# A FLEXIBLE FISCAL RULE IN AN UNCERTAIN WORLD

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**Introduction**

- The financial and economic crisis that started in 2008 as well as the response of governments to the crisis resulted globally in fast rising public debt/GDP ratios.
- Greece, Ireland, Portugal, the US and the UK.
- Financial markets also express uncertainty.
- Calls for 'exit strategies' in the US and UK.
- Public debt/GDP ratio in SA also increases.
- But increase is tame compared to US, EU and Japan.
- Increasing debt levels: Should countries not implement flexible fiscal rules that allow for stimulus measures during recessions, but also indentify an exit strategies.
- If these exit strategies are clearly defined in terms of a fiscal rule, the stimulus measures themselves might generate more market confidence and thus, have a larger impact.

- We argue the case for a policy of ‘anchored flexibility’
  - Flexible fiscal rule that allows for the pursuit of economic stability, but anchors that pursuit always in fiscal sustainability.
- Rule is explicitly structured to be simple
- It is designed in analogy to the inflation targeting framework.
- We explore whether revenue or expenditure carried the largest burden of adjustment in the past.
  - Shows that the largest adjustments fell on revenue
- We propose how expenditure and revenue measures can be augmented to:
  - allow for increased sensitivity to recessions,
  - while also creating a mechanism for a fast adjustment and restitution of fiscal sustainability once the recession passes.

- Kopits and Symansky (1998:18-20) and Kell (2001:8-30) argue fiscal rule should be:

  1. well-defined;
  2. highly transparent;
  3. simple in the eyes of the public;
  4. flexible enough to accommodate cyclical fluctuations and exogenous shocks;
  5. consistent with other macroeconomic policies;
  6. adequate with respect to specific goals;
  7. enforceable in the given environment and supported by efficient policies.

- Kopits and Symansky (1998:19-20): trade-off exists between these characteristics.
- No rule possesses all characteristics, e.g. simpler rules less flexible, but more credible.
- Important characteristic of modern fiscal rules: Reconciling the need for fiscal sustainability with the desire to support economic stability, mostly through automatic stabilisers. In doing so, modern fiscal rules follow directly from Friedman (1948).

## A flexible fiscal framework – the basics

- Fiscal sustainability largely about the trajectory of debt/GDP
- Debt/GDP target might be right place to start thinking about a fiscal rule or framework.
- Suppose the level is set at 35%.
- A deficit target can then be derived from the debt target.
- Deficit target then defined to keep the debt/GDP ratio in the longer run at the 35% level:

$$C^*_t = nD_{t-1}/Y_t$$

- where $C^*$ is the deficit, $n$ is the long-run nominal economic growth rate, $D$ is debt of last year and $Y$ is expected GDP this year.
- Coordinate monetary and fiscal policy: Define $n$ as the central inflation target (4.5% in the case of South Africa) and add the long-run expected real growth rate.
- Central inflation target: 4.5%, long-run growth rate e.g. 3%, nominal growth rate: 7.5%.
- Therefore, the sustainable deficit is 2.4%.
- Decide long-run levels of revenue and expenditure to yield this deficit level.

- Sustainable level of deficit is the Structural Budget Balance (SBB)
- Level of the budget balance after effect of the business cycle has been stripped out.
- Use SBB (=*C**), and estimates for the elasticity of various revenues and expenditure and a forecast for the output gap, to forecast the actual levels of revenue, expenditure and the deficit using Equations (1) to (4) below.

$$T = \left(\frac{T^*}{Y}\right)\left(\frac{Y^*}{Y}\right)^{1-\varepsilon_R} \qquad (1)$$

$$G = \left(\frac{G^*}{Y}\right)\left(\frac{Y^*}{Y}\right)^{1-\varepsilon_G} \qquad (2)$$

$$SBB = C^* = T^* - G^* \qquad (3)$$

$$C = T - G \qquad (4)$$

where $T$ and $T^*$ are revenue and long-run revenue, $G$ and $G^*$ are expenditure and long-run expenditure, $C$ is the deficit, $Y$ and $Y^*$ are output and long-run output, and $\varepsilon_T$ and $\varepsilon_G$ are the elasticities of revenue and expenditure with respect to the output gap.

- Government may then decide to target the level of the actual deficit.
- Doing so also implies that government implicitly is also targeting the SBB.
- Such a deficit target will allow automatic stabilisers to operate.

- BUT, targeting the level of actual deficit is notoriously fraught with problems.
- Favero and Marcellino (2005): In Euro-area economies the standard errors of deficit forecasts are relatively large.
- To target the deficit level using Equations (1) to (4) entails forecasting output gap
- Requires forecasting actual output *and* potential output.
- Both are stochastic in nature.
- Even slight uncertainty with respect to levels of output and potential output translates into considerable uncertainty about output gap.
- Translates via Equations (1) to (4) into considerable unpredicted change in the deficit.
- Therefore, government faces a high probability of missing the targeted deficit level.
- Measuring success by compliance with a fiscal rule that sets a target level for the deficit is nothing more than *deception caused by spurious precision*.
- So how should we think about this problem?

- With or without a fiscal rule, governments always announce a specific point deficit target for the next year and therefore annually target the announced deficit.
- Fiscal rules set up a permanent target with which the annual target needs to comply.
- However, governments are bound to violate such fiscal rules, i.e. miss the target.
- This causes a loss of credibility.
- How can governments use a fiscal rule that deals with the uncertainty involved in setting the budget deficit?
- One solution: Set up a permanent (fiscal rule) target that targets the *standard deviation* of the budget deficit instead of the level of budget deficit.
- Use historic data about the output gap to calculate the standard deviation of the output gap. Place the values of two standard deviations for the output gap into Equations (1) and (2), and then using Equation (4) calculate the two-standard deviation band around the SBB
- This sets upper and lower values within which the announced deficit budgeted for the next year must fall.
- Government then needs to ensure that deficit budgeted for next year falls within band.
- This approach allows the automatic stabilisers to act.

- Benefit of this approach: When actual deficit deviates from budgeted deficit, the probability is high that the actual deficit still falls within the target band.
- Thus, when the actual deficit deviates from the budgeted deficit, but deviations still fall within the target band, government will not lose credibility.
- Since two-standard deviations of the output gap are used to set the bandwidth within which the deficit movements will be limited, it is designed to cover 95% of all output gap movements, *ceteris paribus*.
- However, the *ceteris paribus* clause may be contravened in the event of the unexpected. Furthermore, wrong forecasts for GDP or a lax attitude regarding the deficit that leads to a hardening of the upper bound of the deficit band could lead to a build-up of debt.
- Also possibility of Japanese-style recessionary conditions when a prolonged recession causes the debt/GDP ratio to keep on increasing.
- Under these conditions the deficit rule will not necessarily ensure fiscal sustainability even if the deficit remains within its band.

- To deal with such unexpected built up of debt government may, in addition to the deficit band, also implement a debt feedback mechanism based on a band within which the debt/GDP ratio can be allowed to fluctuate.
- Thus, the feedback mechanism kicks in when the debt/GDP ratio falls outside for instance the 25-45% band.
- A feedback rule might then state that a third of the deviation outside the target band should be subtracted from the deficit.
- The width of the band can be set arbitrarily or with reference to the deficit band.
- Thus, if the deficit band is set using two standard deviations of the output gap in Equations (1), (2) and (4), and if on average downswings last, for instance, for two or three years, government may set the bandwidth for debt so as to allow two or three successive years of the deficit at the maximum of its upper bound.
    - This will prevent a hardening of the upper bound of the deficit band.
    - But also ensures feedback does not occur in the depth of a recession.
- More importantly, the debt feedback rule ensures fiscal sustainability in the longer run by overriding the effect of the deficit rule when debt tends to increase above levels acceptable to government.

What are the benefits of the above framework? There are three main benefits:

1. The framework is simple to explain, as it is analogous to inflation targeting.
2. Fiscal discipline is ensured, but as long as the actual deficit remains within the band, deviations of actual deficits from announced budget targets do not constitute failure to keep to the fiscal rule.
3. The rule proposed is flexible, yet sets limits. It allows a government to react to recessionary conditions, while also *ex ante* sets out the exit strategy government uses. This increases market confidence, which may also help to improve the impact of fiscal stimulus measures.

**Should revenue or expenditure adjust to ensure a sustainable deficit and debt burden?**

- Achieving deficit and debt targets is done indirectly: adjust revenue and/or expenditure.
- IMF's Fiscal Monitor (IMF 2011: 88, 91): In the G7 countries fiscal adjustment usually set out to cut expenditure rather than to increase taxes
- However, expenditure cuts usually turn out to be much less than expected, while revenue collected exceeds expectation.
- Applying a fiscal rule also entails adjusting either revenue or expenditure, or both.
- Understanding revenue and expenditure behaviour of government in the past might act as a guide to future behaviour.
- An understanding of past behaviour can also guide government in making changes to its behaviour.

- To investigate the past behaviour of government estimate fiscal reaction function.
- Follows the specification by Bohn (1998), Claeys (2008), Favero and Marcellino (2005) and Favero and Monacelli (2005).
- From the budget constraint we derive:

$$(B/Y)_t^{Required} = \alpha_t^{Required}(D/Y)_{t-1} = ((r_t - g_t)/(1 + g_t))(D/Y)_{t-1} \qquad (11)$$

- Fiscal reaction function to estimate:

$$(B/Y)_t^{Actual} = \alpha_1 + \alpha_2(B/Y)_{t-1}^{Actual} + \alpha_3(D/Y)_{t-1} + \varepsilon_t \qquad (13)$$

- Claeys (2008:24-30) and Favero and Marcellino (2005:763) follow Bohn's (1998) specification, but they prefer to separate the components of the primary balance
- Substitute expenditure and revenue, in turn, for the primary balance.
- If $\alpha_3/(1-\alpha_2) \geq \alpha^{Required}$ fiscal policy will be sustainable.
- However, this condition is especially limited to cases where r>g.

- Bispham (1987:67–70): when r<g fiscal policy technically speaking cannot become unsustainable (if defined as a public debt/GDP ratio that moves to infinity in finite time).
- If $r \neq g$ Equation (14) describes the dynamics of the debt/GDP ratio over time (with $p$ being the initial debt/GDP ratio at time t=0):

$$D_t / Y_t = (B / Y)(\frac{1+g}{r-g})(\frac{1+r}{1+g})^t - (B / Y)(\frac{1+g}{r-g}) + p(\frac{1+r}{1+g})^t \qquad (14)$$

- When $r > g$ and $t \rightarrow \infty$: Debt/GDP ratio will explode unless first and third term on the right-hand side cancel.
- However, when $r < g$ and $t \rightarrow \infty$: Equation (14) reduces to Equation (15)

$$D_t / Y_t \rightarrow -(B / Y)(\frac{1+g}{r-g}) = (B / Y)(\frac{1+g}{g-r}) \qquad (15)$$

- The debt/GDP ratio will not explode, but rather converge to a stable ratio.
- Thus, when $r < g$ the government need not react to developments in the debt/GDP ratio (within limit of course).

- Favero and Monacelli (2005) and Favero and Marcellino (2005) take a slightly different approach from Bohn (1998) and Claeys (2008), by considering *(r-g)/(1+g)* stance.
- Specifying a reaction function that allows for government's response to vary over time. Equation (13) is then adjusted so that using Equation (11):

$$(B/Y)_t^{Actual} = \alpha_1 + \alpha_2(B/Y)_{t-1}^{Actual} + \gamma_1\alpha^{Required}(D/Y)_{t-1} + \upsilon_t$$
$$= \alpha_1 + \alpha_2(B/Y)_{t-1}^{Actual} + \gamma_1(B/Y)_t^{Required} + \upsilon_t \qquad (16)$$

  where $\alpha_3$ in Equation (13) equals $\gamma_1\alpha^{Required}$ in Equation (16).
- The fixed reaction to the debt/GDP ratio estimated with Equation (13) becomes a time-varying reaction in Equation (16) that depends on the movements in *(r-g)/(1+g).*
- When $r>g$ and fiscal policy is responsive to its debt position $\gamma_1 = 1$ in Equation (16).
- However, just as with the discussion above, when $r<g$ government might decide not to react to its debt, in which case $\gamma_1 = 0$, or it might act countercyclically, which (since g is subtracted from r), means that $\gamma_1<0$, provided that the cyclical increase (decrease) in growth outpaces the cyclical increase (decrease) in the interest rate – seems to be the case in SA – see Figure 2.
- Just as with Equation (13), Equation (16) can also be estimated with the components of the deficit, thus separating revenue and expenditure.

**The reaction of the primary balance/GDP ratio to the debt/GDP ratio**

- Fiscal reaction functions estimated with the *deficit*, *total expenditure*, *total revenue* as well as revenue collected from *income taxes*, *goods* and *sales taxes*.
- Data for government revenue and expenditure originates from the 'National Government Finance' table in the SARB Quarterly Bulletin.
- Annual data since 1968 is available for the types of revenue, except for sales taxes that were first levied in 1970.
- Data for total expenditure and revenue is available from 1960.
- The public debt/GDP ratio refers to gross public debt for national government and is available since 1947.
- Because government data for interest payments by government is only available from the National Treasury since 1971, primary balance data using government data is only available since 1971.
- However, a second primary balance series calculated with national accounts data dating back to 1947 is also used.
- The regressions presented below use all available data (unless otherwise indicated), which means that sample periods are not always the same.
- The output gap was generated using a Kalman filter.

## Table 3 – The fiscal reaction function

| | B/Y |
|---|---|
| | 0.408 |
| **(B/Y)(-1)** | (0.002) |
| | 0.027 |
| **(D/Y)(-1)** | (0.033) |
| | 0.449 |
| **(Y gap)(-1)** | (0.023) |
| **Adj R-sq** | 0.31 |

Sample 1970-2010, p values in ( )

- To deal with possible breaks in the behaviour of government over time use a set of dummies to distinguish between the terms of the various administrations in power.
- Covers all National Party and African National Congress administrations.
- The dummy takes a value of one starting in the year after an administration took power since that would be the first budget fully under control of that administration.
- The administrations were: Malan (1948-54), Strijdom (1954-58), Verwoerd (1958-66), Vorster (1966-78), Botha (1978-89), De Klerk (1989-94), Mandela (1994-99), Mbeki (1999-2008), Motlanthe (2008-09) and Zuma (2009-present). (Motlanthe administration was a caretaker administration until Zuma took power in 2009, their terms are put together.)

**Table 5 – The deficit reaction function with interactive dummies (set 2)**

| | **B/Y** |
|---|---|
| | -0.054 |
| **(D/Y)(-1)** | (0.000) |
| | 0.032 |
| **D4954*(D/Y)(-1)** | (0.002) |
| | 0.023 |
| **D5558*(D/Y)(-1)** | (0.073) |
| | 0.033 |
| **D5966*(D/Y)(-1)** | (0.004) |
| | 0.022 |
| **D6778*(D/Y)(-1)** | (0.152) |
| | 0.057 |
| **D7989*(D/Y)(-1)** | (0.000) |
| | 0.035 |
| **D9094*(D/Y)(-1)** | (0.027) |
| | 0.090 |
| **D9599*(D/Y)(-1)** | (0.000) |
| | 0.125 |
| **D0008*(D/Y)(-1)** | (0.000) |
| **Adj R-sq** | 0.48 |

p values in ( )

**Table 6 – Total revenue and expenditure reaction functions**

| | | Estimated models | | | Long-run parameters ($\alpha_3/(1-\alpha_2)$) | | |
|---|---|---|---|---|---|---|---|
| | | Rev/Y | Exp/Y | Non-interest Exp/Y | Rev/Y | Exp/Y | Non-interest Exp/Y |
| (Rev/Y)(-1) | | 0.967 (0.000) | | | | | |
| (Exp/Y)(-1) | | | 0.860 (0.000) | | | | |
| (Non-interest Exp/Y)(-1) | | | | 0.972 (0.000) | | | |
| (D/Y)(-1) | | 0.023 (0.039) | -0.060 (0.014) | -0.095 (0.001) | 0.697 | -0.429 | -3.373 |
| C | | | 0.060 (0.003) | 0.045 (0.013) | | 0.429 | 1.602 |
| Adj R-sq | | 0.93 | 0.87 | 0.89 | | | |
| Wald Test | t-statistic | 0.155 | 0.006 | 0.681 | | | |
| | F-statistic | 0.155 | 0.006 | 0.681 | | | |
| (Prob) | Chi-square | 0.148 | 0.006 | 0.679 | | | |

Sample 1960-2010, p values in ( )

**Table 7 – Types of revenue reaction functions**

| | Estimated models | | | Long-run parameters ($\alpha_3/(1-\alpha_2)$) | | |
|---|---|---|---|---|---|---|
| | **Inc tax/Y** | **Goods tax/Y** | **Sales tax/Y** | **Inc tax/Y** | **Goods tax/Y** | **Sales tax/Y** |
| **(Inc tax/Y)(-1)** | 0.923<br>(0.000) | | | | | |
| **(Goods tax/Y)(-1)** | | 0.976<br>(0.000) | | | | |
| **(Sales tax/Y)(-1)** | | | 0.937<br>(0.000) | | | |
| **(Prop tax/Y)(-1)** | | | | | | |
| **(D/Y)(-1)** | 0.028<br>(0.009) | 0.007<br>(0.222) | 0.011<br>(0.008) | 0.363 | 0.156 | 0.173 |
| **Adj R-sq** | 0.78 | 0.96 | 0.95 | | | |
| **Wald t-statistic** | 0.029 | 0.388 | 0.027 | | | |
| **Test F-statistic** | 0.029 | 0.388 | 0.027 | | | |
| **(prob) Chi-square** | 0.023 | 0.383 | 0.021 | | | |

Sample 1968-2010 for income and property taxes, 1970-2010 for Goods and sales taxes, p values in ( )

**Table 8 – Total revenue and expenditure reaction functions with interactive dummies**

| | Estimated models | | | Long-run parameters ($\alpha_3/(1-\alpha_2)$) | | |
|---|---|---|---|---|---|---|
| | **Rev/Y** | **Exp/Y** | **Non-interest Exp/Y** | **Rev/Y** | **Exp/Y** | **Non-interest Exp/Y** |
| **(Rev/Y)(-1)** | 0.961<br>(0.000) | | | | | |
| **(Exp/Y)(-1)** | | 0.573<br>(0.006) | | | | |
| **(Non-interest Exp/Y)(-1)** | | | 0.548<br>(0.009) | | | |
| **D5966*(D/Y)(-1)** | 0.019<br>(0.011) | -0.120<br>(0.023) | | 0.499 | -0.282 | |
| **D6778*(D/Y)(-1)** | 0.025<br>(0.002) | -0.094<br>(0.009) | -0.148<br>(0.009) | 0.642 | -0.220 | -0.327 |
| **D7989*(D/Y)(-1)** | 0.035<br>(0.006) | -0.089<br>(0.027) | -0.125<br>(0.006) | 0.897 | -0.209 | -0.277 |
| **D9094*(D/Y)(-1)** | 0.017<br>(0.173) | -0.052<br>(0.015) | -0.057<br>(0.020) | 0.429 | -0.122 | -0.127 |
| **D9599*(D/Y)(-1)** | 0.025<br>(0.001) | -0.043<br>(0.012) | -0.061<br>(0.002) | 0.647 | -0.100 | -0.135 |
| **D0008*(D/Y)(-1)** | 0.024<br>(0.125) | -0.071<br>(0.007) | -0.076<br>(0.002) | 0.622 | -0.166 | -0.168 |
| **C** | | 0.136<br>(0.021) | 0.140<br>(0.009) | | 0.318 | 0.309 |
| **Adj R-sq** | 0.92 | 0.87 | 0.86 | | | |
| **Wald t-statistic** | 0.018 | 0.036 | 0.029 | | | |
| **Test F-statistic** | 0.018 | 0.036 | 0.029 | | | |
| **(Prob) Chi-square** | 0.014 | 0.030 | 0.022 | | | |

p values in ( )

**Table 9 – Types of revenue reaction functions with interactive dummies**

| | Estimated models | | | Long-run parameters ($\alpha_3/(1-\alpha_2)$) | | |
|---|---|---|---|---|---|---|
| | **Inc tax/Y*** | **Goods tax/Y**** | **Sales tax/Y**** | **Inc tax/Y*** | **Goods tax/Y**** | **Sales tax/Y**** |
| **(Inc tax/Y)(-1)** | 0.943 (0.000) | | | | | |
| **(Goods tax/Y)(-1)** | | 0.968 (0.000) | | | | |
| **(Sales tax/Y)(-1)** | | | 0.935 (0.000) | | | |
| **D7890*(D/Y)(-1)** | | 0.018 (0.000) | 0.019 (0.000) | | 0.563 | 0.292 |
| **D9110*(D/Y)(-1)** | | 0.006 (0.035) | 0.011 (0.011) | | 0.188 | 0.169 |
| **D6778*(D/Y)(-1)** | 0.028 (0.000) | | | 0.485 | | |
| **D7989*(D/Y)(-1)** | 0.024 (0.000) | | | 0.416 | | |
| **D9094*(D/Y)(-1)** | 0.011 (0.157) | | | 0.195 | | |
| **D9599*(D/Y)(-1)** | 0.020 (0.000) | | | 0.353 | | |
| **D0008*(D/Y)(-1)** | 0.024 (0.014) | | | 0.425 | | |
| **Adj R-sq** | 0.78 | 0.97 | 0.97 | | | |
| **Walt t-statistic** | 0.000 | 0.006 | 0.024 | | | |
| **Test F-statistic** | 0.000 | 0.006 | 0.024 | | | |
| **(Prob) Chi-square** | 0.000 | 0.003 | 0.018 | | | |

* Sample 1968-2010, ** Sample 1970-2010, p values in ( )

Thus to conclude this section:

About the stationarity of the series...

- once one controls for different administrations almost all the series turned out to be stationary (and in cases where the persistence parameter was close to one, the Wald test confirmed that they were nevertheless less than one).
- This is a finding that concurs with the arguments by Bohn, Claeys and Favero and Marcellino that these series are inherently stationary.

About whether government depended on adjustments to revenues or expenditure, or both when pursuing a fiscal rule...

- When the debt/GDP ratio increased, both revenue and expenditure adjusted, thereby ensuring the sustainability of fiscal policy in the post-WWII period.
- However, when comparing the size of the long-run tax and expenditure parameters, expenditure parameters are smaller than the tax parameters.
- This finding accords with the IMF's finding about the behaviour of G7 government, set out in its Fiscal Monitor (2011).

About the size of the reaction...

- When considering the regressions with the primary balance as dependent variable, it is clear that the size of the parameters mostly reflect the stance of the *(r-g)/(1+g)* gap.
- Thus, although the reaction of the various administrations differed, the extent to which they differed seem to reflect the stance of the *(r-g)/(1+g)* gap at the time.
- Hence, this analysis calls for the use of a time-varying analysis that controls for the movements in the *(r-g)/(1+g)* gap. Thus, the following relationship is estimated:

$$(B/Y)_t^{Actual} = \alpha_1 + \alpha_2 (B/Y)_{t-1}^{Actual} + \gamma_1 (B/Y)_{t-1}^{Required} + \upsilon_t \quad (16)$$

**Figure 2 – The *(r-g)/(1+g)* relationship**

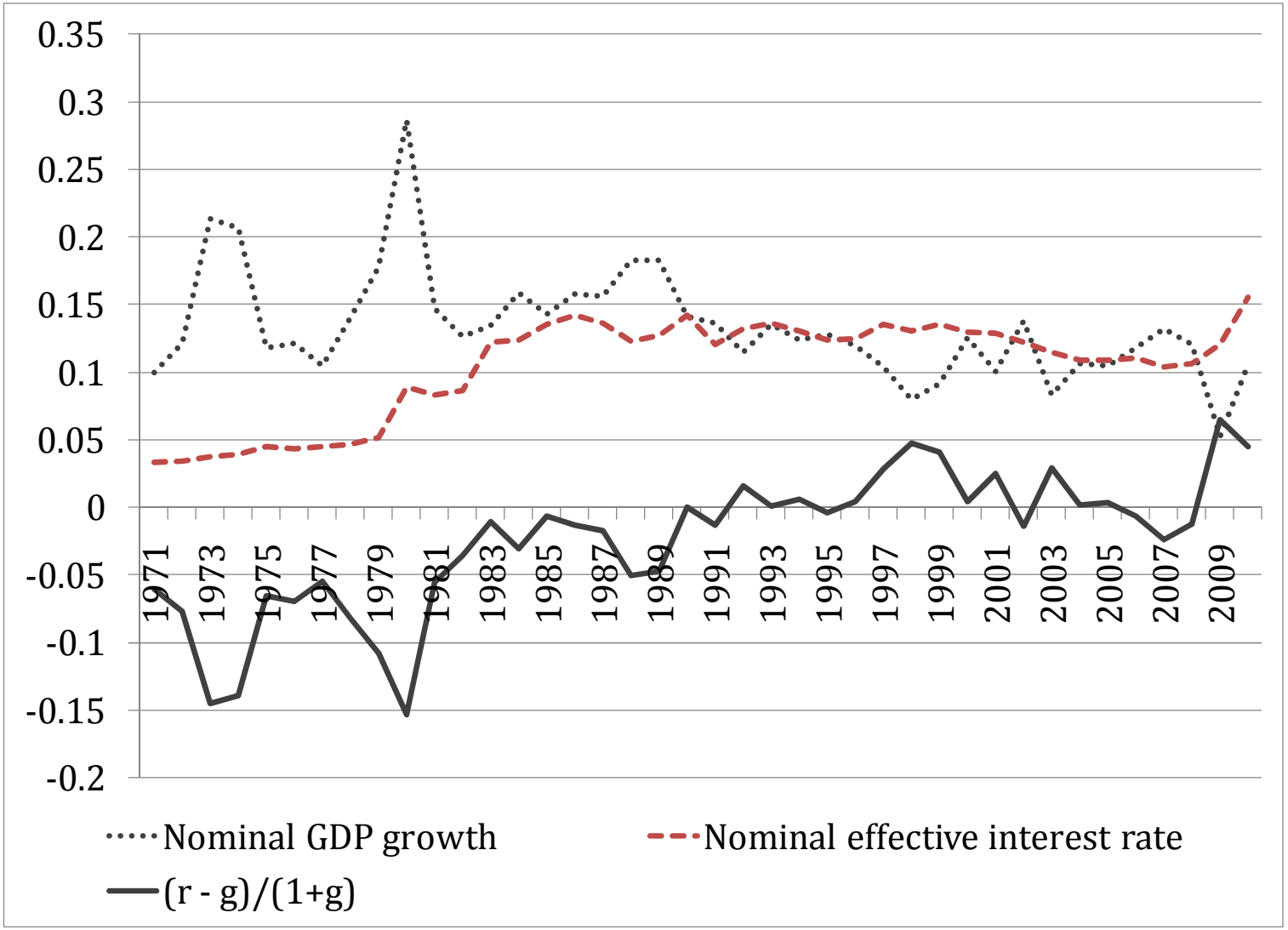
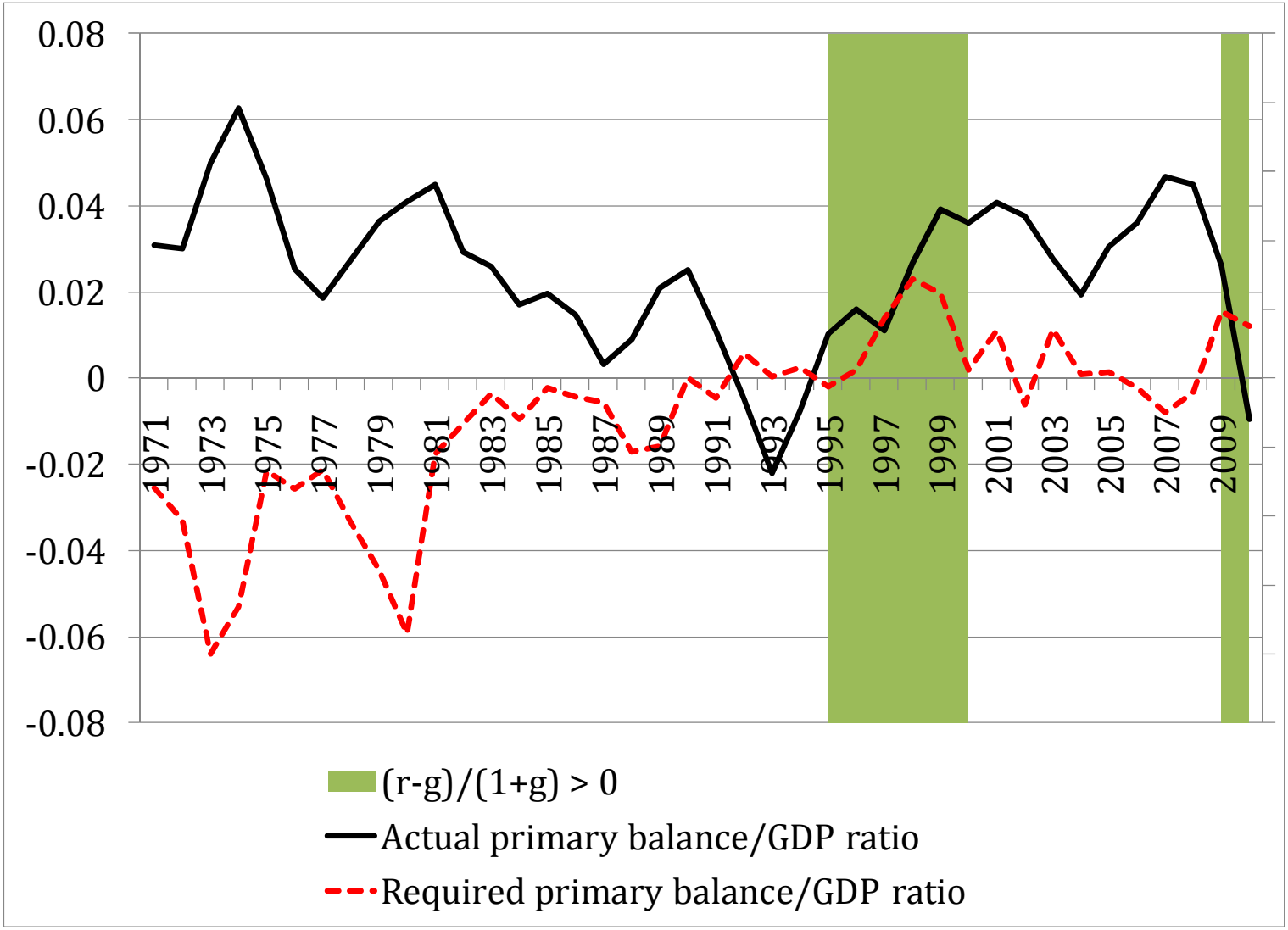


**Figure 3 – The *(r-g)/(1+g)* gap and the actual and required primary balances**



## Table 10 – Reaction functions with time-varying debt parameters (1)

| | B/Y* | Rev/Y | Exp/Y | Non-interest Exp/Y |
|---|---|---|---|---|
| | 0.469 | | | |
| **(B/Y)(-1)** | (0.002) | | | |
| | | 0.655 | | |
| **(Rev/Y)(t-1)** | | (0.000) | | |
| | | | 0.525 | |
| **(Exp/Y)(t-1)** | | | (0.000) | |
| **(Non-interest** | | | | 0.464 |
| **Exp/Y)(t-1)** | | | | (0.006) |
| | -0.486 | 0.257 | 0.463 | 1.150 |
| **$(B/Y)^{Required}$** | (0.008) | (0.057) | (0.001) | (0.002) |
| | 1.337 | | -0.722 | -1.289 |
| **D9599*$(B/Y)^{Required}$** | (0.000) | | (0.000) | (0.002) |
| | 0.007 | 0.081 | 0.127 | 0.135 |
| **C** | (0.082) | (0.007) | (0.001) | (0.002) |
| **Adj R-sq** | 0.57 | 0.80 | 0.71 | 0.78 |
| **Walt t-statistic** | 0.4379 | | | |
| **Test F-statistic** | 0.4379 | | | |
| **(Prob) Chi-square** | 0.4324 | | | |

Sample 1971-2010, p values in ( )

* Wald test $H_0$: $\alpha_2+\alpha_3=1$

**Table 11 – Reaction functions with time-varying debt parameters (2)**

| | Inc tax/Y | Goods tax/Y | Sales tax/Y |
|---|---|---|---|
| | 0.636 | | |
| **(Inc tax/Y)(-1)** | (0.000) | | |
| | | 0.714 | |
| **(Goods tax/Y)(-1)** | | (0.000) | |
| | | | 0.680 |
| **(Sales tax/Y)(-1)** | | | (0.000) |
| | | 0.280 | 0.364 |
| **$(B/Y)^{Required}$** | | (0.031) | (0.010) |
| | 0.168 | -0.258 | -0.412 |
| **$D9599*(B/Y)^{Required}$** | (0.043) | (0.024) | (0.007) |
| | 0.045 | 0.025 | 0.020 |
| **C** | (0.000) | (0.008) | (0.006) |
| **Adj R-sq** | 0.67 | 0.93 | 0.93 |
| **Walt t-statistic** | | 0.673 | 0.391 |
| **Test F-statistic** | | 0.673 | 0.391 |
| **(Prob) Chi-square** | | 0.671 | 0.390 |

Sample 1971-2010, p values in ( )

* Wald test $H_0$: $\alpha_2+\alpha_3=0$

**Explaining the results**

In the reaction functions containing the debt/GDP ratio, the inclusion of interactive dummies multiplied by the debt/GDP ratio, indicate that:

1) The behaviour of total and non-interest expenditure, as well as the different types of revenue changed over time.
2) The size of the reaction of the primary balance to changes in the debt/GDP ratio mostly seem to reflect the stance of the *(r-g)/(1+g)* gap. Hence, the use of the time-varying analysis that controls for the movements in the *(r-g)/(1+g)* gap.
3) The reaction of the revenue/GDP ratio to changes in the debt/GDP ratio is larger than those of the expenditure/GDP ratio. This is accordance with recent findings by the IMF (IMF Fiscal Monitor 2011) for the G7 countries.

## Adjusting the sensitivity of the automatic stabiliser

- A flexible rule very much depends on the workings of the automatic stabilisers.
- However, the 2008/9 financial crisis indicated that governments also change their discretionary fiscal policy.
- Should burden of reaction not to a larger extent be shifted to the automatic stabilisers, thereby automating fiscal reaction to a larger extent?
- Automatic stabilisers eliminate the observation and decision lags that hamper discretionary reactions.
- Shifting the burden of reaction more to the automatic stabilisers, though, may require the enhancement of these stabilisers.
- Baunsgaard and Symansky (2009): Several ways in which the automatic stabilisers can be enhanced without increasing the size of government.
- Include permanent and temporary changes to tax and expenditure frameworks.
- Permanent measures, (e.g. increasing the progressiveness of personal income), will not yield a significant enhancement of the automatic stabilisers.

- Thus, they argue for the use of temporary measures.
- Propose use of temporary measures with high multiplier effects such as temporary tax policies targeted at low-income households that are probably credit or liquidity constrained.
- Rebates on personal income taxes, temporary reductions in VAT, temporary investment tax incentives for businesses that might be credit or liquidity constrained and temporary job creation tax credits.
- On the expenditure side government could use temporary transfers, again to credit and liquidity constrained households, as well as temporarily expand existing unemployment benefits (e.g. longer period of eligibility, higher benefits).
- A catalogue of 'shovel-ready infrastructure projects'
- Payment of temporary subsidies to employers not to retrench workers. Thus, government pays companies directly to keep workers employed.
- Implementation of temporary measures needs to depend on economic trigger indicators (or trip switches)

## Conclusion

- This paper contains a proposal for the use of a simple deficit-and-debt fiscal rule.
- The primary balance/GDP, revenue/GDP and expenditure/GDP ratios did react to the debt/GDP ratio, with the analysis indicating that this reaction mostly reflected movements in the *(r-g)/(1+g)* gap.
- Government could also consider measures to increase this reactiveness of revenue and expenditure, both to changes in debt and the business cycle.