

Debt dynamics in Belgium: towards Maastricht convergence

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Abstract

The worsening fiscal positions, in some cases even leading to a fiscal crisis, in both developed and developing countries brought the issues of debt and fiscal sustainability to the fore of the public policy debate. Debt dynamics are a key determinant of a country's macroeconomic environment and investment climate. This paper introduces an accounting framework to study the evolution of public debt. Subsequently, this framework is applied to analyze the main determinants of the debt-to-GDP ratio of Belgium for the period 1995-2014. The framework underscores the importance of the debt composition, management and structure, the exchange rate and the fiscal stance for debt dynamics, all impacting fiscal vulnerability. We divide our analysis in three parts: i) the years before the introduction of a single currency in the eurozone; ii) the subsequent years, up to 2007 when the Global Financial Crisis (GFC) broke out; and iii) the period from 2008 to 2014.

The results show that: (i) Belgium succeeded in quite drastically reducing its public debt in the run-up to joining the eurozone, and was able to continue doing so up until the Global Financial Crisis (GFC) struck in 2007-2008. This was chiefly accomplished by running large primary surpluses. Moreover, it was aided by a benign economic environment, i.e. relatively high real GDP growth; (ii) the bail-out of the financial sector in 2008 caused public debt to soar. Subsequently, anemic growth in combination with the cost of servicing an already high stock of debt, resulted in the debt-to-GDP ratio steadily creeping up. Primary deficits only played a minor role in the increase of debt, especially given the severity of the GFC.

Keywords: Public Debt, Government Debt, Debt Accounting, Growth, Fiscal Policy.

1. Introduction

The period ranging from the mid-1980s to the mid-2000's was, both in the US and in Europe, characterized by a substantial decline in macroeconomic volatility, which pundits and academics alike referred to as the Great Moderation (e.g. Bernanke (2004) and Gali & Gambetti (2008)). In an environment of strong growth and low inflation, topics such as fiscal sustainability and debt management reduced in importance for policy makers. This radically altered when the Global Financial Crisis (GFC) struck in 2007-2008. It became painfully clear that the pattern of taxing and spending in several countries could not be pursued indefinitely. Hence, the GFC, which originated in the US and was caused by a pernicious combination of dubious lending practices and highly complex and opaque financial products, morphed into a full blown sovereign debt crisis in Europa.

There is no conclusive evidence that high public debt automatically results into lower growth (e.g. Panizza & Presbitero (2014)), nor that there is critical debt-to-GDP ratio after which medium-term economic performance significantly worsens (e.g. Vanlaer, Vereeck, Marneffe, Van Overtveldt (2015)). Nevertheless, elevated levels of public debt have the potential to destabilize an economy. When the private sector starts questioning the fiscal sustainability of a country's macroeconomic policy, it might reassess its spending decisions, pulling back on investment and consumption, as it expects a higher level of taxation in the future (Barro, 1996). This drop in private sector expenditure further reduces growth and consequently increases default risk. Consequently, higher bond yields raise debt servicing cost, potentially to an unsustainable level.

Higher interest rates on government borrowing can also spill over to the private sector, resulting in a crowding out effect (Elmendorf & Mankiw (1999)). This mechanism works as follows. Increasing debt is the result of ongoing deficits, which is tantamount to reduced public saving. When this reduction is not offset by increased private saving and/or capital inflows, the funds available for investment become more scarce, inducing higher interest rates for the whole

economy. It follows that private investment is crowded out, and the capital stock and economic output decline (Traum & Yang (2015)).

Even if the possibility of crowding out is low, for example due to interest rates being stuck at the Effective Lower Bound (ELB), it might be prudent not to let public debt spiral out of control. Governments in the developed world are confronted with a rapidly aging population and the associated surge in entitlement spending. Sound public finances are essential in dealing with the challenges this entails (e.g. Ihuri, Kato, Kawade, & Bessho (2006)).

Low to moderate levels of public debt are also sensible from a precautionary motive. As the recent GFC has shown, a severe crisis almost mechanically increases the debt-to-GDP ratio, due to its impact on economic output. If debt levels are already elevated going into the crisis, fiscal space to counter the negative effects of a recession is limited, potentially resulting in years of sub-par growth. Countercyclical fiscal policy requires some budgetary leeway (e.g. Lane (2012)).

In a world awash with debt, the question of how to lower government debt levels to a more manageable level has come to take center stage (e.g. Aizenman & Marion (2014) and Mauro (2011)). The Fiscal Compact, which came into force into 2013, requires EU countries which have public debt of over 60% relative to GDP, to reduce the debt in excess of this reference level at an average rate of 5% per annum (Council of the European Union, 2012). In a subsequent edition of its Fiscal Monitor (2013), the IMF projected the required pace of consolidation for several highly indebted European countries. A country like Greece, for example, would require an average primary surplus of 7.2% in the decade 2020-2030 for its obligations to first stabilize and then evolve to the 60% target, a feat which several prominent economists deem very unlikely (e.g. Eichengreen & Panizza (2014)).

However, some countries did manage to produce such a drastic reduction in its debt ratio. Belgium, for example, succeeded in lowering its public debt-to-GDP ratio from a high of

130.7% in 1995 to 86.9% in 2007. In this paper, we take an in-depth look into this particular case. More specifically, through an accounting framework, we assess the main determinants of the debt-to-GDP ratio of Belgium for the period 1995-2014. The framework underscores the importance of the debt composition, management and structure, the exchange rate and the fiscal stance for debt dynamics, all impacting fiscal vulnerability. This study focuses on three distinct periods: i) the years prior to the entering the monetary union, starting from 1995; ii) the ensuing years up to 2007 when the Global Financial Crisis broke out; and iii) the period from 2008-2014. Three episodes marked by policy adjustments and substantial macroeconomic developments.

The rest of the paper is organized as follows. In section 2, we review the literature on debt dynamics. Section 3 introduces the framework we constructed for studying debt dynamics, and describes the data used in our analysis. In section 4, we apply this framework to Belgium for the period 1995-2014. Section 5 draws policy lessons for a heavily indebted country which might benefit from a similar evolution in debt as Belgium did over the period under consideration: Greece. Finally, section 6 presents the conclusions.

2. Review of literature

Only a limited number of papers focus specifically on the main drivers of the evolution of public debt-to-GDP through a formal framework. Additionally, there are different strands of literature which touch upon distinct aspects of debt dynamics, all of which we draw from in our analysis. These can be grouped into two broad categories: i) the effect of one specific factor (e.g. fiscal consolidation or interest rate developments) on the evolution of the public debt-to-GDP ratio; and ii) the politico-economic determinants (e.g. ideology of the ruling party) of public debt. We first discuss those papers which do utilize a formal framework to assess public debt dynamics.

Budina & Fies (2005) analyze 31 market access countries (MACs) to gain a better understanding of public debt dynamics in these countries over the period 1990-2002. They establish an accounting framework which deconstructs evolutions in the ratio of public debt-to-GDP into changes in the primary balance, GDP growth, interest rates, foreign currency movements impacting debt issued in these currencies and one-off events such as bank bailouts or privatizations. Their findings suggest that in episodes of large reductions in debt-to-GDP, fiscal consolidation was a key component of credible debt reduction. They also find that declines in public debt ratios were determined by growth and appreciation effects.

Anaya & Pienkowski (2015) construct a single unified framework to explore how the main drivers of sovereign debt dynamics, i.e. the primary balance, the interest rate, growth and inflation, interact with each other. They conclude from their research that some interactions, such as an interest rate shock – especially in a country with unconstrained monetary policy, act as a stabilizer of debt dynamics, whilst others (e.g. a growth shock), intensify the effect of debt accumulation.

Cherif & Hasanov (2012) provide an empirical framework to study debt dynamics in the United States, focusing on the impact of improving the primary balance, i.e. austerity, inflation and growth shocks on public debt. They find that a positive growth shock reduces the public debt-to-GDP ratio categorically, an inflation shock only does so for a few quarters and an austerity shock does not have a statistically significant impact.

Casadio, Paradiso & Rao (2012) analyze the public debt dynamics for Italy. The authors apply different scenarios for both endogenous variables, e.g. Italian real GDP growth and the primary balance, and exogenous variables, e.g. the US growth rate and evolutions in the oil price. They predict that a reduction of the debt ratio to 100% of GDP over a ten year horizon is feasible.

Abbas, Akitoby, Andritzky, Berger, Komatsuzaki & Tyson (2014) study 26 large debt-reduction episodes in 20 advanced economies over the period 1980 to 2013. Strong growth and fiscal consolidation were the main drivers behind these debt reduction efforts. As fiscal policy tightened, strong external demand and loose monetary policy supported output growth.

A large body of literature is devoted to one specific factor impacting the evolution of public debt. The role of the fiscal multiplier, especially in crisis times, has received special attention, following a recent analysis from Blanchard & Leigh (2013). They find that during the GFC, stronger fiscal consolidation is correlated with lower growth than expected and thus higher debt levels relative to GDP than first anticipated. This is corroborated by Corsetti, Meier & Müller, (2012), which finds that output and consumption multipliers are very high during a financial crisis. Auerbach & Gorodnichenko (2012) also show that multipliers of government purchases are larger in a recession.

Denes, Eggertsson & Gilbukh (2013) analyze debt dynamics in an idiosyncratic environment, which is nevertheless very relevant today, i.e. when short-term nominal interest rates approach zero. Their main finding is that, when interest rates are at, or close to, the Zero Lower Bound (ZLB) improving the primary balance, by raising taxes or cutting spending, counterintuitively increases the budget deficit, rather than reducing it and thus raises the debt burden. The reduction in spending or the increase in taxes, slashes output and hence cuts growth by more than the savings caused by the tax increase or spending cut.

Escolano, Kolerus & Ngouana (2014) focus specifically on emerging markets (EMs). They find that an increase in US bond yields causes public debt in EMs to rise by around 4.5 percentage points, relative to GDP. Tighter financial conditions globally impact these countries negatively due to an increasing interest rate-growth differential.

A number of papers explore the determinants of debt from a political or politico-economic perspective. A seminal paper by Roubini & Sachs (1989) suggests that countries which are

defined by a short government tenure and a dispersed governing coalition, on average, run larger fiscal deficits and hence accumulate debt more rapidly. Looking at 298 Flemish municipalities, Ashworth, Geys & Heyndels (2005) show that the number of parties in a coalition positively impacts debt levels. Neck & Getzner (2001) find little empirical evidence to support the claim that the ideology of the ruling party, the form of government or the political business cycle are important drivers of the growth of public debt in Austria over the period 1960 to 1999. Roubini (1991) concludes that increasing political instability in developing countries leads to larger budget deficits and increasing debt. Woo (2003) finds that, both for developed and developing countries, financial depth, income inequality and cabinet size are statistically significant determinants of public deficits.

Our study attempts to further the literature by formalizing an accounting framework to study public debt dynamics. We apply this framework to a specific country, i.e. Belgium. Subsequently, we draw policy lessons for countries which are currently in a similar situation as Belgium was in the mid-1990s (e.g. Greece).

3. Methodology and data

3.1. Methodology

The following section provides the description of the methodology for decomposing the debt dynamics and determinants. We follow Budina and Fiess' (2005) approach for accounting for the decomposition of debt dynamics, linking the changes in debt-to-GDP ratios in Belgium with policy, structural factors and the macroeconomic context. The analysis breaks down the changes in the debt ratio into components such as real growth, primary fiscal deficits, and appreciation/depreciation effects on foreign currency denominated debt. Under this framework, other factors affecting changes in the debt-to-GDP ratios are debt relief, privatization, and fiscal costs related to contingent liabilities from bank sector bailouts, and bailouts of publicly owned

enterprises. In line with Escolano (2010), the underlying equation for the evolution of public debt is:

$$D_t = (PD_t - NDFS_t) + D_{d,t-1}(1 + i_d) + e_t D_{f,t-1}(1 + i_f)$$

where D_t is the total stock of debt at time t . The debt stock is composed of debt denominated in both domestic as well as foreign currencies. Domestic-currency debt ($D_{d,t-1}$) evolves according to the interest rate in the market (i_d), while the evolution of the foreign-currency debt ($D_{f,t-1}$)², expressed in domestic currency, is affected not just by the foreign interest rate (i_f) but also by changes in the exchange rate (e_t). The increase in the stock of government debt is determined by, on the one hand the interest rate on the accumulated debt (D_{t-1}), and on the other hand the difference between the primary deficit (PD_t) and non-debt financing sources ($NDFS_t$).

Dividing both sides by $GDP_t = GDP_{t-1}(1 + g)(1 + \pi)$, with the lower case variables expressed in upper-case variables as a proportion of GDP,

$$d_t = (pd_t - ndfs_t) + \frac{D_{d,t-1}(1 + i_d)}{GDP_{t-1}(1 + g)(1 + \pi)} + \frac{D_{f,t-1}e_{t-1}(1 + i_f)e_t}{GDP_{t-1}(1 + g)(1 + \pi)e_{t-1}}$$

or,

$$d_t = (pd_t - ndfs_t) + d_{d,t-1} \frac{(1 + i_d)}{(1 + g)(1 + \pi)} + d_{f,t-1} \frac{(1 + i_f)(1 + s_t)}{(1 + g)(1 + \pi)} \quad (1)$$

$$d_t = (pd_t - ndfs_t) + (1 - \alpha) d_{t-1} \frac{(1 + i_d)}{(1 + g)(1 + \pi)} + \alpha d_{t-1} \frac{(1 + i_f)(1 + s_t)}{(1 + g)(1 + \pi)}$$

Where α is the share of foreign currency denominated debt in total public debt ($\alpha = \frac{d_{f,t-1}}{d_{t-1}}$)

$$d_t = (pd_t - ndfs_t) + \frac{d_{t-1}}{(1 + g)(1 + \pi)} [(1 - \alpha)(1 + i_d) + \alpha(1 + i_f)(1 + s_t)] \quad (2)$$

² It is impossible for the National Bank of Belgium to split up the holdings of government debt per holder (i.e. domestic vs. external) AND subsequently per currency. It is only possible per holder OR per currency. Hence, we have made the following assumptions: i) all foreign currency debt is external debt (i.e. external debt could be issued in euro and in foreign currency); and ii) all domestic debt is issued in euro.

Define $\hat{i} = (1 - \alpha)i_d + \alpha i_f(1 + s_t)$ as the average nominal interest rate on public debt, and equation (2) can be rewritten as

$$d_t = (pd_t - ndfs_t) + \frac{d_{t-1}}{(1+g)(1+\pi)} [\hat{i} + 1 + \alpha s_t], \quad (3)$$

The average nominal interest rate, \hat{i} , is calculated as the ratio of interest payments on debt divided by the previous period stock of public debt.

Subtracting d_{t-1} from both sides of equation (3) yields

$$\Delta d_t = (pd_t - ndfs_t) + \frac{\hat{i}}{(1+g)(1+\pi)} d_{t-1} - \frac{g}{(1+g)} d_{t-1} + \frac{\alpha s_t - \pi}{(1+g)(1+\pi)} d_{t-1} \quad (4)$$

Based on the conversion of nominal change in exchange rate into real terms, $\frac{1}{1+RXR} =$

$\frac{(1+s_t)(1+\pi^*)}{1+\pi}$, after some algebra, it is possible to show that the numerator of the last term in

equation (4) is:

$$\alpha s_t - \pi = \alpha \frac{1+\pi}{1+\pi^*} + (1 - \alpha) - \alpha RXR \frac{1+\pi}{(1+RXR)(1+\pi^*)} - (1 + \pi) \quad (5)$$

Substituting (5) into (4) gives the basic accounting framework for public debt decomposition:

$$\Delta d_t = (pd_t - ndfs_t) - \frac{g}{(1+g)} d_{t-1} + \frac{d_{t-1}}{(1+g)} \left[\frac{\hat{i}}{1+\pi} - \frac{\pi}{1+\pi} - \frac{\alpha(\pi^* - \pi)}{(1+\pi)(1+\pi^*)} \right] - \alpha \frac{RXR}{(1+\pi^*)(1+RXR)} \frac{d_{t-1}}{(1+g)} \quad (6)$$

Where,

D_t – total public debt, $d_t = D_t/GDP_t$

D_{dt} – domestic public debt, $d_{dt} = D_{dt}/GDP_t$

D_{ft} – foreign public debt, $d_{ft} = e_t D_{ft}/GDP_t$

PD_t – primary deficit, $pd_t = PD_t/GDP_t$

$NDFS_t$ – non-debt financing sources, $ndfs_t = NDFS_t/GDP_t$

e_t – nominal exchange rate (domestic currency per US dollar)

s_t – changes in the nominal exchange rate: $1 + s_t = \frac{e_t}{e_{t-1}}$, with $s_t > 0$ indicating *nominal* depreciation of the local currency

g – real GDP growth rate

π – domestic inflation (change in the domestic GDP deflator)

π^* – US inflation (change in the US GDP deflator)

i_d – nominal interest rate on domestic debt

i_f – nominal interest rate on foreign debt

RXR – change in bilateral real exchange rate, with $RXR > 0$ indicating *real* exchange rate appreciation defined as $\frac{1}{1+RXR} = \frac{(1+s_t)(1+\pi^*)}{1+\pi}$

α – the share of foreign currency denominated debt in total public debt ($\alpha = \frac{d_{f,t-1}}{d_{t-1}}$)

3.2. Data

All data have been gathered from the National Bank of Belgium (NBB). This accounting exercise can be a useful tool to interpret the public debt determinants in Belgium over the period 1995-2014.

Table A in the Appendix provides the summary statistics for total debt, interest payments, the primary balance and real GDP. In our sample, the average debt-to-GDP ratio is 105.74%, starting from a high of 130.75% in 1995 and reaching a low of 86.84% in 2007. Interest payments, expressed as a percentage of GDP, averaged 5.31% and declined unabatedly from 8.96% at the start of our sample to 3.13% in 2014. Finally, the primary balance has an average of 3.28%. This masks vast differences between the period before and the period after the GFC; until 2007, the primary balance averaged 5.02%, whilst from 2008 onwards it was 0.04%.

Figure B in Appendix breaks down the total stock of debt, in per cent of GDP, into domestic borrowing and external borrowing, where the latter is further divided into foreign currency debt and domestic currency debt. It shows that Belgium steadily increased its reliance on external borrowing, but simultaneously reduced its foreign currency lending, which was already rather limited at the start of our sample. Whereas less than a quarter of its public debt was financed

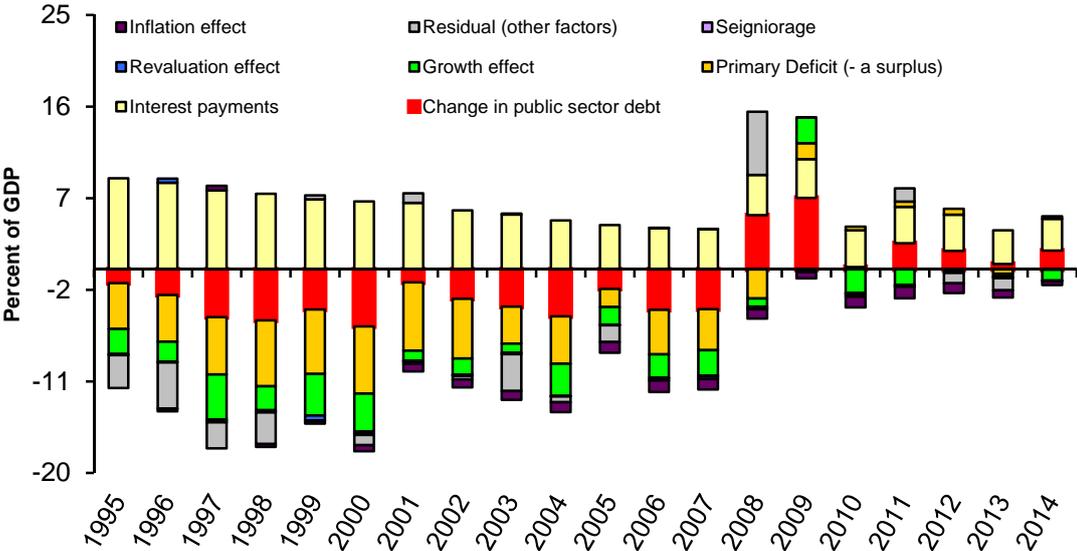
by foreign borrowing in 1995, in 2014 external debt accounted for over 50% of the total stock of debt.

4. Results

Over the period 1995 to 2007, Belgium managed to reduce public debt-to-GDP from 130.7% to 86.9%. Then the GFC hit, which resulted in a rising debt ratio; at the end of 2014, sovereign debt reached 106.9 per cent of GDP. In this section, we took a closer look at what were the primary drivers of the evolution of public debt. We divide our analysis in three parts: i) the years before the introduction of a single currency in the Eurozone, starting from 1995; ii) the subsequent years, up to 2007 when the Global Financial Crisis broke out; and iii) the period from 2008 to 2014. Breaking up the entire period under consideration into these specific episodes allows for studying whether entering a monetary union has had an impact on debt dynamics and how the GFC affected the evolution of public debt.

Figure 1 provides an overview of the evolution of public debt dynamics in Belgium for the period 1995-2015. It tries to link changes in debt-to-GDP ratios to episodes of marked policy change and substantial macroeconomic developments.

Figure 1 - Belgium, debt dynamics, 1995-2014



Source: Authors' calculations

Note: The interpretation of this chart is as follows. The colored segments of each column represent the contribution of each factor in our debt decomposition to the year-on-year change in the debt-to-GDP ratio. Items above the zero line contributed to an increase in the debt-to-GDP ratio, while items below the zero line contribute to a reduction in the debt-to-GDP ratio. As an example, a negative sign for the contribution from real GDP growth in a given year indicates that positive real GDP growth during that year contributed to a reduction in the debt-to-GDP ratio. On the same token, a positive sign for the contribution from real exchange rate changes indicates that a real depreciation increased the debt-to-GDP ratio during that year.

We find that, in the run-up to joining the Eurozone, Belgium succeeded in carrying out considerable fiscal tightening; it had primary surpluses of 4.5 to 6.5 per cent of GDP. In addition, relatively strong growth helped pushed down debt further. This ensured that the public debt-to-GDP ratio was found to have "*sufficiently diminished and [...] approaching the reference value at a satisfactory pace*" as was required by the euro convergence criteria (EMI, 1995).

After entering the monetary union, Belgium continued on its path of fiscal consolidation; the primary balance dipped below 4% in just two years: 2003 (only marginally so) and 2005. Quite high real GDP growth, in combination with modest inflation also helped erode some of the debt. The austerity policy, which was put in place in order to be able to join the eurozone, was essentially maintained unaltered after joining the single currency. Moreover the macroeconomic environment remained quite similar. Belgium was well on its way to reach the public debt-to-GDP target enshrined in the EU treaties.

Then the GFC hit, which caused the uninterrupted series of primary surpluses to turn into, albeit small, primary deficits. It is interesting to note that Belgium never had a primary deficit larger than 1 per cent of GDP, but in one year. At the height of the crisis in 2009, when the economy contracted by 2.6% in real terms, Belgium's primary deficit was 1.6%. This is remarkable, given the severity of the Global Financial Crisis and even more so when you

compare it with the large primary surpluses which were being realized in the preceding periods. Moreover, despite the unfavorable global economic conditions, Belgium did not really experience considerable negative growth. As mentioned above, only in 2009 real GDP growth dipped into negative territory, which is in line with the experience of other core eurozone countries, such as Germany and the Netherlands, where growth - and the primary balance - only in 2009 went sharply negative, after which growth returned, albeit to lackluster levels, and the primary balance again moved to a surplus. This stands in sharp contrast with periphery countries, such as Portugal and Spain, and of course Greece, where the plunge in GDP was significantly more pronounced and primary surpluses were only reached in 2013-2014, if at all.

Table 1 further summarizes the cumulative public debt decomposition. The main determinants of debt dynamics are aggregated for the three periods under consideration.

Table 1 - Cumulative public debt composition

	1995-1998	1999-2007	2008-2014
	Per cent of GDP		
Change in public sector debt	-13,5	-31,7	19,4
Interest payments	32,7	48,6	24,9
Primary Deficit (- a surplus)	-21,2	-44,0	-0,3
Growth effect	-11,2	-21,0	-3,6
Inflation effect	-0,1	-7,4	-5,7
Revaluation effect	0,1	-0,7	-0,2
Seigniorage	-0,4	-0,8	-1,1
Residual (other factors)	-13,4	-6,3	5,3

Source: Authors' calculations

During the period 1995-1998, Belgium's public sector debt-to-GDP ratio declined by 13.5 percentage points. The main factors behind this decline were a combination of primary fiscal

surpluses and quite strong growth. Unaccounted factors also played a substantial role in reducing public debt. As Belgium had an average public debt level of over 125 per cent of GDP over this period, interest payments were large. This was the only factor driving the debt ratio up.

After entering the monetary union in 1999, the same debt dynamics which were in play the previous period helped push down debt further; large fiscal surpluses and high real GDP growth helped scale down public debt from 114.6 per cent of GDP in 1999 to 86.8 per cent of GDP in 2007³. Inflation also had a sizeable effect on this reduction. It is noteworthy that the fit of the model improves, as the residual is significantly smaller⁴. Again, interest payments were the main factor boosting the ratio of public debt-to-GDP.

The Global Financial Crisis completely halted the gradual decline in the public debt-to-GDP ratio and event sent it on an upward spiral. While it stood at 92.2% in 2008, it increased to 106.2% six years later in 2014. One of the primary factors pushing down debt over the previous periods, i.e. a long series of primary surpluses, dissipated and turned into primary deficits in 2009-2011, resulting in a quasi balanced - primary - budget over the period under consideration. Real GDP growth and inflation were to some extent factors that helped in reducing the level of debt-to-GDP, but overall the cost of servicing an already high stock of debt caused the public debt level to increase considerably. Again, the residual is lower (in absolute terms)⁵ compared to the first period.

In conclusion, Belgium succeeded in quite drastically reducing its public debt in the run-up to joining the eurozone, and was able to continue doing so up until the Global Financial Crisis (GFC) struck in 2007-2008. This was chiefly accomplished by running large primary surpluses.

³ As the number shown in the table is composed of the sum of the in- or decrease in the debt ratio of each individual year, it does not precisely match the difference between the debt ratio at the end of the period and the debt ratio at the start of the period.

⁴ In 2003, Belgacom, a Belgian telecommunications company of which the Belgian state was and still is a large shareholder, paid €5 billion to the Belgian government for it to take over its pension obligations. If we exclude this one-off effect, the residual over the entire period 1999-2007 is only 4.5%.

⁵ The fiscal cost of bailing out is estimated at around €15-€20 billion (see e.g. Maurer & Grussenmeyer (2015)). This almost fully accounts for the unexplained factor in the debt dynamics over this period.

Moreover, it was aided by a benign economic environment, i.e. relatively high real GDP growth. The bail-out of the financial sector in 2008 caused public debt to soar. Subsequently, anemic growth in combination with the cost of servicing an already high stock of debt, resulted in the debt-to-GDP ratio steadily creeping up. Primary deficits only played a minor role in the increase of debt, especially given the severity of the GFC. As Belgium has limited foreign currency borrowing⁶, and all the more so since it joined the Eurozone, currency developments only play a marginal effect in its debt dynamics.

5. Policy lessons for Greece

In the previous section, we took an in-depth look at Belgium's debt dynamics over the period and identified the main drivers of the reduction in its public debt-to-GDP ratio from 130.7% in 1995 to 86.9% in 2007. In this section, we try to draw policy lessons for a country which could certainly benefit from a comparable, or preferably even larger, decrease in public debt: Greece. Its debt-to-GDP ratio ballooned from an already sizeable 103.5% in 2006 to 178.6% in 2014⁷. Here, we compare the Greek case to the Belgium one. We not so much aim to argue that Greece and Belgium are identical; the two countries have a very similar population size of approximately 11 million people and also maintain public sector of significant size⁸, but differ quite substantially with regards to economic output⁹. Rather, we seek to both identify the parallels as well as highlight the differences in order for these to be managed conscientiously.

Belgium has been able to significantly lower its debt level so it could comply with the convergence criteria for the Maastricht treaty. If it did not adhere to these, Belgium might not have been able to join the single currency, something which would have been unthinkable for one of the founding members of the European Community. Hence, there was ample political

⁶ Foreign currency borrowing stood at around 12% at the start of the period considered, gradually declined to 2% in 2002 and hovered around 1% for the last 12 years of the period we investigate (source: National Bank of Belgium).

⁷ Source: Eurostat.

⁸ Total general government expenditure amounts to around 50% of GDP in both countries (source: Eurostat).

⁹ In 2014, Belgium's GDP per capita (in PPS) was €34,700 while that of Greece was just €21,200, which makes Belgian citizens around 40% richer than their Greek counterparts (source: Eurostat).

will and public willingness to make hard sacrifices. Similarly, during the stand-off between Greece and its creditors in the summer of 2015, it has become abundantly clear that “Grexit” is a real political option for European leaders, one that cannot be ruled out anymore¹⁰. At the same time however, the people of Greece have shown their unequivocal desire to remain a member of the eurozone, even if this requires harsh austerity¹¹. One could argue that the credible threat of throwing Greece out is similar to the threat of not becoming a member in the first place. Hence, as staying part of the eurozone is as important to the Greek people as entering it was for the Belgian people, they will be willing to make considerable sacrifices to this end.

Part of these sacrifices are realizing sustained primary surpluses. As we showed above, this was the most important factor in driving down public debt in Belgium. Greece has already demonstrated that it is able to pursue significant fiscal tightening. According to Gechert & Rannenberg (2015), Greece’s fiscal consolidation effort over the period 2010-2014 amounted to 24.9% of GDP, the largest of the entire eurozone. To keep debt on a sustainable path, the latest IMF’s 2015 Debt Sustainability Analysis on Greece (2015) estimates that permanent primary surpluses of 3-4% of GDP are required. Whether or not this is feasible will, to a large extent, depend on the willingness of the Greek people to continue enduring the hardship they have faced over the last 5 years. Several factors play into this, such as who holds the sovereign debt and the overall economic climate.

Whereas only around a quarter of Belgium’s stock of public debt was held by non-residents in the years prior to joining the eurozone¹², at the end of 2014 around 83% of Greece’s debt was owed to official - foreign - creditors¹³. Hence, realizing continued primary surpluses to pay down debt in Greece amounts to a massive transfer of Greek wealth abroad. This is politically

¹⁰ See for example the “non-paper” which was drafted by German Finance Minister Wolfgang Schäuble proposing a temporary 5-year Greek exit from the eurozone on July 15th, 2015.

¹¹ During the summer of 2015, in the midst of heated negotiations between Greece and its creditors, opinion polls conducted by GPO showed that more than 70% of Greeks wanted their country to remain part of the eurozone.

¹² Source: National Bank of Belgium.

¹³ Source: The draft budget for 2015 submitted by the Greek government to parliament in October 2014.

a lot more sensitive than in Belgium, where most debt was held by residents. If Greek society considers this unjust, as future generations have to pay for mistakes made by the current and previous government, their willingness to make hard sacrifices might be jeopardized. Hence, this political reality has to be first acknowledged and subsequently managed carefully in order for this perception not to be tilted towards hostility against foreign creditors on the part of Greek society.

Not only do prolonged primary surpluses constitute a transfer of wealth to foreign creditors, it also saps productive resources out of the economy. Indeed, the higher taxes or lower spending that are required to establish a primary surplus, vis-à-vis a balanced budget for example, act as a drag on growth and all the more so in a depressed economy such as that of Greece. Thus, the right pace of fiscal consolidation as not to undermine growth, is essential. As we have seen in the Belgian case, next to primary surpluses, solid growth is required to go down a sustainable and credible path of debt reduction. Hence, putting in place and following through on growth-enhancing reforms will be crucial, not only for Greece, whose GDP fell by more than a quarter over the period 2008-2014, but also for foreign creditors who wish to recover some of the funds they have lent to Greece. A country that does not grow cannot repay its debt. The point we try to make is not so much that primary surpluses are undesirable, but that a fine balance has to be struck between what is politically feasible and economically sensible.

Over the period 1995-2007, the sole factor driving up the debt ratio in Belgium were interest payments, starting from around 9% of GDP and falling steadily over the entire period to just under 4% of GDP. In anticipation of the single currency, interest rates in the eurozone converged to the German rate, which itself declined substantially, as Figure C in Appendix shows. Risk premiums, defined as the spread between a country's 10-year bond yield over that of Germany's, went down across entire the entire eurozone as the sovereign debt of Spain was

considered as safe as that of Germany. Belgium also benefited from this, as its interest expenses declined markedly.

Notwithstanding Greece's far larger stock of debt, total interest expenditures for Greece will not exceed 4.3% of GDP for the period 2015-2020 due to the concessional nature of the loans granted by its creditors¹⁴. It is highly unlikely that, after this period, private investors will be eager to starting borrowing to Greece at these very low rates. Hence concessional loans by official creditors might be the only alternative to ensure Greece's debt servicing costs remain manageable. As the IMF (2015) puts it in the latest Country Report on Greece: "*Greece cannot return to markets anytime soon at interest rates that it can afford from a medium-term perspective.*" For the purpose of debt dynamics, the underlying factor driving down debt servicing costs are irrelevant¹⁵; it does not matter whether it is the result of a reduction in risk premium or very cheap loans from official creditors. The impact on the evolution of debt is the same.

Greece unmistakably faces a tough macroeconomic environment. The world economy faces severe headwinds as economic uncertainty reigns supreme. Can China manufacture a controlled slowdown? Will the US economy be able to withstand further rate hikes by the Federal Reserve? Conversely, the ECB has shown itself willing to pull the necessary monetary levers to sustain the recovery of the GFC and the sovereign debt crisis. A plethora of conventional and unconventional policy tools (e.g. QE, NIRP and forward guidance) tools have been deployed to support growth. Of course, monetary policy can never be "the only game in town" and fiscal policy, in combination with structural reforms, is required to revive the moribund eurozone economy. Nevertheless, the elements discussed above lay the ground for a credible debt reduction plan in order to put Greece's enormous stock of debt on a sustainable footing.

¹⁴ Source: Eurostat.

¹⁵ Of course, the main reason why official creditors grant these concessional loans is because the other factors of its debt dynamics are not that favorable, such as the gargantuan stock of debt in a low-growth environment.

6. Conclusions

In summary, this paper has three main contributions. First, we introduce a formal framework to study debt dynamics. Subsequently, this framework is applied to analyze the main determinants of the debt-to-GDP ratio of Belgium for the period 1995-2014. Finally, we draw policy lessons from this particular case study for Greece, which might benefit from similar debt dynamics as Belgium has experienced.

We find that Belgium managed to significantly reduce its public debt-to-GDP ratio in the run-up to joining the eurozone and continued to do so until the GFC broke out in 2008. The primary driver of this debt reduction effort were large primary surpluses. Quite strong economic growth further helped drive debt down further. Bailing out the financial sector in 2008 resulted in significant increase of public debt. Next, tepid growth in combination with the cost of servicing a large stock of debt, caused the public debt-to-GDP ratio to increase further. Although the Global Financial Crisis is considered to be the worst economic downturn since the Great Depression, primary deficits, e.g. to counter the negative effects of the recession, only played a minor role in the surge in debt.

Next, this paper tries to draw policy lessons from this case study of Belgium for a country which is, compared with its peers, as heavily-indebted as Belgium was at the start of the period under investigation. We do not claim that Greece and Belgium are identical, nor that Greece can simply copy Belgium's policy. We merely highlight some lessons than can be learned from the experience of Belgium. As the great American novelist Mark Twain once wrote: "*History doesn't repeat itself, but it does rhyme.*" Greece is well-served to review the history of Belgium. We consciously do not take a position on whether Greece's debt is sustainable or not and hence whether or not it needs debt relief. It is clear that its partners require Greece to independently manufacture a significant reduction in its debt-to-GDP ratio. Debt relief will only influence the magnitude of this effort.

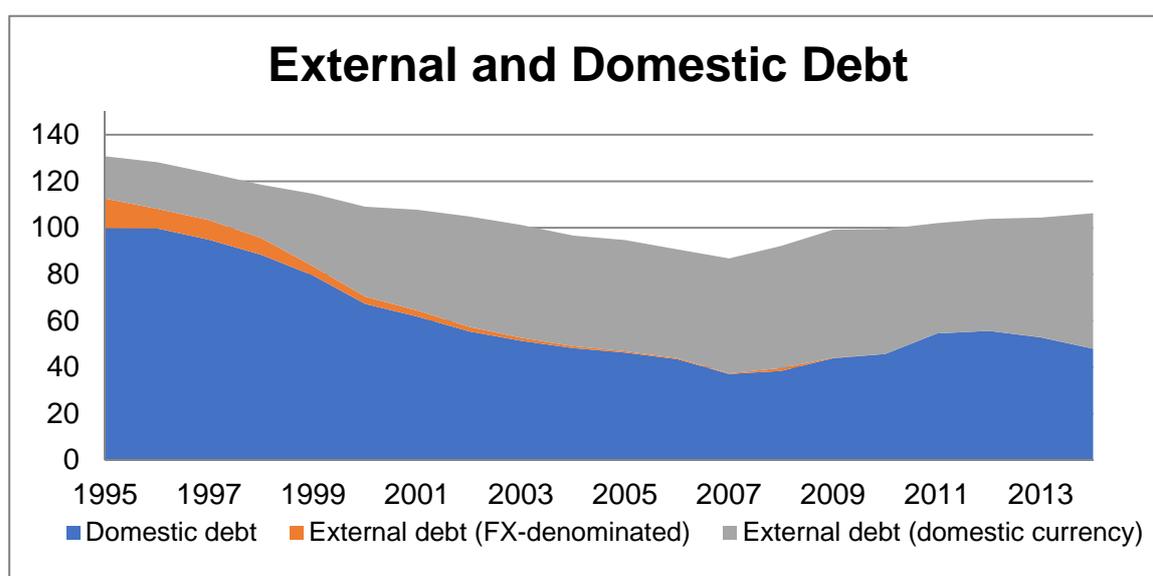
We see three main areas for further research. Firstly, the period under consideration starts in 1995 as the National Bank of Belgium only has detailed data on the characteristics of Belgium's sovereign debt as of then. When more data becomes available, it might be useful to broaden the period which is analyzed. Secondly, the framework introduced in this paper can be applied to a larger pool of countries. This way, common factors in episodes of large debt reductions and increases can be identified. Finally, whereas this paper relies on a debt accounting framework to assess public debt dynamics, the analysis might be extended with a vector autoregression framework, in line with Ryan & Maani (2015).

Appendix

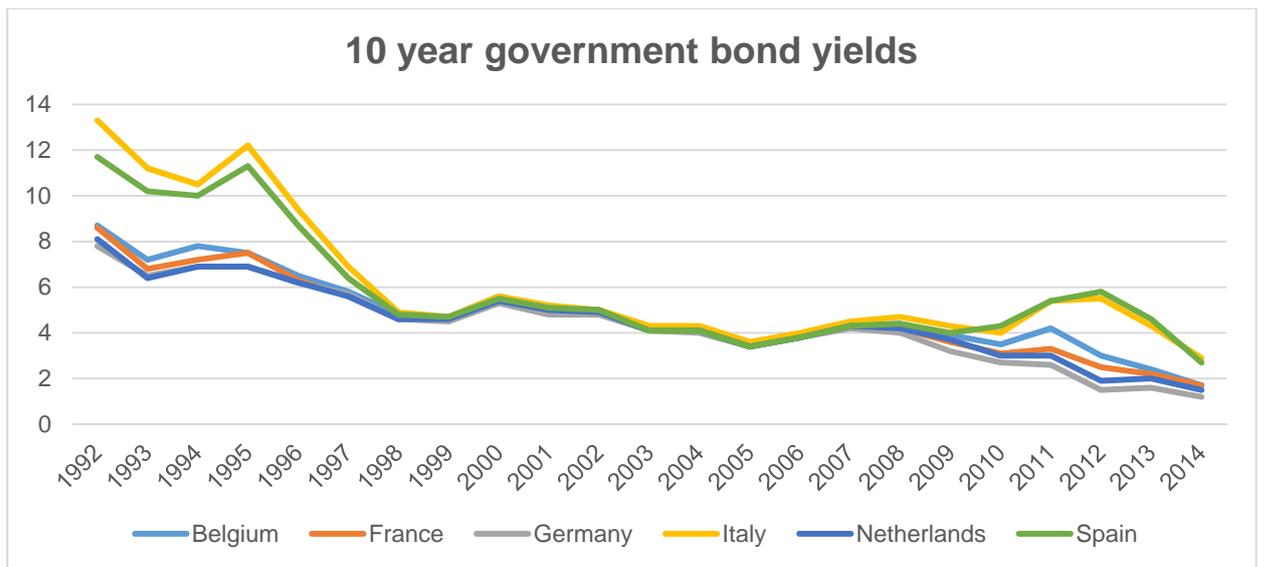
A. Descriptive statistics

Year	Total debt (% GDP)	Interest payments (% GDP)	Primary balance (% GDP)	Real GDP (millions, in 2010 prices)
1995	130,75	8,96	4,51	272.957
1996	128,23	8,52	4,59	277.191
1997	123,55	7,77	5,64	287.567
1998	118,55	7,43	6,48	293.337
1999	114,62	6,90	6,34	304.237
2000	109,03	6,68	6,61	315.039
2001	107,76	6,55	6,72	317.950
2002	104,88	5,81	5,86	322.909
2003	101,22	5,40	3,63	325.782
2004	96,62	4,81	4,65	336.972
2005	94,71	4,36	1,79	343.354
2006	90,74	4,08	4,38	352.385
2007	86,84	3,98	4,04	362.957
2008	92,17	3,95	2,86	366.418
2009	99,20	3,81	-1,56	356.823
2010	99,44	3,60	-0,36	365.747
2011	102,01	3,59	-0,50	371.739
2012	103,84	3,56	-0,58	372.090
2013	104,38	3,30	0,41	373.113
2014	106,22	3,13	0,03	377.003
Average	105,74	5,31	3,28	n.a.

B. External and domestic debt



C. Convergence of eurozone interest rates



Source: OECD.

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