Twin Deficits in Greece

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Introduction

• Twin Deficits Hypothesis: fiscal shocks that cause deterioration of the government’s budget also worsen a country’s current account balance.
• Current Account Deficit = Investment - Private Saving + Budget deficit
• Trade Deficit: when consumption exceeds production
• Ricardian equivalence: consumers internalize the government’s budget constraint and any tax change does not affect their spending. It does not matter whether the government finances its spending through debt or tax increase. Total level of demand remains unchanged.
Background

• Two distinct ways of thinking about the link between fiscal policy and the current account.

• Mundell-Fleming model: with flexible exchange rates, fiscal deficits appreciate the currency: a higher relative price of domestic goods crowds out net export. If fiscal deficits also raise the interest rate, the resulting external imbalance may be mitigated because of a simultaneous fall in domestic investment. This model stresses changes in terms of trade and interest rates.

• Intertemporal approach to the current account emphasize consumption smoothing and optimal intertemporal investment decisions.

• Refined Twin Deficit Hypothesis: twin deficits are more likely if (1) the economy is relative open i.e. highly integrated into world markets and (2) fiscal expansions are persistent (Corsetti and Muller 2006)
Literature I

• Early studies apply OLS regressions to cross country data. Positive and significant relationship between current account deficits and budget deficits is found (Milne 1977 and Bernheim 1987).
• Supportive evidence of the twin deficit hypothesis also provided by simulation studies (Bryat et al 1988 and Zietz and Pemberton 1990).
• VAR models:
  • Abell (1990) employed a sever variable VAR with first differenced data for the US from 1979-85. Granger causality and IRF suggest that the two deficits are twins and that budget deficits affect current account deficits through the transmission mechanisms of interest rates and exchange rates.
  • Bachman (1992) and Rosensweig & Tallman (1993) through unrestricted VAR in differences: government budget deficits have a sizeable effect on trade deficits.
  • Enders & Lee (1990) employ quarterly data 1947-1987 and a six variable structural VAR with differenced data. Supports the Ricardian equivalence: no evidence that BD raises CA.
Literature II

• Cointegration studies (require both CA and BD to be nonstationary, problems?)
• Bachman 1992 fails to find any evidence of cointegration (LR relationship).
• Dibooglu (1997) does find evidence of cointegration and argues that budget deficits and increases in real interest rates are associated with current account deficits.
• Holmes (2010) employ a nonparametric test for nonlinear co-trending and found that deficits are stationary around a nonlinear deterministic trend and are co-trended insofar as they share a common nonlinear deterministic trend.
• VAR in levels
• Kim & Roubini (2008) employ a VAR in levels for the post-Bretton-Woods periods and find that increases in the US government budget deficits actually improve the US current account balance (result opposite to the standard theoretical prediction). Data are quarterly from 1973-2004:1. The empirical results (IRF) suggest that government deficit shocks improve the current account. The current account improvement resulted from a partial Ricardian behavior of private saving (increase) and a fall in investment (a crowding out effect): twin divergence rather than twin deficit. CA counter cyclical: increase in output (productivity shock) increases the demand for foreign goods and worsens the CA. Private savings increase to compensate for the gov saving decrease (Ricardian equivalence) (partial increase).
Literature III

• Corsetti & Muller (2006): In the US and Australia, relative less open and government spending shocks less persistent, ca impact on fiscal policy is rather limited

• Grier & Ye (2009): Quarterly observations from 1948Q1 to 2005Q1. There is no long-run twin relationship between CA and BD in the US. In the short-run there is a significant positive and persistent short-run effect of budget shocks on the CA (SR: VAR-GARCH, demeaned data, GIRF and VD).

• Different samples, different variables, different econometric methodology…different results.

• Chinn (2005): US world’s largest debtor nation. Suggest three policies to reduce the deficit substantially so they will not be no further increases in its indebtedness to the rest of the world: i) A concerted effort to reduce the federal budget deficit, ii) Reducing the quantity of oil imports, iii) Coordinating a revaluation of East Asian currencies.

• Evidence for Greece

• Vamvoukas (1999) employed data from 1948 to 1994 for output, prices, budget deficit and trade deficit. Methodology includes unit root tests and cointegration. Results from the VECM suggest a predominantly unidirectional causality from budget deficit to trade deficit in the LR and in the SR.
• The Greek Economy in graphs…
• Correlation between BD and CA: 0.10
• Correlation between BD and CA once the cyclical component is removed (HP filter): 0.17
• In the US the correlation is -0.16 (Kim & Rounibi 2008)
• Corestti and Muller: -0.24 US, -0.26 UK, -0.16 Canada and -0.37 in Australia using only the cyclical components.
• Greece: -0.00159 ($p$-value 0.91) only the cyclical components
VAR

- Unit Root Tests: ADF, KPSS, nonlinear unit root tests KSS and Unit Root tests with endogenous breaks.
- Evidence for I(0) mainly from the nonlinear unit root tests.
- Vector Autoregressive Model (VAR): RGDP, BD, CA and Long Term Interest rates
- Lag order AIC (2 lags)
- SR: positive but insignificant the lags of BD for the CA equation.
- Generalised Impulse response Functions: conceptual experiment, ordering of the variables.
- Variance Decompositions
- Response Standard Errors from MC 1000 repetitions
- Variations of the VAR do not alter the results
## Unit Root & Stationarity tests

<table>
<thead>
<tr>
<th></th>
<th>Levels</th>
<th>p-value</th>
<th>KPSS</th>
<th>KSS 1</th>
<th>KSS 2</th>
<th>KSS 3</th>
<th>th Structural</th>
<th>Break Date</th>
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<tbody>
<tr>
<td>Current Account</td>
<td>-2.848394</td>
<td>0.0577</td>
<td>0.382527</td>
<td>-1.524872</td>
<td>-1.732349</td>
<td>-4.30529</td>
<td>-1.7779</td>
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<td>Budget Deficit</td>
<td>-2.175386</td>
<td>0.2175</td>
<td>0.361141</td>
<td>-2.058281</td>
<td>-2.643842</td>
<td>-2.374034</td>
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<td>Debt</td>
<td>2.050193</td>
<td>0.9999</td>
<td>0.983643</td>
<td>0.818821</td>
<td>0.113563</td>
<td>-2.858409</td>
<td>-2.8605</td>
<td>1990 trend</td>
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<tr>
<td>Exports/Imports</td>
<td>-1.701652</td>
<td>0.4231</td>
<td>0.230266</td>
<td>-0.651826</td>
<td>-3.101221</td>
<td>-3.089579</td>
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<td>GDP Growth</td>
<td>-1.475524</td>
<td>0.5389</td>
<td>0.758385</td>
<td>-2.510606</td>
<td>-1.891222</td>
<td>-2.582601</td>
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<td>Government Spending</td>
<td>-1.526953</td>
<td>0.5121</td>
<td>0.633804</td>
<td>0.094645</td>
<td>-1.840952</td>
<td>-2.320748</td>
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<td>Long Term Interest rates</td>
<td>-1.60038</td>
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<td>0.214096</td>
<td>-1.253082</td>
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<td>-1.874075</td>
<td>-1.618</td>
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<td></td>
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<td>cv 10%</td>
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<td>0.347</td>
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Response to Generalized One S.D. Innovations ± 2 S.E.
Variance Decomposition ± 2 S.E.

Percent RGDP variance due to RGDP

Percent RGDP variance due to BD

Percent RGDP variance due to CA

Percent RGDP variance due to IR_LONG_TERM

Percent BD variance due to RGDP

Percent BD variance due to BD

Percent BD variance due to CA

Percent BD variance due to IR_LONG_TERM

Percent CA variance due to RGDP

Percent CA variance due to BD

Percent CA variance due to CA

Percent CA variance due to IR_LONG_TERM

Percent IR_LONG_TERM variance due to RGDP

Percent IR_LONG_TERM variance due to BD

Percent IR_LONG_TERM variance due to CA

Percent IR_LONG_TERM variance due to IR_LONG_TERM
Replace Real GDP with GDP Growth

Response of GDP Growth to GDP Growth

Response of GDP Growth to BD

Response of GDP Growth to CA

Response of GDP Growth to IR_Long_Term

Response of BD to GDP Growth

Response of BD to BD

Response of BD to CA

Response of BD to IR_Long_Term

Response of CA to GDP Growth

Response of CA to BD

Response of CA to CA

Response of CA to IR_Long_Term

Response of IR_Long_Term to GDP Growth

Response of IR_Long_Term to BD

Response of IR_Long_Term to CA

Response of IR_Long_Term to IR_Long_Term
Ala Grier & Ye (2009)

Response to Generalized One S.D. Innovations ± 2 S.E.
Granger causality

- TEST FOR GRANGER-CAUSALITY:
  - H0: "BD" do not Granger-cause "GDP_GROWTH, CA, IR_LONG_TERM"

  - Test statistic $l = 2.6202$
  - $pval-F(l; 6, 160) = 0.0189$

- TEST FOR INSTANTANEOUS CAUSALITY:
  - H0: No instantaneous causality between "BD" and "GDP_GROWTH, CA, IR_LONG_TERM"

  - Test statistic: $c = 3.4413$
  - $pval-Chi(c; 3) = 0.3285$
VAR Orthogonal Impulse Responses
Growth and Debt

- Debt: accumulated BD.
- Is growth possible in time of debt?
- Reinhart and Rogoff (2010): threshold effect above 90%.
- Criticism Irons and Bivens (2010): correlation diff to causality, lower growth may cause debt to increase, static and not dynamics, statistical significance etc.
Greece
Conclusions

• Positive (low) correlation between the two
• No long-run relationship between BD and CA.
• Positive but insignificant response of fiscal policy to current account. Increased importance as horizon expands.
• Twin divergence hypothesis is rejected, weak support for the twin deficits.
• High GDP Growth even when debt is around 100% in Greece