Relationship between gdp and public debt

On the Relationship between GDP and Public Debt during the EMU period (1991-present)
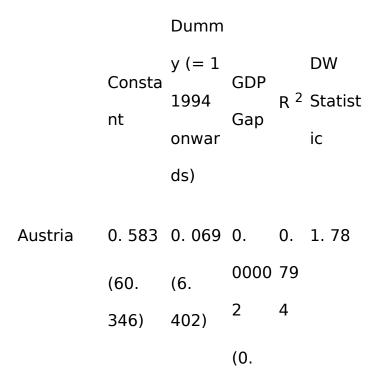
The Maastricht Treaty laid out a central objective: that in order for the EMU to mature and lead to the establishment of a single currency in the EU – i. e. the Euro, the member nations' fiscal and monetary policies had to be harmonized. The first task was for nations to reign-in their public debts by controlling their budget deficits.

The Treaty created objectives that budget deficits had a ceiling of 3% of the GDP and the public debt had a prescribed limit of 60% of GDP. As Chart 1 reveals, that prior to the EMU efforts starting in 1991, there were some member nations that had extremely high public-debt to GDP ratios and they had to be under pressure to stabilize their government spending, and, hence the public debt.

The idea behind imposing the upper limits on debt was to impose discipline and to reduce crowding out of private investment by lowering interest rates. As Chart 2 shows, that even though the growth rates of public debt in the pre-Euro years of the EMU era (1991 to 2005) were lower as compared to the pre-EMU period, they were still high for some countries.

In order to study the relationship between GDP and Public Debt, this paper examines whether governments changed their fiscal policy regimes to suit the Maastricht goals. The dependent variable – the ratio of Public Dent to Nominal GDP – is regressed on the GDP gap (i. e. the difference between Real GDP and the Potential Real GDP) as well as a dummy variable signaling a period when a regime shift would have occurred. The time-period is 1991-

2005 and the data used is from the Eurostat (AMECO). There are two major events in the EMU era – the second phase of the process beginning in 1994 and the establishment of the Euro in 1999. So, two different models are studied – one that has a dummy variable equal to 1 for years 1994 – 2005 (Model A) and the other that has the dummy equal to 1 for 1999-2005 (Model B). If a country began controlling their debt around 1994, there should be a negative coefficient for the dummy in Model A and if they made a serious change in their fiscal policy around the time the Euro began, Model B should have a negative coefficient for the dummy. The coefficient for the GDP-gap variable should be negative – as theory dictates. (Macroeconomic theory tells us that governments ought to use expansionary fiscal policy in times of recessions and contract their deficits when the Real GDP cycle turns positive.)

<u>OLS Results for Model A.</u>

	Constant	Dummy (= 1 1994 onwards)	GDP Gap	R^2	DW Statistic
Austria	0. 583	0. 069	0. 00002	0. 794	1. 78
	(60. 346)	(6. 402)	(0.		

011)

Country					
Belgium	1. 319 (18. 652)	-0. 209 (-2. 625)	-0. 016 (-1. 159)	0. 39	0. 49*
Finland	0. 253 (4. 209)	0. 227 (3. 635)	-0. 023 (-3. 001)	0. 537	1. 06**
France	0. 411 (14. 965)	0. 174 (5. 675)	-0. 0002 (-0. 377)	0. 73	1. 22
Germany	0. 461 (13. 700)	0. 129 (3. 340)	-0. 001 (-1. 431)	0. 743	0. 69*
Greece	0. 873 (17. 589)	0. 214 (4. 891)	-0. 023 (-0. 9	0. 669	2. 12

669)

Ireland	0. 894 (8. 969)	-0. 3503 (-3. 041)	-0. 058 (-2. 499)	0. 65 4	0. 36*
Italy	1. 030 (22. 213)	0. 121 (2. 291)	-0. 001 (-0. 611)	0. 30 4	0. 65*
Luxembou rg	0. 0618 (24. 221)	0. 002 (0. 728)	-0. 011 (-4. 000)	0. 67 6	1. 6
Netherlan ds	0. 758 (15. 175)	-0. 155 (-2. 778)	-0. 003 (-0. 867)	0. 42 2	0. 31*
Portugal	0. 553 (27. 394)	0. 009 (0. 403)	-0. 012 (-2.	0. 46 2	1. 08**

961)

	Constant			R^2	DW Statistic
Spain	0. 473 (12. 669)	0. 097 (2. 319)	-0. 003 (-2. 062)	0. 46 2	0. 33*

OLS Results for Model B.

	Constant	Dummy (= 1 1999 onwards)	GDP Gap	R^2	DW Statistic
Austria	0. 626 (61. 299)	0. 028 (1. 876)	-0. 006 (-1. 502)	0. 29 7	0. 51*
Belgium	1. 288 (50. 896)	-0. 267 (-7. 299)	0. 009 (1. 137)	0. 82 3	1. 35**
Finland	0. 482	-0. 040	-0. 002	0. 05 7	0. 57*

		(9. 978)	(-0. 607)	(-0. 155)	
France	0. 469 (22. 776)	0. 168 (5. 116)	-0. 003 (-3. 446)	0. 68 8	1. 25**
Germany	0. 521 (43. 174)	0. 095 (5. 395)	-0. 002 (-5. 595)	0. 85 5	1. 86
Greece	0. 953 (12. 802)	0. 133 (1. 964)	-0. 066 (-0. 996)	0. 25 1	0. 66*
Ireland	0. 795 (16. 356)	-0. 427 (-4. 952)	-0. 012 (-0. 577)	0. 79 9	1. 05**
Italy	1. 152 (36.	-0. 057 (-1.	0. 001	0. 11 2	0. 59*

	(0.687)	228)	(0.340)		
Luxembourg	0.062 (44.238)	0.001 (0.547)	-0.012 (-4.890)	0.67	1.4**
Netherlands	0.722 (47.386)	-0.188 (-8.339)	-0.001 (-0.047)	0.86	1.51
Portugal	0.554 (46.502)	0.013 (0.737)	-0.013 (-3.314)	0.478	1.19**
Spain	0.548 (17.402)	0.007 (0.130)	-0.004 (-1.487)	0.221	0.23*

* These equations had evidence of auto-correlated errors; ** For these cases it is uncertain as to whether or not autocorrelation exists.

The coefficient for the GDP gap is negative in almost all cases in both models. Most of the countries that do not have negative coefficients for the dummy variables in either model were those that had low public debt ratios to begin with – i. e. Austria, Finland, Luxembourg, Portugal, and Spain. While Germany also had relatively low levels of debt, the integration of East Germany must have generated fiscal pressures. Among the high-debt countries – Belgium, Ireland, France, and Greece – only the first two show evidence of changing their fiscal policies in the EMU period. France and Greece continued with fairly high growth rates of debt growth. The fact that more countries demonstrate regime changes (negative coefficients for the dummy variable) in Model B might reflect that with the starting of the common currency, there was greater pressure to conform to Maastricht's conditions.

(For the cases exhibiting autocorrelated errors, I tried estimating the equations with differenced variables but that did not lead to improvement with respect to the problem. Hence, the original versions are displayed).