INTERNATIONAL MONETARY FUND

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# BELGIUM

## SELECTED ISSUES

March 2020

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# BELGIUM

## SELECTED ISSUES

March 18, 2020

Approved By
**European Department**

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## CONTENTS

# THE APPROPRIATE FISCAL STANCE: A MODEL ASSESSMENT

*Public debt in Belgium has fluctuated between 75 and 140 percent of GDP over the last four decades. This has constrained the ability of policymakers to use fiscal policy to smooth business fluctuations. Lowering public debt would give more space to the government to offset shocks in the future. This note uses a theoretical model that explicitly accounts for the trade-offs between the short-term cost of fiscal tightening and the long-term gains associated with higher fiscal buffers. The medium-term analysis suggests that once the on-going global outbreak of COVID-19 fades out, a gradual consolidation would strike the right balance.*

## A. Introduction

1. **This paper analyzes Belgium's fiscal stance using a structural stochastic model.** Section B shows, using Belgium's past fiscal stance, that high debt can reduce the propensity to use fiscal policy to smooth fluctuations. Section C provides a medium-term model-based advice for the fiscal stance and shows that the long-term gains of restoring buffers outweigh the short-term cost of fiscal tightening.

## B. High Public Debt Restricts the Ability to Smooth Shocks

2. **The fiscal policy stance is assessed with a "Buffer-Stock" model of the government in which a forward-looking government maximizes utility under a debt constraint (Fournier, 2019).**[1] In this model, the government strikes a balance between the objectives of economic stabilization and debt sustainability. For this purpose, it chooses the fiscal stance, defined as a change in the structural primary balance, singling out the discretionary policy choices. Economic output is affected by exogenous shocks, which can persist for some time. The government can loosen the fiscal stance to boost output at the cost of eroding its fiscal buffers, or tighten it to build buffers, but this will come at some cost for output. Recessions reduce potential output, reflecting human and physical capital losses due to economic downturns (hysteresis effect). Fiscal policy is constrained by adverse effects of higher debt such as higher interest rates, a risk to lose market access and a one-year implementation delay. Low debt enables the government to borrow during bad times, like an asset from which the government can draw down to stabilize output in bad times. In other words, low debt is similar to a buffer.

3. **This Buffer-Stock model of the government shows that a government should react to both debt and short-term economic fluctuations.** The utility maximization framework provides a normative view on the fiscal stance. It recommends higher fiscal surplus at higher debt levels to preserve sustainability, and counter-cyclical fiscal stance to smooth fluctuations. Rising interest rates reinforce the motive to reduce debt. At low debt levels, hysteresis reinforces the motive to counter

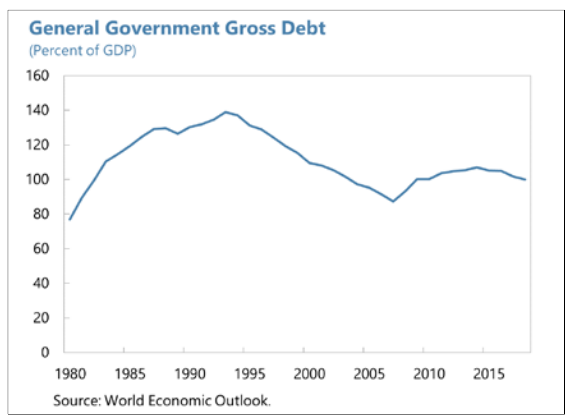
[1] This section provides a brief description of the main features of the model. For a more detailed discussion, see Appendix I and Fournier (2019).

negative shocks. The model provides a recommendation that is consistent with a given assessment of future growth and interest rate prospects, the output gap and the capacity of the government to offset shocks (fiscal multiplier). As assessments are surrounded by uncertainties, policy makers also need to exert judgments on these assumptions. To guide the judgment, the model can describe the extent to which recommendations are sensitive to the main assumptions.

4. **Highly indebted governments should react less to shocks.** The debt buffer (the difference between the current debt level and levels at which sustainability is at risk) has an insurance value—it is the "reserve" of debt that the government can issue to smooth shocks. When the buffer is small, the probability of market stress is high and the marginal value of an extra unit of buffer is large. This provides an incentive to preserve buffers to guard against future shocks. As a result, when debt is high, the optimal policy response to offset a negative shock is smaller than when debt is low.

5. **The fiscal stance in Belgium is analyzed through the lens of this model.** The links between fiscal stance and both debt and economic fluctuations are thus explored. As shown in the next paragraphs, fiscal policy over the last 40 years in Belgium illustrates the case of a highly indebted government which reacted to debt but did not use discretionary fiscal decisions to smooth the business cycle much.

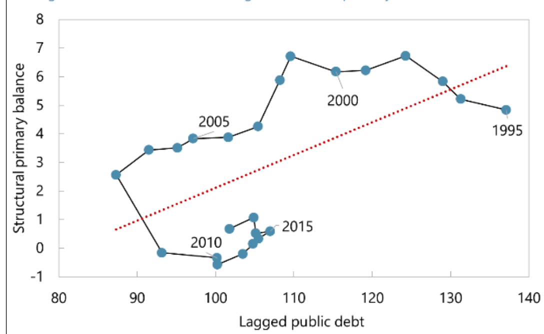
6. **Belgian public debt has fluctuated between 75 and 140 percent of GDP over the last 40 years**. Following the substantial increase in the primary deficits, which started in 1974 to reach more than 8 percent of GDP in 1981, debt reached around 80 percent of GDP and continued to rise through the 1980s. Following a multi-year tightening program encompassing a structural tightening close to 10 percent of GDP between 1981 and 1987 (see Devries et al., 2011 for more details), debt stabilized, albeit at a high level, close to 140 percent of GDP. A second wave of fiscal consolidation in the mid-90s ahead of euro-entry—a structural tightening of more than 5 percent of GDP during 1992-98 allowed debt to decline to around 87 percent of GDP by 2007. Following the global financial crisis, public debt rose again, concomitantly with risk premia. Subsequently, the government stabilized debt with a gradual tightening of the structural primary balance of 1¾ percent of GDP between 2011 and 2017, but debt remained high (around 100 percent) even as borrowing costs declined considerably.



**7. Fiscal policy reacted to high debt**. To assess the reaction of fiscal policy to debt, Bohn (1998) proposed to test whether governments run larger primary surpluses when debt is higher. Accordingly, the government was running sizeable surpluses when debt was high in the 90s, giving room for fiscal easing in the 2000s as debt was relatively lower. This descriptive analysis thus shows a positive association between lagged debt and structural primary balance. Beyond this descriptive evidence, looking at fiscal behavior over one century, Mauro et al. (2015) find a significant and positive reaction of primary surpluses to rising debt in Belgium, confirming that the government's past behavior was sustainable.

**Structural Primary Balance and Public Debt**

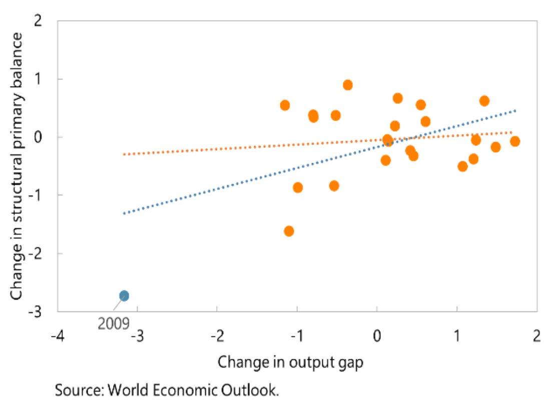
Higher debt is associated with higher structural primary balance

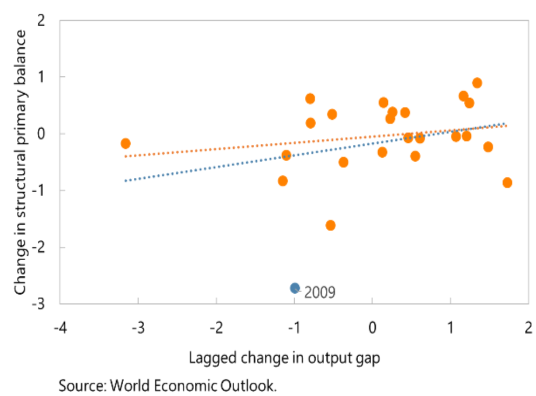



Source: World Economic Outlook.

**8. The high debt level appears to have prevented policymakers from responding to cyclical conditions**. Fiscal easing during downturns and tightening during boom smooth the business cycle. Accordingly, in 2009, the government stimulated the economy to counter the global financial crisis. However, an analysis of 1995–2018 data suggests this was an exception. Leaving this large reaction aside, the absence of a significant positive correlation between changes in output gaps and changes in structural primary balances suggests that the government did not react to the cycle much. This absence of a link with the cycle is hardly due to implementation delays: the fiscal stance is not linked to the lagged change in the output gap either.

**No Association Between Fiscal Stance and the Business Cycle**

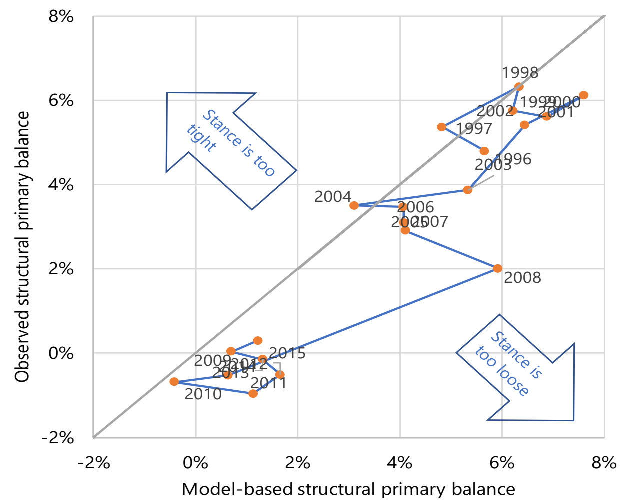



Note: The red line shows the regression line without year 2009, and the blue line the regression with year 2009. Results would be very similar with real time output gap as revisions affect the level of the output gap, rather than the change.

**9. A retrospective model-based analysis suggests that both the large fiscal surpluses before joining the euro and the sharp easing during the global financial crisis were appropriate**. The "Buffer-Stock" model of the government described in Appendix I and in Fournier (2019) provides a benchmark to assess past choices. The model is calibrated to Belgium following Fournier and Lieberknecht (Forthcoming) (Table 1). The model used here is the same as the one used for the 2019 Article IV consultation for France.[2] The approach to calibrate the parameters is also similar, and reflects country-specific features such as higher openness and hence lower fiscal multiplier in Belgium. Overall, a comparison between the observed fiscal stance and the model recommendation illustrates the extent to which the government struck a balance between stabilization and debt objectives. Debt sustainability concerns dominate in the case of a high-debt country, and as discussed above, the government did react to rising debt. As a result, government behavior is broadly consistent with the model recommendation.

**Fiscal stance and model recommendation**




Source: WEO and IMF staff calculations.

## C. Restoring Medium-Term Fiscal Buffers

**10. Model-based simulations are used to compute the optimal fiscal stance over 2020–25**. Simulations take 2019 as given and an optimal fiscal path is calculated over 2020–25. A negative shock is assumed in 2020 to reflect the unfolding global outbreak of COVID-19.[3] One-off COVID-19 related spending is excluded from the structural primary balance discussed here. The model-based solution is adjusted to consider the ongoing low interest rate environment, in line with staff's baseline projections over 2020–25. Beyond 2025, the interest rate-growth rate differential is assumed to increase linearly over fifteen years to reach a long-run historical average (see Table 1 on model calibration).

**11. In the current context of high public debt and a negative on-going shock, the model recommends an improvement of the overall and structural primary balances of 1½ and ¾ percent of GDP, respectively, by 2025 relative to their 2019 levels**. The recommended medium-term adjustment is slightly frontloaded, which would strengthen its credibility. As Belgium is a small open economy, the fiscal multiplier is likely more moderate, enabling a relatively larger fiscal consolidation (especially if focused on improving spending efficiency) with moderate output

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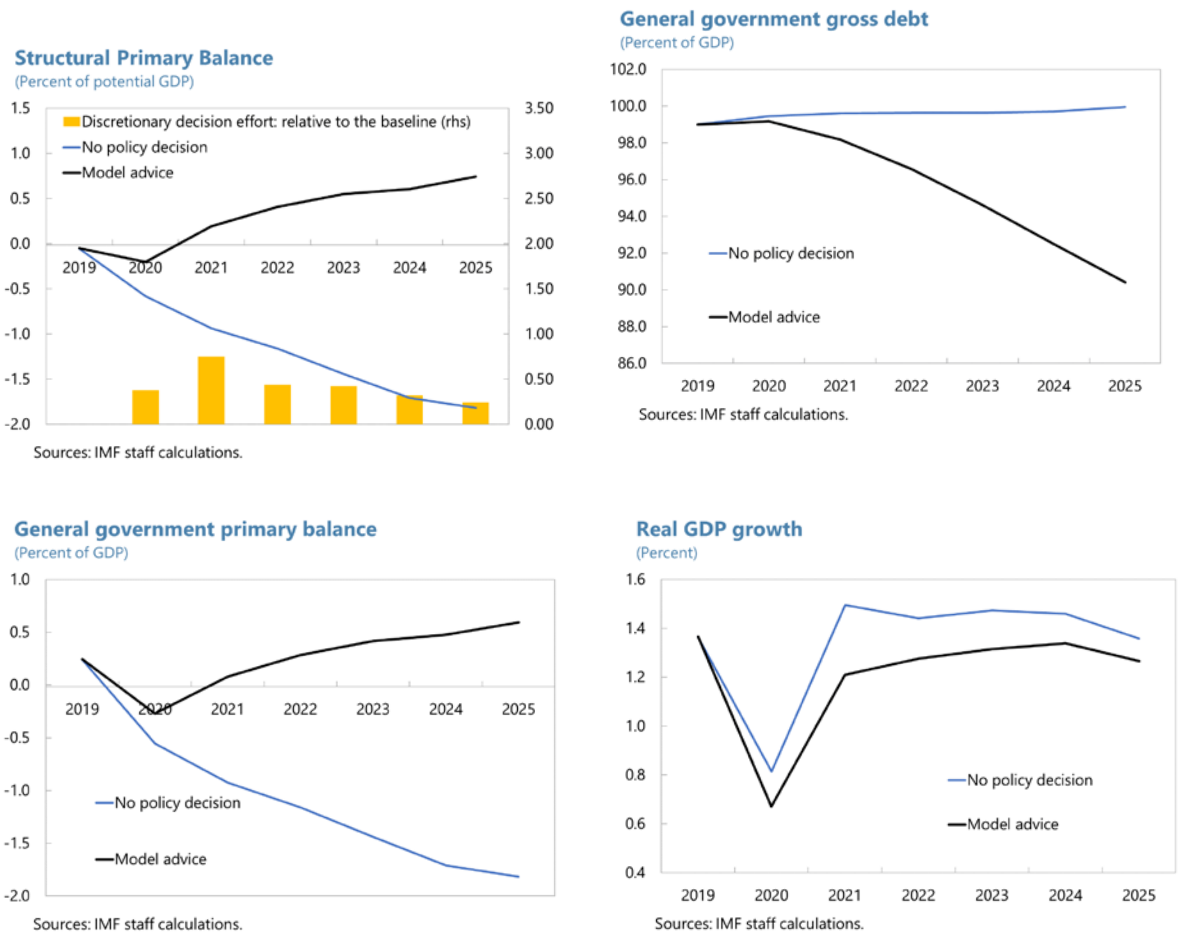
[2] See the Selected Issues Paper "The Appropriate Fiscal Stance in France: A Model Assessment".

[3] This reflects information available on 6 March 2020 and is consistent with an expected output loss of about ½ percentage point of GDP in 2020 embedded in staff's baseline projections for Belgium.

costs. However, in 2020, the caretaker status of the current government and the fact that the year has already started, together with the ongoing shock, limit the ability to tighten the fiscal stance this year. It is thus assumed that the consolidation in structural terms will only be feasible starting in 2021, with a neutral stance this year. The model-advised medium-term consolidation helps to bring debt down by around 10 percent of GDP relative to its 2019 level, at a moderate and temporary output cost, whereas the benefits of lower debt in terms of lower risk premium and higher capacity to offset shocks are permanent.

**Figure 1. Belgium: Fiscal Tightening to Restore Fiscal Buffers**



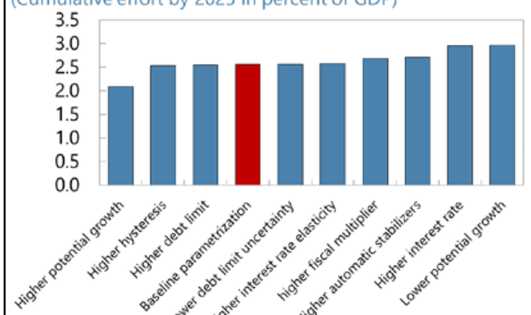

12. **The overall fiscal effort required to achieve the recommended medium-term structural adjustment is around 2 ½ percent pf GDP.** The baseline staff projection suggests that in the absence of corrective measure structural primary balance will decline by close to 2 percent of GDP by 2025. This reflects rising spending pressures related to aging costs. The model recommends a stance in terms of structural primary balance including healthcare and pension spending pressures. Each year, the fiscal effort (yellow bars) should combine measures avoiding or compensating slippages and additional measures to increase the structural primary balance.[4] Thus, by 2025, the

[4] Each year, this fiscal effort is the recommended change in structural primary balance minus the change in structural primary balance in a passive scenario.

government should implement discretionary changes amounting to about 2½ percent of GDP to bring public debt firmly on a downward trend. With this, the government would be in a better position to face expected aging costs beyond that horizon. It is worth noting that pension spending contribute to aggregate demand: avoiding these spending increases, or offsetting these by cuts in other spending items implies avoiding a fiscal expansion at a time when debt is high and the output gap is closed, and should thus not be seen as fiscal tightening.

**13. These results are fairly robust to sensitivity checks.** The model recommendation to improve the structural primary balance holds under a broad range of assumptions. In particular, results are not very sensitive to the elasticity of debt to interest rate.[5] The results are also not very sensitive to the parameters governing market-access risk because the optimal policy reacts preemptively to contain the interest rate burden, before being too constrained by the debt limit. By contrast, results are sensitive to the interest and growth rate assumptions. If growth were permanently higher (or lower), the appropriate fiscal stance should be easier (tighter) as debt dynamics would become more (less) favorable. The recommended consolidation should also be somewhat larger if fiscal multipliers or automatic stabilizers are higher, as fiscal consolidation entails larger output costs and hence the government is more debt-adverse. It should be slightly lower if hysteresis were higher to reduce the slight risk that consolidation is associated with a recession.

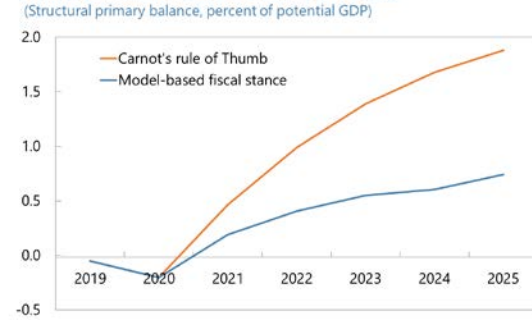
**Discretionary effort: sensitivity analysis**
(Cumulative effort by 2025 in percent of GDP)




Source: IMF staff calculations.
Note: In the higher interest rate scenario, the interest rate is 0.5% higher. In the higher automatic stabilizers' scenario, automatic stabilizers are 50 percent larger than the baseline value. In the lower shock persistence, the persistence parameter is set to 0.4 instead of 0.6. In the faster interest rate normalization, it takes five years after 2024 for the effective interest rate to reach its long-run value. In the lower potential growth scenario, potential growth is 0.5% lower. In the higher hysteresis scenario, hysteresis is 50% larger than in the baseline. In the higher debt limit scenario, debt limit is set at 170 percent of GDP. In the

**14. The model recommendation to consolidate is softer than the rule of thumb by Carnot (2014), another approach in the literature**. This rule of thumb is based on the average of a primary gap indicator (capturing the effort needed to preserve sustainability) and a macroeconomic score (capturing the cyclical position of the economy). Carnot's rule is parametrized with the same initial conditions that in the model exercise presented above (that is, high debt, closed output gap, and negative structural primary balance). As Carnot's rule does not internalize the record-low interest rate environment, it recommends a sharper medium-

**Comparison with Carnot's rule of Thumb**
(Structural primary balance, percent of potential GDP)




Source: IMF staff calculations.

[5] The reason for the low sensitivity is that a higher elasticity of interest rates to the debt level has two effects that, in this specific exercise, broadly offset each other: (i) it raises the marginal cost of a given increase in debt (leading the government to target a lower debt level); but (ii) it lessens the surplus needed to reduce debt (dampening the debt-aversion effect induced by (i)) because the interest rate burden drops faster when debt declines.

term consolidation than the model. Indeed, an alternative of the Buffer-stock model of the government with a faster normalization of the interest rate would also recommend a more ambitious path.

**15. In sum, this paper shows that once the current crisis is over, rebuilding fiscal buffers is essential to helping Belgium confront the next shock from a stronger fiscal position**. Overall, this illustrates a major motivation for a credible medium-term fiscal consolidation strategy. When a government reduces debt, it increases its capacity to react to shocks later. This entails a short-term cost that is, in the case of Belgium, worth the effort as this capacity to smooth future shocks increases future welfare (the marginal benefit of building buffers is thus high). In addition, a large capacity to react with fiscal policy reduces the risk of long-lasting effects of a large crisis (such as the loss of skills associated with long-term unemployment). Historical data show that in the past, the Belgium government's reaction to the cycle was limited to a single event. By contrast, if Belgium could firmly anchor public debt on a downward path, future governments would be able to offset downturns while keeping debt sustainability concerns under control.

# Appendix I. Model Details[1]

**1. The government maximizes household utility by choosing a change in structural primary balance to stabilize output fluctuations intertemporally under constraints.** The value function of the government is

$$V_t(d_{t-1}, gap_{t-1}, pb_{t-1}^{st}) = \max_{\Delta pb_t^{st}} E_t[u(c_t, L_t) + \beta V_{t+1}(d_t, gap_t, pb_t^{st})]$$

where $t$ is the year, $d_t$ is the gross government debt to potential GDP ratio, $gap_t$ is the output gap, $pb^{st}_t$ is the structural primary balance, $c_t$ is aggregate consumption[2], $L_t$ is labor, u(.,.) is the instantaneous utility function and $\boldsymbol{\beta}$ is the discount factor. The state of the economy is summarized by three variables: government debt, the output gap and the structural primary balance. The optimization is subject to the structure of the economy and the government budget constraint that takes the form of a risk to lose market access rising in debt (see below).

**2. The value function consists of the per-period utility function u(.) and the expected continuation value discounted by β.** The per-period utility function is:

$$u(c_t, L_t) = \frac{{c_t}^{1-\sigma}}{1-\sigma} - \xi {y_t^*}^{1-\sigma} \frac{L_t^{1+\eta}}{1+\eta}$$

which is a standard constant relative risk aversion utility function in consumption and labor where $\boldsymbol{\rho}$ is the parameter of risk aversion. Households enjoy consumption, but also face labor disutility. Utility peaks at an equilibrium output for which the marginal income gain of work equates the marginal loss of utility due to labor. $\xi$ is calibrated so that utility peaks when output is equal to its potential. In other words, utility declines not only if output decreases below its potential, but also if output increases above potential, consistent with the view that positive output gap can be associated with costly distortions. This gives the government a motive to counter output deviations from this potential.

**3. The model features rising market pressure when debt is rising**. First, the interest rate increases in public debt, with a calibration in line with empirical evidence (Gruber and Kamin 2012; Poghosyan 2012; D'Agostino and Ehrmann 2014; Fall and Fournier 2015; Henao-Arbelaez and Sobrinho, 2017). This sensitivity of the interest rate to debt reflects a higher risk premium, it can be regarded as the consequence of an excess of supply of government bonds. Furthermore, the risk premium increases in the change in debt; investors are more likely to be concerned if debt is rising. Symmetrically, even at high debt level, risk premium may be moderate if the government shows its capacity to reduce it. Second, a risk to lose market access rules out unbounded debt paths. The probability to lose market access also depends on the level and the change of government debt:

[1] This appendix follows closely Fournier (2019).

[2] Public and private consumption are not distinguished, and hence assumed to provide the same utility.

$$P(lma) = [1 + exp( d_1(1 - d_t/\overline{d} - d_2(d_t - d_{t-1})))]^{-1}$$

where $d_1$ governs the debt limit uncertainty, $d_2$ governs the effect of a debt change on the risk to lose market access, and $\overline{d}$ is the debt level at which the probability to lose market access is 50 percent (given no change in the debt level). If the government loses market access, the government has to keep debt constant under an adverse scenario of a shock of $d_3\sigma$, where $\sigma$ is the standard deviation of economic shocks, to be explained below.

**4. The budget constraint of the government is governed by a standard debt accumulation dynamic,** with a deterministic stock-flow adjustment $sf_t$ that can capture planned one-offs:

$$d_t = \left(\frac{1 + r_0 + \alpha_1 d_{t-1} + \alpha_2 \Delta d_t)}{1 + g_t{}^*}\right) d_{t-1} - pb_t + sf_t$$

**5. Output is driven by a long-term exogenous potential growth and hysteresis costs in the long-run.** Output is produced by a standard linear production function in labor:

$$Y_t = A_t L_t$$

where $A_t$ is productivity and L is labor. Potential output $\bar{Y}_t$ is the output that would prevail if labor is at its equilibrium level $\bar{L}$:

$$\bar{Y}_t = A_t \overline{L}$$

**6. Productivity is affected by a permanent hysteresis effect of crisis**. If production is below its perceived potential, unemployed workers can see their skills, their network and their morale all decay (Blanchard and Summers, 1987, DeLong and Summers, 2012).

$$A_t = A \prod_{\tau=1}^{t} \Big( (1 + g_\tau^*) \big(1 + h.\big( min(gap_{\tau-1}, h^{th}) - h^{th} \big)\big)\Big)$$

where $A = \overline{L} = 1$ and $g^*$ is potential growth that would prevail in the absence of hysteresis.

**7. The parameter $h \geq 0$ governs the size of hysteresis, a permanent loss of potential output level, and $h^{th}$ is a threshold below which hysteresis kicks in.** The calibrated effect on output level is in line with Mourougane (2017) who finds large hysteresis effects on potential GDP level but no effect on long-run potential growth.

**8. The output deviates from its potential because of a process of shocks $v_t$ and because of the primary balance**. The sensitivity of the output gap to the primary balance is its derivative with respect to the primary balance, which is set equal to a usual fiscal multiplier $m_1$ when the economy is at output equilibrium. This is consistent with the literature, which either defines the fiscal multiplier as the effect of level of primary balance (or tax, spending level) on a level of output (or consumption, investment) as in Blanchard and Perotti (2002), or matches first differences on both sides (e.g., Alesina et al. 2015 in the empirical literature or Zubairy 2014 in the modeling literature). The fiscal multiplier depends on the output gap itself, reflecting recent empirical literature on larger multipliers in downturns (Baum et al, 2012; Auerbach and Gorodnichenko 2013), corroborated by modeling with financial frictions (Canzoneri et al., 2016). Indeed, when slack is large, a demand stimulus is more likely to boost output as there is spare production capacity. The additional term governed by coefficient $m_2$ magnifies the multiplier in downturns:

$$\frac{\partial gap(pb_t, v_t)}{\partial pb_t} = -m_1(1 - m_2 gap(pb_t, v_t))$$

**9. The primary balance is the sum of a cyclical component and of a structural component decided by the government:**

$$pb_t = pb_t^{st} + a.gap_t$$

where a is an automatic stabilizer coefficient. This defines a two-way relationship between the output gap and the primary balance. An increase in the structural primary balance is a fiscal tightening, this implies a decrease in the output gap. At the same time, a decrease in the output gap reduces tax revenue or increases means-tested transfers, and this implies a decrease in the primary balance. The equilibrium is solved analytically, and an approximation of the solution for small shocks shows that the effect of shocks and of changes in the primary balance are reduced by automatic stabilizers: [3]

$$gap_t \approx \frac{v_t - m_1 pb_t^{st}}{1 + m_1 a}$$

The structural balance that offsets the underlying shock process is $v_t/m_1$ in this approximation. It is larger when the fiscal multiplier is lower. It is worth noting that the parameter $m_1$ captures a causal effect of the primary balance on the output gap. Many authors regard the fiscal multiplier as the causal of a change in the structural primary on output, encompassing the mitigating effect of automatic stabilizers (as in Batini et al. 2014). The multiplier considered in such papers corresponds to $m_1/(1+m_1.a)$.

**10.** Finally, the aggregate resource constraint is:

$$c_t = y_t(1 - \chi(\Delta pb_t^{st})^2)$$

where $c_t$ denotes aggregate consumption (both private and public), and the last term represents some fiscal adjustment costs, which we model as direct resource costs. These adjustment costs can reflect implementation costs of changes in spending plans, costs associated with tax uncertainty (e.g. Skinner, 1988). This can also reflect the difficulty in reversing fiscal decisions (IMF, 2017). This adjustment cost is relative to output.

[3] This approximation is a simplified version of the actual formula used in the model. See the appendix and Fournier (2018) for more details.

**11. The calibration used for Belgium is reported in Table 1**. Most parameters are taken from Fournier and Lieberknecht (2020) who provide the information used for this purpose. Some parameters reflect cross-country empirical evidence that embed more information than country-specific estimates (e.g. the elasticity of debt to interest rate, or the risk aversion parameter). Some other parameters are specific to Belgium:

**Table 1. Belgium: Baseline Calibration**

| | |
|---|---|
| **Welfare function** | |
| Discount factor $\beta$ | 0.99 |
| Risk aversion $\sigma$ | 2 |
| Labor elasticity $\eta$ | 1/0.3 |
| Weight of labor $\xi$ | 1 |
| **Fiscal parameters** | |
| Fiscal multiplier when the gap is null $m_1$ | 0.50 |
| Fiscal multiplier sensitivity to shocks $m_2$ | 3 |
| Automatic stabilizers (primary balance semi-elasticity to the gap) $a$ | 0.66 |
| Adjustment cost $\chi$ | 3 |
| **Interest rate and debt parameters** | |
| Growth-adjusted interest rate when debt is 90 percent of GDP | 1.02% |
| Effect of debt level on the risk premium $\alpha_1$ | 1.5% |
| Effect of debt change on the risk premium $\alpha_2$ | 0.5% |
| Debt level at which the risk to lose market access is 50% $\overline{d}$ | 150% |
| Debt limit accuracy $d_1$ | 3 |
| Effect of debt change on the risk to lose market access is $d_2$ | 1 |
| Adverse scenario coefficient in case of loss of market access $d_3$ | -1% |
| **Economy parameters** | |
| Potential GDP per capita growth | 0.9% |
| Shock persistence $\rho$ | 0.70 |
| Shock size $\sigma$ | 1.8% |
| Hysteresis | 10% |
| Hysteresis threshold | -1% |

- The potential growth assumption is an average of WEO potential growth over 2017–21. The growth interest rate differential is calibrated with 20-year averages of historical data. Shock parameters (size σ and persistence ρ) are estimated with past shocks reflecting the output gap and the primary balance:

$$v_t = \left(gap_t - \frac{1}{m_2}\right)e^{-m_1 m_2 pb_t} + \frac{1}{m_2}$$

- The fiscal multiplier calibration is set to 0.5 as assumed in the recommended scenario in the staff report.

- The automatic stabilizer coefficient is taken from Price et al. (2015).

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