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Consolidation under the Europe's New Fiscal Rules: Analyzing the Implied Minimum Fiscal Effort

*Tero Kuusi*¹

Abstract

The new EU fiscal framework builds on several overlapping target measures and convergence rules. Thus, it is not clear how strict goals the framework sets for public finances. In this paper we build a simulation framework that solves the minimum fiscal effort under different assumptions on the initial state of the economy and the expected economic conditions during the consolidation. We then use the model to analyze several fiscal consolidations. We find that Germany, France, Spain and Italy are currently in compliance with our measure of minimum fiscal effort, but Spain is at risk of falling behind the required pace of consolidation in the near future. As a historical reference we revisit the Finnish Great Depression of the early 1990s. We find that the consolidation was in compliance with the fiscal rules, but during the first years of the consolidation the difficulty of detecting the phase of the business cycle could have considerably increased the restrictiveness of the rules. Finally, we address the looming sustainability gap in the Finnish public finances that reflects the cost of aging population. Under no policy change the required correction is found to become substantial by 2030.

Tiivistelmä

EU:n uudet finanssipoliittiset säännöt asettavat monia päällekkäisiä tavoitteita ja aikatauluvaatimuksia julkistalouden tasapainotuksille. Onkin epäselvää, miten voimakkaita toimenpiteitä vaaditaan, jotta ne täyttäisivät sääntöjen vähimmäisvaatimukset. Tässä artikkelissa laaditaan simulointimalli, jolla vähimmäisvaatimukset voidaan laskea erilaisissa tasapainotuksen aikana vallitsevissa olosuhteissa. Mallia sovelletaan useisiin esimerkkitapauksiin. Työ osoittaa, että nykykriisin aikana Saksa, Ranska ja Italia ovat saavuttaneet sääntöjen asettamat minimitalvotteen, mutta Espanjan kehitys ennakoi sääntörikkomuksia lähivuosina. Historiallisena esimerkkinä käytetään Suomen 1990-luvun lamaa seurannutta julkistalouden tasapainotusta. Voidaan havaita, että tasapainotus oli keskimäärin sääntöjen mukainen, mutta sen alkuvuosina epätie-toisuus suhdannekehityksestä olisi saattanut lisätä merkittävästi sääntöjen asettamia vaatimuksia. Lopuksi tarkastellaan Suomea lähivuosisikymmeninä uhkaavaa kestävyysvajetta. Mikäli kestävyysvajetta ei korjata, tulisi julkistalouden tasapainotus olemaan huomattava 2030-luvun alkuun mennessä.

JEL codes: E61, E62, H6

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1 Introduction

As a result of the ongoing global financial crisis and the followed sovereign debt crises public finances in Europe are in poor shape. To enhance fiscal credibility new fiscal rules for Europe have been set up. The rules include the so-called “six-pack” of legislative measures and a new treaty incorporating the “fiscal compact” that aim at strengthening the procedures to reduce public deficits and address macroeconomic imbalances. However, from an economic perspective it is still unclear, how well the new EU fiscal rules work. The rules consist of several target measures: the headline deficit, the debt-to-GDP ratio, the structural budget balance, and government expenditure. Furthermore, there are explicit convergence rules for the debt-to-GDP ratio and the structural budget balance, and there is a mix of headline and cyclically-adjusted measures. As a result, the implications of the rules are often ambiguous and state contingent.

To shed more light on the functioning of the rules, we ask a simple question: if a breach of the rules is identified, how much fiscal effort does it take to return legislative compliance? To answer the question, we build a simulation framework that solves the minimum fiscal effort under different assumptions on the initial state of the economy and the expected economic conditions during the consolidation.² In the exercise we use DG ECFIN (2011, 2012A, 2013B) that provide detailed description of the new rules. The rules cover the required fiscal position at the end of the consolidation program, the minimum rate of deficit reduction during the consolidation, and the nature of the consolidation. We introduce the rules as constraints to our numerical minimization problem. Furthermore, we use the Commission method to measure structurally adjusted deficit and provide quasi real-time estimates to gain more insight to the use of structural adjustment.

We then use the simulator to analyze past, present and future fiscal consolidations. We investigate the ongoing fiscal consolidations in Germany, France, Italy and Spain. We find that all countries are currently in compliance with our measure of minimum fiscal effort, but Spain is at risk of falling behind the target in the near future. In France, Italy and Spain there is still need to further consolidate in order to meet compliancy with the required fiscal position at the end of the consolidation program.

As our historical reference we revisit the Finnish Great Depression of the early 1990s. Between the years 1987 and 2012 the Finnish economy has experienced substantial economic turbulence which makes its history a natural testing ground for the use of the rules. The strongest cycle consists of the economic overheating in the late 1980s and the subsequent Finnish Great Depression. In the aftermath of the crisis the country managed to successfully rebalance its public finances in (at least ex-ante) difficult economic conditions. We ask whether the consolidation was in compliance with the new fiscal rules. We find that the diffi-

² To our knowledge, Barnes et al. (2012) and Rawdanowicz (2012) are the closest references to the current approach.

culty of detecting the phase of the business cycle increased the restrictiveness of the rules considerably as our real time output gap estimates suggest that the cyclical component of the headline deficit was small in the early 1990s.

Finally, we address the looming sustainability gap in the Finnish public finances that reflects the cost of aging population. We use DG ECFIN (2012B) projections of public finances to measure the required fiscal consolidation to fill the sustainability gap in accordance with the new rules. We find that the required correction may eventually become substantial. That is, the country's primary balance over GDP ratio must improve more than 8 percentage points if the correction is delayed until 2030.

2 The New Fiscal rules

In this section the new fiscal rules are shortly reviewed based on the recent information published by the European Commission (DG ECFIN 2011, 2012A, 2013B). The legislation can be divided into two parts, the preventive arm and the corrective arm that we review in separate subsections.

2.1 The preventive arm

The preventive arm consists of rules that set boundaries for medium to long-term policies with the task of preventing pro-cyclical fiscal policy during upturns. The preventive arm provides a safety margin between the actual policies, and the 3% deficit rule / 60% debt rule which set the boundaries for sustainable fiscal policies in the stability and growth pact. In particular, the preventive arm sets a 1 % limit for structural deficit and prohibits the rate of government expenditure growth to exceed the reference medium-term rate of potential GDP growth in "good times", unless the excess is matched by discretionary revenue measures.

Within these limits stricter targets can be set based on medium term budgetary objectives (MTO) provided by the member countries for the Commission in every three years. MTO are based on stability and convergence programmes, which adequately reflect objectives of the stability and growth pact. The task of the Commission is to evaluate the objectives and monitor the compliance of the actual policies. A more detailed description of the preventive arm can be found in Table 1.

Table 1: The Preventive Arm of the Stability and Growth Pact

I. Goals for individual member countries:

- 1. In most cases countries should not exceed 0.5% deficit / GDP in structural terms. In any case countries should not exceed 1% deficit / GDP**

2. Countries should meet country-specific medium-term budgetary objectives (MTO) which may set stricter goals in structural terms.
3. They should avoid annual expenditure growth to exceed the reference medium-term rate of potential GDP growth in "good times", unless the excess is matched by discretionary revenue measures.³
4. In case of overachieving the MTO, expenditure can exceed medium-term growth if, controlling for significant revenue windfalls, MTO is still respected throughout the programme period.

II. If the goals are not reached, the member country should correct its fiscal position:

1. Pursue annual adjustment in cyclically adjusted terms, net of one-off and other temporary measures of 0.5 pps of GDP
2. Growth rate of the expenditure net of discretionary revenue measures in relation to the reference medium-term rate of potential GDP growth should be expected to yield an annual improvement in the government balance in cyclically adjusted terms net of one-offs and other temporary measures of 0.5 pps of GDP
3. If MTO is not reached and debt level exceeds 60% with pronounced risk of debt sustainability, a faster path towards the MTO is required
4. In case of unusual event or severe economic downturn for the Euro Area or the Union as a whole temporary departures from MTO allowed on condition that this does not endanger fiscal sustainability on the medium-term
5. Structural reforms (major health, pension and labor market reforms) may entitle to temporary deviations from the MTO within an appropriate safety margin to the deficit reference value.

¹ The reference medium-term rate of potential GDP growth will be the average of the estimates of the previous 5 years, the estimate of the current year, and the projections for the following 4 years. Good times are identified based on overall economic assessment. In principle, they are periods when output exceeds its potential level, taking into account tax elasticities. Given the uncertainty surrounding output gap levels, changes in output gaps could be also considered. The considered expenditure aggregate excludes interest expenditure, expenditure on EU programmes fully matched by EU funds revenue and non-discretionary changes in unemployment benefit expenditure. Expenditure aggregate should be adjusted by averaging investment expenditure over 4 years. Furthermore, tax revenue windfalls and shortfalls should be taken into account. Windfall tax revenues should be understood as revenues in excess of what can normally be expected from economic growth.

2.2 The corrective arm

In line with the provisions of the Treaty on the Functioning of the European Union (TFEU), the Commission has to examine compliance with budgetary discipline on the basis of both the deficit (3% of GDP) and the debt criteria (60% of GDP). The corrective arm of the stability and growth pact is implemented if the rules are breached (for exceptions, see the Appendix). Commission will always prepare a report under Article 126(3) of the Treaty when at least one of conditions 1 or 2 in Table 2 holds, before the Council decides by qualified majority whether the deficit and/or debt is excessive based on an overall assessment (Art. 126(6) TFEU).

Table 2: The Corrective Arm of the Stability and Growth Pact

I. When are debt and deficit rules breached?

1. A reported or planned government deficit exceeds the reference value of 3% of GDP.
2. A reported government debt is above the reference value of 60% of GDP, and all of the following three rules hold
 - its differential with respect to the reference value has not decreased over the past three years at an average rate of one-twentieth as a benchmark, which is measured by an excess of the debt ratio reported for the year t over a backward-looking element of a benchmark for debt reduction computed as follows (DD = benchmark, D = debt)

$$DD_t = 0.6 + \frac{0.95}{3} \left(\frac{D_{t-1}}{GDP_{t-1}} - 0.60 \right) + \frac{0.95^2}{3} \left(\frac{D_{t-2}}{GDP_{t-2}} - 0.60 \right) + \frac{0.95^3}{3} \left(\frac{D_{t-3}}{GDP_{t-3}} - 0.60 \right) \quad (1)$$

- the budgetary forecasts as provided by the Commission services indicate that, at unchanged policies, the required reduction in the differential will not occur over the three-year period encompassing the two years following the final year for which the data is available, which is measured by an excess of the debt ratio forecast by the Commission services for the year t+2 over a forward-looking element of a benchmark for debt reduction computed as follows

$$DD_{t+2}^f = 0.6 + \frac{0.95}{3} \left(\frac{D_{t+1}}{GDP_{t+1}} - 0.60 \right) + \frac{0.95^2}{3} \left(\frac{D_t}{GDP_t} - 0.60 \right) \quad (2)$$

$$+ \frac{0.95^3}{3} \left(\frac{D_{t-1}}{GDP_{t-1}} - 0.60 \right)$$

- the breach of the benchmark cannot be attributed to the influence of the cycle, to be assessed according to a common methodology to be published by the Commission. In particular, the Commission shall use a cyclically adjusted debt measure. (We introduce the measure in the next section.)

II. A minimum fiscal effort towards compliance

- Consistent with a minimum annual improvement in its cyclically adjusted balance net of one-off and temporary measures of at least 0.5 of a percentage point of GDP as a benchmark.
 - Begin on the second year after the excessive deficit occurs.
- Having corrected its excessive deficit a Member State should present budgetary objectives consistent with the respect of the debt reduction benchmark, including the forward looking element by the end of a three year transitional period.
 - In order to define sufficient progress towards compliance, the Commission will identify a minimum linear structural adjustment ensuring that Member States will comply with the debt rule at the end of the transition period.
 - The annual structural adjustment should not deviate by more than ¼ % of GDP from the minimum linear structural adjustment ensuring that the debt rule is met by the end of the transitional period.
 - At any time during the transition period, the remaining annual structural adjustment should not exceed ¾ % of GDP.

3 Methodology

In this section we use the descriptions of the fiscal rules to formalize a numerical simulation model. The model allows us to assess the minimum fiscal effort to achieve compliance with the rules under different assumptions on key economic variables, such as the initial level of debt, deficit, nominal interest rates and

expected rate of economic growth. Furthermore, we review the Commission method to estimate structural deficit.

3.1 Sufficient progress towards compliance

We next identify a minimum structural adjustment path ensuring that a country will comply with the fiscal rules at the end of the transition period. To solve the minimum path, we define a numerical optimization problem.

We make several assumptions to characterize the minimum path. First, following DG ECFIN (2012B) and Rawdanowicz (2012), we assume that the transition path is linear.⁴ During the three year transitional period the linearity assumption follows directly from the rules. However, we acknowledge that otherwise the interpretation of the rules is not clear-cut. In principle the minimum deficit reduction effort is 0.5 percentage points of GDP during the corrective part (deficit exceeds 3 percentage points of GDP), while the debt reduction effort may change when the 3 percent deficit benchmark is reached.⁵ That may be the case, for example, when the country has a large debt stock and the three year linear adjustment to meet the debt reduction benchmark sets stricter than 0.5 percentage point limit for the deficit reduction.

However, rule II.3 in Table 1 states that if MTO is not reached and the debt level exceeds 60% with pronounced risk of debt sustainability, a faster path towards the MTO is required. Furthermore, the fiscal path set out during the excessive deficit procedure has to also take into account the need to comply with the debt benchmark. Therefore, the 0.5 percentage point deficit reduction pace may not be enough and we instead set it to match the rate of consolidation during the three year transition period.

Furthermore, we assume that the country must meet either the MTO or the debt reduction benchmark in three years after it has reached the 3 percent deficit benchmark. We find that without this assumption even highly indebted countries may have transitional periods that last much longer than three years, when they converge towards their MTOs.

The adjustment path is defined for given initial deficit (d_0), initial primary deficit (b_0), initial debt (D_0), stock-flow adjustments (sfa_t), the path of the nominal gross domestic production (GDP_t), and the path of nominal interest rates (r_t). Let us first define

⁴ However, DG ECFIN (2012B) does not attempt to minimize the fiscal effort needed to reach compliance with the rules. We extend the approach of Rawdanowicz (2012) by providing more detailed description of the rules and subject the structural budget deficit to the linear adjustment.

⁵ An assumption that Barnes et al. (2012) uses.

$$D_t = D_{t-1} + d_t + sfa_t$$

$$d_t = b_t + r_t D_{t-1}$$

$$GDP_t = GDP_0 \prod_{k=1}^t (1 + g_k)$$

Furthermore, we allow for non-zero fiscal multipliers ($m_k^g > 0$) and non-zero debt elasticity of interest rate ($m^r > 0$):

$$g_t = g_t^{exo} + \sum_{k=0}^K \left[m_k^g * \frac{b_{t-k} - b_{t-k-1}}{GDP_{t-k-1}} \right]$$

$$r_t = r_t^{exo} + m^r \frac{D_{t-1}}{GDP_{t-1}}$$

Finally, the rules are partially determined in terms of structural and headline deficit and cyclically adjusted debt. We mark the structural deficit measures and cyclically adjusted debt with ($\widehat{}$) so that

$$\widehat{d}_t = d_t - d_t^{adj}$$

$$\widehat{b}_t = b_t - b_t^{adj}$$

$$\widehat{D}_t = \frac{D_t + \sum_{j=0}^2 d_{t-2}^{adj} * GDP_{t-j}}{GDP_{t-3} \prod_{h=0}^2 (1 + y_{t-h}^{pot}) (1 + p_{t-h})} \quad (3)$$

where d^{adj} and b^{adj} are adjustments that are used to control for cyclical and other temporary factors affecting the public finances. As debt expenditures are not structurally adjusted when primary deficit is measured, $d^{adj} = b^{adj}$. Finally, the formula for the cyclically adjusted debt, \widehat{D}_t is taken from DG ECFIN (2013B). y_{t-h}^{pot} refers to the growth rate of potential output, and p_t to inflation in period t.

Then we proceed to formalize the minimization problem. We assume that the country minimizes the average pace of primary deficit reduction to achieve compliance with the rules at the end of the transitional period and during the consolidation⁶. We first solve the problem for a transition that lasts τ periods:

⁶ We acknowledge that other assumptions could be used. For example, the country could minimize the maximand of the reduction pace in any given year, or maximize the level of debt during the transition. However, under the linearity of structural deficit reduction it is most likely that the assumption does not greatly affect the results.

$$\Delta b_{\tau}^{min} = \min_x [b_0 - b_{\tau}]$$

s. t.

$$\frac{\hat{d}_{t-1}}{GDP_{t-1}} - \frac{\hat{d}_t}{GDP_t} = x \mid t \leq \tau \quad (4)$$

$$x \geq 0.005 \quad (5)$$

$$\min\left(\frac{D_{\tau}}{GDP_{\tau}} - DD_{\tau}, \frac{D_{\tau+2}}{GDP_{\tau+2}} - DD_{\tau+2}^f, \frac{\widehat{D}_{\tau}}{GDP_{\tau}} - 0.60\right) \leq 0 \mid \frac{D_{\tau}}{GDP_{\tau}} \geq 0.60 \quad (6)$$

$$\frac{\hat{d}_{\tau}}{GDP_{\tau}} \leq MTO \quad (7)$$

$$\frac{\hat{d}_{\tau-4}}{GDP_{\tau-4}} \geq 0.03 \mid \tau \geq 4 \quad (8; \text{three year rule})$$

$$\tau \leq T \quad (9)$$

Eq. (4) states that the deficit reduction effort is linear in structural terms. That is, it falls at a constant rate of x percentage points. Eq. (5) ensures that the deficit reduction effort is at least 0.5 percentage points per year. Eq. (6) states that the debt reduction benchmark must be met at the end of the consolidation program if the level of debt is higher than the 60 % reference value. That is, if any of the debt rules (measured in terms of the forward-looking and the backward-looking debt reduction in eq. (1) and (2), as well as the cyclically adjusted debt in eq. (3)) are fulfilled. To solve for the forward-looking debt reduction benchmark we follow the example of DG ECFIN (2013B) and assume that the structural deficit is kept constant at $\frac{\hat{d}_{\tau}}{GDP_{\tau}}$ for three years starting from the beginning of the year τ . We also impose that the debt rule applies only when the stock of cyclically adjusted debt exceeds 60 percent of GDP.

According to eq. (7) the final deficit ratio should not exceed the MTO. Eq. (8) sets an additional limit to the schedule: After the country has reached 3 percent level of (structurally unadjusted) deficit per GDP, it should not take more than 3 years before the debt reduction benchmark or the MTO is reached.⁷ That is, 4 years before the program ends the country still will have deficit per GDP higher than 3 percent. Naturally, if the program is shorter than 4 years, the rule does not apply. In what follows, we refer to eq. (8) as “the 3 year rule”. Finally Eq. (9) is a possible additional constraint (T) on the length of the transitional period.

⁷ In our examples we show that even countries with major need for consolidation may ultimately converge towards their MTOs. Thus, we assume that the same time limit holds for programs converging towards debt reduction benchmark, and for programs converging towards the MTO. We also assume that the three year rule is applied beyond the current crisis.

In practice, we solve the endogenous variables (debt, primary deficit and GDP growth in case of a fiscal multiplier) on a tight grid of the possible rates of adjustment, x . Programs that are found to be in breach of the rules are discarded and the minimum is selected from the remaining set of feasible adjustment programs. Finally, after the minimum program is solved for a reasonable variety of transition periods, we can choose among them the program (τ) that minimizes the annual average fiscal effort, $\frac{\Delta b_t^{min}}{\tau}$.⁸

3.2 Measuring the Structural Deficit

In order to have historical perspective to the use of the current method, we also use the Commission data and algorithms to provide quasi-real time estimates of the structural deficit. We use Commission's statistical model to solve the output gap with parameters (priors and functional forms) that are taken from the actual Commission forecast exercises. For each year the output gap is calculated after excluding the data for the following years. For example, the quasi real-time estimates for the year 2000 are estimated by using the data provided by the Commission until the year 2000.

This subsection provides a short introduction on the measurement of the output gap using the Commission method. We leave detailed description of the data and practical issues to the section where results are presented.

The Commission uses a production function based estimation procedure to measure potential output. The production function is assumed to be of the Cobb-Douglas form

$$Y_t = TFP_t K_t^\alpha L_t^{1-\alpha},$$

where Y_t is the GDP, TFP_t is the total-factor productivity, K_t is the physical capital stock, and L_t is the labor input in the year t . α is the nominal factor share of capital in value added.

The output gap can be measured by first estimating the potential levels of TFP_t and L_t , which we denote as TFP_t^{pot} and L_t^{pot} , respectively. The output gap consists of two components

$$LN(Y_t) - LN(Y_t^{pot}) = LN(TFP_t) - LN(TFP_t^{pot}) + (1 - \alpha)(LN(L_t) - LN(L_t^{pot})).$$

TFP gap measures cyclical changes in the efficiency of capital and labor use, while the labor gap measures the difference between the actual employment and the potential employment.

⁸ That is, we find the minimum $\min_\tau [\frac{\Delta b_t^{min}}{\tau}]$.

The potential employment is further decomposed into parts. It equals the total potential labor force adjusted for the structural unemployment. The potential labor force, on the other hand, is defined as the total working age population multiplied by the potential participation rate. Thus, the potential employment is

$$L_t^{pot} = POP_t^W PART_t^{pot} (1 - NAWRU_t) H_t^{pot},$$

where POP_t^W is the population of working age, $PART_t^{pot}$ is the potential participation rate, $NAWRU_t$ is the level of structural unemployment, and H_t^{pot} is the trend number of hours per worker .

Thus, solving the potential output requires the estimates of four variables: $PART_t^{pot}$, $NAWRU_t$, H_t^{pot} and TFP_t^{pot} . The Commission uses HP –filter to estimate $PART_t^{pot}$ and H_t^{pot} , while the estimation of the other two components is based on the use of bivariate particle filters. The observed variable ($VAR_t = TFP_t$ or L_t) can be divided into structural component and cyclical component, while further information regarding the latter can be obtained with an additional indicator variable ($INDICATOR_t =$ capital utilization rate or inflation). A simplified version of the system of equations is

$$VAR_t = X_t + \epsilon_t^{trend} + \epsilon_t^{cycle}$$

$$INDICATOR_t = \epsilon_t^{cycle} + s_t^{ind}$$

$$\epsilon_t^{trend} = linear(s_t^{trend}), \epsilon_t^{cycle} = linear(s_t^{cycle})$$

In particular, the estimation procedure aims at making inferences on the states of the two unobservable processes, ϵ_t^{trend} and ϵ_t^{cycle} , which are the states of the structural and cyclical components of the variables in period t, as well as additional explanatory variables (X_t) arising from economic theory (in particular, a reduced form labor market model, when employment is explained). The processes are autoregressive and functions of the current and past unobservable shock innovations (s). Information on observed variables, indicator variables in particular, as well as structural assumptions regarding the interaction of the variables can be used to have an estimate of the current states. Finally, potential level of the variable is obtained by removing the cyclical component of the variable. Further details on the use of the particle filters can be found in the technical Appendix available at the Commission web-page.

After the output gap is measured, it is used to make cyclical adjustments to the budget deficits. Using the OECD (2005) methodology the overall cyclical sensitivity of the budget balance is used:

$$CAB_t = DEF_t - \epsilon * GAP_t,$$

where CAB_t is the cyclically adjusted budget balance, DEF_t is the budget balance, ϵ is the overall elasticity of fiscal balance to the business cycle, and GAP_t is the output gap. Furthermore, the cyclically adjusted

budget balance can be corrected for known temporary factors and one-offs (OO_t) to have an estimate of the structural balance (SB_t):

$$SB_t = CAB_t - OO_t$$

4 Fiscal Consolidations

In this section we use the simulation model to analyze the size of the minimum fiscal effort during fiscal adjustments. We first apply the rules to the current crisis. Then we revisit the Finnish recovery after the 1990s crisis. Finally, we study the anticipated fiscal adjustment in the near future due to the increasing cost of aging.

4.1 Fiscal Consolidations during the Current Crisis

In our first application we investigate the nature of current consolidations in Europe. We take four examples (France, Germany, Italy and Spain) and use the long-term economic projections of DG ECFIN (2012B) and our numerical algorithm to simulate consolidation programs.⁹ The fiscal consolidations are assumed to begin in the year 2010¹⁰. We then compare their observed and anticipated fiscal effort based on DG ECFIN (2013A) with the fiscal effort implied by the simulated programs. The examined countries all entered the excessive deficit procedure in 2009. In 2012 the Council decided to abrogate the excessive deficit procedure for Germany and in 2013 for Italy. The other two countries still remain in the procedure in 2013.

We make several assumptions. In line with DG ECFIN (2012B) we assume that each percentage point of primary deficit reduction will lower the current GDP growth by 0.5 percentage points. Other assumptions that are required to generate the projections of the variables are reported in DG ECFIN (2012B, pp. 21)

Figures 1-4 show the structural deficits, deficits, structural primary deficits, and the EMU debt, respectively, in the four member countries between the year 2010 and the end year of the simulated consolidation programs¹¹. We find that the observed and anticipated fiscal effort (decline of the structural deficit) corresponds relatively closely to our simulated consolidation. The decline of the structural deficit has been larger in the first years of the consolidation, while the forecasts of fiscal effort for the years 2013 and 2014 sug-

⁹ The data includes forecasts of nominal GDP, nominal interest rates, stock—flow adjustments, and the size of structural adjustment.

¹⁰ We acknowledge that there is a time inconsistency problem in our simulations, as the programs are partly based on information that was not available until 2012. We discuss informational problems more closely in our other examples.

¹¹ Data for the years 2013 and 2014 are based on Commission forecasts reported in DG ECFIN (2013).

gest that the pace of consolidation is slowing down and the average pace is converging towards the minimum fiscal effort, or even falls behind it.

In all simulations inequality constraints 4, 6 and 7 are binding. That is, countries will converge towards the minimum MTO with half a percentage point deficit at the end of the program. The path towards the MTO is sufficient to guarantee compliance with the debt benchmark¹², while the pace of deficit reduction exceeds 0.5 percentage points and it is governed by the three year rule.

The current average pace of fiscal effort in France suggests that the country should reach the MTO by the year 2018. Our model suggests that the country will reach the 3 percent (unadjusted) deficit benchmark in 2016. The debt ratio should start falling by the year 2015 at the latest. However, our calculations show that the country still has a substantial fiscal consolidation ahead of it. After 2014 the structural deficit must still be reduced by another 3 percentage points.

The results show that the German consolidation has outpaced the minimum fiscal effort. This is likely to be the case, because the minimum structural deficit (0.5 of GDP) at the end of the simulated program is larger than the country's actual MTO. According to the minimum program the debt ratio starts to decrease in 2013 while in the data the turn was seen already in 2012.

Italy has also reached the minimum MTO. However, it is noticeable that its headline deficit is still high indicating that improvement in public finances due to cyclical factors is needed. The anticipated fiscal effort for the years 2013 and 2014 suggests that the recovery is expected to be slow in the near future (figure 2). According to our simulated programs (figure 4) the debt ratio should start falling in 2013. A noticeable feature in figure 4 is that the EMU debt is anticipated to increase faster than our simulated consolidation suggests, while the structural deficit remains within the boundaries of the program. That is likely to reflect debt expenditures and stock flow adjustments that are higher than expected at the time of the writing of the DG ECFIN (2012B).

According to our estimates the Spanish economy has the largest need to adjust its public finances in the near future. The deficit reduction pace in 2010-2013 is found to be consistent with the minimum deficit reduction, but in 2014 it is anticipated that the deficit may exceed the boundaries of the program. The deficit (primary deficit) must still be adjusted more than 5 (5.5) percentage points after 2014 to meet compliance with the rules at the end of the program. Because the country still has a large budget deficit, the length of the consolidation program will be longer than in the other countries. The debt ratio is expected to

¹² We find that when the forward-looking debt reduction rule is removed, the debt reduction benchmark becomes a binding constraint for most of the countries.

start falling in 2015, but it will take another 6 years before the country reaches the end of the consolidation.

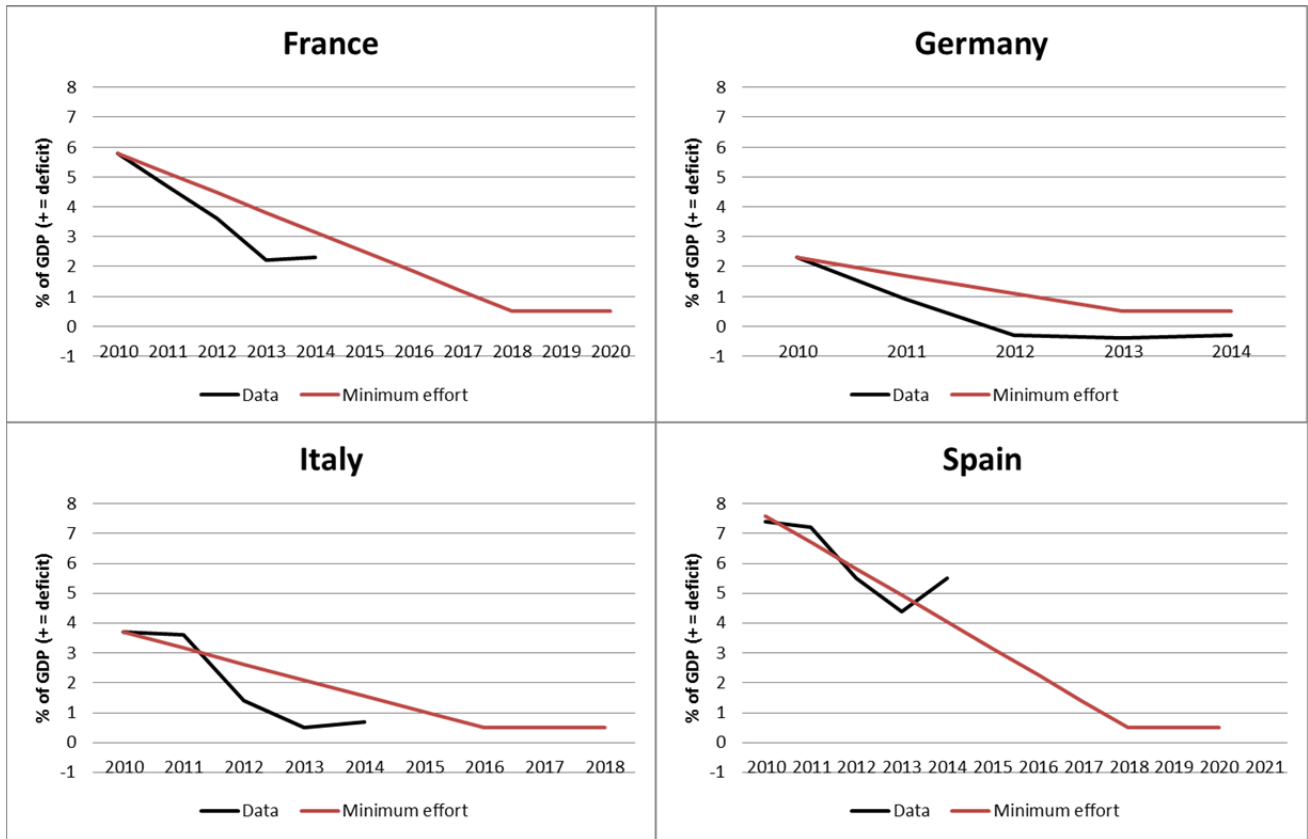


Figure 1: Structural deficit

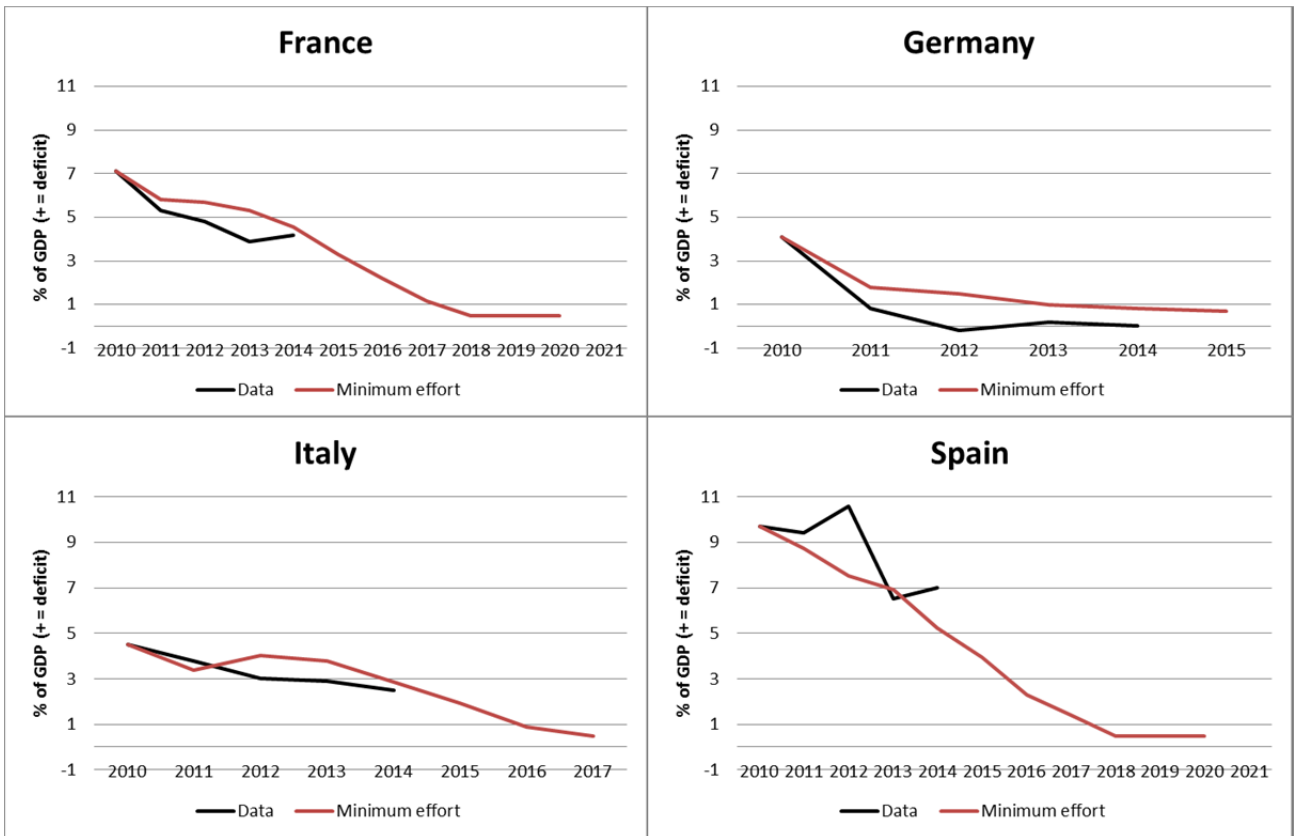


Figure 2: Headline deficit

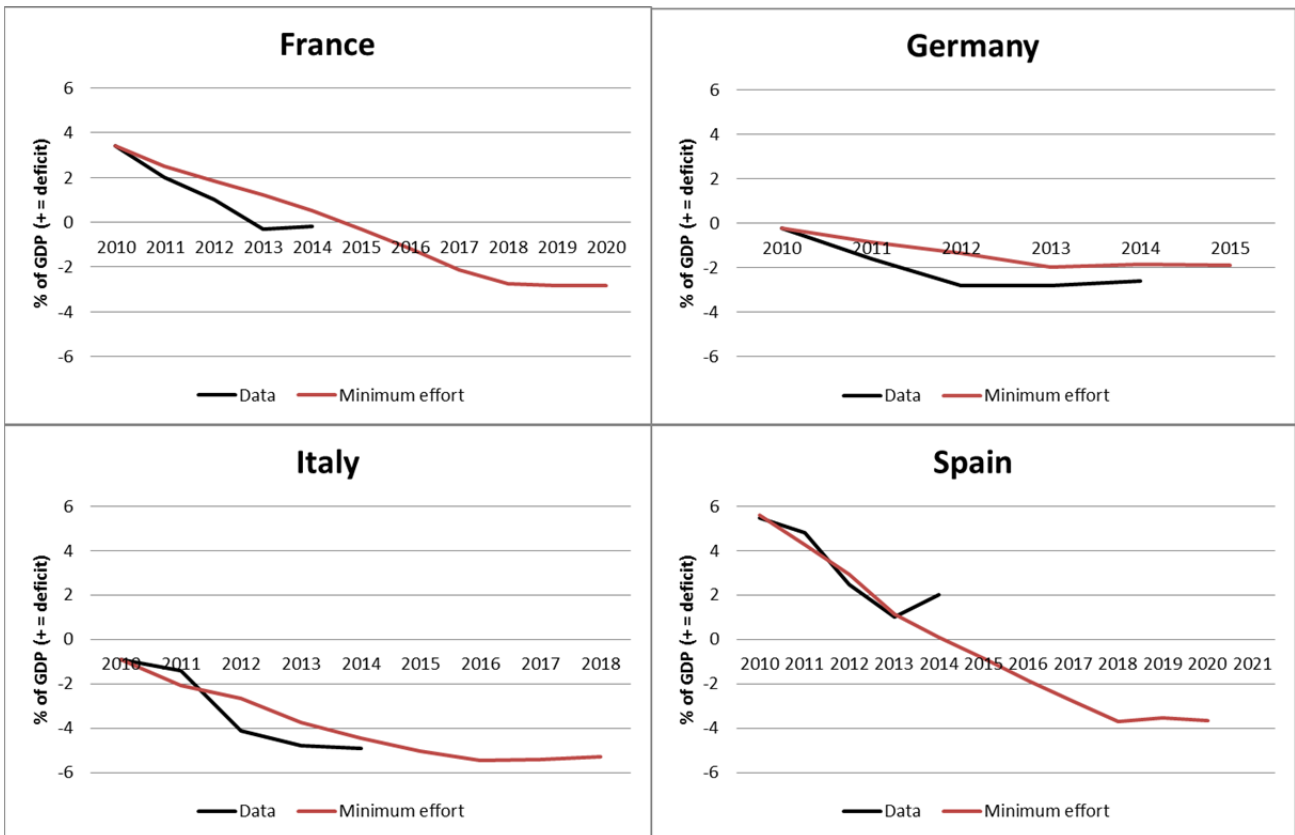


Figure 3: Structural primary deficit

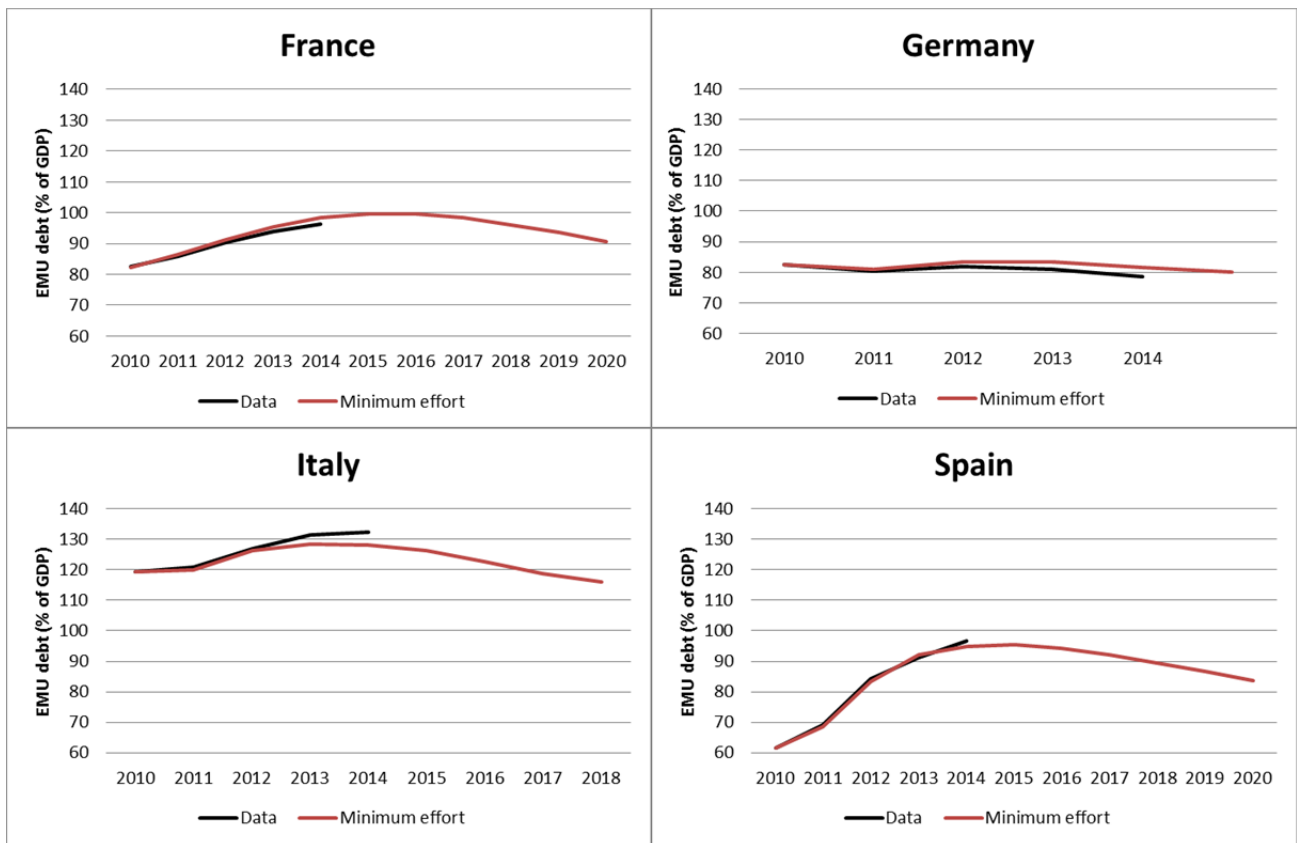


Figure 4: EMU debt

4.2 The Finnish Great Depression

Next, we simulate the rules under assumptions that reflect economic growth and interest rates as well as the state of the public finances in the aftermath of the 1990s crisis in Finland. We find that a historical reference to a completed fiscal consolidation is useful for two reasons. First, it serves as a benchmark for the amount of fiscal effort required in the current crisis. Second, we can analyze how the rules work in real-time data compared to our view of the crisis ex-post. In this section we analyze the consolidation program under different assumptions on the medium-term developments in the economy. We leave the analysis of the structural adjustment to the next section.

Based on the Research Institute of the Finnish Economy (ETLA) long-term estimates of economic growth in the early 1990s, we set the annualized long-term government interest rate at 8 percent and the nominal GDP grows at 3 percent per year¹³. The assumptions can give a sense of the ex-ante knowledge that was available on the recovery at the time of the making of the hypothetical consolidation program. The initial values of the key economic variables are set to reflect levels of the year 1993, a year after the excessive deficit emerged. The initial debt level is set at 55.3 percent of GDP, the headline deficit is at 8.3 percent of

¹³ We abstract from further use of fiscal multipliers and debt-sensitive interest rate.

GDP, and the primary deficit is at 3.9 percent of GDP. According to our estimates, the adjustment to deficit due to the influence of the cycle is -1.42 percentage points of GDP responding to a roughly 2.8 percent output gap. The deficit is structurally corrected based on our quasi real-time estimates which we discuss in the next section in more detail.

In our benchmark simulation (figure 5) the structural deficit reaches the MTO (0.5 percent deficit / GDP) at the end of the consolidation. The MTO is sufficient to guarantee a debt level that is lower than the debt reduction benchmark at the end of the program. Inequality constraints 4, 7 and 8 are binding in the simulated consolidation program. The rate of fiscal effort is found to exceed the 0.5 percent deficit reduction minimum.

We find that the required pace of consolidation outpaced the actual consolidation in the early parts of the programs while the average rate falls within the boundaries set out by the minimum requirements. Gross debt increases in the scenarios more than in the actual data. This is partly due to stock-flow adjustments, and partly due to lower interest rates and the picking-up of the economic growth in the mid-1990s.

Furthermore, we analyze how different economic conditions affect the minimum fiscal effort in figure 5. In particular, we consider different interest rates, GDP growth rates and levels of initial debt. First, the results show that when the nominal interest rate is 4 percent (the approximate level at which the interest rates converged at the end part of the consolidation), and GDP grows faster than anticipated, the minimum fiscal effort is substantially lower than in the benchmark simulation. In this case, the actual consolidation is in compliance with the rules.

We consider an alternative case in which the debt level is substantially higher (100 % of GDP) than in the benchmark scenario. We denote this scenario as “high debt” scenario. We find that in this case the minimum fiscal effort increases substantially if the interest rate is also high. The primary deficit must fall over 6 percentage points in a single year in order to force the debt-ridden economy to adjust linearly its structural deficit. It is noticeable, that in the case of high debt the binding fiscal rule is the debt reduction benchmark, while the structural deficit must fall below the MTO at the end of the program. Inequality constraints 4, 6 and 8 are binding in the simulated consolidation program.

The “high debt and interest rate” scenario illustrates why reaction to the debt problem is necessary if there is possibility that the interest rate will increase substantially during the crisis. This is the case, even if economic growth is relatively fast (see, “high debt, interest rate and growth” scenario) However, the country can deal with the debt problem with manageable level of deficit reduction if the interest rate remains low at the same time, as the “high debt” scenario shows.

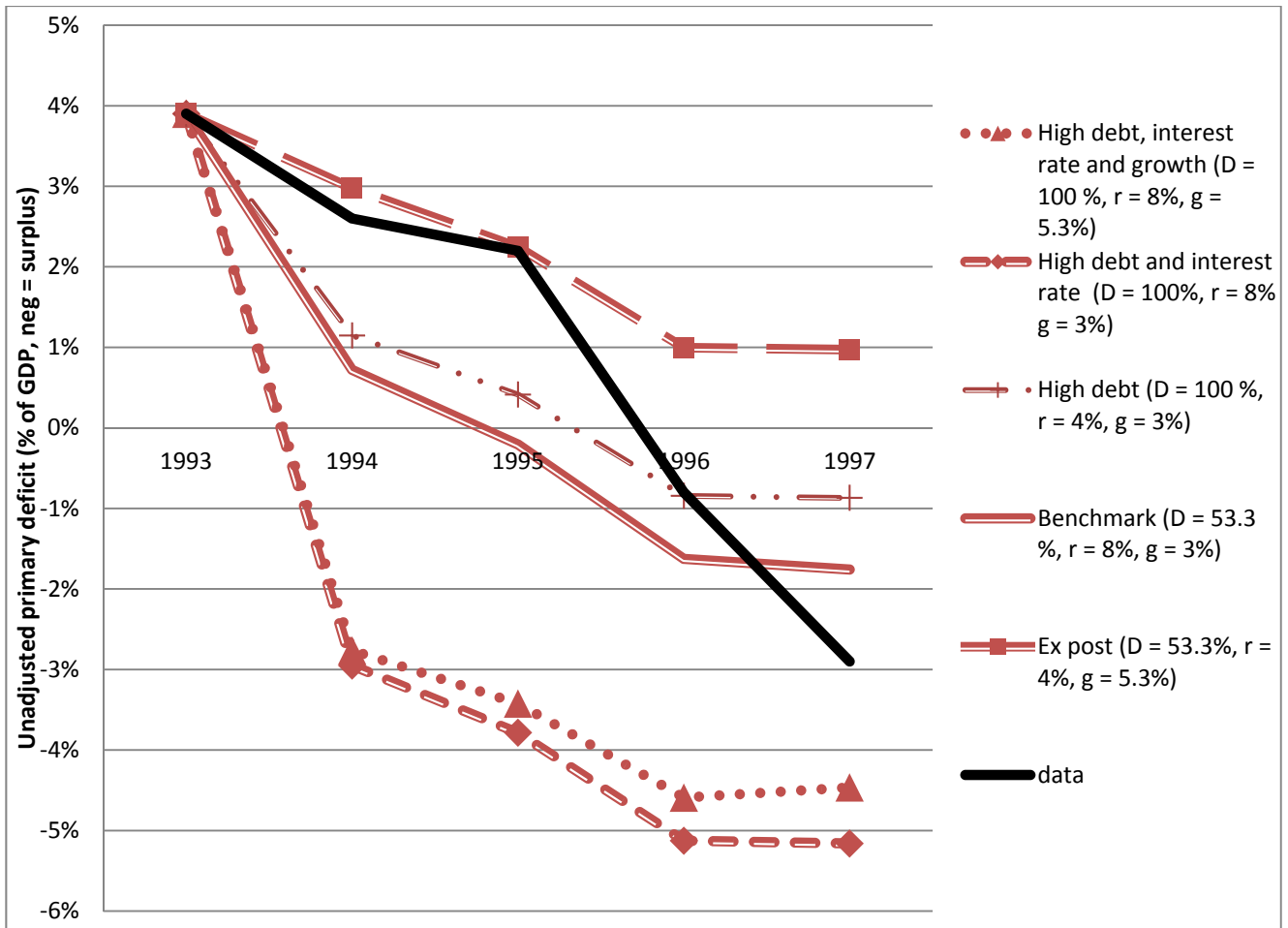


Figure 5: Minimum fiscal effort in terms of unadjusted primary deficit under different assumptions

Lastly, it is worth noticing that our focus on the deficit over GDP ratios hides the importance of GDP growth as a contributing factor to the success of consolidation. Alternatively, we can study the absolute amount of fiscal effort required to achieve the consolidation and compare it with the data. We find that the absolute required fiscal effort is much larger than in the case of the actual growth rate during the recovery, if the anticipated 3 percent growth would have prevailed.

To conclude, the deficit reduction effort during the Finnish Great Depression was on average sufficient to reach compliance with the EU rules. However, without the ex-post information on economic growth and interest rates the effort may have been too weak in the early part of the recovery.

4.3 Ageing Finland in 2025-2030

Maintaining the current level of public services for the aging population is expected to increase public expenditures considerably in the near future. It has already raised concerns over the long-term sustainability

of public finances in many countries, including Finland. For example, DG ECFIN (2012B) anticipates a gradual increase in the general government deficit under the current public policy. The Finnish public debt is expected to increase to 68.3 percent of GDP and the budget deficit to 5.5 percent by the year 2025. The same report anticipates that the problem escalates by the year 2030 when the level of debt is expected to reach 91.5 percent of GDP and the headline deficit is at 8.2 percent. Thus, it is most likely that without a considerable policy change the Union will at some stage demand a correction to the fiscal policy that would return compliance with the fiscal rules.

We next use the measurements by DG ECFIN (2012B) to anticipate a fiscal consolidation that the country may face in the following decades if public policies fail to respond to the problem. Based on the forecasts we construct a deficit reduction program that is initiated either in 2025 or 2030.¹⁴

The simulation is initiated from an initial state of debt and deficit in 2025 (2030): 68.3 (91.5) percent and 5.5 (8.2) percent, respectively. Primary deficit is set at 2.7 (4.2) percent of GDP. Following DG ECFIN (2012B), we assume nominal GDP to grow at 3.3 (3.4) percent rate and the nominal interest rate is set at 4.5 (4.8) percent. We assume that the output gap is zero. In line with DG ECFIN (2012B) we assume that each percentage point of primary deficit reduction will lower the current GDP growth by 0.5 percentage points.

Using these modeling assumptions, we again calculate feasible correction programs. The results are reported in figures 6-8. We find that the deficit reduction effort that takes the country to the 0.5 percentage point deficit at the end of the program is adequate to diminish debt at the rate higher than the 1/20th debt reduction pace in both cases. Inequality constraints 4, 7 and 8 are binding in the simulated consolidation programs. In terms of fiscal effort the consolidation will require to adjust the primary deficit by roughly 8 percentage points of GDP if it is started in 2030. Its magnitude is comparable to the consolidation during the Finnish Great Depression of the 1990s (13 percentage points). When the consolidation is started in 2025, the fiscal effort will only be 5 percent. The program will be shorter due to the 3 years rule. Consequently, the pace of fiscal adjustment is similar in both scenarios.

¹⁴ We remain agnostic over the events that would lead to the initiation, or the reasons why the initiation is delayed

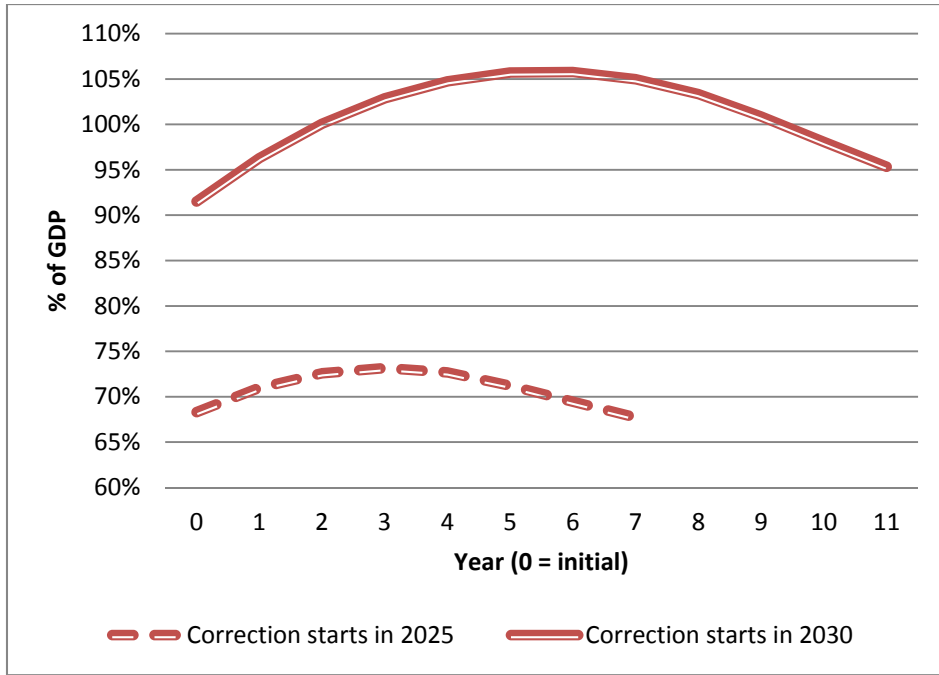


Figure 6: Debt under the minimum correction

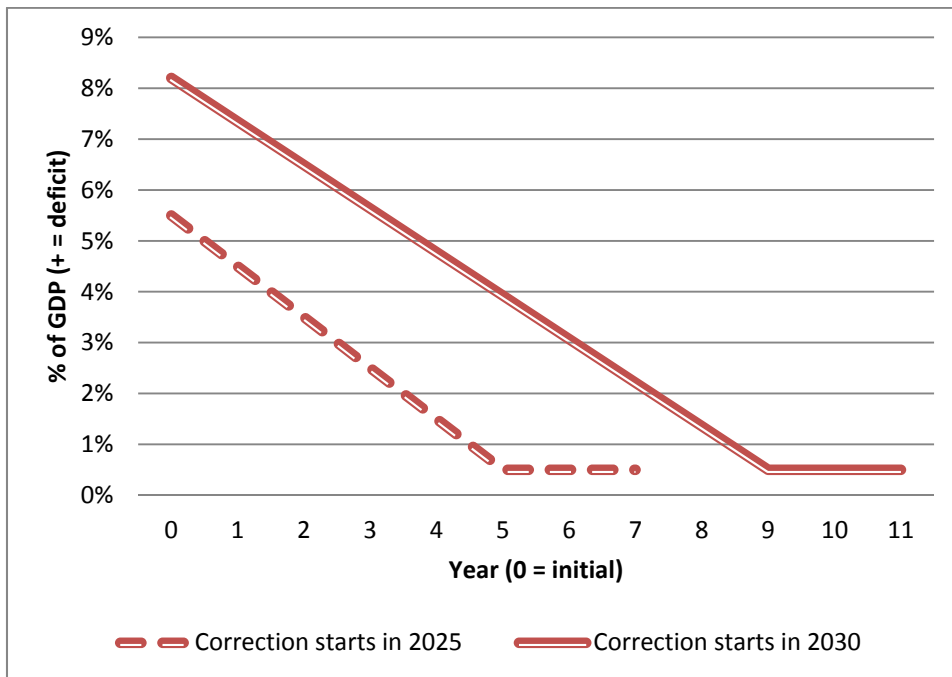


Figure 7: Minimum correction of deficit



Figure 8: Primary deficit under the minimum correction

5 Structural Deficit

The previous section did not explicitly take stand on the role of structural adjustment in the functioning of the new fiscal rules. Yet, the structural adjustment provides a potentially important tool for controlling cyclical changes in public finances. Focus on structural deficit is important at least for two reasons. First, structural adjustment may alleviate some of the apparent frontloading in the fiscal rules, as the primary deficit reduction pace tends to be fast especially during the early part of consolidation. If deficit is cyclically corrected, the adjustment may become smoother. Second, the structural adjustment promotes countercyclical fiscal policy during the economic upturns when the MTO defined in structural terms should set stricter limits to public finances.

Ultimately, it is an empirical question, how well the structural measures succeed at their task to control the effects of the cycle. This section uses the new Commission method and quasi real-time data to discuss the question. We investigate the real-time performance of the new fiscal rules using the Finnish example.

5.1 Quasi real-time estimates of the Structural Deficit

We next provide a detailed description of the assumptions that we make to estimate the structural deficit.

We use the Commission’s statistical model to solve the output gap with parameters (priors and functional forms) that are taken from the actual Commission forecast exercise (winter 2012-2013). In addition, we take exogenous variables from the dataset corresponding to the exercise. However, while the Commission uses capital utilization rate as an indicator variable, we use the amount of new orders series from Business Tendency Survey conducted by the Confederation of Finnish Industries (EK).¹⁵ The series spans until the year 1974 whereas the Finnish capital utilization rate series begins from the year 1995. This allows addressing the usefulness of the Commission method with a larger dataset. The alternative series is normalized so that its mean and variance equal with those of the capital utilization rate series used in the winter 2012-2013 forecast exercise. Furthermore, we do not use forecasts to extend the time-series that are used in the estimation procedure and abstract from the use of one-offs.¹⁶

To justify the modifications, we compare in figure 9 the estimated series with those provided by the Commission in 2006-2012¹⁷. We find that the differences between our estimates and the Commission estimates are relatively small. The mean absolute error is 0.46 percentage points. It appears that the Commission’s estimates are smaller in absolute value and thus more conservative than ours. We also compare our estimates of the structural adjustment to the ones provided by the Commission in its autumn forecast of the corresponding year in figure 10.

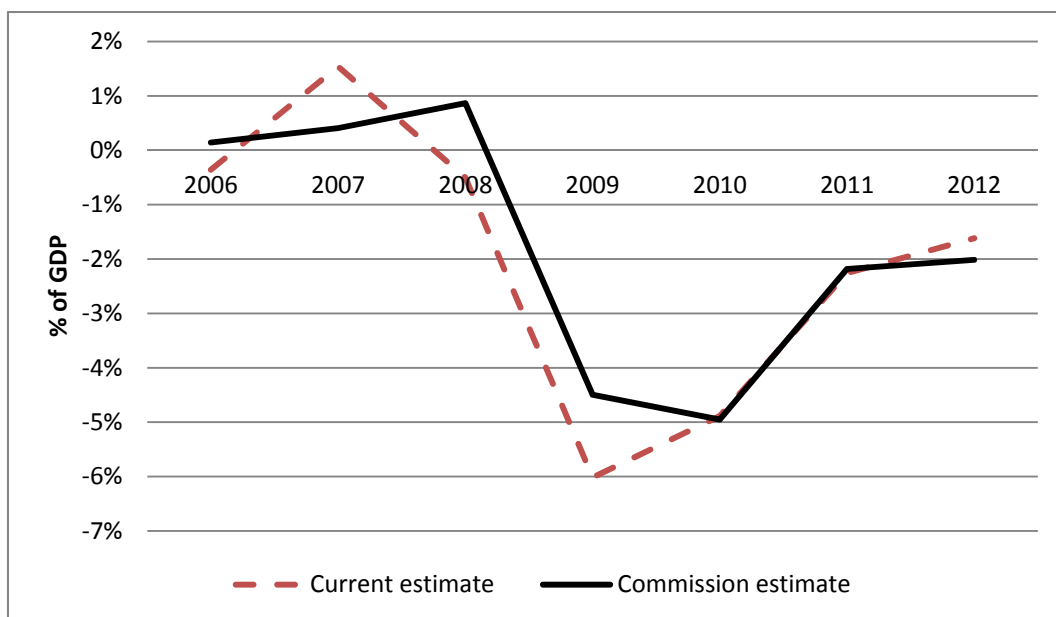


Figure 9: Output Gap

¹⁵ We use the index value that concerns the question: “What is the amount of the firm’s new orders as compared to normal times?” We use yearly averages of quarterly series (BTEOLRSL:B5AS) until 2010 and (BTEOLL:B8S) after 2010.

¹⁶ For the estimates prior to 1995 we need to linearly extrapolate burn-in values of the TFP series for the years 1950-1960. We also allow a moderately wider prior distribution of the innovation variance in the indicator model of TFP.

¹⁷ In figures 9 and 10 the winter forecasts for the corresponding year are reported.

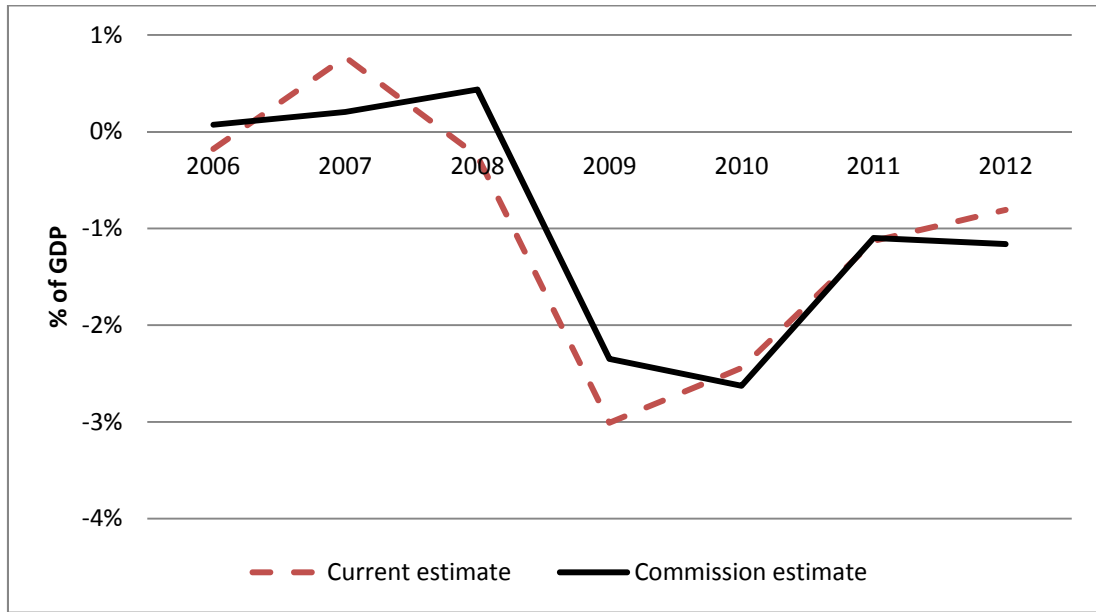


Figure 10: Structural adjustment ($-\epsilon_t GAP_t$)

5.2 The Effect of the Real-Time Adjustment

We then use the estimated structural adjustment to study the fiscal rules. Figure 11 reports the adjustments in the years between 1987 and 2012. It shows that the ex-post large positive output gaps have been for the most part unobservable ex ante. The Finnish government had a sizable budget surplus in the 1980s due to the favorable economic conditions, while the economic contraction of the early 1990s deteriorated public finances rapidly due to the operation of automatic stabilizers and fall in revenues in the economic downturn. However, in practice the cyclical adjustment of the budget balance turns out to have been relatively weak.

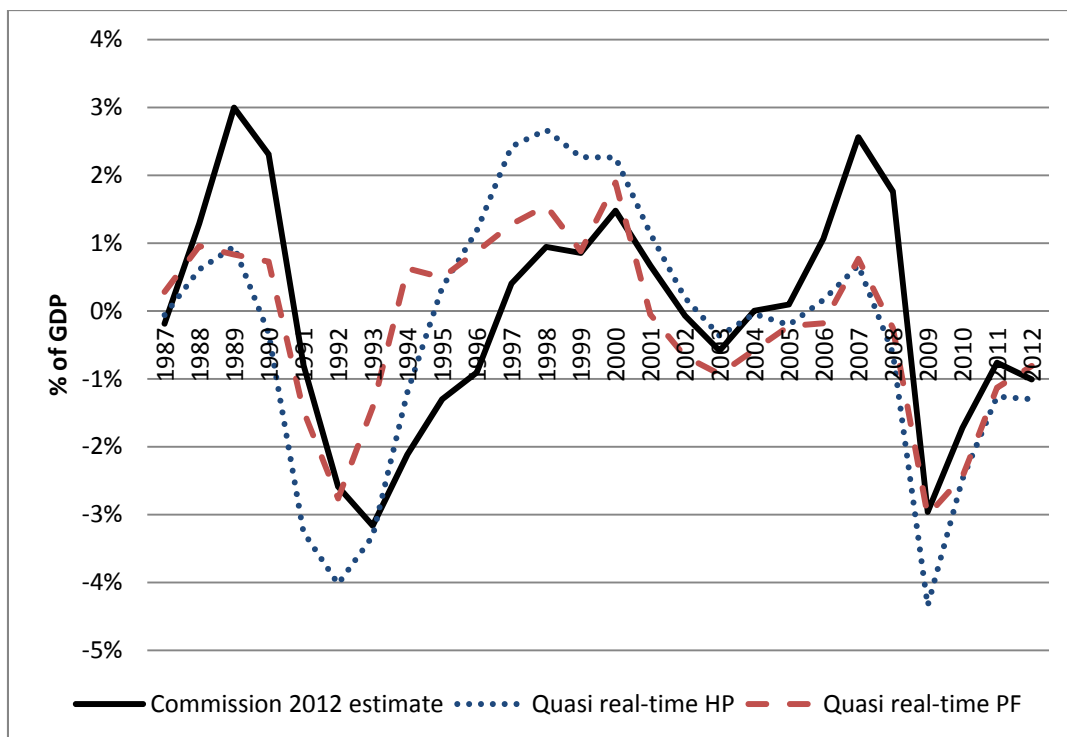


Figure 11: Structural adjustment: ex post vs. quasi real-time estimates

The difference between the real-time and the ex-post cyclical adjustment is substantial. Prior to the 1990s and the 2010s crisis, the difference between quasi real-time and ex-post estimates was more than 2 percentage points.¹⁸ On the other hand, the real-time output gap seem to underestimate the negative cyclical component during the economic contractions. During the downturn the cyclical adjustment should enable the use of automatic stabilizers, but in practice the observed cyclical component rapidly disappeared.

To further illustrate how the structural adjustment affects the implied fiscal effort, we next revisit the benchmark fiscal consolidation program after the Finnish Great Depression in section 4.2. In figure 12 we compare the required adjustment of the unadjusted primary deficit with quasi real-time structural adjustment and the ex-post structural adjustment. The figure shows that the quasi real-time measure leaves much less room for the fiscal policy to maneuver and the required correction is front-loaded. The rules are less restrictive when the ex-post estimates of structural deficit are used.

¹⁸ The expenditure component has more effect. During the 1980s Finnish government expenditures increased faster than the long-term GDP growth. To address the long term GDP growth rate, we take historical values of real GDP growth and use OECD projections of economic growth for two next years to extrapolate future economic growth. In other upturns the expenditure growth did not exceed the medium term economic growth.

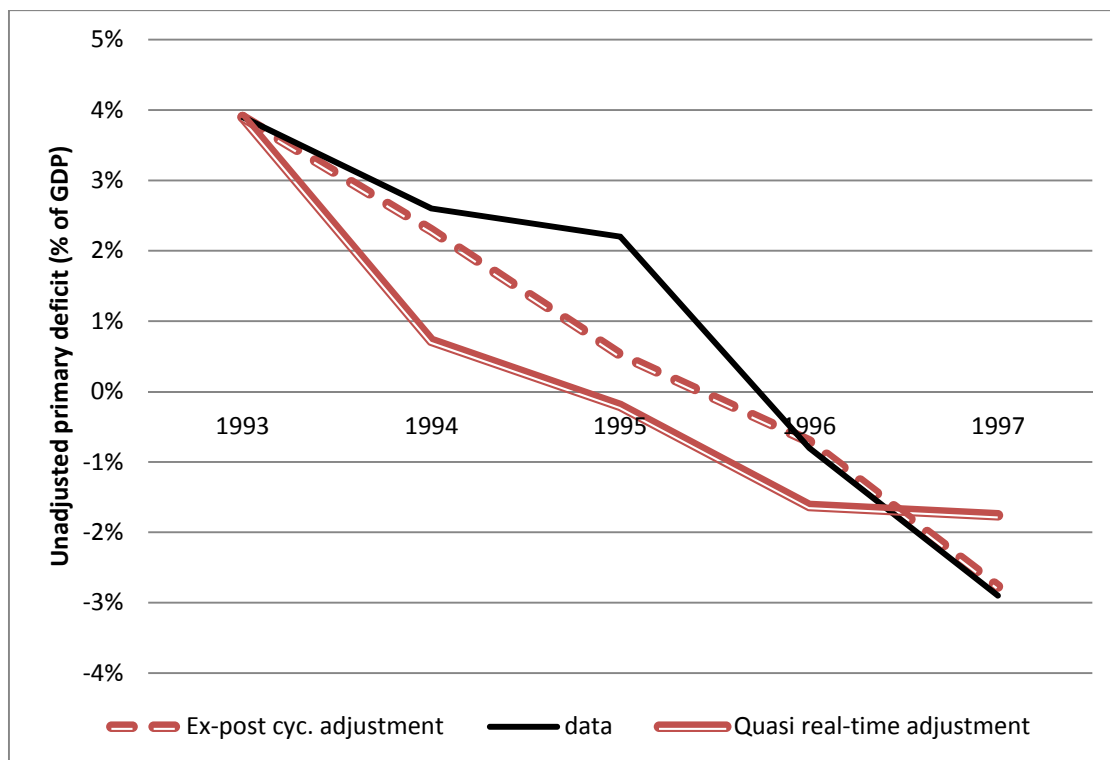


Figure 12: Primary deficit and the effect of the ex-post structural adjustment

6 Discussion of the New Fiscal Rules

Several remarks can be made based on the analysis. First, it suggests that difficulty to distinguish between a structural shock (having a permanent effect on the economy) and a cyclical shock (having a transitory effect) affects greatly the functioning of the rules. From this point of view the gradual response advocated by the rules seems reasonable. Thwaites (2006), for example, shows that under structural uncertainty the fiscal policy should respond slowly to shocks. The weight that is given on the possibility of having a transitory shock is initially large, and thus the fiscal response should be weak¹⁹. However, the possibility that the country has faced a structural shock becomes larger, when the crisis prolongs. The policy response should become stronger, in particular, if it is expected that fiscal sustainability problems transform into higher borrowing costs.

However, it can be argued that the new rules take the uncertainty into account only partially. Countries that have higher risk to face structural shocks should choose lower steady state debt levels, which gives them more fiscal space during downturns. Yet, the 60 percent public debt ratio is common to all countries. Fortunately, countries still have the right to aim at target below the benchmark; a right that they should

¹⁹ Possibility of substantial fiscal multipliers also supports the gradualist approach.

exercise. Indeed, there exists recent economic literature that addresses the optimal debt level of the economy and finds that it may differ across countries (see, e.g. Checherita-Westphal et al., 2012). They derive optimal levels of debt from a theoretical model of optimal public investments. Ghosh et al. (2011) analyze optimal level of debt from the perspective of generating “fiscal space”, and the limits where fiscal policy has become unsustainable in historical perspective. However, more work in this direction is needed.

Finally, we acknowledge that although it is not possible to remove the ambiguity regarding the nature of the shocks, several methodological improvements have been taken in the estimation of the output gap which aims at better detecting the cycle in real time (Larch & Turrini, 2009). However, the task of detecting business cycles is inherently difficult and the differences of methodologies (the HP –filter based and production function based in our example) are limited. Rather, recent examples show that a battery of indicators may be needed in the future. The commission already has a set of early warning indicators to detect imbalances (DG ECFIN, 2011). Bénétrix, & Lane (2013) suggest that the cyclical adjustment could be measured separately for different tax bases. According to Lendvai et al. (2011) the current account could be used to provide additional information of the changes in total indebtedness.

7 Conclusions

In this paper we use a numerical simulation model to measure the minimum fiscal effort that is needed to reach compliance with the Europe’s new fiscal rules. We then compare actual fiscal consolidations and the minimum effort implied by the new fiscal rules. We find that Germany, France, Spain and Italy are currently in compliance with our measure of minimum fiscal effort, but Spain is at risk of falling behind the required pace of consolidation in the near future. We also revisit the Finnish Great Depression of the early 1990s. The deficit reduction effort during the Finnish Great Depression was on average sufficient to reach compliance with the EU rules. However, without the available information on economic growth and interest rates the effort may have been too weak in the early part of the recovery. Thus, we find that the difficulty of making inferences on the phase of the business cycle and the cyclical nature of the shocks affects considerably the restrictiveness of the new fiscal rules.

Appendix

Exceptions foreseen in Article 126(2) (DG ECFIN 2012A, pp. 8-10)

(i) The excess of the deficit ratio over the reference value is only exceptional and temporary, or the ratio has declined substantially and continuously and reached a level that comes close to the reference value.

- Unusual event outside the control of the Member State concerned and with a major impact on the financial position of the general government, or it has to result from a ‘severe economic downturn’.
 - Downturn is severe if excess over the reference value results from a negative annual GDP volume growth rate or from an accumulated loss of output during a protracted period of very low annual GDP volume growth relative to its potential. The indicator for assessing accumulated loss of output is the output gap.’
- The excess is temporary if the forecasts provided by the Commission indicate that the deficit will fall below the reference value following the end of the unusual event or the severe economic downturn.

(ii) Commission should also report other relevant factors

- the developments in the medium-term economic position (in particular potential growth, including the different contributions provided by labor, capital accumulation and total factor productivity, cyclical developments and the private sector net savings position);
- the developments in the medium-term budgetary position (in particular, the record of adjustment towards the medium-term budgetary objective, the level of the primary balance and developments in primary expenditure, both current and capital, the implementation of policies in the context of the prevention and correction of excessive macroeconomic imbalances, the implementation of policies in the context of the common growth strategy of the Union and the overall quality of public finances, in particular the effectiveness of national budgetary frameworks);
- the developments in the medium-term government debt position, its dynamics and sustainability (in particular, risk factors including the maturity structure and currency denomination of the debt, stock-flow adjustment and its composition, accumulated reserves and other financial assets, guarantees, notably linked to the financial sector, and any implicit liabilities related to ageing and private debt, to the extent that it may represent a contingent implicit liability for the government.
- Special consideration will be given to: budgetary efforts towards increasing or maintaining at a high level financial contributions to fostering international solidarity and to achieving Union policy goals; the debt incurred in the form of bilateral and multilateral support be-

tween Member States in the context of safeguarding financial stability; the debt related to financial stabilization operations during major financial disturbances.

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