusing on fiscal sustainability through the analysis of the responsiveness of fiscal surplus at different levels of debt, find that fiscal responsiveness diminishes as debt moves above 50 percent of GDP. In the case of Australia, it is interesting to notice
that the total revenue-ratio has not grown much after 2012, when the debt-to-GDP ratio exceeded 60 percent of GDP.

Australia is an interesting case study, as the debt-ratio has increased quite significantly since the GFC, after a period of decreasing debt-to-GDP levels, which may be connected to the increased budget deficit level evident after the crisis. This research finds it important, therefore, to investigate how monetary debt levels have fluctuated across the time sample, and to examine the potential diluting effect of high growth in the debt-ratio, and how this may produce distortions of the understanding of the debt trends. Moreover, this research assesses the relationship between net-borrowing trends and the GDP-ratio of debt and the underlying dynamics of government revenues and expenditure levels to answer Research Question 1 regarding the limitations of the debt-to-GDP ratio. Finally, the chapter examines the potential level of influence the debt-to-GDP ratio measurement has within the Australian policy-making environments in order to determine if policy-makers and advisory agencies have identified any limitations of the measurement from a policy-making perspective. This will allow this research to address the Overarching Research Question of how accurate and valuable the debt-to-GDP ratio is to guide policy decisions and debt strategies.

7.1 – The Quantitative Limitations of the Debt-to-GDP Ratio

Section 7.1 examines the trends and fluctuations in macroeconomic variables and government financial accounts in relation to the sovereign debt-to-GDP ratio to answer Research Question 1: what are the limitations of the GDP-ratio measurement of sovereign debt? The section has three subsections. Section 6.1.1 outlines the debt-to-GDP ratio trends in relation to net-borrowing levels and nominal economic growth rates to investigate how the budget balances and economic growth trends correspond with Australia’s debt-ratio fluctuations over time. Section 6.1.2 assesses movements in the monetary value of debt and the nominal GDP to examine the potential distortion arising from high economic growth on the debt-ratio. And finally, section 6.1.3 investigates the fluctuations in government revenues and expenditure levels to highlight potential limitations of the debt-to-GDP ratio in terms of the ratio’s ability to portray the government’s capability to pay debt obligations. Collectively, these three sections will enable this research to determine the different potential limitations of the GDP-ratio based on quantitative data. Most importantly, these potential limitations include the
ability of the debt-ratio to act as a measurement to provide a correct understanding of the debt trends in periods of high economic growth and economic recession, and the government's ability to service debt liabilities through the capacity to generate government revenue as the economy grows, and the significance of government expenditures during times of escalating debt levels.

7.1.1 – Sovereign Debt-to-GDP Ratio Trends, Net-Borrowing Levels and Nominal Economic Growth Rates

This section outlines the debt-to-GDP ratio trends in relation to net-borrowing and economic growth levels in Australia to investigate how the budget balance and nominal economic growth rates correspond to debt-ratio fluctuations over time. This will highlight the significance of the government's budget balance on the debt-ratio, as well as provide a foundation for additional analysis of the impact of fluctuating economic growth trends on the debt-ratio measurement. The statistical data analysed in this section, including the on the debt-to-GDP ratio and net-borrowing levels have been collected from the OECD Database (2017), while the nominal economic growth rates has been collected from OECD Statistics (2016). The percentage-point change in the debt-to-GDP ratio have been calculated by the researcher based on the GDP-ratio data from OECD Database (2017).

As illustrated in Figure 7.1, Australia had a decreasing sovereign debt-ratio between 1995 and 2007, from 59.6 percent to 33.3 percent of GDP. This can be linked to the decreasing net-borrowing needs between 1995 and 1996 shown in Figure 7.2, which was lowered from 2.7 percent to 0.8 percent of GDP. While this is a preferential budget deficit trend, the government still operated with a small budget deficit up to 1996. Over the next decade, the positive net-borrowing trend continued, and the government operated with a budget surplus averaging at 0.7 percent of GDP between 1997 and 2007. At the same time, Australia’s economy grew by an average of 6.8 percent between 1995 and 2007, as indicated in Figure 7.2, and the upswing in economic growth may suggest that increased taxation revenues had a positive impact on the budget surplus. Interestingly, Figure 7.2 also reveals that the largest decrease in the debt-ratio by 6.5-percentage points occurred in 1999, which was the same year as net-borrowing levels decreased by a substantial amount to -2 percent of GDP. This indicates that the decreased budget deficit was related to the decreased debt-ratio, as economic growth...
remained stable between 1998 and 1999. Generally, the combination of budget surplus and strong economic growth rates between 1997 and 2007 can be argued to be the underlying factors resulting in the continuous reduction in the debt-ratio over the time period, as the negative net-borrowing needs reduce the requirement for borrowed capital to finance government budgets. Additionally, the increased value of the GDP through the economic growth between 1997 and 2007 has had an impact on the debt-ratio over time, as the value of the denominator grew larger than the debt component.

While the Australian economy enjoyed an economic growth rate of 9.1 percent in 2008, as shown in Figure 7.2, there was a clear shift in the net-borrowing needs, which increased from -0.7 percent in 2007 to 3.9 percent of GDP in 2008. The budget deficit continued to increase in 2009 to a peak of 5.6 percent of GDP, and although the budget deficit level decreased after 2009, it still averaged at 4 percent of GDP between 2010 and 2012. In comparison, economic growth contracted significantly from 9.2 percent in 2008 to 1.8 percent in 2009, before recovering to 8 percent in 2010. By 2012, economic growth had again declined to 3.3 percent, as illustrated in Figure 7.2. During this period, the sovereign debt-ratio started to increase rapidly from 33.3 percent in 2007 to 62.5 percent of GDP in 2012; in other words, the ratio increased by 28.2 percentage points.

Figure 7.1 – Sovereign Debt-to-GDP Ratio, 1995-2015

The first significant increase in the debt-ratio occurred in 2009, when the ratio increased by 8.6-percentage points to 43 percent of GDP, as illustrated in Figure 7.1 and Figure 7.2. This was the same year that economic growth contracted by the largest amount from 9.2 percent in 2008 down to 1.8 percent in 2009. At the same time, Figure 7.2
demonstrates how the net-borrowing ratio peaked at 5.6 percent of GDP, escalating quickly over two years from a previous budget surplus of -0.7 in 2007. Furthermore, the largest debt-ratio increase occurred in 2012, when the ratio increased by 12.1-percentage points to 62.5 percent of GDP, as shown in Figure 7.1. This contradicts the positive trend in the budget deficit, as the net-borrowing level decreased by almost 2-percentage points to 3 percent of GDP. Nonetheless, significant reductions in economic growth from 7.2 percent in 2011 to 3.3 percent in 2012 may represent the underlying factor of the largest increase of the debt-ratio during the time sample. The two largest increases in the debt-ratio in 2009 and 2012 were accompanied by significant reductions in the economic growth rate compared to previous levels. However, while net-borrowing levels escalated rapidly in 2009, it actually improved when the debt-ratio increased by the largest amount in 2012. Although the government was still facing budget deficits between 2009 and 2012, the decrease in the severity of the budget deficit should indicate lower government borrowing needs, which should have decreased the escalation of the debt-ratio in 2012 compared to in 2009. In a similar way, the higher economic growth rate in 2012 compared to in 2009 should have had a potentially more positive impact on the debt-ratio, due to the rise of the GDP denominator in the ratio.

Figure 7.2 – Net-Borrowing Levels, Nominal Economic Growth Rates and Percentage Point Changes in Debt-to-GDP Ratio, 1995-2015

(Source: OECD Database, 2017; OECD Statistics, 2016; and author’s own calculations)

Although there was an overall decreasing trend in both budget deficit and economic growth rates between 2013 and 2015 as demonstrated in Figure 7.2, the two variables were relatively stable between 2012 and 2013 at around 3 percent. At the same time,
there was a large 4-percentage point decrease in the debt-ratio in 2013. The lack of movement in economic growth and net-borrowing in this year indicates that an actual decrease in the debt level occurred, rather than being a result of fluctuations in the GDP. Nonetheless, as the budget deficit decreased from 3 percent in 2013 to 2.8 percent of GDP in 2015, and the economic growth rate decreased from 3.3 percent in 2013 to 1.8 percent in 2015, the sovereign debt-ratio portrayed in Figure 7.1 continued to increase by almost 10-percentage points from 58.5 percent in 2013 to 68.1 percent of GDP in 2015. Consequently, the debt-ratio increased due to the combination of elevated net-borrowing needs and a slower growth of the GDP between 2013 and 2015.

Overall, the debt-ratio had a stable decreasing trend between 1995 and 2007, from about 60 percent to 33.3 percent of GDP, when the government’s budget was relatively balanced and economic growth was high. Since 2008, however, the debt-ratio has increased quickly to 68 percent of GDP by 2015, with the exception of a decrease in 2013. Although the debt-ratio increased between 2008 and 2015 with the only exception being in 2014, there were three large percentage point increases in the debt-ratio that intensified the trend, namely in 2009, 2012 and 2013. During those years, economic growth was fluctuating, and the Australian government operated with a relatively significant budget deficit, which highlights increased borrowing, and the debt-ratio increased. Overall, the budget surplus and the debt-ratio trends in Australia show a stronger relationship, as the debt-ratio decreased during periods of budget surplus up to 2007, while the budget deficits resulted in elevating debt-ratio trend after the GFC, with the exception of the debt-ratio decrease in 2014.

The trends in debt-ratio during the pre- and post-GFC periods, in combination with the shift in economic growth rates and net-borrowing levels, prompts this research to question the underlying nominal trends in debt and GDP during economic growth and the impact of the decreased growth rates after 2009 on the debt-ratio’s ability to effectively portray nominal debt trends during the two periods. Section 7.1.2 below will assess the debt-ratio trends in comparison to monetary debt and GDP levels to assess the extent of debt increases in relation to the high and declining economic growth rates, and the ability of the debt-ratio to portray actual monetary debt-level fluctuations.
7.1.2 – Monetary Level of Sovereign Debt and the Nominal GDP

This section assesses the movements in the monetary value of debt and the nominal GDP to examine how Australia’s nominal debt level corresponds with the fluctuations of the debt-to-GDP ratio trends. The aim is to evaluate how the debt-ratio potentially distorts the perception of the actual debt-level trend across the time sample. Additionally, it will examine how high and decreasing economic growth have impacted the debt-ratio to gain a deeper understanding of the potential distortion effect arising from fluctuating economic growth on the debt-ratio level over time. The nominal GDP data analysed in this section has been collected from the OECD Statistics (2017).

The research encountered data limitations for Australia, as there were no data available on the monetary value of sovereign debt through the OECD Statistics (2017) or other databases at the time of the data collection. Therefore, this research calculated the monetary debt levels by using the nominal GDP in Australian dollars (AU$) and the debt-to-GDP ratio to find the monetary value of debt. The calculation formula used can be reviewed in Chapter 3, section 3.5 page 51 in the paragraph addressing quantitative data limitations. The lack of any data reported for Australia resulted in the inability to test the calculated debt levels, and the estimated monetary debt level was solely based on the debt-ratio and the nominal GDP. Nonetheless, the data gave an indication of the overall trend in monetary debt level in relation to GDP fluctuations, and provided the ability to assess the differences in debt-ratio and debt-level trends over time. The calculated monetary value of debt is portrayed in Figure 7.3.

**Figure 7.3 – Nominal GDP and Calculated Sovereign Debt in Million AU$, 1995-2015**

(Source: OECD Statistics, 2017; author’s own calculations)
In contrast to the decreasing debt-ratio trend between 1995 and 2007 in Figure 7.1, from 59.6 percent to 33.3 percent of GDP, the debt level in monetary value in Figure 7.3 was relatively stable and increasing by 24 percent. More specifically, although the debt level decreased between 1997 and 2000, the overall monetary debt level increased from AU$315,574 million in 1995 to AU$398,670 million in 2007. On the other hand, Figure 7.3 illustrates that the nominal GDP increased by 122.6 percent during the same timeframe, from AU$529,598 million in 1995 to AU$1,178,809 million in 2007. Therefore, the larger increase in the nominal GDP of 122.6 percent compared to the 24 percent increase in the monetary debt level contributed to the perception of decreasing debt level due to the reductions in the debt-ratio. Consequently, the decline in the debt-ratio did not constitute an actual decrease in sovereign debt level between 1995 and 2007, but rather the faster growth rate in the nominal GDP. In other words, as the nominal GDP grew 5.1 times faster than monetary debt, the debt-to-GDP ratio was diluted over the time period between 1995 and 2007.

When the budget deficit highlighted in Figure 7.2 started to escalate in 2008, the debt-ratio increased rapidly by 28.2-percentage points between 2009 and 2012. In comparison, the debt level in monetary terms increased by a significant 71.3 percent, from AU$557,852 million in 2009 to AU$955,791.5 million in 2012, as shown in Figure 7.3. At the same time, the nominal GDP level increased by only 17.7 percent from AU$1,297,280 million to AU$1,527,529 million between 2009 and 2012. Hence, as the debt level in monetary terms increased about four times faster than the sluggish GDP growth, the debt-ratio correspondingly escalated more intensively during this period.

As revealed in Figure 7.2, the debt-ratio decreased by 4-percentage points in 2013, while economic growth and the net-borrowing level remained stable. Figure 7.3 shows a decrease in the monetary debt level by 17.9 percent from AU$955,791.5 million in 2012 to AU$930,196 million in 2013, based on the calculated debt data, which was the only decrease in the monetary debt across the time sample. In contrast, the nominal GDP increased by 4.1 percent from AU$1,527,529 million to AU$1,589,940 million between 2012 and 2013. The combination of the reduced monetary level of debt and the increase in nominal GDP, therefore, reduced the debt-ratio in 2013. The debt in monetary value continued to increase rapidly after 2013 to AU$1,127,016.3 million in 2015, as demonstrated in Figure 7.3, which was an increase of 21.2 percent from 2013 levels. In
comparison, Figure 7.3 shows the nominal GDP increase by only 4.1 percent from AU$1,589,940 million to AU$1,654,864 million between 2013 and 2015, as indicated by the sluggish economic growth rate demonstrated in Figure 7.2. Consequently, monetary debt increased almost 5.2 times faster than the nominal GDP, and the debt ratio increased by almost 10-percentage points over two years to 68.1 percent of GDP in 2015, which was the highest debt-to-GDP ratio level across the 20-year time sample.

Overall, the monetary debt level in Australia has been increasing continuously between 1995 and 2015, with the only exception occurring in 2013, when debt decreased. Across the time sample, the nominal GDP increased by 212.5 percent, while the monetary debt level increased by 257.1 percent. The debt accumulation occurred mostly after 2008 and was linked to the sudden change in net-borrowing needs from 2008 onwards, which did not recover to the pre-crisis level by 2015. Additionally, the recovery of economic growth has been slow. The significant change in growth in nominal debt and GDP before and after the GFC can be better appreciated by comparing the pre- and post-crisis growth rates of the two variables. Leading up to the crisis, the nominal GDP grew by 67 percent between 2000 and 2007, while monetary debt increased by a relatively low 36 percent. On the other hand, the nominal GDP increased less between 2007 and 2015, by 40.4 percent, while monetary debt increased significantly by 187 percent. As debt grew almost 4.3 times faster than the nominal GDP after 2008, the debt-ratio more than doubled in just 8 years. In general, between 1995 and 2007, the debt-level grew at a slightly lower rate than the GDP levels resulting in a decreasing debt-ratio trend. However, sovereign debt in monetary terms accumulated over time. After 2008, the growth trend in debt increased dramatically, while the GDP growth declined, which effectively increased the debt-ratio. As the difference between monetary debt and nominal GDP growth intensified leading up to 2015, as economic growth continued to decline and debt increased more rapidly, this demonstrates the need to both decrease borrowing as well as recover economic growth rates to tackle the increasing debt-ratio.

7.1.3 – Total General Government Revenue, Expenditure, and Taxation Revenue Ratios (% of GDP), and Taxation Revenue in Monetary Values

This section investigates the fluctuations in general government revenues and expenditure levels to further examine the net-borrowing level trends to gain a better understanding of the underlying budget dynamics on debt fluctuations before and after
the GFC. The aim is firstly, to determine the impact of the GFC on revenue and expenditure flows and their relation to debt-level trends; secondly, to highlight potential limitations of the debt-to-GDP ratio in regard to the government’s ability to generate revenues during fluctuating economic growth periods; and finally, to assess the ratio’s overall ability to portray the government’s capability for debt repayments. The data analysed in this section has been collected from both the OECD Database (2017) and OECD Statistics (2017). More specifically, the total revenue- and expenditure-ratios was collected from the OECD Database (2017), while the total taxation revenue was collected from the OECD Statistics (2017). As there was no taxation revenue-ratio reported by the international databases, the research has calculated the data set by using the formula highlighted in Chapter 3, section 3.4 on page 51, by using the taxation revenue and nominal GDP data in AU$, collected from OCED Statistics (2017).

As demonstrated in section 7.1.2, the Australian government operated with a relatively neutral net-borrowing level of 1.1 percent of GDP across the time sample, but there was a clear shift from a budget surplus reflected through a negative net-borrowing level between 1995 and 2007 to a budget deficit after the GFC. More specifically, the government revenue- and expenditure-ratios intersected in 2008 and continued the deteriorating trend resulting in budget deficits between 2009 and 2015, as illustrated in Figure 7.4. In contrast to the GDP-ratio denominated revenue and expenditure trends, the taxation revenue in monetary value has increased steadily across the time sample, with the exception of a decrease occurring between 2007 and 2009, as demonstrated in Figure 7.5.

Between 1995 and 2001, the Australian government operated with an average budget surplus, as highlighted in section 7.2.1 through the net-borrowing trends. Figure 7.4 shows that the total revenue-ratio increased from 35.2 percent in 1995 up to a peak of 37.4 percent of GDP in 1999, while the expenditure was 34.5 percent in 1999. Simultaneously, the taxation revenue level in monetary terms increased from about AU$149,200 million in 1995 to AU$197,100 million in 1999, as seen in Figure 7.5. At the same time as the total revenue peaked and the expenditure-ratio was lowered in 1999, the debt-ratio reduced by 6.4-percentage points, which was the largest amount across the time sample, as illustrated in Figure 7.2 in section 7.1.1.
However, Figure 7.4 demonstrates that the positive trends shifted and, as the expenditure-ratio was 35.3 percent and the revenue-ratio decreased to 35.1 percent of GDP in 2000, this resulted in a budget deficit. The taxation revenue in Figure 7.5, on the other hand, increased to AU$214,700 million in 2000 where it stagnated and only increased by about AU$3,300 million in 2001 to AU$218,000 million. Accordingly, the debt-ratio in Figure 7.2 in section 7.1.1 decreased by only 1.1-percentage point in 2000 with further decreases in the percentage point debt reduction in 2001 and 2002, and was, therefore, a smaller reduction compared to 1999 when the government had a budget surplus and a stronger growth in taxation revenue flows.

The net-borrowing trend improved from 2001, as the budget surplus returned through increases in the total revenue-ratio and a decrease in the expenditure-ratio evident in Figure 7.4. More specifically, the expenditure-ratio decreased by 1.8-percentage point from 35.3 percent in 2000 to 33.5 percent of GDP in 2005, and the revenue increased by 0.9-percentage point from 35.1 to 36.2 percent of GDP in 2004. Further, the revenue-ratio increased to 36.4 percent in 2005, before decreasing to 35.1 percent of GDP in 2007, while the expenditure-ratio continued the decreasing trend to a low-point of 32.8 percent in 2007. In comparison, Figure 7.5 illustrates that the taxation revenue in monetary value increased at a steady pace between 2001 and 2007, from AU$218,000 million to about AU$350,100 million in 2007.
The budget surplus quickly diminished after 2008, as total revenue and expenditure ratios shifted positions substantially, as illustrated in Figure 7.4. The expenditure-ratio increased quickly from 32.8 percent in 2007 to 35.5 percent of GDP in 2009, while the total revenue decreased from 35.1 percent in 2007 to 32.5 percent of GDP in 2009. The decreasing trend in the total revenue-ratio continued to a low-point of 32.2 percent of GDP in 2010. This means that the total revenue-ratio decreased by -8.3 percent between 2007 and 2010, while expenditure increased by 6.6 percent during the same period. As the total revenue-ratio decreased, both the taxation revenue in monetary value and GDP-ratio also decreased. The taxation-ratio decreased in a similar manner as the total revenue-ratio, from 29.7 percent in 2007 to 25.6 percent of GDP in 2010. While the taxation revenue in monetary terms has mostly had an increasing trend since 1995, it actually decreased between 2007 and 2009, from about AU$350,100 million to AU$334,900 million, as shown in Figure 7.5.

In 2009, Figures 7.1 and 7.3 in sections 7.1.1 and 7.1.2 illustrated that the debt-ratio and monetary level of sovereign debt escalated most intensively, which corresponded to the lower revenue levels in both total and taxation terms of GDP in combination with the increased expenditure-ratio in Figure 7.4. More specifically, the decrease in total revenue-ratio accumulated to -8.3 percent between 2007 and 2010, while the taxation-ratio was lowered by -13.8 percent, which demonstrates that the taxation-ratio was more volatile as a result of the GFC than the total revenue-ratio. Additionally, as the increase in expenditure was 4.2 percent, the debt level rose to a larger extent due to the declined...
revenue flow compared to the increased expenditure levels after the GFC, due to the higher percent impact evident in the revenue compared to the expenditure.

Between 2011 and 2014, the total revenue-ratio increased from 32.4 percent to 33.6 percent of GDP, while the taxation-ratio rose from 26.3 percent to 27.6 percent of GDP. In comparison, the expenditure-ratio grew from 35.1 percent in 2011 to 36.2 percent of GDP in 2014. Overall during this period, the total revenue-ratio increased by 3.7 percent, while the expenditure-ratio increased by 3.2 percent. This indicates a recovery of the revenue-ratio, while there was deterioration in the expenditure-ratio trend. In 2012, both the monetary debt level and the GDP-ratio declined the most dramatically as the ratio increased with 12.1 percentage points, although, this was the only incident where the debt level in monetary value declined across the time sample. This may have been a result of the increased revenue levels, as well as explaining the elevated expenditure-ratio, as the government paid debt liabilities in 2012. Nonetheless, the expenditure level increased by 1.7 percent between 2014 and 2015, while the total revenue-ratio rose by only 0.2 percent, and there was an increased net-borrowing level in 2015. When assessing Figure 7.5, the growth in the taxation revenue in monetary value decreased in 2014, which may be connected to lowering economic growth, and the underlying factor behind the sluggish growth in the total revenue-ratio.

The persistent budget deficit after 2011 demonstrates the underlying cause of the increased sovereign debt level, and the debt-ratio increased by almost 10-percentage points between 2013 and 2015, as revealed in section 7.1.1. Expenditure continued to increase between 2014 and 2015, while the revenue- and taxation-ratio remained more stable, as shown in Figure 7.4. The increase in debt over these two years, therefore, appears to be determined more by the deterioration in the expenditure-ratio rather than the revenue-ratio.

Across the time sample, Australia’s total revenue-ratio decreased by -1.5-percentage point, while the expenditure-ratio increased by 1.7-percentage point. This highlights the relative trend between the two variables in terms of GDP and illustrates how the expenditure level had deteriorated to a larger degree than revenue-ratios. Overall, the total revenue-ratio and the taxation-ratio fluctuation was relatively synchronised across the time sample. In average terms, the taxation-ratio was -18 percent lower than the total
revenue-ratio; however, the percent difference was -17.4 percent between 1995 and 2007, before increasing to -18.8 percent between 2008 and 2015. This shows how the taxation-ratio was impacted to a larger degree after the GFC compared to the total revenue-ratio, which can be a result of reductions in tax rates as a part of the fiscal stimulus program. In monetary terms, the taxation revenue increased by 199.5 percent between 1995 and 2014, from about AU$149,200 million to AU$446,800 million, with the only reduction in taxation revenue evident between 2007 and 2009. In comparison, the nominal GDP increased by 212.5 percent across the time sample, which demonstrates how the taxation revenue increased by 13-percentage points less than the nominal GDP. Moreover, the taxation revenue increase differed in the seven-year pre- and post-GFC periods, as it grew by 60.6 percent between 2001 and 2007, while only by 27.6 percent between 2007 and 2014. This illustrates a significant impact by the GFC on revenue flows, and contrasts the overall similar percentage growth in nominal GDP and taxation revenue.

7.2 – The Qualitative Limitations of the Debt-to-GDP Ratio: Is the GDP-Ratio Valuable for Governmental Policy-Making?

Australia enjoyed strong economic growth and budget surplus due to the increased taxation revenue flows and lowered expenditure levels leading up to the GFC. As a result, the debt-to-GDP decreased leading up to 2007. However, the decreased international demand for Australia’s resources and the lowered value of the Australian dollar after the GFC (Australian Industry Report, 2016) reduced economic growth and taxation revenues, which produced increasing budget deficits. The increased budget deficit in combination with the decreased economic growth resulted in the debt-ratio almost doubling between 2008 and 2015. As demonstrated in section 7.1.2, the debt-to-GDP ratio trend did not portray the actual monetary debt trend, as debt continuously increased from 1997. This contrasts with the decreasing debt-ratio between 1997 and 2007, which was mostly due to a stronger growth rate in the nominal GDP than nominal debt.

The following section, therefore, investigates the influence of the GDP-ratio on policy-making. Additionally, it aims to examine if there are limitations of the GDP-ratio as discussed and identified among policy-makers and budget advisors, to be able to answer Research Question 2: how influential and valuable measurement from a policy-making perspective.
7.2.1 – The Influence of the Net-Debt Measurement on Fiscal Policy, the Impact of Commodity Prices on The Debt-to-GDP Ratio and the Government’s Expenditure and Revenue Flows

At the start of the interviews, in answering the question of what measurement of sovereign debt is important for debt analysis and policy-making in Australia, the interview participants highlight that the net-debt measurement of debt is the most influential. Interviewee A1 states that based on a 20-year experience “the principal measurement in Australia is net-debt … and the debt-to-GDP ratio has not been used extensively for policy-making [in Australia]”. Interviewee A2 confirms this by asserting:

On a Commonwealth [federal] level, the net-debt measurement in market value … is the most important in short-term analysis. Net-debt includes asset investments in cash and deposits, [as well as] the Future Fund (the Australian sovereign wealth fund), which is the largest item in the net-debt on the asset side [of the measurement].

The focus on net-debt signifies the government’s aim to include assets to the analysis of debt liabilities to be able to analyse the debt position in Australia to guide policy-making. However, Interviewee A1 highlights a potentially problematic issue, by asserting:

In an Australian context, [an issue] relates to interest-bearing assets [as] the net-debt measurement nets … our interest-bearing assets [off liabilities], and the issue then is around the policy of those assets compared to the liabilities. For example, our higher education loans appear as an asset in the balance sheet, [which] reduces the net-debt. One of the issues that are [discussed] at the moment is that the quality of those assets is falling … a lot of loans [have been] made to students who have not completed their courses and are unlikely to pay their loans. And in the broad context … [the issuance of] these loans have been increasing, so they are an increasing part of the government’s balance sheet.

In other words, the increasing proportions of student loans result in larger government assets, which pushes the net-debt measurement down; however, the decreasing quality of these assets jeopardises the government’s ability to ensure revenue flows from them. In this way, the net-debt measurement may not portray the ability of the government to
repay liabilities without putting some pressure on the budget balance. This could decrease the value of the net-debt measurement over time.

On the question regarding the level of influence the GDP-ratio has within policy-making, Interviewee A1 asserts that:

One of the reasons for [the low reliance on the debt-to-GDP ratio] is probably because our debt level has not been particularly high…[and] it tends to be more discussed by countries that have higher debt-to-GDP ratios and higher servicing levels [on their debt].

As highlighted in section 7.1.1 and Figure 7.1, Interviewee A1’s statement on the low-debt reasoning for not using the GDP-ratio extensively can be understood as Australia’s debt level has been fluctuating between 33 and 68 percent of GDP. The low-debt argument is supported from an empirical standpoint, as these levels are considered to be low and medium according to the research by Reinhart and Rogoff (2010; 2012). Nonetheless, Interviewee A1 mentions that “[the GDP-ratio] is a parameter that people keep an eye on, particularly in terms of sustainability … and [especially] if it changes or increases quickly”. As section 7.1.2 showed that the debt-to-GDP ratio over-doubled between 2007 and 2015, this could indicate that the GDP-ratio is a measurement that the government is monitoring, depending on their perception of what constitutes a rapid increase.

While the debt-to-GDP ratio may not have a great influence in short-term analysis and fiscal policy decisions, both interviewees highlight that the GDP-ratio is used to analyse debt trends over longer time periods, as well as for forecasts and projections of future debt trends. Interviewee A2 states that:

[In] long-term analysis, for example [through] the Intergenerational Report (a 40-year projections report), the key measurements the government assesses are the net-debt and gross-debt as GDP-ratios. This is due to the time factor; [we] need to include the movement of the economy [in relation to] debt projections to understand fiscal sustainability over time.

Moreover, Interviewee A2 also stresses that “in the [government] budget, net-debt as a GDP-ratio is reported for [debt] forecasts and projections”. Interviewee A1 agrees by
explaining “the GDP-ratio gives us a better measure over time, instead of using nominal figures [for long-term analysis]”.

Therefore, the participants stress that the debt-to-GDP ratio plays a more important role in long-term analysis and scenario developments compared to short-term, as it provides the ability to assess the debt trends in relation to the growth of the economy.

When I asked the participants about potential limitations of the GDP-ratio from a policy-making perspective, both interviewees highlighted several aspects that are problematic. Interviewee A2 explains that Australia does not have a debt strategy linked to a specific debt-to-GDP ratio target, which connects to issues of short-term fluctuations during economic turmoil. More specifically, Interviewee A2 highlights that:

The GDP-ratio is not helpful in the short-term [due to fluctuations of governmental] liabilities. For example, in Ireland and Jamaica, the crash of the financial system caused debt levels to quickly increase from relatively low levels to become very high. [Therefore], the GDP-ratio is not helpful in the short-term [due to] pressures of the financial crisis and financial system crash on fiscal deficits, which again increases debt levels in the short-term. But as the economy recovers, the GDP-ratio balances out again.

Although not experienced to the same degree in Australia, sections 7.1.1 and 7.1.2 indicate how the financial crisis resulted in significant increases in the net-borrowing levels and reductions in economic growth, and the debt-to-GDP ratio increased rapidly. As net-borrowing has remained high and economic growth has been persistently lower than pre-crisis levels, the debt-to-GDP ratio has continued to grow up to 2015.

Related to the decreasing nominal GDP growth rate found in section 7.1.2, Interviewee A1 explains:

An issue … in Australia’s context has been the volatility of the nominal GDP. As Australia is one of a number of countries where nominal GDP has been very volatile … and while the real GDP is growing by a relatively constant amount, about two percent, the [nominal] deflator has been very volatile”. [Between 2005 and 2012], when commodity prices were going up, the GDP was growing very fast … and the rapid growth in the [GDP] denominator
tended to mask what may have been a stronger growth in sovereign debt. Over the last years, the opposite happened, as commodity prices have fallen, the deflator fell to around zero [and] we saw a pick-up in the GDP-ratio [of debt], purely because the deflator was so flat.

This information connects to findings in sections 7.1.1 and 7.1.2, where evidence illustrates the impact of the relative growth rates between the GDP and sovereign debt and the impact on the debt-to-GDP ratio. If the growth rate of the nominal GDP is stronger than growth in sovereign debt, the debt-to-GDP ratio will decrease. On the other hand, if the nominal GDP growth rate is lower than the growth rate of debt, the debt-ratio will increase at a fast rate. The decreasing growth in the nominal GDP was evident in the eight-year comparisons between the pre- and post-GFC periods, where the growth in nominal GDP declined from 67 percent between 2000 and 2007 to 40.4 percent between 2007 and 2015. However, the main reason for the increasing debt-ratio after the GFC was the significant increase in growth in debt, from 36 percent to 187 percent, so the decline in growth in the GDP denominator was not the only cause of the increase in the debt-ratio after the GFC.

The interviewees also highlight the impact of the GDP-ratios of revenue and expenditure, which has indirect implications for sovereign debt levels. Interviewee A1 focuses on the government expenditure trends by asserting:

[The GDP-ratio] also tends to mask growth in government spending as well … in the 2000s a lot of people were saying that government spending as a share of GDP was slightly falling, but the growth in government spending was actually very high. And then, once the nominal GDP started to come off due to the fall in commodity prices, we got a more realistic indication of where spending levels were.

This is evident through the empirical research in sections 7.1.2 and 7.1.3 and relates to the data on nominal GDP in Figure 7.3 and the government expenditure ratio in Figure 7.4. More specifically, the data on expenditure shows that government spending decreased between 2000 and 2007, while economic growth was high. When economic growth declined significantly in 2008 and 2009, the expenditure-ratio increased rapidly due to a combination of the increase in the expenditure level and the decrease in the
GDP denominator. As economic growth has not recovered to pre-crisis levels, the expenditure rate has an increasing trend.

On the other hand, Interviewee A2 focuses on the issue of the GDP-ratio as a denominator of debt due to the different fluctuations in the GDP compared to government revenue. Although not providing an example from the Australian economy specifically, Interviewee A2 highlights the potential limitations through a work experience in Papua New Guinea by explaining a new large gas project greatly impacted the level of GDP; however, as the government gave tax breaks to attract [foreign] companies, the government revenue did not increase at the same level as the GDP. This, therefore, is problematic when considering the debt-to-GDP ratio measurement.

In section 7.1.3, this research found that the growth rates were similar in nominal GDP, by 212.5 percent, and the taxation revenues of 199.5 percent between 1995 and 2015. Therefore, the limitation of the different growth rates of GDP and government revenues appears to be not a significant problem for the government based on the 20 years assessed in this research. Nonetheless, while the taxation revenue grew by 60.6 percent between 2001 and 2007, it only increased by 27.6 percent between 2007 and 2014. Moreover, the Australian government's total revenue was highly reliant on taxation revenue flows, as it was only -18 percent smaller than the total revenue on average across the time sample. This underlines the importance of monitoring the trends over time to ensure that potential differences in growth do not impact repayment capacity.

Overall, the GDP-ratio is not used extensively in policy-making in Australia, and is mainly used for long-term analysis and forecasts, while net-debt is the principal measurement guiding policy decisions. It is also highlighted that using the debt-to-GDP target is unfavourable in the event of a financial crisis, due to the volatility of the nominal GDP and its impact on the GDP denominator in the short-term. Therefore, the Australian government does not have a specific debt-ratio target that guides fiscal policy decisions regarding debt levels. Another limitation of the measurement discussed was the impact on the perceived expenditure levels denominated in GDP over time and how it can distort the perception of expenditure trends. Moreover, it was highlighted that the debt-to-GDP ratio has limitations due to the lack of insight into the government’s ability
to generate revenue flows, as the impact of economic growth on government revenues depends on the taxation policy.

7.3 – Summary

Australia has had relatively modest debt levels in terms of GDP with an average of 47.1 percent of GDP. The debt-ratio has moved in a u-shaped trend, reducing from 58.6 percent in 1995 down to 33.3 percent of GDP in 2007. Nonetheless, due to substantial increases in net-borrowing needs, the debt-ratio increased from 33.3 percent 2007 up to 68.1 percent of GDP by 2015.

While the debt-ratio was almost 10-percentage points above the 1995-level in 2015, debt levels in monetary terms have increased at a faster rate after the GFC. Between 1995 and 2007, monetary debt increased by 24 percent, while the nominal GDP increased by 122.6 percent, contributing to the lowering of the ratio value of debt. Furthermore, this highlights that the Australian government is still increasing debt levels, while operating with budget surpluses, as the total revenue-ratio exceeded expenditure levels during this period. Between 2007 and 2012, the debt-ratio escalated, as the debt level in monetary value increased by 71.3 percent compared to a modest 17.7 percent increase in the nominal GDP. Therefore, as the debt level increase was larger than the increase in the GDP, debt-ratio escalated to 62.6 percent of GDP. The largest increase in the debt-ratio occurred in 2011, by 16.2-percentage points. At the same time, budget deficits escalated due to a larger decrease in revenue flows compared to the increase in the expenditure level.

The increasing trend in debt levels continued between 2013 and 2015, growing by 17.9 percent, while the GDP growth declined further to only 8.3 percent; and therefore, the debt-ratio reached a peak in 2015 at 68.1 percent of GDP. Moreover, while the total revenue-ratio increased, there were larger increases in expenditure levels between 2013 and 2014. One of the potential underlying factors producing a lower growth in the revenue-ratio was the slower growth rate in the monetary value of taxation revenues evident in 2014 and 2015. The elevated expenditure levels contributed to the acceleration in the debt increases to a larger degree than the fluctuation of the total revenue-ratio. Overall, the Australian government needs to address the net-borrowing levels to ensure a
high level of fiscal sustainability, as well as ensuring improved economic growth rates, to be able to effectively reduce debt levels and the debt-to-GDP ratio over time.

Across the time sample, Australia’s monetary debt level increased by 257.1 percent, while the GDP increased by 212.5 percent. This demonstrates how Australia’s monetary debt had grown faster than nominal GDP growth, which resulted in a higher debt-to-GDP ratio in 2015 compared to in 1995. In terms of taxation, the monetary value increased by 199.5 percent over the time sample, which is slightly below the growth in GDP. This illustrates the link between economic growth and taxation revenue flows; however, the taxation revenue growth declined after the GFC, as it grew by 60.6 percent between 2001 and 2007, while by only 27.6 percent between 2007 and 2014. This demonstrates a significant impact by the GFC on revenue flows and contrasts the overall similar percentage growth in nominal GDP and taxation revenue.

In conclusion, there are three key limitations of the debt-to-GDP ratio found through the analysis of the quantitative data. Firstly, the debt-to-GDP ratio distorts the understanding of the monetary debt level trend, especially before the GFC. This is understood as the debt-ratio decreased significantly, while the monetary debt level was relatively stable, increasing by 24 percent. The debt-to-GDP ratio trend could therefore impact the willingness of the government to decrease debt levels while enjoying increased taxation revenue and budget surplus, as it already appears to be decreasing.

Secondly, the debt-ratio has increased significantly after the GFC due to a combination of decreased revenue flows and increased expenditures. While the revenue-ratios show a recovering trend after 2010, the expenditure-ratio was still increasing up to 2014. Moreover, the increase in expenditure between 2013 and 2014 was stronger than the recovery of the revenue-ratio. Therefore, while the overall taxation revenue increased by a very similar growth percentage as nominal GDP, indicating that the GDP-ratio has the ability to portray the repayment capacity in terms of revenue flows, the growing expenditure has resulted in persistent budget deficits. This highlights that, in the case of Australia, the lack of insight into the expenditure side of the budget can jeopardise the ratio’s ability to portray repayment capacity if expenditures continue to rise.
When addressing the qualitative data for Research Question 2 on how influential and valuable the GDP-ratio is within policy-making, it is highlighted in the interviews that a range of factors decrease the government’s and advisory agencies’ use of the GDP-ratio. In general, the debt-to-GDP ratio is not used extensively as a measurement to guide short-term policy-making and debt strategies. The reasoning is a combination of the low level of Australia’s debt-to-GDP ratio level, and the limitations of the measurement in relation to the volatility of the nominal GDP denominator in the short term. This has deterred the use of debt-ratio thresholds by the Australian government. Arguments were also made on its lack of insight into the government’s ability to generate revenues, distortions of expenditure levels and, ultimately, the ability of repayment. Therefore, the GDP-ratio is mostly used in debt forecasts and projections, while the net-debt measurement is the principal measurement used in the policy-making environment. The qualitative data, therefore, support several of the empirical findings of this research.

Consequently, both the quantitative and qualitative data assert that the GDP-ratio is not very influential due to a range of limitations impacting the accuracy of the GDP-ratio measurement. When answering the Overarching Research Question of whether the GDP-ratio is accurate and valuable for policy-makers in Australia, the conclusion is that the limitations of the GDP-ratio results in policy-makers not considering the measurement accurate not valuable for the government’s decision-making on fiscal and debt policy strategies.
8.0 – Introduction

In today’s highly integrated world economy, international institutions such as the United Nations (UN), the International Monetary Fund (IMF) and the World Bank play an important role in the promotion of macroeconomic and fiscal stability and in identifying and resolving potential economic vulnerabilities and financial crises. After the creation of the UN in January 1942, 44 member countries met in July 1944 at the Bretton Woods Conference in New Hampshire United States (US) and established the World Bank and the IMF (Bretton Woods, 2018). The purpose of these specialised, autonomous agencies within the UN was initially to rebuild the devastated economies after the war, to promote international economic collaboration and avoid financial crises such as the Great Depression (UN, 2018; Bretton Woods, 2018). Today, the IMF and the World Bank have 189 member countries (IMF, 2018b), and their institutional mission and purpose have been adjusted to meet the changing economic environments. The World Bank focuses on developing economies and tackling poverty-related issues through lending to, for example, development projects (World Bank, 2018). On the other hand, the IMF’s main responsibility is to provide lending to member countries with actual or potential balance of payment issues (IMF, 2018b). The IMF assisted, for example, during the Latin American Debt Crisis in the early 1980s, the Asian Financial Crisis (AFC) in 1997 as well as during the most recent Global Financial Crisis (GFC), which developed into the European Sovereign Debt Crisis. During the GFC, the IMF provided financial assistance to the troubled European economies, including Greece, Portugal and Ireland. These assistance programs were provided in collaboration with key European institutions, including the European Commission, the European Central Bank and the European Stability Mechanism, among others. These represented the first assistance programs to advanced economies and resulted in changes to the IMF’s lending policies due to the severity of the crisis, the dramatically escalated sovereign-debt levels and the consequent need for extraordinarily large financial assistance (Pisani-Ferry et al., 2013).

The institutions emphasise the importance of effective sovereign debt management to ensure financial stability and fiscal sustainability within member countries, and consequently they have created several projects to assist policy-makers. As international financial integration in the current world economy has become very extensive, the
institutions stress that a large governmental debt portfolio impacts a government’s budget dynamics and ability to ensure favourable fiscal policies, as well as affecting investor confidence and economic activities. Additionally, government debt portfolios have become increasingly complex, due to such actions as the issuance of, for example, Eurobonds, local currency bonds and the potential impact of contingency liabilities (World Bank, 2017).

To address these important changes, the IMF and the World Bank have cooperated on a number of occasions. Most importantly, in 2001 they developed a set of sovereign debt guidelines, as well as two policy-making tools to assist member economies. The Debt Sustainability Analysis (DSA) framework was created in 2002 and the Medium-Term Debt Management Strategy (MTDS) tool was launched in 2007 (IMF, 2017). The aim of these tools is to provide member countries with analysis and to assist in the development of debt strategies to ensure financial stability and debt sustainability.

The significant involvement of the international organisations and their efforts in debt analysis, policy advice and knowledge contributions make these institutions a very important subject for this research. Including the institutions are crucial, firstly, in answer Research Question 1 regarding the limitations of the debt-to-GDP ratio in order to gain knowledge of the institutions’ perspective of the debt-to-GDP ratio and to investigate whether the institutions have identified potential positive or negative aspects of the GDP-ratio of sovereign debt to. Secondly, to address Research Question 2 on how valuable and influential the debt-to-GDP ratio is for policy-making, the research seeks to highlight the level of influence of the debt-to-GDP ratio within institutional debt analysis and policy advice to member countries to supplement the country analysis.

Ultimately, by including the institutions’ perspectives on debt measurement and knowledge of debt analysis and policy advice, this research aims to supplement the country analysis to successfully answer the Overarching Research Question of how accurate and valuable the debt-to-GDP ratio is as a measurement to guide policy-making to ensure sustainable sovereign debt policies and strategies.

This chapter is structured as following. Section 8.1 addresses the interview data, to investigate the level of influence the debt-to-GDP ratio has within the institutions’ debt
analysis, policy advice and debt strategies provided to member economies compared to other measurements. Additionally, section 8.1 analyses the limitations and benefits of the debt-ratio measurement from the institutional points of view. Finally, section 8.2 provides the conclusions for the chapter and answers the questions based on the analysis and findings from the international institutions.

8.1 – Interview Data

This section highlights the key data collected through interviews with the UN, the World Bank and the IMF to answer Research Question 1 and 2. The aim is to gain knowledge of the institutional perspectives to supplement the country analyses to build a stronger foundation to answer the overarching question: how accurate and valuable the debt-to-GDP ratio is for policy-making purposes. Section 8.1.1 covers the important measurements within institutional analysis, while section 8.1.2 determines the relative importance of monetary value of debt compared to the debt-to-GDP ratio. These two sections address Research Question 2: how influential the debt-to-GDP ratio is within debt analysis and policy-making? and Research Question 1: what are the limitations of the debt-to-GDP ratio from an institutional perspective? Section 8.1.3 examines the data collected on the institutions’ observed limitations of the GDP-ratio.

8.1.1 – Important Measurements and Parameters within Institutional Analysis

To start the investigation of the level of influence of the debt-to-GDP in comparison to other measurements and parameters, the interviewees are firstly asked an open-ended question regarding what measurements of sovereign debt are monitored and used for debt analysis and policy advice by the institutions. Moreover, the interview questions address more specifically the importance of the monetary value of debt and the debt-to-GDP ratio within the institutions debt analysis and policy-advice.

The UN interviewee emphasises that the UN “do not use a specific measurement of debt. A lot of [the work] is research based and [focuses on] capacity building and helping countries in terms of debt management”. Moreover, the UN interviewee highlights different areas that they assess, including:

The short or long term [proportions of debt], whether …debt is in local or foreign currency, … the growth of debt … and [if] debt finance consumption or investment. …We look at a lot of variables, not only the
monetary value of debt. We also look at the structure of the economy [and export] to [understand] how the government create revenues… [and their] capacity to repay debt.

Overall, the UN interviewee asserts:

The composition, the currency of the debt is important, the interest rate of debt and the growth rate of debt is important. These are all important factors that have implications for the sustainability of debt, which is not captured by the debt-to-GDP ratio. [Ultimately,] it is not a consensus on what the right measurement should be, each individual measurement has its own advantages and disadvantages, and it is important to use a combination of measurements.

Similarly, the World Bank (WB) and the IMF interviewees highlight that there is not only one particular measurement in focus, and a combination of parameters is needed for effective debt analysis. The WB interviewee highlights that, across the different units within the World Bank, “we are looking at all aspects of sovereign debt including the numbers, the composition [and duration to assess] different aspects or measurements of sovereign debt”. More specifically, the WB interviewee highlights:

From an economics perspective, the focus is mostly on the macroeconomic and fiscal parameters. … From our point of view [the debt and risk management team], the main objective is to support [national] debt managers [in the] development [of] debt management strategies in the medium and long-term … to [ensure] sustainable funding mechanism and to minimise risks at lowest possible cost. In order to measure [these aspects], we are using the Medium-Term Debt [Management] Strategy (MTDS) tool. This tool includes measures … [such as] the foreign and local currency composition … the duration of the debt [through] indicators like the average time to maturity, [and] the average interest rate of the debt portfolio. [The interest rate assessment] gives indication of the fixed or floating composition of the debt portfolio. This is important because if the fixed portion of the debt portfolio if high, the fluctuations in the interest rates market will not have short-term impact on the debt portfolio. [Duration] is also important because of the liquidity risk aspect, [and] if the
duration of a debt portfolio is too short, there might be sustainability and re-financing problems. So, there are a number of ratios and indicators used to analyse the debt portfolio and to develop debt policy.

The IMF interviewee emphasises on the importance of the Debt Sustainability Analysis (DSA) tool to assess debt vulnerabilities of countries, which also includes similar parameters:

[The DSA tool] takes into account many indicators, such as the current debt [and debt projections] ... mostly gross debt as a GDP-ratio, [but the net-debt measurement is also used when reliable data is available. We also look at] the structure and proportion of external debt, the maturity through for example the average maturity ... the proportions of fixed and floating [interest] rates of the debt, and the policy frameworks. We [assess] debt [vulnerabilities through] a baseline scenario and sensitivity tests ... The stress scenarios ... [are based on] underlying assumptions of fiscal balance, [costs of financing], economic growth and the interest rates trends, to give a good understanding of potential debt dynamics in different situations.

While highlighting similar reasons for why maturity is important for a country’s debt sustainability, the IMF interviewee also asserts:

The features of the creditor base [is also important]. For example, if the creditor base is diversified, if they are reliable, and if they are domestic or foreign. If a country has a large proportion of foreign currency debt, the country is more vulnerable to exchange rate changes, which can ... put pressure on payment capacity of a country as well as impacting foreign currency reserves.

All the interviewees assert that analysis of debt risks and sustainability cannot be determined by just one particular indicator of debt, and there is a clear consensus on the combination of parameters and ratios that needs to be used. This ensures the debt analysis builds on the beneficial information each indicator provides, while counteracting their limitations through the combination of the others. The three institutions all focus on the composition of maturity, currency denomination and fixed and floating interest rate proportions of debt. This highlights the complexity of the institutional debt analysis.
and the need to assess qualitative features of the debt portfolio in combination with quantitative data to understand debt vulnerabilities. Additionally, the UN interviewee also highlights the importance of the structure of the economy and what borrowed capital is actually used for, although not elaborating on the different implications when debt finances government consumption or investment. This research argues that if debt finances government investments, it would have the potential of creating financial returns through the multifaceted impact that increased economic growth, employment and consumption have on government revenues. On the other hand, if debt finances government expenditure related to operational costs, financial returns may be minimal, therefore increasing the risks associated with debt.

8.1.2 – Monetary Value of Debt versus the Debt-to-GDP Ratio

Regarding the monetary value of debt, both the WB and IMF interviewees indicate that it is not very valuable or important measurement in the context of institutional analysis. The WB interviewee highlights that “the monetary value is important [on the sub-national level] because … you cannot use the debt-to-GDP ratio”. However, the monetary value is still not sufficient by itself, and “the interest rate payment over revenue-ratio or over expenditure-ratio” should also be assessed “to get a better understanding of [the debt] positions” [On the federal level] the monetary value of debt is not so important, as [debt] needs to be relative to [for example] national income.”

The WB interviewee explains the limitations of the monetary value of debt from the institutional standpoint, as “small countries may have a relatively small amount of debt but compared to their [low] income, it can be high”. The IMF interviewee provides further details by stressing:

The monetary value … tells us very little about the debt level [beyond] the value of debt liabilities at a specific time… only looking at the debt liabilities is too limited for analysis [and] debt need to be analysed [in relation to] the country’s repayment capacity. One country can have a monetary debt at a low level compared to another, but the country with the smaller amount of debt might still have debt sustainability issues, if the size of the economy and the national incomes is much smaller. Therefore, the debt-to-GDP ratio is more important, as it shows the debt in relation to national incomes.
Due to the limitation of monetary value to portray the debt levels of different countries in relation to repayment capacity, the interview conversations move towards the beneficial aspects of the debt-to-GDP ratio. The WB interviewee maintains that The World Bank also uses the debt-to-GDP ratio, stating “[it] is an important measurement ... because it represents [debt relative to] the income level of the government, and gives a message to the investors of what extent the country can repay debt by using its own revenues or national income”. But it is not the only measurement that provides insight into the ability of a country to repay sovereign debt liabilities. The WB interviewee continues by highlighting “we have other measurements, like the interest payment over tax revenue or interest payment over public spending … [that] provide [information] to understand how risky the debt portfolio is”.

While the UN interviewee expresses that the GDP-ratio is not important within the UN, the World Bank and IMF highlight the ratio as a more important measurement. The debt-to-GDP ratio plays a role within the DSA tool, as briefly highlighted by the IMF interviewee in section 8.1.1. Additionally, the IMF interviewee explains the benefit of the debt-to-GDP ratio as “the ratio gives … the ability to understand how debt moves compared to the growth of the economy”. Moreover, the WB interviewee elaborates on how the DSA tool “includes scenario analysis based on the debt-to-GDP ratio, to show how the debt portfolio is sustainable under different scenario, [for example] external shocks, [such as] currency, interest rate, or commodity shocks”. Therefore, in the context of the DSA tool, the WB and IMF interviewees highlight that the debt-to-GDP ratio play a role to portray how vulnerable the debt portfolio is. Nonetheless, the WB interviewee also explains:

An external shock may quickly change the indebtedness. … [When a currency] devaluation occurs … the value of foreign currency debt will go up quickly, depending on [the debt] composition. [As] tax revenue is in local currency, the government will face big [repayment] difficulties. The debt-to-GDP ratio is not enough [to portray this change] and that is a negative of the ratio … [one] indicator is not enough, you need a set of indicators where each of them has their own strengths and weaknesses.

While the WB interviewee asserts that the monetary debt levels may be important for local governments, the measurement is not very important for the assessment of debt on
the federal level, which is the main area of analysis by the IMF and the World Bank. Monetary value of debt is challenging to use as an indicator, as it only highlights the value of debt liabilities at a specific moment in time, and it could be impacted, for example, through currency shocks if the country holds a large proportion of foreign denominated debt. Furthermore, an additional difficulty is determining what is a high level of debt in different countries by using the monetary value, as it does not provide important information of debt relative to national income, which has an impact on the level of government revenue flows. Consequently, it is highlighted that monetary value would need to be assessed in combination with ratios such as interest rate payments over government revenue or expenditure. The limitations, and the highlighted need to portray debt relative to, for example, national income, have made the debt-to-GDP ratio more important from the perspectives of the IMF and the World Bank. More specifically, the GDP-ratio is important within the DSA tool and assists the IMF in analysing debt through different stress scenarios to portray debt levels in different scenarios. Nonetheless, the GDP-ratio cannot be relied on by itself, as it has its own weaknesses, and needs to be assessed in combination with other indicators, as highlighted in section 8.1.1. The GDP-ratio is not highlighted as an important parameter within the UN, and the UN interviewee highlights the need to assess the structure of the economy and its exports to gain an understanding of the revenue flows of the government. He also stresses that, therefore, there is a need to assess debt in relation to the ability of the government to repay debt liabilities.

8.1.3 – Limitations of the Debt-to-GDP Ratio

There are positive aspects of the GDP-ratio measurement; however, the interviewees quickly highlight several limitations that impact their reliance on the debt-to-GDP ratio within debt policy advice. The UN interviewee highlights a key limitation of the debt-to-GDP ratio connected to the different levels of debt sustainability of countries with similar debt-to-GDP levels, and that some countries can still have sustainable debt at higher debt-ratio levels. The UN interviewee explains that:

The issue is that we do not know what [debt-to-GDP] threshold to use to signal if a country has a debt issue or not. For example, you can have a country like South Korea that has a very high debt level in terms of GDP, but it is not a problem. The US can have a high debt-ratio level, and again, it is not a problem. But for like a country like Mali, with a lower debt-ratio
than the US, it is a problem. This is [an important] context, the story around the economy matters more than the debt-to-GDP ratio indicator by itself. Because you can have two countries with the same debt-ratio, but you can have debt problems in one, while the other has no problems.

The IMF interviewee highlights a similar aspect as well as the importance of initial debt levels combined with the debt-to-GDP ratio trends by asserting:

The debt-ratio trend important, but so is the initial debt level and the fiscal situation of the country. For example, an increasing debt-to-GDP ratio in a country with [initially] low [debt] may have less vulnerability compared to a country with a stable ratio at a high level. But it can be difficult to determine what is a low and high debt-ratio level [in different countries], which is connected to [country] specific [fiscal and macroeconomic] features. Certain countries can have debt problem at a relatively low level of debt in terms of GDP, and other countries can be highly indebted without payment issues.

The comments by both the IMF and UN interviewees highlight that the debt-to-GDP ratio is not universally portraying sustainability of debt levels in different economies or regions. Countries with the same debt-to-GDP level can have very different economic structures and revenue flows, and therefore, different capabilities to maintain and manage certain levels of debt. The debt-to-GDP ratio measurement is, therefore, limited in its ability to signal increasing vulnerabilities at a specific ratio level, and in determining what would be a high debt-ratio. Ultimately, there are country-specific economic and fiscal features that impact the sustainability debt at a GDP-ratio level. This impacts the ability of a specific threshold level to promote debt at a sustainable level. The IMF interviewee elaborates by referring to the EU’s Stability and Growth Pact (SGP) debt threshold of 60 percent of GDP:

Many countries, and the EU’s SGP, focus on debt-ratio level ceiling of 60 percent of GDP, but for some countries, this level of debt could already be problematic, so there is a need to be looking at other aspects [such as fiscal and macroeconomic conditions] … to understand what debt-to-GDP level to consider low and high [for individual countries].
The WB interviewee also explains the different approaches to the GDP threshold level in relation to the EU’s SGP, as he states:

Until the crisis [GFC hit], the fiscal rule of debt was 60 percent of GDP, but now, … most of the EU countries have gone beyond this and [have changed their approach to the threshold]. Some countries are more conservative; [targeting] a lower level of debt-to-GDP rule, for example 30 to 40 percent, while others fiscal rules are closer to 70 to 75 percent of GDP.

Ireland is one of the case-study economics where debt escalated dramatically from a low level of debt, by over 100-percentage points of GDP, after the GFC. In response to this experience, government officials and economists within the Central Bank took a much more conservative approach to the GDP-ratio threshold target due to the experience during the GFC, which resulted in Ireland becoming engulfed in the European Sovereign Debt Crisis. Through interviews and media conferences, it became clear that, due to country specific features such as the impact of the MNC sector on the GDP, economists and the Irish Finance Minister were aiming for a threshold around 45 percent of GDP to ensure fiscal flexibility and the ability to weather potential crises in the future.

On the other hand, the case study on Greece highlights that the country has a more optimistic approach to the threshold, where interviews of government officials and economists highlight that their aim was to decrease the debt-to-GDP ratio level to 60 percent of GDP. This may be connected to their long history of having a debt-ratio well above 90 percent of GDP, as well as a different economic structure and fiscal and macroeconomic policy priorities.

Another limitation of the debt-to-GDP ratio is highlighted by the WB interviewee, who expresses that “the debt-to-GDP ratio itself is not enough [due to potential] asset position of a government”, which can have a significant impact on the government’s ability to repay debt, and therefore, impact sustainability. To explain, the WB interviewee states:

Countries [such as] Japan or the US have high amounts of debt [in monetary value], and … debt-to-GDP ratio [levels] are relatively high compared to other countries … these countries [have] debt-to-GDP ratios
[well above] 100 percent, which is high. But [the GDP-ratio] is not the only parameter to look at because it only [focuses on] the liability aspect of situation [in relation to national income], and … these countries also have a lot of assets. [For example, Japan] have invested heavily in foreign assets … and the US government [also] has huge amounts of assets. [Therefore] we also look at the net-debt, [which] is quite low compared to the gross debt-ratio for these countries, so this is also a part of [our] analysis.

Moreover, the WB interviewee highlights: “we also look at the net-debt, [where] we are netting out the liabilities, or some of the debt, with the assets [held by the government] to get the net amount of debt”. While the IMF interviewee highlights the more prominent use of gross debt as a GDP-ratio within their analysis, the net-debt measurement is also mentioned. Nonetheless, the net-debt measurement is more difficult to use due to the “different types of assets in different countries and how they are valued, but when net-debt data is reliable we use it to supplement the gross debt analysis”.

Norway is a great example of an economy with significant government assets in the Government Pension Fund that directly impact the payment capacity of the government, as the interest returns are supplemented to the budget to avoid borrowing capital for spending purposes. The extraordinary size of this asset would have a substantial impact on Norway’s net-debt level, which can be assumed to be much lower than the debt-to-GDP ratio level. This also indicates that Norway may be able to sustain a much higher debt-to-GDP ratio level compared to a country with no significant government assets.

Based on the information provided by the interviewees, two key limitations of the debt-to-GDP ratio are highlighted. Firstly, different countries have different abilities to maintain debt sustainability at a certain GDP-ratio level. Secondly, there is a lack of insight into government’s assets that impact the government’s liquidity and potential revenue flows, and consequently, can increase the level of debt-to-GDP ratio that could be considered sustainable. Although the appropriate GDP threshold can be difficult to determine, having a GDP-ratio threshold can be beneficial from the perspective of signalling the debt target to investors, and assist government to understand how they are performing in terms of this threshold. Exceeding the GDP threshold in the short-term
does not necessarily mean that the debt has become unsustainable, as the WB interviewee confirms:

Under [different] stress scenarios, the ratio may change quickly. Then you look at for example the cost of funding, [and] even if the government [exceeds the aimed threshold], the funding cost is not too high. [A higher debt-to-GDP ratio level can be acceptable] because of other monetary, macroeconomic and fiscal policy parameters. So, investors look at the big picture … to get a good perspective [on the situation].

If short-term debt-ratio increases are a result of short-term expenditures increases or decreases in the GDP denominator, there is minimal need for concern. On the other hand, if debt increases are due to a large and persistent budget deficit, it could become a problem if not adjusted. The WB interviewee explains:

There are three pillars in the budget … revenue, expenditure and the deficit financing. [By] setting out the expenditure and revenue, you are setting the budget balance, [and] the borrowing [needed] to finance this deficit. If you have a strong budget [with] less deficits, then it means you have less debt. For … debt sustainability analysis, one of the most important indicators is the primary surplus, which directly influences the sustainability analysis.

While it may be argued that the debt-to-GDP ratio provides an indication of the debt level in relation to national income, and that the size of the economy results in a larger revenue flow for governments, revenues are not a good indication of the government’s budget balance that depends on government expenditures. As highlighted in section 8.1.2, the debt in monetary value only focuses on the value of liabilities and does not provide an awareness of the government's ability to repay through revenues. As a reciprocal argument, this research into the debt-ratio only focuses on comparing debt to the revenue side of the government budget. An additional limitation of the GDP-ratio, therefore, is that it does not highlight the underlying reason for government borrowing, which is identified as the budget deficits by the WB interviewee above. Moreover, due to the focus on the revenue side of the budget, the GDP-ratio trend lacks insight into the underlying budget pressures that increase debt levels, and ultimately excludes information about how the government is able to ensure debt repayment based on expenditure adjustments.
A final limitation of the GDP-ratio indicated by the UN interviewee is the dynamic between the composition and proportion of foreign debt and the ability of the government-generated revenue to pay these foreign liabilities. The UN interviewee asserts:

The external debt has foreign exchange implications ... and you have to take into account the foreign exchange dynamics, which is important to the government’s capacity to generate enough foreign currency revenues to repay foreign debt through [for example] export. The debt-to-GDP ratio does not highlight this aspect of the composition of debt and the government’s capacity to repay foreign debt. So, it is important when discussing sovereign debt issues, [to grasp the potentially] big difference between the sustainability of ... domestic or external [debt].

Additionally, from a developing economy perspective, a key underlying component on the government’s ability to generate revenue, and especially, foreign currency revenue, is the type of products being exported. The UN interviewee explains:

If [countries] do not export dynamic products, ...[with] high income elasticity and opportunities of export market expansions. ... Then your chance to repay debt is limited. [Dynamic products] have high demand, [and] you are more likely to gain foreign exchange to repay your foreign currency debt, even if something goes wrong in the international market, [due to] growing demand. But if you are exporting products that are commodities, with [low] demand and elasticity, the capacity to ensure repayments can be difficult. That is an aspect the GDP-ratio does not give good information about.

So, while the debt-to-GDP ratio is argued to show debt in relation to revenues, it does not indicate the repayment capacity on foreign denominated debt, which the UN interviewee argues is important in the context of the economic structure of the exports of a country. Although this may not be a significant problem within advanced economies, or within the EMU, the argument still has implications that point to a limitation of the GDP-ratio of debt. On the other hand, although the product elasticity is not as vulnerable, interviewee A1 highlighted the impact of fluctuating commodity prices in Australia on the debt-ratio.
More specifically, high commodity prices leading up to the GFC increased the GDP significantly and mask stronger growth in sovereign debt. After the GFC, the deflator collapsed close to zero as commodity prices fell and the GDP-ratio increased. As the Australian economy relies on exports, the prices of products greatly impact the debt-to-GDP ratio, as well as impacting the government’s taxation revenue flows.

Before finalising the interviews, I asked the interviewees if there had been any recent discussions about efforts to develop a new measurement of sovereign debt. While no new measurements were suggested, however, both the UN and WB interviewees highlight that qualitative factors and aspects of debt are increasingly being recognised and emphasised by institutions within their analysis and policy advice. More specifically, the UN interviewee asserts: “I know it is discussions surrounding not only including quantitative measurements in analysis, but also [assessing] qualitative aspects of debt [including composition and maturity], because that is where you will find the actual problems”. The WB interviewee also underlines that “there is increased focus on duration and composition”, which he links to the MTDS tool to determine a wide range of debt risks in order to develop debt management strategies. Finally, the IMF interviewee asserts that continuous discussion and adjustments to the DSA tool are important to ensure that the tool is updated based on research and feedback from member countries.

8.4 – Summary

It becomes clear through the interviews with the UN, the World Bank and the IMF that a wide range of indicators and parameters are used within debt analysis. While the UN interviewee highlights that the debt-to-GDP ratio is not influential within debt analysis by the UN, it is a measurement used within the IMF’s DSA tool. More specifically, the GDP-ratio is used to portray debt movements in relation to the growth of the economy as well as through assessment of debt scenarios during different external and economic shocks. Although the interviewees report different levels of influence by the GDP-ratio, the three institutions maintain that analysis of debt risks and sustainability ultimately require a combination of several indicators to be able to take advantage of their benefits while counteracting their limitations. Overall, the interviews highlight there is a consensus as to which indicators are needed, including qualitative assessments of the government debt portfolios. The key indicators are the maturity of debt, for example through the measurement of average maturity, the composition of debt, including
currency denominations, and proportions of fixed and floating interest rates. These aspects of debt are emphasised as crucial for the assessment of debt risks and sustainability.

Monetary value of debt is not widely used for general government debt analysis by the IMF and the World Bank, and is seen to be limited, as it only portrays the value of debt liabilities at a specific moment in time. It also difficult to determine what is a high level of debt in different countries by using the monetary value, and it does not provide important information of debt relative to national income. One of the positive aspects of the debt-to-GDP ratio is that it provides insight into the debt level relative to national income, and therefore, indirectly indicates the relative level of government revenues, as a larger economy will generate more taxation revenues. The need to portray debt relative to, for example, national income has made the debt-to-GDP ratio more important compared to monetary value within the IMF and the World Bank. However, interest rate payments as a ratio of taxation revenue of expenditure are highlighted as additional indicators of repayment capacities of governments.

Although the debt-to-GDP ratio is regarded to be more valuable than the monetary value of debt, several limitations are highlighted, ranging from its lack of ability to identify debt sustainability issues, its inability to indicate the level of government assets and their ability to generate revenues, and the impact of economic structure and exported products on the distortions on the ratio measurement. More specifically, the GDP-ratio is not universal, as countries with the same debt-to-GDP level can have very different capabilities to maintain and manage these levels of debt. Similarly, one country can have a much lower debt-to-GDP ratio level and be experiencing debt problems, while another may have a much higher level with no issues. These situations highlight the importance of government revenue flows and assets, which ultimately result in different abilities of repayments. Government assets are important, as they may provide governments with additional non-taxation revenue flows that would not be captured by the GDP-ratio, however, potentially having great impact on the liquidity and repayment capacities of governments. Moreover, the fact that the debt-ratio is not universal is connected to the different economic structures and country-specific macroeconomic and fiscal features, which is not portrayed by the GDP-ratio itself. These limitations impact the effectiveness of the use of threshold-strategies by economies, and governments should engage in
analysis to determine their individual threshold level that would promote debt sustainability.

As the debt-to-GDP ratio is not universal across countries or regions, it makes the determination of a specific threshold between “good and bad” debt levels difficult. Consequently, the theoretical contributions determining GDP thresholds negatively impacting economic growth, such as by Reinhart and Rogoff (2010, 2012), Cecchetti et al. (2011) and Baum et al. (2013), may be inaccurate due to different economic structures or macroeconomic features. Or the GDP threshold-denominated theories focusing on fiscal responsiveness and sustainability by Mendoza and Ostry (2007) and Ghosh et al. (2011) may be incorrect for different countries based on the different levels of revenue flows and government assets.

To answer Research Question 2: what is the level of influence of the debt-to-GDP ratio within international financial institution’s debt analysis and policy advice, a mixture of findings challenges the use of the measurement. Ultimately, the combination of the identification that all indicators have their own strengths and weaknesses, the use of a wide range of indicators by the institutions, and the highlighted limitations impact the reliance and the level of influence that the GDP-ratio has within institutional debt analysis and policy advice. Although the debt-to-GDP ratio is more prominently used within the DSA, it is still recognised that it needs to be accompanied by other measurements to analyse debt levels and effectively provide policy advice. Ultimately, the interviewees express the increased recognition and importance of qualitative indicators within debt analysis, including various compositions and maturity parameters of debt portfolios.

When it comes to Research Question 1: what are the limitations of the debt-to-GDP ratio, the international financial institutions highlight several. These include the lack of universal indication of debt sustainability, the difficulty in determining the sustainable GDP-ratio level in different countries, the lack of information on the economic structure, the ability for government to generate revenue flows and the levels of government assets and non-taxation revenues. These limitations again reinforce the answer to the Research Question 1 regarding the level of influence, especially from a policy advice perspective, as the limitations decrease the reliance on the measurement.
Finally, addressing the Overarching Research Question on how accurate and valuable the debt-to-GDP ratio is for policy-making draws from the findings and conclusions from both of the above questions. Ultimately, the GDP-ratio is highlighted as inaccurate in several ways, especially when assessing and comparing debt-ratio levels in multiple countries. Although it is valuable in the context of assessing debt in comparison to the size of the economy, the ability of governments to generate revenues will still differ between economies and impact the primary surplus. The severe inaccuracies within the debt-to-GDP ratio impact the ability of institutions to promote policies based on GDP-ratio levels to ensure equal sustainability across countries. Additionally, the debt-to-GDP ratio measurement is not very valuable by itself and needs to be assessed in relation to other measurements to be able to assist policy-makers both from the institutional and the governmental debt analysis and policy-making perspectives.
Chapter 9 – Discussion

9.0 – Introduction

This chapter discusses key quantitative and qualitative findings among the case-study economies and international financial organisations, to develop comparative answers to Research Questions 1: what are the limitations of the debt-to-GDP ratio; and Research Question 2: how influential is the debt-to-GDP ratio from a policy-making perspective. The chapter analyses the findings in relation to key theoretical contributions within fiscal sustainability and sovereign debt. Moreover, the chapter discusses key similarities and differences in the patterns of the countries’ economic and fiscal variables, and themes within the qualitative data collected, to determine how country-specific features and conditions impact the limitations of the debt-to-GDP ratio and the levels of influence of the measurement within policy-making. Overall, the comparative conclusions will answer the Overarching Research Question: how accurate and valuable the debt-to-GDP ratio is for policy-making purposes.

Section 9.1 reviews the quantitative data to determine the comparative, across-country limitations of the GDP-ratio from an accuracy point of view, while section 9.2 discusses the qualitative data to determine country-specific limitations impacting how influential and valuable the debt-to-GDP ratio is for national and institutional policy-making; and finally, section 9.3 answers the research questions.

9.1 – Quantitative Limitations of the Debt-to-GDP Ratio

This section focuses on the quantitative data, and compares GDP-ratio trends, nominal debt and GDP fluctuations, and the macroeconomic and fiscal variables of the four case-study economies to develop comparative conclusions on the limitations and inaccuracies of the debt-to-GDP ratio. More specifically, section 9.1.1 focuses on the debt-to-GDP ratio trends, economic growth and the nominal debt and GDP level fluctuations across the case-study economies to highlight the comparative distortions of the debt-ratio measurement. Section 9.1.2 assesses the cross-country similarities and differences in the net-borrowing trends and debt-ratio changes and reflects on the reasons behind government borrowing. And finally, section 9.1.3 compares the governments’ total revenue, expenditure and taxation revenue data to demonstrate comparative differences in the ability of the case-study countries to generate revenue flows. Ultimately, this section
comparatively discusses the range of quantitative limitations and inaccuracies to be able to answer Research Question 1: what are the limitations of the debt-to-GDP ratio?

9.1.1 – The Debt-to-GDP Ratio: Inaccuracy in Portraying Nominal Debt Trends
This section compares and discusses the trends in the debt-ratio and the underlying fluctuations in the nominal debt and GDP levels within the case-study economies. The discussion highlights the similarities and differences in the trends across the case-study economies, and how GDP-ratio distorts the perception of nominal debt trends over time. The section reflects on the comparative debt-ratio levels in relation to research focusing on determining the debt-ratio thresholds resulting in negative impacts on economic growth (Reinhart & Rogoff, 2010; Cecchetti et al., 2011; Baum et al., 2013). Additionally, the discussion indicates how the distortion effect of the debt-to-GDP ratio may reinforce the “fiscal illusion” theory put forward by Buchanan and Wagner (1977) and impact voters’ perception expansionary policies during election years as highlighted by Alesina and Perotti (1995).

As illustrated in Figure 9.1, Australia and Ireland had declining debt-to-GDP ratio trends between 1995 and 2007. Australia’s debt-ratio decreased from 59.8 percent to 33.3 percent of GDP, while Ireland’s debt-ratio declined to an even larger extent, from 80.1 percent to the lowest debt-ratio level among the case-study economies at 27.4 percent of GDP.

**Figure 9.1 – Sovereign Debt-to-GDP Ratios, All Case-Study Economies, 1995-2015**

(Source: OECD Database, 2017)
Both economies had low debt-ratio levels highlighted to have no negative impacts on economic growth, according to Reinhart and Rogoff (2010, 2012), Baum et al. (2013), and Cecchetti et al. (2011). The debt-ratio decreases were due to large increases in nominal GDP compared to low growth in monetary debt. Australia’s economic growth averaged at 6.8 percent and the nominal GDP grew by 122.6 percent compared to a modest increase in debt by 24 percent. Ireland’s economic growth was on average 11.4 percent and the nominal GDP increased by a large 260 percent, while debt only increased by 9.5 percent. The large decreases in the debt-ratios were, therefore, a result of the high GDP growth rates that greatly exceeded growth in monetary debt, and the ratio levels were effectively reduced. This distortion in the GDP-ratio resulting in a decreasing trend leading up to the GFC, could enable the “fiscal illusion” argument by Buchanan and Wagner (1977) and impact voters’ perception of the benefits and costs of expansionary policies in electoral years, as highlighted by Alesina, 1993 and Alesina and Perotti, 1995. Nonetheless, as the debt-ratios were low, the importance of the “fiscal illusion” would be minimal, and the risks of the voters’ perception of expansionary policies would not jeopardise fiscal and debt sustainability.

In contrast to the decreasing debt-ratio trends in Ireland and Australia in Figure 9.1, Greece had two periods of relatively stable debt-ratio levels, namely between 1995 and 1999 when the ratio averaged at 96.6 percent, and between 2000 to 2008 when the average was 113.6 percent of GDP. Greece had the second highest average economic growth between 1995 and 2008 of 7.7 percent amongst the case-study economies, which indicates that the monetary debt level was not stable like the debt-ratio indicated. More specifically, monetary debt increased by 187.4 percent, while the nominal GDP grew by 160 percent between 1995 and 2008, and the similar increases in both variables resulted in the debt-ratio disguising the growth in monetary debt. Nonetheless, the increasing debt burden produced additional interest rate payments and increased pressure on the government’s budget. Although the debt-ratio was relatively stable, Greece’s debt-ratio was already 55.8-percentage points above the Stability and Growth Pact (SGP) ceiling of 60 percent of GDP when joining the EMU in 2001. Debt was also above the 85 to 95 percent of GDP thresholds highlighted to have negative impact on economic growth by Reinhart and Rogoff (2010, 2012), Cecchetti et al. (2011), Baum et al. (2013). Nonetheless, economic growth was strong, and the debt-levels did not show signs of having negative impact on growth in the pre-crisis period. Although the debt-ratio was high, the stable
trend could have important impact the public’s perception of the underlying trends in nominal terms and reinforce the “fiscal illusion” highlighted by Buchanan and Wagner (1977) in relation to their understanding of the intertemporal budget constraint. Additionally, the GDP-ratio trend could have impacted the government’s willingness to reduce debt, as the voters’ perception of the benefits and costs of expansionary policies in electoral years could have been distorted (Alesina, 1993; Alesina and Perotti, 1995). These areas of the literature may explain an underlying influence behind the government’s decisions of increasing nominal debt at a very similar rate as the nominal GDP growth.

Due to the GFC, the debt-ratios in Greece, Ireland and Australia started to increase, as illustrated in Figure 9.1. Ireland had the largest increase among the case-study economies, by 105.3-percentage points, reaching a peak of 132.7 percent of GDP in 2013. Between 2007 and 2013, monetary debt increased by 356.6 percent, and while the average economic growth rate was -0.3 percent, the nominal GDP decreased by -8.7 percent. The significant increase in debt and the negative GDP growth quickly escalated the debt-ratio, producing severe debt sustainability issues resulting in the financial assistance program in 2010. Ireland clearly illustrates how large increases in debt combined with economic contractions can result in dramatic changes in the debt-to-GDP ratio over a very short time period due to extensive financial sector bailouts. Ultimately, the debt-ratio moved from being considered highly sustainable to becoming unsustainable in just six years. While Ireland had the lowest debt-ratio level among the case-study economies before the crisis, with less than half of the SGP 60 percent debt-to-GDP ceiling, the explosive trend clearly illustrated that a low debt-ratio level is no guarantee of avoiding a debt crisis.

From 2013 to 2015, Figure 9.1 shows that Ireland’s debt-ratio decreased significantly to 91.5 percent of GDP. While the debt-ratio signals a substantial decrease in debt, the increased economic growth was the key underlying factor of the debt-ratio trend, especially when economic growth reached 34.7 percent (25.6 real economic growth) in 2015. More precisely, debt decreased by -6.5 percent, while the nominal GDP increased by 42 percent, which supports the statement by Interviewee I2 that the reduction in the debt-ratio was merely a mechanical decrease due to the inflated GDP denominator in Chapter 5, section 5.1.2 (p. 95). This highlights that very high economic growth rates can distort the debt-ratio trend and debt-ratio can be more optimistic than the actual monetary debt level trend. From the theoretical perspective that high debt impacts
growth when exceeding 85 to 95 percent of GDP highlighted by Reinhart and Rogoff (2010), Baum et al. (2013), and Cecchetti et al. (2011), it appears that Ireland’s high debt-ratio did not negatively impact on economic growth after 2013, as economic growth recovered to an extraordinary level by 2015. On the other hand, if the government did not borrow to provide the financial sector bailouts, the deterioration of economic growth could have been more severe. The lack of impact on economic growth in Ireland supports the argument by Elmendorf and Mankiw (1999) that there is a distinction between short- and long-term debt-ratio levels and the impact on economic growth, and that high debt in the long-term has greater effect on economic growth compared to a short-term elevation in debt levels.

The Greek debt-ratio was much more volatile during the crisis, as it increased to 135 percent of GDP in 2009, decreased in 2010 and 2011, before rapidly increased to 164.5 percent of GDP in 2012, as shown in Figure 9.1. During this period, the economic recession was severe at an average of -3.7 percent and with a peak contraction of -8.6 percent in 2011, as highlighted in Chapter 4, section 4.1.1 (p. 60). When assessing monetary debt, this research found significant inaccuracies between the debt-ratio levels and the fluctuations in the nominal debt and GDP, which was explained in detail in Chapter 4, section 4.1.2 (p. 64-65). In short, the debt-ratio trend and the fluctuations in nominal debt and GDP moved in opposite directions on multiple occasions, and this research argues that the Greek debt-to-GDP ratio was inaccurate and unreliable between 2009 and 2015.

From the theoretical perspective that high debt impacts growth, the persistent economic recession between 2009 and 2015 affecting Greece could relate to the very high debt-ratio levels above the 85 to 95 percent of GDP thresholds highlighted by Reinhart and Rogoff (2010), Baum et al. (2013), and Cecchetti et al. (2011). The argument that the debt-ratio level negatively impacted economic growth recovery after crises can be made, however, not until the debt-ratio was above 40 to 60 percentage points above the highlighted thresholds. Moreover, the impact of debt on economic growth and the prolonged economic recession in Greece could be argued to relate to the argument by Elmendorf and Mankiw (1999) that high long-term debt levels have elevated negative impact on economic growth compared to short-term debt levels increases.
This research stresses that the initially high debt levels could potentially have further eroded economic growth during the crisis, due to the distortion effect within debt-ratio due to the deflating GDP denominator after 2009, which could result in a vicious cycle. If high debt-ratio levels impact economic growth, and the decrease in economic growth resulted in increasing debt-ratio levels, this could again deteriorate economic growth further. This could explain the prolonged economic recession in Greece and the increasing debt-ratio levels after 2012. On the other hand, the decrease in the nominal GDP and the prolonged economic recession may also be connected to the inability of the Greek government to facilitate consumption focused expansionary policies, which had superficially inflated the nominal GDP growth since the 1990's (Pelagidis, 2010, p. 3), due to the high debt level and restricted access to capital markets. Ultimately, this research supports the argument by Panizza and Presbitero (2013) that economic growth is not only impacted by debt, however, could be linked to multiple factors.

Although Australia was not as severely hit by the GFC as Ireland and Greece as demonstrated in Figure 9.1, the debt-ratio increased from 33.3 percent in 2007 to 62.5 percent of GDP in 2012. Australia's economic growth was volatile throughout the GFC, but was on average 5.9 percent between 2008 and 2012. In nominal terms, debt increased by 120.9 percent, while the GDP only increased by 21.3 percent between 2008 and 2012, which exposes the significant debt increase behind the debt-ratio trend. While the debt-ratio decreased to 58.5 percent in 2013, it continued increasing to 68.1 percent by 2015. During this period, economic growth was low in Australian terms, at an average of 2.7 percent, and the nominal GDP increased by only 4.1 percent. On the other hand, monetary debt increased by 17.9 percent, which explains the continued increase in the debt-to-GDP ratio.

In 2015, Australia was in the medium-to-high category highlighted by Reinhart and Rogoff (2010), but this level should not have negative impact on economic growth, as it was still well below the 85 to 95 percent threshold (Reinhart and Rogoff, 2010; Baum et al., 2013; Cecchetti et al., 2011). Therefore, other factors could have resulted in the decreasing economic growth, which indirectly impacted the debt-ratio due to the deflation of the GDP. Interviewee A1 highlighted that the high commodity prices between 2005 and 2012 masked the increase in monetary debt, while the decreased commodity prices
after 2012 resulted in an opposite movement in the debt-ratio, as the GDP denominator was flat.

Norway had an increasing debt-ratio before the GFC, from 27.6 percent in 1998 to 57.8 percent of GDP in 2006, as illustrated in Figure 9.1. This occurred even though the average economic growth was 7.8 percent, which indicates that monetary debt increased significantly. More specifically, monetary debt grew by 109.7 percent, while the nominal GDP increased by 90.5 percent, and the lesser growth in the GDP denominator produced an increasing debt-ratio. Although the debt-to-GDP ratio more than doubled leading up to the GFC, Norway was the only case-study economy with significantly reducing debt-ratio levels during the crisis, from 57.8 percent to 32.8 percent of GDP in 2014. The economic growth rate was on average 6 percent between 2006 and 2012, although it was -6.7 percent in 2009. The nominal debt fluctuated and decreased by -19.4 percent, while the GDP increased by 41.8 percent between 2006 and 2014, which explains the declining debt-ratio trend. In 2015, the debt-ratio increased by 5.9-percentage points, as monetary debt grew by 17.5 percent and the GDP decreased by -0.7 percent.

Across the time sample, although Norway’s debt-ratio doubled leading up to the GFC, it was located in the low and low-to-medium categories within Reinhart and Rogoff’s (2010) research and should not have negative impacts on economic growth as it was well below the 85 to 95 percent of GDP thresholds (Reinhart and Rogoff, 2010; Cecchetti et al., 2011; Baum et al., 2013). This was supported by the economic growth trends after the GFC, which recovered swiftly. Overall, the Norwegian debt-ratio range was similar to Australia’s across the time sample; however, the economies’ debt-ratios moved in opposite directions before and after the GFC. As Australia’s debt-ratio has increased steadily after the GFC, it could be argued that the voters’ “fiscal illusion” (Buchanan & Wagner, 1977) is playing a more prominent role during election years, compared to Norway, and that voters underestimate the benefits and costs of expansionary policies after the GFC.

When assessing nominal growth rates across the time sample, Greece’s debt increased by 238.1 percent, while the GDP only increased by 88.8 percent. In comparison, Ireland’s debt increased by 367.4 percent compared to an increase in the GDP by 366.7 percent. Both Norway and Australia had relatively similar growth rates, where Norway’s debt grew
by 236.8 percent compared to a GDP increase of 223.7 percent, and Australia’s debt increased by 257.1 percent and the GDP grew by 212.5 percent. By comparing the long-term nominal growth rates in debt and GDP of the case-study countries listed in Table 9.1 and combining it with the discussion on the debt trends, there are three interesting findings to highlight.

Table 9.1 – Growth Rates in Monetary Debt, Nominal GDP and Taxation Revenue, 1995-2015

<table>
<thead>
<tr>
<th>Country</th>
<th>Debt Growth</th>
<th>GDP Growth</th>
<th>Tax Revenue Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greece</td>
<td>238.1%</td>
<td>88.8%</td>
<td>150.4%</td>
</tr>
<tr>
<td>Ireland</td>
<td>367.4%</td>
<td>366.7%</td>
<td>246.9%</td>
</tr>
<tr>
<td>Norway</td>
<td>236.8%</td>
<td>223.7%</td>
<td>209.1%</td>
</tr>
<tr>
<td>Australia</td>
<td>257.1%</td>
<td>212.5%</td>
<td>199.5%</td>
</tr>
</tbody>
</table>

(Source: author’s own calculations based on OECD Statistics, 2017)

Firstly, the initial debt level is an important factor and can produce severe debt sustainability issues during financial crises. Greece’s overall percentage increase in debt was less than those of both Ireland and Australia across the time sample, and only 1.3-percentage points higher than the debt growth in Norway. Nevertheless, the growth trend was not the main cause of the debt crisis; the problem was the initially high debt level. Greece’s nominal debt increased gradually up to 2008, but the trend was disguised by the debt-ratio due to the similar growth rates in nominal debt and GDP, which highlights the limitation of the GDP-ratio in portraying the underlying debt trends that produced increased debt sustainability issues. As the economic recession decreased the GDP denominator significantly after 2008, the debt-ratio increased dramatically to a peak in 2015, and counteracted decreases in monetary debt in 2011 and after 2012. Therefore, a stable debt-ratio trend during periods of high economic growth can be concerning when debt levels are high. The limitation in the debt-to-GDP ratio in demonstrating the emerging debt sustainability issues during stable ratio level periods, highlights the need to assess the growth rates in nominal debt and GDP could provide a broader understanding of monetary debt trends to make well informed policy decisions and debt strategies.
Secondly, the debt growth trend is an important factor that can produce severe debt crises, as was evident in Ireland where the debt crisis unfolded in a matter of six years. While Ireland’s debt grew by 367.4 percent across the time sample, 357.9-percentage points of this increase occurred between 2007 and 2013. Consequently, although Ireland had the lowest debt-ratio among the case-study economies in 2007, the severe increase resulted in an explosive debt-ratio trend. This highlights the volatility of the debt-to-GDP ratio during the GFC and exemplifies the importance of the debt trend, regardless of the initial debt levels. More specifically, this demonstrates how the debt-to-GDP ratio is limited in its ability to ensure debt sustainability through debt-threshold strategies pursued by policy-makers during a financial crisis, as Ireland had below half the EU’s SGP debt ceiling before the crisis.

Thirdly, the dilution of the debt-ratio during periods of high economic growth and low debt increases can decrease the debt-ratio significantly. This was evident during the pre-crisis periods in Australia and Ireland, as well as through Ireland’s extraordinary economic growth in 2015. This makes the debt-ratio a difficult measurement to use to assess actual monetary debt trends and could impact the perception of debt level trend among politicians and the public. Nonetheless, by attempting to ensure that nominal GDP growth exceeds debt increases during periods of high economic growth, a government can effectively “grow out of debt” from a debt-to-GDP ratio perspective.

Overall, the importance of the initial debt level, the high volatility of the debt-ratio trend during crises, and the impact of fluctuations in the GDP denominator that distort the debt-ratio, make the debt-to-GDP ratio difficult to use to portray debt levels and sustainability. The distortion effect within the debt-to-GDP ratio resulting in a stable debt-ratio during periods of high growth may reinforce or fuel the “fiscal illusion” highlighted by Buchanan and Wagner (1977) and distort voters’ understanding of the future costs and benefits of expansionary policies (Alesina & Perotti, 1995). Additionally, as a low debt-ratio level is not a guarantee to ensure debt sustainability, and financial crisis can greatly impact the debt-ratio level in a very short period of time, this research argues that the debt-to-GDP measurement it would not be sufficient for policy-makers to use the GDP-ratio measurement of debt.
This research finds supporting evidence of Elmendorf and Mankiw’s (1999) theory, as the data demonstrates that Greece’s high and stable debt-ratio level can have resulted in a more significant impact on economic growth and longer recovery after crisis, compared to the explosive short-term debt-ratio increase in Ireland. This research argues that the debt-ratio’s dilution effect due to the impact of high economic growth in the GDP denominator could ensure short-term debt-ratio increases would have limited impact economic growth, as the government can “grow out of debt”, as long as debt is not accumulating over time.

On the other hand, this research finds very limited evidence supporting the GDP-ratio thresholds between high debt and economic growth found by Reinhart & Rogoff (2010), Ceccherita et al, (2011) and Baum et al, (2013) among the high indebted case-study economies. This research, therefore, supports Greiner (2012) arguments that the relationship between debt and economic growth is non-linear, and Panizza and Presbitero’s (2013) statement that there are other underlying factors that can impact economic growth, not only high debt levels.

Finally, growing out of debt through a proportionally larger increase in the nominal GDP compared to debt is not enough by itself to ensure repayment capacity and debt sustainability, as it depends on what borrowed capital finances, and the ability of a government to transform economic growth into increasing revenue flows. The following two sections investigate in more detail the aspects of why the case-study governments borrowed by assessing net-borrowing levels, and the comparative ability of governments to generate revenue flows.

9.1.2 – Net-Borrowing Trends and the Debt-to-GDP Ratio: Why Governments Borrow and the Impacts on Debt-to-GDP Ratio Level Sustainability

This section discusses the underlying reason for government borrowing by comparing net-borrowing trends and fluctuations in the debt-to-GDP ratio among the case-study economies. This section deliberates on the net-borrowing trends in light of key theories, including Keynes (1980) and Barro (1979), to complement the analysis on why governments borrow, while linking it to the discussion on the limitations and inaccuracies of the debt-to-GDP ratio.
Between 1995 and 2007, both Ireland and Australia had balanced budgets, as highlighted in Figure 9.2, where the average budget surplus was 0.3 percent in Australia and 1.1 percent of GDP in Ireland. During this period, both economies had small increases in monetary debt, and the debt-to-GDP ratio decreased significantly due to high economic growth, as discussed in section 9.1.1. More specifically, with a larger average budget surplus, Ireland’s debt increased by 9.5 percent, which was less than Australia’s 24 percent increase in debt. Larger percentage-point decreases in Australia’s and Ireland’s debt-ratios occurred when the net-borrowing levels were lowered in 1999 and 2000 respectively, as illustrated by the minuses on the graph lines for each economy in Figure 9.2. This demonstrates a positive relationship between budget surplus and fluctuations in the debt-to-GDP ratios, which supports Barro’s (1979) argument that budget surplus increase during economic growth and result in decreasing debt-ratio levels.

Figure 9.2 – Net-Borrowing Levels, All Case-Study Economies, 1995-2015

(Source: OECD Database, 2017)

After 2007, the budget surpluses deteriorated in both economies and the debt-ratios increased. Ireland’s net-borrowing levels peaked at 32.1 percent of GDP in 2010, which was the highest deficit level observed among the case-study economies, as illustrated in Figure 9.2. This corresponds with the dramatic increase in Ireland’s debt-ratio compared to the other case-study economies, as discussed in section 9.1.1. Nonetheless, Ireland’s budget balance recovered to the largest extent among the case-study economies, down to 1.9 percent by 2015, while the debt-ratio decreased significantly due to the large increase in nominal GDP. Australia’s budget deficits did not deteriorate as dramatically, and decreased much slower than Ireland’s, from 5.6 percent 2008 to 2.7 percent in 2015.
Hence, the increasing debt-ratio trend was slower and peaked at 68.1 percent of GDP in 2015, as economic growth continued to decrease up to 2015.

As demonstrated in detail for both Ireland in Chapter 5, section 5.1.1 and Australia in Chapter 7, section 7.1.1 the data showed a strong relationship between net-borrowing and debt-ratio increases. Overall, Barro’s (1979) assumption that budget deficit and debt levels would increase during economic turmoil is demonstrated is confirmed due to the relative differences in net-borrowing levels and the impact on the debt-ratio increases in both economies. This highlights Barros’s (1979) “taxation smoothing” theory as the governments financed increased expenditure with debt rather than increasing the taxation rates. If the Australian government had to provide financial sector bailouts, the debt-ratio could have increased much more substantially, as experienced in Ireland. While Ireland had a much larger increase in deficit compared to Australia, they were able to decrease it to a lower level by the end of the time sample, which resulted in decreases in debt due to the improvement in economic growth. From Barro’s (1979) theoretical standpoint, Australia’s debt may continue increasing, if economic growth does not rise and the government lowers the budget deficit.

From a Keynesian perspective, the increased debt levels in Australia could be classified as unproductive as they are connected to increased budget deficits, and therefore, to a larger degree financed governmental policies and operational costs. In regard to Ireland, it is inconclusive as to how the financial sector bailouts would be classified according to Keynes (1980). Nonetheless, they resulted in stabilisation of the economy and counteracted potentially devastating decreases in economic activity and increased unemployment. Overall, Keynes (1980) argued that financing budget deficits with debt should be avoided, and ultimately, the economies should replace unproductive debts. Consequently, both economies need to regain their balanced budgets, as well as ensuring new debt is productive and generating investment returns.

In contrast to Ireland and Australia, Figure 9.2 demonstrates that Greece operated with high budget deficits across the time sample. Between 1995 and 2008, Greece’s budget deficit averaging at 6.9 percent of GDP, before it escalated to a peak of 15.1 percent of GDP in 2009, and the Greek government’s budget balance was high and volatile at the end of the time sample. As analysed in detail in Chapter 4 in section 4.1.1, there were no
clear relationship between the net-borrowing levels and debt-ratio evident in Greece. The findings illustrated that the distortion effect resulting in a stable debt-ratio level trend leading up to the GFC, due to the similar growth rates in nominal debt and GDP, did not reflect the high net-borrowing needs of the government. Additionally, the inaccuracies in the debt-ratio trend compared to the fluctuations between nominal debt and GDP between 2009 and 2012, demonstrated in detail in Chapter 4, section 4.1.2 (p. 64-65), reinforced the lack of relationship between net-borrowing and debt-ratio levels after the GFC. More specifically, the debt-ratio trend between 2009 and 2012 moved in an opposite manner compared to net-borrowing level trend. On the other hand, this research found a strong relationship between the nominal debt and net-borrowing level trends throughout the time sample, which has been investigated in detail in Chapter 4, section 4.1.2 (p. 66). Therefore, this research highlights that the debt-to-GDP ratio level trend can distort the perception of monetary debt trends and disguise the impact of government budget deficit levels, if the government is running deficits during periods of high economic growth.

Overall, Greece does not validate Barro’s (1979) deficit argument, as the economy was running large budget deficits that increased the debt level significantly during periods of high economic growth, especially when considering that the economic growth had positive impacts on taxation revenue flows. Due to the combination of the elevated debt levels and large budget deficits prior to the GFC, it was no surprise that Greece was the epicentre of the European Sovereign Debt Crisis, as decreased economic growth deteriorated taxation revenues and escalated budget deficits further, which resulted in large increases in the debt-ratio. From Keynes’ (1980) perspective, the high budget deficits throughout the time sample indicate that debt-financed governmental operational expenditure in the long-term. Therefore, the large Greek debt burden would be classified as unproductive as it would produce minimal cash or service returns to the governments.

In contrast to the other three case-study economies, Norway operated with a high budget surplus across the time sample, as illustrated in Figure 9.2. Similar to Greece, this research found no evidence of a clear relationship between net-borrowing and debt-ratio level trends through the analysis of the data in Chapter 6, section 6.1.2. Nonetheless, the reasoning behind the lack of relationship between the two variables was in sharp contrast to the findings in Greece. Due to the large budget surpluses, the Norwegian government
did not borrow to finance operational expenditure, and this research found that the debt-ratio decreased during lowered budget surplus and increased during elevated budget surplus, as shown through the pluses and minuses in Figure 9.2. Moreover, Norway’s debt-ratio level actually peaked at the same time as budget surplus peaked between 2006 and 2008, as elaborated in Chapter 6, section 6.1.1 (p. 107).

Overall, the inconsistent fluctuations in the net-borrowing and debt-ratio levels demonstrate no clear relationship between the two variables, and ultimately, the constant budget surplus highlight the government’s capacity to borrow for other purposes. The Norwegian interviewees clarified that the government borrowing finance capital transactions through state banks, including the student loan bank Lånekassen, as elaborated on in Chapter 6, section 6.2.1 (pp. 119-120). As these loans are classified as government assets as they are to be repaid with interest, Keynes (1980) would argue that the debt is productive. The productive debt argument can be connected to both the cash return aspects of the lending activities, as well as the higher education levels and the associated increase in income levels that would have a positive impact on taxation revenue flows. From the perspective of Barro’s (1979) “taxation smoothing” theory, the fluctuations in state lending would result in changing expenditure levels, so financing lending with debt enables the government to keep taxation rates constant over time, while meeting lending objectives. On the other hand, as the Norwegian government had budget surpluses throughout the GFC, although the economy contracted in 2009, Barro’s argument that economic recession produces budget deficits and increases debt-ratio levels is not illustrated in the case of Norway.

In summary, budget deficits are the underlying cause of increasing debt levels in Greece, Ireland and Australia. This research discovered that the relationship between the net-borrowing level and the debt-to-GDP ratio levels is the strongest among the economies with balanced budgets. Before the GFC, Ireland and Australia’s positively balanced budgets were accompanied with decreasing debt-ratio levels, while debt-ratios increased as budget deficits increased during the crisis. The larger net-borrowing needs in Ireland correspond to the larger increase in the debt-ratio, compared to the more modest increases in both variables in Australia. In Greece, the relationship between the net-borrowing trend and the debt-ratio fluctuations is distorted due to similar increases in debt and economic growth during the pre-crisis period. Additionally, the inaccuracies of
the debt-ratio after 2009 weaken the connection between debt-ratio fluctuations and net-borrowing levels. Nonetheless, there is a strong relationship between the net-borrowing levels and the monetary debt trend, which highlights the benefits of assessing net-borrowing levels when debt-ratio trends are stable to appreciate the underlying monetary debt trend, to counteract the limitation of the debt-to-GDP ratio in portraying underlying debt trends during economic growth periods. In an economy with a high budget surplus, there is no clear relationship between net-borrowing and debt fluctuations, as the government does not borrow capital to finance the gap between revenue and expenditure. Although the GFC decreased budget surpluses, the crisis did not result in deficits, and consequently, the Norwegian government was able to decrease their debt level as the government could adjust borrowing independent of deficit needs.

This research claims that Keynes’ (1980) argument that debt should be productive would have a great impact on the debt-to-GDP ratio sustainability trends in different countries. If an economy is borrowing money to finance investments that produce increased economic activity, rather than to finance government’s operational costs it will have increased debt sustainability through three channels. Firstly, it could increase the dilution effect on the debt-to-GDP ratio through increased nominal GDP growth. Secondly, it could increase taxation revenues for example through increased employment, income levels and elevated investments rates. And thirdly, depending on the nature of the investment, it could potentially increase non-taxation revenue flows within the government’s total revenues. Ultimately, productive debt generating investment return would have the ability to “pay itself” to some extent, through the combination of increased revenue flows, the diluting the debt-to-GDP ratio and decrease the cost of government investments over the maturity period of debt liabilities due to inflation. Additionally, productive debt would increase the debt-to-GDP level that a country can maintain as sustainable, through the increases in revenue. However, to be able to monitor and assess these positive trends, the debt-to-GDP ratio is limited as a measurement, and analysis of comparative growth rates would be imperative. On the other hand, if borrowed capital finance the government’s operational expenditures, there could be limited beneficial impacts on economic growth, revenue flows and assets. This could result in a lower ability for the government to “grow out of debt” from the debt-ratio perspective, while also decreasing debt-to-GDP ratio threshold that the government
could ensure is sustainable, as the increased debt levels and interest rate payments would elevate the pressures on the government revenues through increased expenditure levels.

9.1.3 – Revenue Flows, Expenditure Levels and Government Assets: Differences in Repayment Capacities Underlying the Debt-to-GDP Ratios

The World Bank and the IMF interviewees highlighted the importance of the debt-to-GDP ratio as it indicates debt in relation to national income in Chapter 8, section 8.1.2 (p. 155). However, this does not mean that government revenue flows are equal in all countries as they depend on taxation rates and non-taxation revenues. By comparatively assessing revenue data the case-study economies, this research determines similarities and differences in the countries’ total, taxation and non-taxation revenue levels. The discussion emphasises on the limitation of the GDP-ratio in relation to repayment capacities and the impact of the differences in revenue flows on debt-to-GDP ratio level sustainability. While there is no research that has investigated the disparities between revenue flows among economies, the research reflects on the limitations of the GDP-ratio to the theoretical contribution by Bohn (1991) that focus on the adjustments in revenue and expenditure levels to tackle budget deficits, Ghosh et al.’s (2011) research on high debt-ratio’s impact on primary surplus responsiveness, and Mendoza and Ostry (2007) and Checherita-Westphal et al.’s research that estimates the optimal debt-to-GDP ratio levels fiscal sustainability.

When comparatively assessing the governments’ total revenue-ratios, as highlighted in Figure 9.3, one key difference stands out between the countries, which is the differences in total revenue-ratio levels among the case-study economies. With an average revenue-ratio of 55.6 percent of GDP between 1995 and 2015, Norway had the highest revenue-ratio, while Greece had the second highest with an average of 41.2 percent. Australia and Ireland had similar revenue-ratios, both averaging at 34.8 percent of GDP across the time sample, which was significantly lower than Greece’s average. While Greece’s high revenue-ratio average is connected to the increasing trend after 2009, it is important to consider the deflated GDP denominator due to the economic recession, which increased the ratio. The extent of the impact of the economic recession is highlighted by the lower revenue-ratio average between 1995 and 2008 of 39.3 percent of GDP. Additionally, Ireland’s reduction in the revenue-level in 2015 was due to the high economic growth diluting the ratio-level as explored in Chapter 5, section 5.1.3 (p. 92). Overall, the
differences in the total-revenue levels among the case-study economies demonstrate that
governments have different levels of revenue in comparison to the size of the economies.
Consequently, this points to the limitation and inaccuracy of the debt-to-GDP ratio’s
ability to indicate debt levels in relation to government revenues.

Figure 9.3 – Total General Government Revenue Ratios, All Case-Study
Economies, 1995-2015

Although there were limitations in the expenditure-ratio data for Greece, the combination
of high the Greek revenue-ratio in Figure 9.3 and the net-borrowing levels discussed in
section 9.1.2 indicate that the expenditure-ratio was higher throughout the time sample.
Greece’s average expenditure-ratio was the highest during the GFC, at 55.8 percent of
GDP between 2007 and 2014. To compare similar timeframes, the revenue-ratio averaged
at 43.5 percent, and the average expenditure-ratio exceeded the revenue-ratio by 12.3-
percentage points. As both the revenue and expenditure-ratios increased during the crisis,
due to the decreasing GDP denominator as illustrated in Chapter 4, section 4.1.3 (p. 68-69),
the GDP ratios of the two variables is limited in their ability to portray the relative
importance of the two variables’ fluctuations underlying the budget deficits. Additionally,
the distortion effect arising from the economic recession on the revenue and expenditure-
ratios, makes the revenue- and expenditure-ratios not the optimal measurements to
understand post-GFC budget adjustments made to tackle budget deficits in relation to
Bohn’s research (1991) on how the governments need to either decrease expenditure or
increase revenue due to the intertemporal budget constraint. This highlights that
monetary denominations of revenue and expenditure levels are vital to assess the budget
adjustments government undertake to lower deficits.
Norway had an average expenditure ratio of 41.3 percent, and the 14.3-percentage points difference between the average ratios clearly demonstrates the large budget surplus. Additionally, the decrease in budget surplus after 2011 shown in Figure 9.2 was due to a larger increase in expenditure levels evident in Figure 9.4, while Figure 9.3 shows how the revenue-ratio started decreasing in 2013. As Norway had a continuous budget surplus, there was no need for budget adjustments to tackle budget deficits, which eliminates the need to assess Norway in relation to Bohn’s (1991) research on how governments balance the budget after a period of budget deficit, due to the intertemporal budget constraint.

Figure 9.4 – Total General Government Expenditure Ratios, All Case-Study Economies, 1995-2015

While Australia and Ireland had very similar net-borrowing trends leading up to the GFC, they experienced very different deteriorations in expenditure after the GFC, as illustrated in Figure 9.4. Nonetheless, their average expenditure-ratios across the time sample are surprisingly similar. Australia’s average expenditure-ratio was 34.7 percent of GDP and only 0.1-percentage point smaller than the average revenue-ratio, highlighting a relatively balanced budget across the time sample. On the other hand, Ireland’s expenditure-ratio average was 38.4 percent, and was 3.6-percentage points higher than the average revenue-ratio. This highlights Ireland’s larger budget surplus and lower expenditure-ratio than Australia’s between 1998 and 2005. Additionally, averaging the expenditure-ratio over the 20-year time sample decreases the understanding of the severity of the escalation in expenditures between 2009 and 2012, which increased the debt level significantly. Nonetheless, the severe expenditure increases between 2009 and 2012 in Figure 9.4
compared with the relatively stable decrease in revenue in Figure 9.3 demonstrates the clear connection between debt and expenditure trends.

As highlighted in Figure 9.2, Ireland’s net-borrowing needs decreased in 2015, which indicates that while the revenue-ratio declined in 2015 as shown in Figure 9.3, the expenditure-ratio must have decreased to a larger extent. Ultimately, the high economic growth rate in 2015 greatly distorted the revenue- and expenditure-ratios levels in the same way as within the debt-to-GDP ratio, which eliminates the ability of the GDP-denominated revenue and expenditure-ratios to accurate assess budget adjustments that lowered the budget deficit. In Australia, the increase in debt was due to a combination of increased expenditure and decreased revenues. Although both the revenue- and expenditure-ratios slightly increase towards the end of the time-sample, the expenditure ratio increased to a larger extent than revenues in 2015. However, as economic growth declined, it is difficult to determine the extent of the increase in Australia’s expenditure levels in relation to debt levels. Nonetheless, the decrease in economic growth could be the underlying factor that lowers revenue growth, while the government has increased spending. In term of Bohn’s (1991) research into how governments adjust revenue and expenditure levels to decrease deficits due to the intertemporal budget constraint, the combination of the increased expenditures and slower growth in revenues reflects the increase in debt in 2015, as the Australian government did not undertake budget adjustments to lower borrowing.

While the net-borrowing levels and the relative fluctuations in the revenue- and expenditure-ratios are important to understanding fiscal situations of economies, it is important to investigate taxation-revenue levels to understand underlying differences in the reliance on taxation revenues within the total revenue levels among the case-study economies. Figure 9.5 depicts the calculated taxation revenue-ratios of the case-study economies, which demonstrate a relatively synchronised movement to the total revenue-ratios of each respective country, as elaborated on in the respective country chapters.

Similarly as the total revenue-ratios, there were variations between the economies’ taxation-ratios, as well as differences in the averages between the two revenue-ratios and monetary taxation revenue growth rates. The average difference between the total
revenue- and taxation-ratios is important as it highlights the extent the governments rely on non-taxation revenue flows within the total revenues.

**Figure 9.5 – Calculated Government Taxation Revenue Ratios, All Case-Study Economies, 1995-2015**

Norway had the largest difference between the two revenue-ratios, as the taxation-ratio was on average -25.9 percent smaller than the total revenue-ratio, which indicates a larger proportion of non-taxation revenue within the government’s total revenue. This relates to the Government Pension Fund (the Fund) producing large investment returns that supplement the government’s taxation revenues. Greece had the second largest difference, as the average taxation-ratio was -21.8 percent smaller than the total revenue-ratio. While Australia had a difference of -18 percent, Ireland had the lowest difference between the two ratios, as the average taxation-ratio was only -15.8 percent smaller than the total revenues. This highlights that the Irish government is the most reliant on taxation revenues within the total revenue-ratio compared to the other case study economies, and the government has the most vulnerable total revenue flows during financial crises when taxation revenues decrease.

The combination of different total and taxation revenue-ratios and the variations in non-taxation revenue flows can impact the case-studies economies’ fiscal surplus responsiveness, as non-taxation revenues may be less vulnerable to economic growth fluctuations compared to taxation revenues. These features establish that revenue levels are not parallel to the size of the economy, which can have implications for the research on fiscal space and the debt-ratio levels that ensure fiscal sustainability. More specifically,
it can impact the research findings on primary surplus responsiveness at specific debt-to-GDP ratio levels (Mendoza and Ostry, 2007; Ghosh et al., 2011), as an economy with higher levels of total and taxation revenue-ratios could potentially see primary surplus responsiveness decrease at a higher debt-to-GDP ratio level compared to an economy with lower total and taxation revenue-ratios. Moreover, differences in total revenue-ratios demonstrate that the optimal debt-to-GDP ratio level between 50 and 60 percent of GDP for fiscal flexibility can differ between economies, as well as be highly depended on the expenditure-ratio levels and the long-term net-borrowing levels (Mendoza and Ostry, 2007; Checherita-Westphalia et al., 2014). To further evaluate the differences in revenue flow within the debt-to-GDP ratios among economies, this research comparatively assesses long-term taxation revenue and nominal GDP growth rates highlighted in Table 9.1 in section 9.1.1 (p. 170), as well as the changing taxation growth rates in the pre- and post-GFC periods.

Surprisingly, Greece had a significantly higher taxation revenue growth of 150.4 percent compared to the 88.8 percent growth in nominal GDP between 1995 and 2015, as highlighted in Table 9.1 in section 9.1.1 (p. 170). In other words, taxation revenues grew considerably faster than the economy over the 20-year time sample, which should have had a positive impact on the repayment capacity underlying the debt-to-GDP ratio, based on analysis of the revenue side of the budget. Additionally, the larger increase in taxation revenue compared to nominal GDP indicates that the repayment capacity based on the taxation revenue trend would increase at a specific debt-to-GDP level over time. In sharp contrast to the growth rates in Greece, Ireland had the highest nominal GDP growth of 366.7 percent, while the taxation revenue only grew by 246.9 percent across the time sample. The 120-percentage points difference in the two growth trends represents the largest differential among the case-study economies, which highlights that the economy grew faster than taxation revenues, which decreases repayment capacity at a specific debt-to-GDP level based on the taxation revenue trend decreased over time.

If the expenditure-ratios in Greece and Ireland were similar, the clear differences in the growth rates in taxation revenues and nominal GDP would impact their respective debt-to-GDP ratio levels that would have negative impact on primary surplus and fiscal sustainability, where Ireland’s debt-ratio threshold would be lower than Greece’s and decrease over time. Therefore, in relation to Ghosh et al.’s (2011) research determining
the debt-to-GDP ratio threshold where primary surplus diminishes, this research argues that relative growth rates in taxation and nominal GDP could decrease the accuracy of the GDP-ratio threshold for different economies over time and result in distinctive thresholds for different economies.

In contrast to both Greece and Ireland, Norway and Australia had relatively similar growth rates in both taxation revenues and nominal GDPs across the time sample, as demonstrated in Table 9.1 in section 9.1.1 (p. 170). Norway had a small growth differential of 14.6-percentage points where taxation revenue grew by 209.1 percent compared to the nominal GDP growth of 223.7 percent, while Australia only had 13-percentage points difference between the growth rates, as taxation revenue increased by 199.5 percent and the nominal GDP grew by 212.5 percent between 1995 and 2015. The small growth differences between the two variables in both economies highlight that economic growth was relatively parallel to taxation revenue growth, which is positive in regard to the debt-to-GDP ratio’s ability to portray debt-to-GDP levels in relation to government income over time. Moreover, this highlights that repayment capacity at a specific debt-to-GDP level based on the taxation revenue trend remains relatively stable over the 20-year time sample. In terms of Ghosh et al. (2011) debt-to-GDP ratio threshold, the similar movement in taxation and nominal GDP indicates that the debt-to-GDP ratio threshold where primary surplus diminishes would not change over time.

While the comparative growth rates across the time sample are significantly different between Greece, Ireland and Norway and Australia, there are distinctions between the pre- and post-GFC periods, which intensified the differences between growth rates, especially in Greece and Ireland. All the four case-study economies essentially had very similar growth rates in between their respective economic growth and taxation revenue growth before the GFC; however, the crisis had adverse effects on taxation revenue growth in comparison to nominal GDP.

Greece’s taxation revenue increased by 189.8 percent compared to an increase of 160 percent in nominal GDP between 1995 and 2008. Nonetheless, Greece’s taxation revenue decreased by -15.3 percent, while nominal GDP by -26.5 percent between 2008 and 2014, which underlines the impact of economic recession on the taxation revenues. However, taxation revenues were less vulnerable that nominal GDP during the crisis, as
nominal GDP decreased to a larger extent that taxation between 2008 and 2014. In comparison, Ireland’s taxation revenue grew 244.4 percent and nominal GDP increased by 259.9 percent respectively between 1995 and 2007, which confirms the debt-to-GDP ratio’s ability to portray debt relatively proportionally to government taxation revenues. Nonetheless, the GFC had adverse effects on the two variables, as taxation revenues decreased by -24.4 percent, while a much smaller decline in nominal GDP by -8.7 percent occurred between 2007 and 2010. This does not only illustrate the substantial decrease in taxation revenues due to the GFC, but also that the GFC has severely impacted the debt-to-GDP ratio’s ability to portray debt proportionally to government revenue, as the Irish taxation revenues decreased to a much larger extent than the nominal GDP.

Norway’s growth rates in taxation and GDP continued to remain similar between 1995 and 2012, although taxation revenue and nominal GDP decreased in 2010, as established in Chapter 6, section 6.1.3, (pp. 116-117). This reinforces the understanding that the debt-to-GDP ratio portrays debt relative to government taxation revenues consistently up to 2012. Nonetheless, the difference between the two variables increased significantly between 2012 and 2015, as taxation decreased by -3.2 percent although the nominal GDP increased by 51 percent. The difference between the growth rates in the two variables also increased in Australia during the GFC, as the taxation revenue grew by 63.1 percent and the nominal GDP increased by 67 percent between 2000 and 2007, while taxation growth was 27.6 percent compared to the nominal GDP increase of 37.2 percent between 2007 and 2014. This highlights a significant reduction of taxation revenue growth due to declined economic growth, as well as a larger decline in taxation growth compared to GDP growth that signifies that the GFC has resulted in a larger differential in the growth rates between taxation and nominal GDP.

While Ireland regained taxation revenue growth in 2010, Greece, taxation revenue did not increase until 2015. Nonetheless, Ireland’s taxation revenues grew at a lower rate than nominal GDP between 2010 and 2015, by 33.3 percent compared to 53.1 percent, however, taxation only increased by 2.5-percentage points between 2007 and 2015. This demonstrates that the debt-to-GDP ratio’s ability to portray the Irish debt level proportionally to taxation revenues deteriorated further after the crisis, and that taxation revenues were more vulnerable both during and after the crisis compared to the nominal
GDP. This is concerning considering Ireland’s high reliance on taxation revenues within total revenues, and the large difference between taxation and nominal GDP growth rates after the GFC, could decrease the optimal debt-to-GDP ratio level that would ensure ideal fiscal space and positive primary surplus responsiveness.

Overall, the comparative analysis of taxation revenue and nominal GDP growth reveal that the debt-to-GDP ratio had a higher accuracy in its ability to portray debt levels relative to the size of the economy over time before the GFC. However, the increased differences in growth rates in taxation and nominal GDP after the crisis, especially in Ireland, highlight that the GDP-ratio is increasingly limited in its capacity to indicate debt relative to government revenues across countries and across time. The GFC has ultimately resulted in larger differential growth rates between taxation and nominal GDP in Ireland, Australia and Norway, due to larger decreases taxation growth. On the other hand, Greece had less decrease in taxation growth compared to the more substantial decreases in nominal GDP levels during and after the GFC.

This research investigates total government expenditures-ratio, which includes interest rate payments of debt, and therefore cannot make direct assessments in relation to Mendoza and Ostry (2007) and Ghosh et al.’s (2011) research findings on the impact of high debt-to-GDP levels on primary surplus responsiveness. Nonetheless, the combination of differences in total and taxation revenue-ratios, the proportions of non-taxation revenue and taxation revenue growth in comparison to nominal GDP highlights variations in a government’s ability to generate revenues in relation to the size of the economy. These features highlight firstly, that the debt-to-GDP ratio is not universal in portraying debt levels in relation to government revenues; secondly, the potentially changing repayment capacities at a specific debt-to-GDP ratio levels over time based on taxation growth compared to nominal GDP growth, where the differential has been amplified after the GFC in; and thirdly, that the combination of different revenue-ratio levels, the non-taxation revenue proportions and taxation revenue growth can impact debt-to-GDP ratio levels where the primary surplus responsiveness is affected. Consequently, these country-specific revenue flows and trends could result in differences in the optimal debt-to-GDP level that ensures fiscal flexibility and sustainability among economies, which could differ the more generalised research findings put forward by Mendoza and Ostry (2007) and Checherita-Westphal et al. (2014). However, the
expenditure and resulting net-borrowing levels are crucial to being able to determine the optimal debt level of different economies. This is highlighted by the fact that Greece had the second largest total revenue and non-taxation revenue levels in combination with very high taxation revenue growth compared to nominal GDP, however, operated with large budget deficits due to the very high expenditure levels. Therefore, future research is needed to determine how to best determine optimal debt levels, for example, by assessing expenditure growth rates in comparison to nominal GDP in relation to taxation revenue growth rates.

9.2 – Comparative Qualitative Data Analysis of the Limitations of the Debt-to-GDP Ratio and the Level of Influence of the GDP-Ratio

This section discusses the key qualitative data findings from the interviews with the international financial institutions and the case-study economies. The section considers important limitations of the debt-to-GDP ratio from the institutional perspective and elaborates on country-specific contexts highlighted by the case-study economies that impact the policy-makers perspectives on the measurement. Overall, this section determines the range of limitations to supplement the quantitative data discussed in section 9.1 to answer Research Question 1: what are the limitations of the debt-to-GDP ratio? Additionally, by elaborating on the limitations and the most important measurements used by the governments, the section provides a deeper understanding of how limitations decrease the levels of influence of the measurement in policy-making to be able to answer Research Question 2: how influential is the debt-to-GDP ratio from policy-making perspectives?

Through the interviews with representatives from the World Bank and the IMF, it was expressed that, although the debt-to-GDP ratio is a better measurement than nominal debt and is used to assess the impact of economic shock scenarios on debt projections in the IMF’s DSA, the measurement is inadequate by itself. On the other hand, the UN interviewee strongly asserted that the GDP-ratio was not an important measurement within UN analysis, due to its limitations. The limitations were exemplified by all three interviewees, as they highlighted that a specific debt-to-GDP ratio level in two economies does not portray the respective countries’ repayment capacities or debt sustainability levels. Combined, the interviewees stressed that economic structures and commodity compositions, variations in governments’ asset levels, and the maturity,
interest rate and external debt compositions of the debt portfolios of different economies result in different underlying implications of a debt-to-GDP ratio level, as explained in Chapter 8, section 8.1.3 (pp. 155-156, 157-158, 160). These features highlight that the debt-to-GDP ratio is not universal across different economies, and consequently, the GDP-ratio is insufficient by itself, and the institutions use a wide range of measurements and parameters, as highlighted in Chapter 8, section 8.1.1 (pp. 150-153), to effectively analyse debt levels, risks and sustainability of economies. Ultimately, as the GDP-ratio is not universal across countries, it was asserted that there is no consensus of what constitutes a high or low GDP-ratio level, or what ratio level signals if an economy has repayment and sustainability issues.

There were several similar and interconnected themes highlighted through the interviews with government and fiscal advisory agency participants in the case-study economies, which provided details on how country-specific economic, fiscal and debt portfolio features explain limitations in the debt-to-GDP ratio from a policy-making perspective. Combined, the case-study economies’ interviewees provided in-depth knowledge of how country-specific features decrease the universal nature of the measurement that was emphasised by the interviewees from the international institutions. Moreover, the information particularised that there was a lack of accuracy and reliability of the debt-to-GDP ratio measurement, which ultimately decreases its level of influence and value within both national policy-making and international debt analysis.

While the IMF interviewee mentioned macroeconomic features, the UN interviewee elaborated on how the economic structure and the elasticity of commodities impact the ability of economies to generate revenues and sustain repayment capacities at different levels of debt-to-GDP, as described in Chapter 8, section 8.1.3 (pp. 157, 160). Although the elasticity of exports and foreign exchange rates, as emphasised by the UN interviewee in Chapter 8, section 8.1.4 (p. 160), may not be a significant problem within the EMU and advanced economies compared to developing economies, there are still implications through fluctuating commodity prices and demands evident in, for example, Australia. As the Australian economy relies on exports, commodity prices and demand can greatly impact the taxation revenue flows underlying the debt-to-GDP ratio. Additionally, the importance of the tourism industry in Greece can result in volatile economic growth and revenue flows, especially during financial crises. Therefore, different economic structures
and industry compositions underlying the GDP may affect the impact on the government revenue flows and repayment capacity.

While not focusing on the relationship between commodity prices and government revenues, Interviewee A1 elaborated on the impact of commodity prices on the nominal GDP and the consequential distortion of the perception of GDP-ratio trends in Chapter 7, section 7.2.1 (pp. 142-143). In short, Interviewee A1 explained how high commodity prices camouflaged debt and expenditure increases underlying the GDP-ratios, while decreasing commodity prices resulted in the actual debt and expenditure trends being revealed. Although this topic was not addressed during the interviews with the Norwegian government representatives, the Norwegian economy’s reliance on the petroleum industry, and large government taxation revenues arising from this sector, could produce similar underlying dynamics between petroleum prices, the GDP-ratios and taxation revenue fluctuations. As a result of the volatile nominal GDP and deflator, the Australian interviewees asserted that the debt-to-GDP ratio is not a very valuable measurement for short-term debt analysis and policy formulations. Nonetheless, the GDP-ratio play a larger role in long-term debt analysis to assess how debt moves in relation to the size of the economy.

Ireland’s economic structure and high economic growth was a key theme highlighted by the Irish interviewees as producing significant limitations and distortions in the debt-to-GDP ratio due to the large MNC sector, as elaborated on in detail in Chapter 5, section 5.2.1 (p. 95). Additionally, the statement by Mr John Flynn (p. 96) highlighted that the changes in the statistical calculation framework of the GDP in 2014 have resulted in elevated distortions in Ireland’s GDP in comparison to national production and GNI trends. Ultimately, as detailed in Chapter 5, section 5.2.1 (p. 95), Interviewee I2 emphasised that the exceptional growth rate in 2015 produced a merely mechanical reduction in the debt-to-GDP ratio, which was confirmed within the quantitative data analysis in Chapter 5, section 5.1.2 (p. 88). This distortion, due to the large increase in nominal GDP, decreased the debt-to-GDP ratio’s ability to accurately portray the sustainability of Ireland’s debt burden. To counteract the impact of the large MNC sector on the GDP, the Irish government introduced a new measurement in July 2017 to supplement the debt-to-GDP ratio, namely the Gross National Income* (GNI*), which more correctly reflected the debt level in regard to national income, as explained in detail.
in Chapter 5 section 5.1.2 (p. 97). This ultimately reflects the extent of the limitations and limited value of the GDP-ratio as a policy-making tool in Ireland.

These statements reveal that differences in economic structure, and the fluctuations in commodity prices and demands, can produce different dynamics within the debt-to-GDP ratio levels in different economies through varying distortion effects, different levels of vulnerabilities of economic growth rates, and distinctive relationships between the GDP, national production levels and GNI. These features can, therefore, be underlying factors resulting in lack of consensus among the large number of different debt-ratio thresholds highlighted by Reinhart & Rogoff (2010), Ceccherita et al. (2011), Baum et al. (2013) and Furceri and Zdzenicka (2012). Although not being all-inclusive, the combination of the quantitative and qualitative findings supports Greiner’s (2012) argument that the relationship between debt and economic growth is non-linear, and Panizza and Presbitero’s (2013) statement that there are other underlying factors that impact economic growth, not only high debt levels.

On the other end of the spectrum, the Greek participants highlighted how the economic recession after 2008, and the large reductions in nominal GDP, significantly impacted the debt-to-GDP ratio trend, as mentioned in Chapter 4, section 4.2.1 (p. 77) and supported by the nominal GDP data in section 4.1.2 (pp. 65-66). Interviewee G1 explained that the key limitation of the GDP-ratio in the Greek context is connected to changes in the debt portfolio characteristics, including maturity and interest-rate compositions. Ultimately, the GDP-ratio does not capture the favourable profile of Greece’s public debt, following the PSI procedures in 2012, that significantly reduced debt, decreased the costs of debt through lower interest rates, and substantially increased the maturity, as elaborated on in Chapter 4, section 4.2.1 (p. 72-73). These changes increased the repayment capacity and debt sustainability significantly in Greece; however, this is not reflected through the GDP-ratio, and especially due to the impact of the decreased nominal GDP level. Consequently, the Gross Financing Needs (GFN) was adopted to better reflect the debt portfolio changes, as explained in Chapter 4, section 4.2.1 (pp. 73-74), and Interviewee G2 stated that the GFN is the most important tool for analysing Greek debt sustainability.
The composition of the debt portfolio was also highlighted as important for policy-making by the interviewees in Ireland, Norway and Australia, and the institutional representatives emphasised that maturity, interest rate and external debt features are increasingly being recognised as essential characteristics within debt and risk analysis. The composition of the debt portfolio could ultimately result in differences in the debt-to-GDP ratio levels that countries can sustain, as the repayment capacity would vary depending on the maturity, the interest-rate’s impact on cost of debt, and the potential variations in cost of debt depending on currency denominations and exchange rate fluctuations, as explained in more detail in Chapter 8, section 8.1.2 (pp. 515-152). Therefore, a specific debt-to-GDP ratio level can have distinct implications in different economies, which further strengthens the understanding that the GDP-ratio of debt is not universal across countries, due to qualitative features of governments’ debt portfolios. Additionally, the fluctuating foreign exchange rates and interest rates may change the underlying repayment capacity of a country, regardless of a stable debt-to-GDP ratio level. The changes in Greece’s debt portfolio also point to how repayment capacity and debt sustainability underlying the debt-to-GDP ratio are not static over time.

A final key feature that decreases the universal nature of the debt-to-GDP ratio and impacts the GDP-ratio level economies can sustain is that different levels of government assets result in varying levels of government liquidity, as explained by the World Bank interviewee in Chapter 8, section 8.1.3 (p. 157-158). In short, a government with a high level of assets would be able to sustain a higher debt-ratio level compared to an economy with low levels of assets. The debt-to-GDP ratio is, therefore, limited in its ability to portray repayment capacity and debt sustainability in relation to the liquidity of a government.

Although the Norwegian interviewees did not highlight specific limitations to debt-to-GDP ratio from a Norwegian context, as the interviewees asserted that it is not used within policy-making, there was a clear focus in the interviews on the Fund and its beneficial interaction with the government’s budget. Due to the combination of the discretionary aspect of government borrowing to facilitate state lending, the high budget surplus and the very large government asset-generating revenue flows, this research argues that a limitation of the debt-to-GDP ratio as a policy-making tool in the Norwegian context is that it does not reflect actual repayment capacity and fiscal
flexibility. Ultimately, these fiscal features highlight that the government could maintain fiscal and debt sustainability at a higher debt-ratio level, as explained by the World Bank interviewee.

On the other hand, the quality of government assets can decrease over time. Interviewee A1 highlighted the decreasing quality of the student loan assets of the Australian government, which have become a larger component within the government asset portfolio over the years, as explained in Chapter 7, section 7.2.1 (p. 140). The decline in the quality and liquidity of government assets can result in distortions within the net-debt measurement, reduce fiscal flexibility, and, depending on the extent of the decline in quality, lower the optimal debt-to-GDP ratio level that ensures fiscal sustainability. Accordingly, the different revenue flows and trends found in the quantitative data in combination with varying levels and quality of government assets highlights that Ghosh et al.’s (2011) debt-ratio thresholds impacting primary surplus responsiveness can vary among economies. Additionally, the optimal debt-to-GDP level to ensure fiscal flexibility and sustainability among economies could differ, compared to the more generalised debt-ratio thresholds put forward by Mendoza and Ostry (2007) and Checherita-Westphal et al. (2014).

Overall, the limitations of the debt-to-GDP ratio identified by the interviewees from the case-study countries, that directly link to country-specific economic, fiscal and debt portfolio features and conditions have resulted in a low or decreasing influence of the GDP-ratio within budget and debt policy formulation. Similar to the international institutions, the case-study countries’ governments use a wide range of measurements to monitor and assess debt levels. Norway stood out as the country where the interviewees most clearly expressed that the debt-to-GDP ratio does not play any role in policy-making, which directly links to the low debt levels, high budget surplus and the Fund’s investment return. The Norwegian government, therefore, in order to maintain budget surpluses, focuses on fiscal indicators, where the non-oil deficit is the most important to ensure that the non-oil deficit equals the real investment return from the Fund. In Australia, the most important measurements of debt are revealed to be the net-debt measurement and the market value of outstanding debt, while the GDP-ratio is utilised for long-term analysis to better assess the movements of debt in relation to the economy.
In terms of a debt-to-GDP ratio threshold strategy, the A2 interviewee highlights that there is no such strategy in place, due to the volatility of the GDP-ratio measurement.

As Ireland and Greece are EU members, the interviewees assert that the GDP-ratio is important, due to the European membership and the SGP guidelines. Interviewee G2 explained that EU economies with debt-ratios exceeding 60 percent have the responsibility to decrease debt linearly over 20-years, as outlined in Chapter 4, section 4.2.1 (p. 74), which highlights how the debt-ratio would influence policy-making within highly indebted EU economies. Nonetheless, as affirmed above, their country-specific conditions have resulted in the GDP-ratio being increasingly limited, and both economies have adopted alternative indexes to supplement the GDP-ratio to be able to more accurately assess repayment capacities and debt sustainability. But the EU economies cannot eliminate the GDP-ratio, they can only change the importance of the measurement within debt analysis and strategies, as emphasised by Interviewee G1 in Chapter 4, section 4.2.1 (p. 74).

In terms of debt-threshold strategies, the interviewee from the IMF highlighted that, while many EU economies focus on the debt-to-GDP ratio ceiling of 60 percent, this could already be a problematic level for some countries (Chapter 8, section 8.1.3, p. 156). Additionally, the interviewee from the World Bank asserted that many of the EU countries have gone beyond the fiscal rule of debt at 60 percent of GDP after the GFC, and that some countries now take a more conservative view of the debt-to-GDP rule, aiming at for example 30 to 40 percent, while others aim for 70 to 75 percent of GDP (p. 157). As highlighted in Chapter 5, section 5.2.1 (pp. 98-99), Ireland has recognised the increased limitations of the GDP-ratio due to their economic context and has adopted a lower debt-threshold strategy at 45 percent of GDP to ensure the ability to build a fiscal buffer to safeguard fiscal sustainability for the future. This highlights how Ireland has taken into consideration the limitation of the GDP-ratio, which exemplifies the statement by the IMF interviewee that governments need to consider economic and fiscal conditions to understand what debt-ratio level is the most appropriate for them specifically. On the other hand, the statements by interviewee G1 point to the aim to lower debt levels to meet the 60 percent debt-threshold within the SGP (Chapter 4, section 4.2.1, p. 74). This may be due to the very high debt level in combination with the
obligation of the SGP; however, it may be necessary to reassess if the 60 percent threshold sufficiently safeguards fiscal sustainability when the target has been met.

The limitations highlighted by the respective governments, in combination with the information provided by the international institutions, underline the need to consider country-specific economic, fiscal and debt portfolio features to effectively analyse the impact of debt levels on repayment capacity and debt sustainability, to ensure successful debt policies. From an institutional perspective, the fact that the GDP-ratio is not universal or static over time impacts the effectiveness of the measurement to assess debt risks and repayment issues across countries. Additionally, this impacts national policy-making and appropriateness of threshold-strategies, especially when considering the volatility of the debt-ratio levels during financial crises, and each country needs to assess what debt-to-GDP ratio level is the most appropriate for them. Ultimately, a wide range of measurements are needed to take advantage of measurements’ strength and eliminate their weaknesses. The development of new measurement indexes by the highly indebted economies highlights the governments’ recognition of the limitation of the GDP ratio, as well as the identification of country-specific features that need to be addressed from a measurement perspective.

9.3 – Summary Answers to the Research Questions

Research Question One: What are the Limitations of the GDP-Ratio?
This research has found that the debt-to-GDP ratio is limited through four themed areas that connect to a wide range of quantitative and qualitative distortions and limitations that challenge the accuracy of the GDP-ratio measurement. Combined, these limitations and inaccuracies demonstrate that different economic, fiscal and debt portfolio dynamics result in the key limitation of the measurement: that it is not universal across countries and not static over time.

The first limitation is the inaccuracy of the debt-to-GDP ratio’s ability to portray monetary debt trends, due to the relative growth rates in the nominal GDP and debt variables. The comparative growth rates can result in three distortion scenarios that impact the perception of underlying debt-level trends. Firstly, high economic growth can inflate the GDP denominator and can dilute the debt-to-GDP ratio. An economy with a higher growth in nominal GDP compared to debt can “grow out of debt” from the
perspective of the debt-to-GDP ratio measurement, although debt may remain stable or slightly increase over time, depending on the extent of economic growth. Secondly, when nominal GDP and debt grow at similar rates, it results in a stable debt-ratio trend, although monetary debt can increase significantly over time. Thirdly, prolonged economic recession can increase indebtedness as the deflating GDP denominator increases the debt-ratio level, regardless of declining debt trends if debt decreases are less than nominal GDP decreases. The distortion effects can be reinforced by economic structures and fluctuations in commodity prices and demand for economies' export products. The GDP-ratio is, therefore, limited in its ability to portray vulnerabilities within economies growth rates, and distinctive relationships between the GDP, national production levels and GNI, which strengthen the notion that the debt-to-GDP ratio is not universal across economies.

The second limitation is connected to the different objectives underlying government borrowing activities, which can impact the debt-to-GDP ratio level trend and the debt sustainability of GDP-ratio levels in different economies. If a government borrows capital to finance investments that produce amplified economic activity, it can increase the dilution effect on the debt-to-GDP ratio through increased nominal GDP growth. Additionally, the debt can “pay itself” to some extent through increased taxation revenues through, for example, increased employment, income levels and elevated investments levels, and, depending on the nature of the investment, it could potentially increase non-taxation revenues arising from larger government asset portfolios. On the other hand, if debt finances budget deficits arising from governments’ operational expenditure levels exceeding revenues, there will be minimal positive impacts on economic growth resulting in static revenue flows. Moreover, if governments run deficits to finance consumption-based expansionary policies in the long-run, nominal GDP can increase superficially, which may result in a distortion of the debt-to-GDP ratio trend; however, when the government discontinues these types of long-term consumption policies, the nominal GDP can be more vulnerable to decline, which may then produce increasing debt-ratio levels.

The third limitation is that the debt-to-GDP ratio inaccurately portrays debt relative to governments’ revenue levels in different countries, which may result in differences in governments’ repayment capacity. While the debt-to-GDP ratio depicts debt relative to
the size of the economy, this research has established that there were variations in the case-study economies’ total and taxation revenue-ratio levels, disparities in the governments’ non-taxation revenue flows demonstrating differences in the reliance on taxation revenues within total revenues, and different growth rates in taxation revenues compared to nominal GDP. Additionally, the qualitative data emphasised that the level of government assets can impact the debt-ratio levels governments can sustain. Besides the differences in revenue levels, the variations in taxation revenue growth compared to nominal GDP highlights that repayment capacity related to debt-to-GDP ratio levels is not static over time. The research found that taxation growth decreased more than nominal GDP growth rates in all the case-study economies after the GFC, except Greece. A lower growth rate in taxation revenues compared to nominal GDP indicates that the repayment capacities at a specific debt-to-GDP ratio level decrease over time, especially if a government is highly reliant on taxation revenues within total revenues. On the other hand, if taxation revenues grow faster than nominal GDP, repayment capacity at a specific debt-to-GDP ratio level could improve over time, as long as expenditures do not increase to the same extent.

Although the revenue features highlighted above can impact the repayment capacity and debt sustainability at a specific debt-to-GDP ratio level over time, having high revenue-ratios, taxation revenue growth and large proportions of non-taxation revenues do not guarantee budget surpluses, as it is determined by the expenditure levels of the government, which was clearly demonstrated in Greece. As the debt-to-GDP ratio has both inaccuracies in portraying relative revenue flows of governments, while lacking insight into expenditure levels and the budget balance, the debt-ratio has no real ability to indicate the repayment capacity and fiscal sustainability of economies.

The fourth limitation of the debt-to-GDP ratio is the lack of insight into differences in maturity, interest-rate and external debt compositions of economies’ debt portfolios. These features greatly impact the repayment capacity of governments, as well as the accuracy and insightfulness of the debt-to-GDP ratio in relation to debt sustainability. Moreover, debt portfolio features were highlighted as increasingly important for debt sustainability analysis by the international institutions, and were common features highlighted as important for debt analysis and policy-making by the case-study countries’ interviewees.
Research Question Two: How Influential is the Debt-to-GDP Ratio within Policy-Making by Governments and International Financial Institutions?

The interview data revealed that there were some variations in the reliance of the debt-to-GDP ratio measurement; however, it was either not influential or had decreasing influence. More specifically, the measurement is not considered very valuable for short-term, budget and debt policy formulations within governments or debt analysis by institutions, which was justified through country-specific and general limitations of the measurements as a policy and analysis tool, as well as its volatility. The various limitations highlighted link the quantitative research findings and strengthened the importance of economic and fiscal features and conditions within the policy-making and debt analysis.

The GDP-ratio had lower influence in the low-debt, non-EU case-study economies. Norway does not utilise the GDP-ratio, due to the low level of debt, large budget surplus, the discretionary borrowing objectives, and most importantly, the non-taxation revenues from the Fund that greatly impact fiscal policy and flexibility. Australia also emphasised on the low debt level, while the distortion effect of the ratio measurement connected to fluctuating commodity prices and financial crises was argued to limit the use of the measurement for short-term policy development.

Nonetheless, the GDP-ratio was highlighted to be used for long-term debt analysis to portray debt growth in comparison to the growth of the economy. In Ireland and Greece, the EU memberships and the SGP guidelines result in a higher level of influence of the GDP-ratio. Nonetheless, these economies have identified clear limitations of the GDP-ratio and its inaccuracies in assessing debt sustainability, which was linked to country-specific features and conditions. Therefore, the Irish and Greek governments have developed new measurements to supplement the GDP-ratio.

The GDP-ratio also has limited influence among the international financial institutions and is mostly used within IMF’s DSA tool to analyse economic shock scenarios on debt projections. The limitations of the GDP-ratio, and the notion that it is not universal across countries, decrease the effectiveness of the measurement to analyse debt risks and repayment issues and in developing debt strategies.
Overarching Research Question: How Accurate and Valuable is the Debt-to-GDP Ratio for Policy-Making?

In conclusion, this research has demonstrated that the limitations of the debt-to-GDP ratio decrease its accuracy as a policy-tool for governments and as a measurement to analyse debt from an institutional perspective. Inaccuracies are found in the GDP-ratio’s ability to portray monetary debt level trends, highlight pressures on the government budget balance, liquidity and repayment capacity and portray fiscal and debt sustainability in different economies. Additionally, this research found clear inaccuracies in the debt-ratio trend in relation to fluctuations in the nominal GDP and debt after 2009, which directly challenges the accuracy and validity of the debt-to-GDP ratio measurement in Greece. The GDP-ratio is not static, and the ratio levels an economy can effectively maintain as sustainable change over time, depending on the changes in economic and fiscal features, as well as on qualitative aspects of the debt portfolio. Due to its limitations and inaccuracies, the measurement is not very valuable for policy-making to guide debt policy decisions and to develop debt strategies. From regional and international institutional perspectives, the fact that the measurement is not universal decreases its value for cross-country debt analysis, as it is unable to portray repayment issues and debt vulnerabilities across countries. Thereover, the measurement needs to be assessed in combination with a range of other measurements to be able to effectively ensure and promote sustainable fiscal and debt policies.

Ultimately, the various combinations of the features highlighted above produce different debt-to-GDP ratio levels resulting in repayment and debt sustainability issues, which result in the most important limitation of the debt-to-GDP ratio: that it is not universal across countries and not static over time. An economy with high economic growth and budget surplus, large amounts of government assets producing non-taxation revenues, a similar or greater taxation revenue growth rate compared to nominal GDP and preferential debt portfolio features would be able to sustain a higher debt-to-GDP ratio level. On the other hand, the combination of low economic growth, large budget deficits, low levels of government assets and non-taxation, lower growth rate in taxation revenue compared to nominal GDP and unfavourable debt portfolio compositions means that the government would be able to sustain a lower debt-to-GDP ratio level. Additionally, the sustainable debt-ratio level of a country can change over time, depending on fluctuations within the variables and features.
Chapter 10 – Conclusion

10.0 – Introduction
This research has critically examined the limitations and the accuracy of the debt-to-GDP ratio and identified quantitative factors, including economic and fiscal variables, that distort the perception of debt level trends and produce different dynamics that impact the sustainability of the GDP-ratio levels of governments. Moreover, this research has interviewed government and institutional representatives and determined that the limitations of the GDP-ratio lowers the value and influence of the measurement. By combining the quantitative and the qualitative data, it has become clear that the debt-to-GDP ratio is unreliable for governmental policy-making and institutions as a policy tool to formulate budget and debt policy strategies. The qualitative data both supported the quantitative data findings and supplemented additional information and context not exposed through the assessment of economic and fiscal variables. Ultimately, the mixed-method research design has enabled this research to find crucial quantitative and qualitative limitations to develop a broader understanding of limitations and inaccuracies that impact the influence and value of the GDP-ratio for policy-makers.

This chapter is structured as follows: firstly, section 10.1 reconfirms the significance of the research; secondly, section 10.2 elaborates on the policy-making and theoretical implications of the research findings; thirdly, section 10.3 provides insight into the research limitations; and finally, section 10.4 highlights important areas for future research.

10.1 – Significance of the Research
This research identified a very undeveloped area in the literature on what measurement is best to use within research and policy-making, and as the debt-to-GDP ratio is a very prominent measurement used in international institutional reports and research efforts, this research has addressed the important gap in the literature: the lack of critical examination of the limitations and accuracy of the debt-to-GDP ratio. By examining the limitations and inaccuracies of the GDP-ratio measurement, this research has also been able to address the second gap in the literature: the lack of research determining the level of influence and value the GDP-ratio measurement has for governmental policy-making and institutional analysis and assistance. The research also supplements the highly
positivist, quantitative literature on sovereign debt with a mix-method pragmatic research design to develop a broader conclusion on the research problem and questions. The importance of the mix-method research method has been demonstrated as limitations of the GDP-ratio are not only found within quantitative economic and fiscal variables, but also through qualitative features within a country’s debt portfolios. Additionally, the qualitative data has provided additional contexts that would not have been available by purely focusing on quantitative data and analysis techniques.

The combination of a wide range of limitations and inaccuracies in the debt-to-GDP ratio resulting in the measurement not being universal or static, the recognition of these limitations among policy-makers and economists, the recent development of new country-specific measurements and the low level of influence of the GDP-ratio in policy-making and institutional analysis and assistance, underlines the importance of this research in supplementing the literature. Overall, this research develops a new scope within the literature, and has both theoretical and practical implications that may promote a wide range of future research efforts. This research has the ability to spark debates regarding what caused the inaccuracies on the debt-ratio in Greece after 2009 and the impact of globalisation on the debt-to-GDP ratio after the changes in the statistical calculation framework in 2014, highlighted in Chapter 5, section 5.2.1 (p. 96) on Ireland, and ultimately, highlights the need for future research on how to best measure sovereign debt for economies with different needs to effectively assist policy-makers.

10.2 – Practical Implications of the Research Finding
As this research demonstrates that there are country-specific economic and fiscal features, and debt portfolio aspects resulting in the debt-to-GDP ratio not being universal and static, there are implications for policy-making and for research that utilise the measurement to develop generalised analyses and conclusions across different countries.

10.2.1 – Policy-Making Implications
In terms of practical impact, this research provides increased knowledge of country-specific limitations and inaccuracies in the debt-to-GDP ratios, and highlights the fact that it is not universal can greatly impact the approach to standardised regional GDP-
ratio denominated guidelines. By demonstrating the need to consider country-specific fiscal and economic features and qualitative features of debt portfolios, this research can influence the development of more appropriate fiscal and debt guidelines for different economies within the EU’s SGP. This could be achieved by grouping countries with similar features together and propose different debt ceilings and fiscal guidelines for the different country groups to promote increased fiscal and debt sustainability within the monetary union.

The combination of governments recognising the limitations of the GDP-ratio for policy-making purposes and the development of country-specific measurements by high-debt economies to improve their ability to correctly assess debt sustainability, shows that governments take actions to counteract the inaccuracies of the GDP-ratio measurement. This confirms this research’s argument that governments cannot rely on theoretical conclusions and regional guidelines and have to make specific policy-targets based on their unique economic and fiscal situations. Moreover, governments could benefit from monitoring taxation revenue growth in comparison to nominal GDP to confirm the repayment capacities behind the debt-to-GDP ratio levels over time. Monitoring the quality of assets to analyse the reliability of non-taxation revenue flows may also increase the ability of governments to take corrective actions to safeguard future repayment capacities.

10.2.2 – Theoretical Implications
Elmendorf and Mankiw (1999) argued that the beneficial effects of sovereign debt were highly dependent on the amount, composition and duration of the additional debt, and that the positive effects of debt were more prominent in the short-term compared to if debt accumulates in the long-term. This research supplements this argument by highlighting the implications of what debt finances on economic growth, which links the Keynes (1980) research argument on productive debt and the presence of Barro’s (1979) “taxation smoothing” theory within economies. Additionally, the distortion effect within the GDP-ratio may strengthen or weaken the impact of debt levels on economic growth during and after financial crises. If Barro’s (1979) “taxation smoothing” theory explains debt elevations due to elevated expenditure levels during financial crises, which increases the debt-ratio due to the decrease in nominal GDP and the increase in debt, the debt-ratio will have a greater ability to dilute during succeeding economic expansion
periods as expenditure decrease and nominal GDP grows, effectively decreasing the debt-ratio. The dilution effect can, therefore, lower the impact on economic growth arising from short-term debt-level increases. With a balanced or surplus budget during economic expansions, economies would have a greater ability to use debt for productive purposes as argued by Keynes (1980), which this research argues can reinforce the dilution effect within the debt-ratio due to a more significant impact on economic growth, taxation revenues and potentially increasing government assets.

On the other hand, if Barro’s (1979) “taxation smoothing” theory is not evident in an economy due to high budget deficits during periods of high economic growth, the debt increases are most likely to be unproductive as there is a higher likelihood of it financing government operation expenditures (Keynes, 1980) and debt will accumulate over time. Moreover, if debt finances long-term consumption-focused expansionary policies, it could lead to unsustainable inflation of nominal GDP and distort the debt-ratio by creating stable trends. However, as budget deficits are likely to increase during a financial crisis and put pressure on unsustainable consumption policies, the nominal GDP decrease could be intensified, which again can escalate the debt-to-GDP ratio. This situation could then decrease the ability of the government to take advantage of the dilution effect within the debt-ratio during economic extensions, and impact economic growth to a larger extent. Therefore, the objective of government borrowing and the distortion effects within the debt-ratio can be an underlying reason for there to be different impacts arising for short-term and long-terms debt increases on economic growth.

This research also has implications for the research efforts by Reinhart and Rogoff (2010), Baum et al. (2013), Cecchetti et al. (2011), among others, that attempt to determine the debt- to-GDP ratio threshold where high debt impacts economic growth. Firstly, they would also need to consider what debt finances, as different objectives behind government borrowing can have different impacts on economic growth and result in different GDP-ratio levels where debt negatively impacts economic growth. The most important findings, however, are the distortion effect within the debt-to-GDP ratio due to the relative growth rates in nominal debt and GDP, the impact on economic growth arising from the differences in economic structure, and the fluctuations in commodity prices and demand for economies’ export products, that can reinforce the
distortion effects within the debt-to-GDP ratio due to different vulnerabilities within economies’ growth rates. Based on these findings, this research raises a couple of questions: can a measurement that is a ratio between debt and GDP effectively portray how debt impacts the GDP growth rate? And can research that uses the GDP-ratio distinguish whether an increase in the debt-ratio is due to an actual increase in debt or a decrease in the nominal GDP, for example, related to economic recession or a decrease in commodity prices and demands? Although not having affirmative answers to these questions, this research highlights that the different economies’ features highlighted above in combination with the notion that the GDP-ratio is not universal across countries would significantly decrease the value of generalised research efforts attempting to determine a common threshold level across economies, as economies would have different threshold levels where debt can impact growth.

Although this research does not cover all factors that can impact economic growth, the findings provide support to Greiner’s (2012) arguments that the relationship between debt and economic growth is non-linear and depends on rigidities within the economy. These findings also support Panizza and Presbitero’s (2013) argument that the lack of consensus within the literature on the threshold between debt and growth is connected to other underlying factors impacting economic growth. This research supplements their arguments by asserting that the limitations of the debt-to-GDP ratio can be underlying reasons for the lack of threshold consensus, and the notion that the GDP-ratio is not universal is a key reason why research should not attempt to develop general GDP-ratio thresholds for different economies.

This research also has implications for the research by Mendoza and Ostry (2007) and Ghosh et al. (2011) that examined the impact of debt levels on the primary surplus responsiveness using the debt-to-GDP ratio and determining thresholds where debt impacts primary surplus. These research efforts should consider the variations in levels of government assets and non-taxation revenues, the comparative growth rates of taxation revenues and nominal GDP and the maturity and interest-rate composition of the debt to more accurately determine at what GDP-ratio threshold debt jeopardises the fiscal balance. These features could ultimately result in different primary surplus dynamics underlying debt-to-GDP ratio levels, and as the GDP-ratio is not universal, the debt-to-GDP ratio threshold conclusions would potentially vary among economies.
These country-specific revenue flows and trends, and asset levels, could also result in differences in the optimal debt levels denominated in GDP, resulting in variations within the research findings by Mendoza and Ostry (2007) and Checherita-Westphal et al. (2014).

Due to the identified limitations and inaccuracies of the debt-to-GDP ratio by governments, which decrease the influence, reliance and value of the debt-to-GDP ratio measurement, there is a clear disconnect between the highly GDP-ratio-focused theories and policy-making. Additionally, the fact that the GDP-ratio is not universal impacts the value of theoretical contributions denominated in the GDP-ratio within policy-making. Therefore, by more carefully categorising countries by taking into account country-specific features and qualitative debt portfolio aspects, research can appeal more to specific country groups to assist policy-making to a greater extent, as governments may recognise the increased relevance for their specific situations.

10.3 – Research Limitations

This research has encountered some quantitative data limitations. For Greece, there were data limitations as government expenditure-ratios were not reported between 1995 and 2006; nonetheless, as the research collected total revenue-ratios for the entire time sample, as well as the data on net-borrowing levels, the research was able to indicate the relative fluctuations in expenditure ratios. Additionally, there were data limitations in monetary debt levels for Norway and Australia; nonetheless, as highlighted in Chapter 6 in section 6.1.2 (p. 110) and Chapter 7 in section 7.1.2 (p. 132), the research undertook calculations to develop the necessary data based on the collected nominal GDP and debt-ratio levels from the OECD Database and Statistics (2017).

As the research focuses on a timeframe between 1995 and 2015, there was a relatively short time frame after the GFC that was covered by this research. Some of the economies had not fully recovered in terms of economic growth rates, net-borrowing levels, including the ability to lower expenditure levels and regain taxation growth, and the debt levels. Therefore, this research did not have the capability to assess the full extent of the distortion effect of the debt-ratio within the post-GFC period. Additionally, this research has not been able to determine the long-term impact of the GFC on taxation revenue levels. As the GFC resulted in decreasing taxation revenue levels, and
increased disparities between taxation revenue and nominal GDP growth rates, the time frame does not allow the assessment of governments’ ability to close the gap in the growth rates over time and improve taxation revenue levels.

This research undertook a critical examination of the debt-to-GDP ratio and found country-specific fiscal and economic features and qualitative debt portfolio aspects that impact the universal and static aspects of debt-to-GDP. Nonetheless, it does not determine the relative importance or specific extent of the effects of the features on the accuracy of the GDP-ratio or what the optimal debt-to-GDP ratio levels of countries should be. This is due to the qualitative analysis methods utilised, and to specify the relative impacts and importance of the features on the sustainability of debt-ratio levels in different economies, quantitative and statistical methods are needed.

The purpose and objective of this research was not to directly test other research efforts’ findings, which would require additional data sets. Due to the focus on total revenue and expenditure as GDP-ratios, which includes debt interest-rate payments, this research does not have the ability to directly examine the impact of high debt on primary surplus responsiveness as researched by Ghosh et al. (2011), as well as Mendoza and Ostry (2007) and Checherita-Westphal et al. (2014) determining the optimal debt-ratio level for fiscal sustainability, as it would require this research to include additional expenditure data that excludes interest-rate payments. The use of revenue- and expenditure-ratios also decreases the capability of this research to assess relative budget adjustments made to address budget deficits as investigated by Bohn (1991). This is due to the distortions linked to fluctuating nominal GDP levels, which impact the ratio-levels regardless of changing monetary expenditure and revenue levels. Therefore, GDP-ratio data is limited and inconclusive when judging governments’ efforts to decrease budget deficits.

10.4 – Future Research
There are several future research areas discovered by this research beyond the importance of categorising countries based on the economic and fiscal features and debt portfolio aspects to investigate different GDP-ratio thresholds where debt negatively impacts economic growth and primary surplus responsiveness, as highlighted in section 10.2.1.
Future research could supplement this research by determining the relative importance and impact of the different economic and fiscal features and debt portfolio aspects on the debt-ratio levels different economies can sustain. As highlighted in Chapter 9 section 9.1.3 (pp. 188-189), this research found country-specific revenue flows and trends that could result in differences in the optimal debt-to-GDP level for fiscal flexibility and sustainability among economies. Nonetheless, the expenditure and net-borrowing levels are crucial to be able to determine the optimal debt level of different economies. Therefore, future research could examine how to best determine optimal debt levels, for example, by assessing expenditure growth trends in comparison to nominal GDP and in relation to taxation revenue growth. By developing a framework, future research may be able to more accurately determine the optimal debt-to-GDP ratio levels for different country groups and assist economies in debt strategy development.

Upcoming research could also examine the extent of the impact of globalisation on different countries’ GDP due to the change in the statistical calculation framework of the GDP in 2014. More specifically, research could examine the impact on the relative growth rates in GDP, national production, GNI and government taxation revenues within economies with large MNC sectors, to address questions such as: how do large MNS sectors with large proportions of IP assets and outsourced production impact a nation’s GDP and debt sustainability? And how does MNC play a role in the debt-to-GDP ratio trends within economies if, or when, they relocate their operations to new countries?

Another interesting area that could be elaborated on based on the distortion effect within the debt-to-GDP ratio found in this research, is how the GDP denominated measurement is potentially used by the government and/or media leading up to elections. This could expose the influence of the GDP-ratio measurement on the public perception of debt and expenditure levels and trends, and in this way complement Buchanan and Wagner’s (1977) concept of “fiscal illusion” by highlighting potential strategic use of the measurement to promote expansionary fiscal policies and re-elections.
Appendix 1

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To Whom It May Concern

Human Research Ethics Approval
“The Limitations of the GDP-Ratio Measurement of Sovereign Debt
and its Influence on Policy-Making”
(Ref: 2016/919)

I am pleased to advise that this research has approval to commence from the Griffith University
Human Research Ethics Committee, a committee established and operating in accordance with
the standards and principles of the Australian National Statement on Ethical Conduct in Human
Research (2007) and Griffith University policy.

The decision to approve is dated 10 January 2017 and covers the period 10 January 2017 to
1 June 2018.

For any queries regarding this ethical approval please contact the Committee Secretary on tel:
07 3735 4375 or research-ethics@griffith.edu.au.

Yours sincerely,

Dr Amanda Fernie
Secretary to the Griffith University
Human Research Ethics Committee and
Manager, Research Ethics and Integrity
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25 June 2018
Appendix 2

RESEARCH PROJECT INFORMATION SHEET

The Limitations of the GDP-Ratio Measurement of Sovereign Debt and Its Influence on Policy-Making

Research Team

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Why is the Research Being Conducted?
The research project is conducted as a component of the student’s, Victoria Rummelhoff, academic program at Griffith University.

Research Objectives
The main objective of the research is to facilitate critical in-depth investigation of the limitations of the Gross Domestic Product (GDP)-ratio measurement of sovereign debt, and its influence within governmental policy-making. The purpose is to provide new knowledge about the debt-to-GDP ratio’s potential level of impact on debt policy decisions within national policy-making, in comparison to its prominence within the literature, and regional and international institutional guidelines. Consequently, the research aims to extend the scope of the current literature by gaining insight into potential differences in the use of the debt measurement within literature, institutions and the government policy-making. In practical terms, the research aims to supply new knowledge with the goal of encouraging effective coordination of the debt-measurement used within sovereign debt policy-making in different sectors to promote sustainable sovereign debt guidelines, advice and overall debt levels.

Your Role in the Research
By participating in the research you will assist in the collection of qualitative data and information of how governments, regional and/or international institutions use of the debt-to-GDP ratio to guide debt policy strategies and guidelines.
The semi-structured interviews will be conducted either face-to-face, over phone or Skype depending on your preference and/or convenience. The interview consists of about 15 questions, and is expected to take up to 30 minutes. The questions will be a combination of open and close-ended questions to allow for a wide range of information, including specific and unknown data. Due to your position within the National government, or institutions such as the Parliamentary Budget Office (PBO), International Monetary Fund (IMF) or the World Bank, you will be asked a series of questions relating to your experience, involvement in policy-making/advice, and the potential use of the GDP-ratio in institutional guidelines and governmental budget and sovereign debt policy advice.

**Expected Benefits of the Research**

The research has the potential to have great significance and importance within sovereign debt literature and theory, as well as contribute to future research aiming to improve the sovereign debt measurement within institutional guidelines and policy-strategies for greater debt sustainability in the future.

**Audio-Recording, Confidentiality, Privacy and Risks**

We hope to audio-record the interview, and the recordings will be transcribed to ensure the accuracy of the data collected. The transcripts will be analysed through qualitative methods of content analysis of your descriptions and information provided. The research considers the data collected through the interviews to be of low risk for you and do not contain sensitive personal or public information. The conduct of this research involves the collection, access and/or use of your identified personal information. Your identified personal information, including name and professional role/position may appear in the publications/reports arising from this research. This is occurring with your consent. Any additional personal information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded, except where you have consented otherwise. For further information consult the University’s Privacy Plan at http://www.griffith.edu.au/about-griffith/governance/plans-publications/griffith-university-privacy-plan, or telephone (+61)(07) 3735 5585.

We recognises that you may prefer to review potential quotes before publications, and the research team is prepared to facilitate this on requests. We provide the option of no audio-recordings and/or anonymity if you request this. This will be optional within the informed consent form through separate tick-boxes, where you can opt out of these aspects by not ticking the boxes. The de-identification of your personal details will include name, country, work position or affiliated institution, and will be coded to avoid third party recognition.

**Data Access, Storage and Distribution**

Regarding who has access to the interviews recordings the research team underlines that these are made for transcription purposes; therefore, access will be limited to the research team. The interview recordings will be destroyed after being transcribed. The research team does not identify any wider users of data collected; however, a de-identified copy of your interview transcript may be used for other research purposes similar to this research.

In terms of data storage, the Griffith University guideline stipulates that the research will have to be retained over a minimal period of five years from the release of findings,
unless contractual agreements state otherwise. This will include the questionnaires and the transcripts made from the interviews. The qualitative data will be stored for the duration on university property in a locked filing cabinet. The research data will be stored electronically on a password protected university computer. The research offers you the distribution of appropriate summary of the results and/or an electronic version of the finalised thesis. This will be made available in a timely manner.

**Your Participation is Voluntary**
The participation in the research is voluntary, however, greatly appreciated by the research team. You can withdraw from the research project at any time, without any explanation or penalties.

If you have any further questions about the research or the research questions, please do not hesitate to contact Victoria Rummelhoff on email v.rummelhoff@griffith.edu.au to gain further information before completing the consent form.

**Ethical Conduct of This Research**
Griffith University conducts research in accordance with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the ethical conduct of this research project, you are encouraged to contact the Manager, Research Ethics on +61 7 3735 4375 or research-ethics@griffith.edu.au.

Kind Regards,
Victoria Rummelhoff and the research team

*Griffith University Australia, Griffith Business School, Department of International Business and Asian Studies* - Griffith University Ethics Ref/no: 2016/919.
Appendix 3

CONSENT FORM

The Limitations of the GDP-Ratio Measurement of Sovereign Debt and Its Influence on Policy-Making

Research Team

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Contact Phone: (+61) (0) 414944016
Contact Email: v.rummelhoff@griffith.edu.au

By signing below, I confirm that I have read and understood the information package and in particular have noted that:

- I understand that my involvement in this research will include the participation in a semi-constructed interview over phone or via Skype;

- I have had any questions answered to my satisfaction;

- I understand the risks involved;

- I understand that there will be no direct benefit to me from my participation in this research;

- I understand that my participation in this research is voluntary;

- I understand that if I have any additional questions I can contact the research team;

- I understand that I am free to withdraw at any time, without explanation or penalty;
I understand that I can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on (+61) 3735 4375 (or research-ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project.

☐ I agree to participate in the project.

☐ I agree to be audio-recorded for transcription purposes.

☐ I agree for my identity (name, professional role) to be disclosed in any output related to this research.

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<thead>
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<th>Name</th>
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<tbody>
<tr>
<td>Signature</td>
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Griffith University Australia, Griffith Business School, Department of International Business and Asian Studies - Griffith University Ethics Ref/no: 2016/919
Appendix 4

The Limitations of the GDP-ratio Measurement of Sovereign Debt and Its Influence on Policy-Making

Interview Questions

Question 1 – Consent related questions if signed consent form has not been received before the interview.
Answer:

Question 2 - What is your level of education and area of expertise?
Answer:

Question 3 - What are your current work position and key responsibilities?
Answer:

Question 4 - What measurements of sovereign debt play an important role in monitoring, reporting, analysis and policy-making within the World Bank?
Answer:

Question 5 - How valuable is the debt-to-GDP ratio in regard to understanding debt trends, vulnerabilities of high debt levels and debt sustainability from an institutional perspective?
Answer:

Question 6 – How valuable is the sovereign debt-to-GDP ratio as a measurement to inform and guide governmental policy-making regarding sovereign debt levels and trends?
Answer:

Question 7 - To what extent does the monetary value of sovereign debt play a role in debt analysis, advise and strategies?
Answer:

Question 8 – How important is the government’s financial accounts and fiscal balance/sustainability for debt analysis and advice within the World Bank?
Answer:
Question 9 – Are there any positive and/or negative aspects of the debt-to-GDP ratio (or other important debt measurements) identified among analysts, advisors or policymakers within the World Bank?
Potential follow-up question: How do these aspects impact the use of the GDP-ratio in policy advice and decisions?

Answer:

Question 10- Are there any new sovereign debt measurements being discussed, and/or developed?

Answer:

Question 11 – Would you like to include information that has not been highlighted through the questions in this interview/questionnaire?

Answer:

Question 12 - Do you know of potential valuable participates that may be interested in participating in this research project?

Answer:

Question 13 - Would you be interested in an electronic copy of the finalised thesis?

Answer:

If you have any enquiries regarding the interview questions, please email Victoria Rummelhoff on v.rummelhoff@griffith.edu.au and I will be more than happy to answer your questions.

On behalf of the research team, and myself, I would like to greatly thank you for your participation in this interview.

Best regards,
Victoria Rummelhoff

Griffith University Australia, Griffith Business School; Department of International Business and Asian Studies.
Appendix 5

List of Interviewees

Greece
Date of interview: 5. October 2017, 9.30am (Athens time)
The participant wanted to remain anonymous, including name and position.
Interviewee code: G1
Ministry of Finance: Public Debt Management Agency (PDMA)

Questionnaire Participant
Questionnaire return over email on the 9. March 2018
Participant code: G2
The participant wanted to remain anonymous, including name and position.
Parliamentary Budget Office (PBO) Greece

Ireland
Date of interview: 23 July 2017, 12.30 pm (Irish time)
Name: John McCarthy
Interviewee code I1
Position: Ministry of Finance, Chief Economist

Date of interview: 18. February 2018, 12.00 pm (Irish time)
Interviewee code: I2
The participant wanted to remain anonymous, including name and position.
National Treasury Management Agency (NTMA)

Norway
Date of interview: 25. August 2017, 9.00 am (Norwegian time)
(Group interview with three participants).
The participants wanted to remain anonymous, including names and position.
Interviewee codes: N1, N2 and N3.
Ministry of Finance: 2 participants from the Economic Policy Department (N1 and N2)
and 1 participant from the Asset Management Department (N3)

Australia
Date of interview: 23. August 2017 3.00 pm (Australian time)
The participant wanted to remain anonymous, including name and position.
Interviewee code: A1
Parliamentary Budget Officer at the PBO, Australia

Date of interview: 28. September 2017, 3.00 pm (Australian time).
The participant wanted to remain anonymous, including name and position.
Interviewee code: A2
The Australian Treasury
International Organisations

**World Bank:**
Date of interview: 24. October 2017, 4.00 pm (Washington time)
Name: Mr Coskun Cangoz
Interviewee code: WB
Position: Head of Debt and Risk Management

**UN:**
Date of interview: 23. November 2017, 10.00 am (Geneva time)
Name: Mr Patrick Osakwe
Interviewee code: UN
Position: Chief of the Trade and Poverty Branch, the UN Conference of Trade and Development.

**IMF:**
Date of interview: 20. February 2018, 3.30 pm (Washington time)
The participant wanted to remain anonymous, including name and position.
Interviewee code: IMF
Fiscal Affairs Department
References List


References:


