

Fiscal Sustainability: the Role of Inflation

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Motivation

- The question as to whether public debt is sustainable is a central consideration in any macroeconomic analysis of fiscal policy
- This question is more relevant today than ever before, as the mean level of public debt in advanced OECD economies increased from 37% in 1980 to 76% in 2021. A strong rise by about 10 pp. took place during the Covid-19 crisis
- Since mid-2021, inflation in the euro area has increased at a pace last seen in the 1970s and early 1980s after being below 2% target for a decade
- The impact of inflation on the indicators of debt sustainability has not been properly studied yet:
 - Fiscal authorities anticipating a decline in the debt ratio (denominator effect) may loosen fiscal stance
 - Fiscal authorities may view higher inflation as an opportunity to strengthen the fiscal policy stance

Recent literature

- This presentation is based on the results from two research papers I have been working on:
- A. Afonso, J. Alves, O. Matvejevs, O. Tkačevs (2023). Fiscal sustainability: the role of inflation (work in progress)
- K. Staehr, O. Tkačevs and K. Urke (2023). Fiscal performance under inflation and inflation surprises: evidence from fiscal reaction functions for the euro area. Latvijas Banka Working paper 4/2023

Definition of fiscal sustainability

- Public debt is considered sustainable if it satisfies the intertemporal budget constraint (IBC) without a major correction in fiscal stance given the costs of financing it faces in the market
- There are no universally accepted fiscal sustainability indicators
- Bohn (1998) suggested a model-based sustainability framework (fiscal reaction function, FRF) linking primary balance to public debt in the previous period:

$$PB_t = k + \beta D_{t-1} + e_t$$

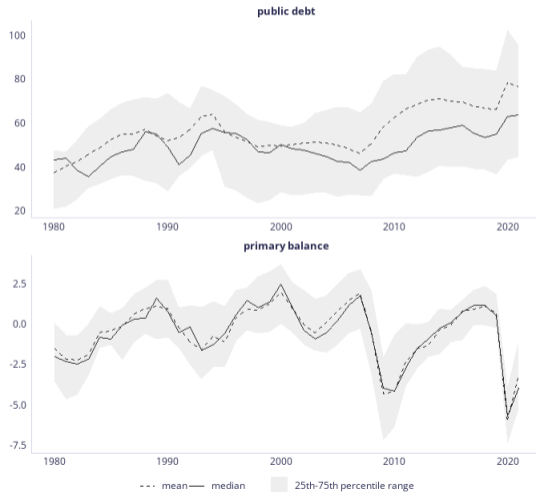
- According to Bohn (1998) a positive response of primary balance to public debt, i.e. $\beta > 0$, is sufficient to satisfy the IBC in a general equilibrium model under reasonable assumptions
- Higher value of β implies a bigger fiscal response and leads in the long-run to a lower debt-to-GDP ratio

The two-step procedure

To estimate the impact of inflation on fiscal sustainability:

- We estimate the time-varying fiscal response coefficients β for each country/period from fiscal reaction functions using the Schlicht (2021) method
- We regress the previously obtained fiscal response coefficients on the measures of inflation
- OECD countries, Euro area countries, 1980-2021

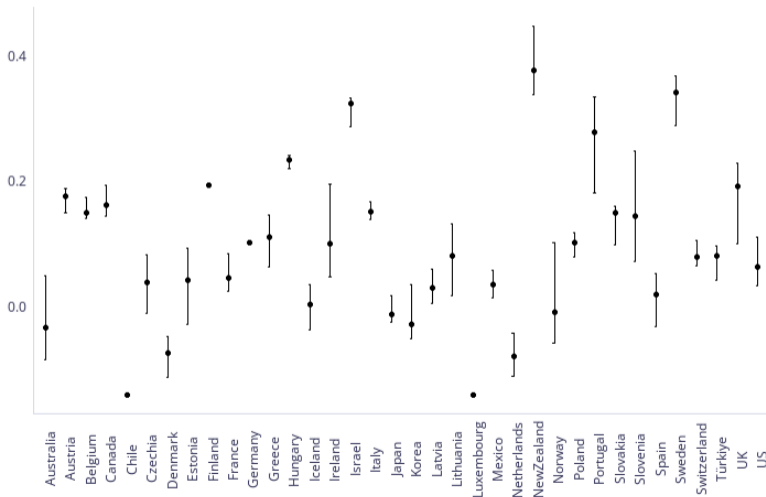
Primary balance and public debt



Estimates of the fiscal response coefficient (by year)



Estimates of the fiscal response coefficient (by country)



The impact of inflation on the fiscal response coefficient

Table: Regression estimation results for the time-varying fiscal response coefficient obtained from the fiscal reaction function

Variable	HICP	HICP core	HICP energy	HICP	HICP
Inflation	0.0082***	0.0097***	0.0003	0.0171***	0.0089***
Inflation * Inflation				-0.0008**	
Inflation * High debt					-0.0052*
R-G	-0.0025***	-0.0031***	-0.0006	-0.0014*	-0.0020**
REER	0.0003	0.0003	0.0000	-0.0009	-0.0006
Constant	0.0584	0.0570	0.0981	0.152**	0.139***
R^2	0.162	0.221	0.006	0.226	0.186
Number of observations	442	442	442	442	442

Inflation and fiscal aggregates

- What are the mechanisms of the above uncovered effect? How exactly inflation translates into an improved fiscal sustainability measure?
- We estimate the fiscal reaction function for several components of primary balance and use inflation and inflation forecast error as one of the determinants
- Euro area 12 countries (homogeneous institutional setup: inflation 2%, deficit 3%, tax system, wage-setting process), 1999-2021

The impact of inflation on primary balance, revenue and expenditure

Variable	Estimation method: System GMM. Dependent variables:		
	(1) Primary balance	(2) Total revenue	(3) Primary expenditure
Lagged dependent	0.565*** (0.075)	1.001*** (0.023)	0.802*** (0.070)
Lagged debt	0.039*** (0.006)	0.001 (0.004)	-0.027*** (0.010)
Output gap	0.294** (0.136)	-0.113*** (0.033)	-0.253*** (0.071)
HICP inflation	0.666*** (0.138)	0.281*** (0.064)	-0.365** (0.157)
Constant	-3.990*** (0.778)	-0.989 (1.028)	11.522*** (2.700)
Number of observations	276	276	276
Max lag	2	2	2
Hansen test	0.326	0.387	0.523
AR(1) test	0.069	0.005	0.046
AR(2) test	0.908	0.525	0.892

Back on the envelope estimate of economic magnitude

- Inflation volatility was quite low over 1999-2021
- Large estimated coefficient value translates into a change in primary balance 0.5%-0.7% of GDP
- It constitutes approx a quarter of primary balance volatility in Germany and Belgium

Table: Economic magnitude of the effect

Item	Germany	Belgium
Inflation (mean)	1.522	1.909
Inflation (std)	0.793	1.055
Coefficient	0.667	0.667
Effect of 1 std increase	0.531	0.704
Primary balance (std)	1.949	3.443

The impact of inflation on different components of revenue and expenditure

Variable	Estimation method: System GMM. Dependent variables:				
	(1) Indirect taxes	(2) Direct taxes	(3) Social security contributions	(4) Primary current expenditure	(5) Capital expenditure
Lagged dependent	0.940*** (0.052)	1.047*** (0.047)	0.963*** (0.031)	0.947*** (0.062)	0.245*** (0.029)
Lagged debt	0.003 (0.002)	0.003 (0.003)	0.000 (0.001)	-0.026*** (0.009)	-0.003 (0.004)
Output gap	-0.058*** (0.011)	-0.040** (0.019)	0.003 (0.014)	-0.194** (0.098)	-0.062*** (0.008)
HICP inflation	0.162*** (0.031)	0.149*** (0.043)	-0.052 (0.034)	-0.284* (0.162)	0.068 (0.073)
Constant	0.184 (0.597)	-1.080 (0.684)	0.605 (0.444)	4.789** (2.120)	3.486*** (0.404)
Number of observations	276	276	276	276	276
Max lag	2	3	2	2	2
Hansen test	0.580	0.504	0.399	0.216	0.595
AR(1) test	0.009	0.004	0.023	0.003	0.161
AR(2) test	0.380	0.142	0.907	0.116	0.385

The impact of inflation forecast errors

Variable	Estimation method: System GMM. Dependent variables:					
	(1) Primary balance	(2) Total revenue	(3) Primary expenditure	(4) Primary balance	(5) Total revenue	(6) Primary expenditure
Lagged dependent	0.570*** (0.070)	1.004*** (0.028)	0.881*** (0.058)	0.627*** (0.056)	1.001*** (0.038)	0.903*** (0.060)
Lagged debt	0.026*** (0.005)	-0.001 (0.004)	-0.024* (0.013)	0.025*** (0.005)	0.003 (0.003)	-0.032** (0.013)
Output gap	0.254* (0.151)	-0.104*** (0.038)	-0.092** (0.041)
Output gap forecast error	0.401*** (0.117)	-0.074** (0.036)	-0.373*** (0.129)
HICP inflation forecast error	0.698*** (0.197)	0.355*** (0.072)	-0.835*** (0.117)	0.538*** (0.208)	0.372*** (0.079)	-0.562** (0.217)
Constant	-1.977*** (0.429)	-0.182 (1.172)	7.344*** (1.750)	-2.174*** (0.469)	-0.143 (1.558)	7.281*** (1.877)
Number of observations	256	256	256	239	239	239
Max lag	2	2	2	2	2	2
Hansen test	0.225	0.434	0.191	0.329	0.344	0.497
AR(1) test	0.091	0.018	0.031	0.113	0.027	0.079
AR(2) test	0.938	0.993	0.695	0.836	0.944	0.515

Conclusions

- Higher inflation (particularly its core component) improves fiscal sustainability measure, inducing public debt ratios to converge to lower mean levels
 - this effect gets weaker as inflation itself grows, because inflation cannot generate infinitely strong fiscal response
 - it gets weaker for higher debt levels, possibly pointing to the presence of fiscal fatigue
- Inflation improves primary balance by raising budget revenue (direct and indirect taxes) and lowering budget primary expenditure (primary current expenditure)
- Inflation impact on fiscal outcome could be due to its surprising effect
- Unexpectedly low inflation may lead to a deterioration of the fiscal balance
- Impact of inflation may be different depending on whether it is supply-side vs demand-side driven as well as different in the short vs long-term (we are working on both topics...)