The Greek economy under the twin-deficit pressure: a demand orientated growth approach

22nd Annual Conference on Alternative Economic Policy in Europe

September 15-17, 2016 | Coimbra

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Paper Outline

1. Motivation
2. Introduction and Literature review
3. Historical evidence of Greece on the twin-deficits
4. Empirical findings on Thirlwall’s Law
5. Empirical findings from the extended model with internal and external constraints
6. Simulation approach
7. Conclusions and policy recommendations
Motivation

- Greece as a special economy with failure in the Eurozone
- Internal and External constraints to take into account
- A more appropriate model to explain the twin deficit hypothesis in Greece
- Detect structural drawbacks in the economy
- Design scenarios that possibly lead to higher growth
Basic literature review

- Demand orientated approaches

- **Aggregate** BoP constrained growth – Thirlwall’s Law (1979)

- **The Twin-Deficit** constrained growth – Soukiazis-Cerqueira-Antunes (2012)

- **The aim**: whether the extended model is more appropriate to explain the current situation in Greece.
The profile of the Greek economy

<table>
<thead>
<tr>
<th>Period</th>
<th>GDP growth (average growth rate - %)</th>
<th>Deficit (%GDP)</th>
<th>Debt (% GDP)</th>
<th>Current account (% GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981-2014</td>
<td>0.95</td>
<td>-7.6</td>
<td>91.57</td>
<td>-5.32</td>
</tr>
<tr>
<td>1981-2000</td>
<td>1.6</td>
<td>-8.81</td>
<td>67.59</td>
<td>-2.19</td>
</tr>
<tr>
<td>2001-2014</td>
<td>0.02</td>
<td>-6.47</td>
<td>125.84</td>
<td>-9.81</td>
</tr>
</tbody>
</table>
The Balance of Payments equilibrium growth rate

\[ \dot{p}_d + \dot{x} = \dot{p}_f + \dot{m} \]
\[ \dot{m} = \psi(p_f + \dot{e} - p_d) + \pi \dot{y} \]
\[ \dot{x} = h(p_f + \dot{e} - p_d) + \varepsilon \dot{y}^* \]

\[ y_{BP} = \left[ (1 + \eta + \psi) (\dot{x} - \dot{p}_d - \dot{y} + \varepsilon \dot{y}^*) \right] / \pi \]

\[ y_{BP} = \frac{\dot{x}}{\pi} \quad \text{or} \quad y_{BP} = \frac{\varepsilon}{\pi} \dot{y}^* \]
Table 1. Computation of the balance of payments equilibrium growth rate in Greece, 1995-2014.

<table>
<thead>
<tr>
<th>$\dot{x}$</th>
<th>$\pi$</th>
<th>$\epsilon$</th>
<th>$\dot{y}^*$</th>
<th>$\dot{y}_{BP} = \frac{\dot{x}}{\pi}$</th>
<th>$\dot{y}$</th>
<th>$\dot{y}-\dot{y}_{BP}$</th>
<th>Current account (%GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.080</td>
<td>1.865</td>
<td></td>
<td>2.188</td>
<td>1.055</td>
<td>-1.132</td>
<td>-8.44</td>
<td></td>
</tr>
<tr>
<td>4.518</td>
<td>2.154</td>
<td></td>
<td>5.218</td>
<td>-4.319</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: $\dot{x}$ is the annual growth of real exports, $\pi$ the income elasticity of the demand for imports, $\epsilon$ the income elasticity of the demand for exports, $\dot{y}^*$ the growth rate of real GDP of the OECD countries, $\dot{y}$ the growth rate of real GDP in Greece, and $\dot{y}_{BP}$ the balance of payments equilibrium growth rate (own calculations).
The extended growth model with internal and external constraints

\[ r \delta c + \pi g + \pi_x + \pi_k \delta \delta_m (\delta \delta_{-} \delta \delta_{+}) \]

\[ \delta \delta = \epsilon_x \delta \delta_{-} + \delta_x (\delta \delta_{-} \delta \delta_{+}) \]

\[ \delta \delta = \epsilon_c \delta \delta_d \]

\[ \delta \delta = \epsilon_K \delta \delta + \epsilon_r \delta \]

\[ G_n + iB_H + i^*B_F = tYP + D \]

\[ XP + D_F e - i^*B_F e = MP e \]
The reduced form of the growth rate of domestic income

\[ \dot{y}_{ext} = \frac{A}{B} \]

\[ A = \left( \xi - \frac{w_M}{w_x} (\frac{P^* e}{P}) \pi_x \xi \right) \delta \xi + \left( \delta_x (1 - \frac{P^* e}{P} \frac{w_M}{w_X} \pi_x) - \delta_m \frac{w_M}{w_X} (\frac{P^* e}{P}) \right) (\delta \xi^* + \delta - \delta \delta^*) + \]

\[ \begin{align*}
A &= \delta \xi + (1 - \xi) \frac{w_D}{w_x} (\delta \xi^* - i^*) - (1 - \xi) \frac{w_B}{w_x} \Delta i^* - \\
&\quad \left\{ \frac{(\Delta i - \Delta \delta \delta \xi w_B)}{(1 - t) + r \xi w_B} (\pi_c \xi_c) + \pi_k \xi_k, (\Delta i - \Delta \delta \delta) + \\
&\quad + \pi_g \left[ - \Delta i \frac{\xi w_B}{w_G} - \Delta i^* e (1 - \xi) \frac{w_B}{w_G} \right] + \delta \xi^* + \delta \right\} \\
\end{align*} \]

\[ B = \frac{w_M}{w_x} \left( \frac{P^* e}{P} \right) \{ \pi_c \xi_c + \pi_k \xi_k + \pi_g \left[ \frac{t}{w_G} + \frac{w_D}{w_G} - \frac{i \xi w_B}{w_G} - i^* e (1 - \xi) \frac{w_B}{w_G} \right] \} - \\
(1 - \xi) \frac{w_D}{w_x} \]
Table 2. Computation of the growth rates of domestic income. Greece, 1995-2014

<table>
<thead>
<tr>
<th>$\varepsilon_x$</th>
<th>$\pi_x$</th>
<th>$\varepsilon_c$</th>
<th>$\pi_c$</th>
<th>$\varepsilon_k$</th>
<th>$\pi_k$</th>
<th>$\pi_\sigma$</th>
<th>$\varepsilon_r$</th>
<th>$\delta_m$</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.540</td>
<td>0.712</td>
<td>0.997</td>
<td>0.233</td>
<td>2.610</td>
<td>0.336</td>
<td>0.209</td>
<td>0.165</td>
<td>0.360</td>
</tr>
<tr>
<td>$\delta_x$</td>
<td>$t$</td>
<td>$r$</td>
<td>$\dot{p}$</td>
<td>$\dot{y}^*$</td>
<td>$w_D$</td>
<td>$w_G$</td>
<td>$w_B$</td>
<td>$\xi_D$</td>
</tr>
<tr>
<td>0.141</td>
<td>0.387</td>
<td>0.052</td>
<td>0.032</td>
<td>0.022</td>
<td>0.071</td>
<td>0.427</td>
<td>1.196</td>
<td>0.541</td>
</tr>
<tr>
<td>$\xi_B$</td>
<td>$w_M$</td>
<td>$w_X$</td>
<td>$i$</td>
<td>$i^*$</td>
<td>$\Delta i$</td>
<td>$\Delta i^*$</td>
<td>$e$</td>
<td>$\dot{e}$</td>
</tr>
<tr>
<td>0.541</td>
<td>0.331</td>
<td>0.231</td>
<td>0.084</td>
<td>0.040</td>
<td>-0.007</td>
<td>-0.003</td>
<td>1.023</td>
<td>-0.002</td>
</tr>
</tbody>
</table>

\[
\left( \frac{\xi_B}{\xi_D} \right) \dot{p}^* + \dot{e} - \dot{p} = (\Delta i - \Delta \dot{p}) \dot{p}^* (\dot{p} - i^*)
\]

1.065 -0.017 -0.001 0.017 -0.006

\[ \dot{y}_{ext} = 0.776\% \]
\[ \dot{y}_{BP} = 2.188\% \]
\[ \dot{y} = 1.055\% \]

**Notes:** small Greek letters are the elasticities taken from Table D.1 of Appendix D and other variables are average growth rates for the whole period. $\xi_D$ and $\xi_B$ was computed by the authors as an average for the period 1997:4 to 2013:4 (Central Bank of Greece)
A simulation approach (towards internal equilibrium)

i) Policies to reduce internal imbalances: If we set the GSP targets of a 3% deficit and 60% debt the estimated growth rate in Greece is around 0.702% which is slightly lower than the prevailing rate of 0.776%. Reducing simultaneously the share of public spending from the observed rate \( w_G = 0.427\% \) to 0.30\% the growth rate is even lower, 0.613\%. Therefore, austerity measures towards fiscal discipline are not growth enhancing at this stage of economic performance in Greece.

ii) Lower financial costs: Domestic interest rate is on average \( i = 8.4\% \) which is much above the foreign interest \( i^* = 4.0\% \). Assuming a more favorable monetary policy of the ECB towards a reduction in the cost of financing the economy, i.e. setting a 2\% interest rate, could help the economy to grow around 0.922\% a bit faster than the observed rate, 0.776%.

iii) Higher taxes and lower government spending: If taxes on income increase from the average rate \( t = 38.7\% \) to 45\% and government spending (as percentage of GDP) falls from the average rate \( w_G = 42.7\% \) to 30\%, income growth falls from 0.776\% to 0.611\%. Again, austerity measures are not friendly to higher growth.
A simulation approach (towards external equilibrium)

(i) Policies to reduce the exports dependence on imports: Reducing the high dependence of exports on imports from $\pi_x=0.712$ to $\pi_x=0.60$, the estimated growth rate in Greece boosts from the prevailing rate of 0.776% to 1.666% which is a significant achievement. Therefore, policies should be developed to encourage the use of national inputs in the export sector.

(ii) Policies towards trade equilibrium: Equalizing the exports share to that of imports $w_m=w_x=33.1\%$ the estimated growth rate increases to 3.828%, or alternatively, reducing the imports share to the exports level $w_m=w_x=23.6\%$ the growth rate increases to 4.106%, which are both remarkable achievements. Therefore policies towards trade equilibrium boost economic growth in Greece.

(iii) Constant relative prices: If we assume that relative prices stay constant in the long-run $p^*+\dot{\pi} - \dot{p}=0$, and $(P*e)/P =1$, then the estimated growth slightly drops from 0.776% to 0.741%. Two main remarks can be made with respect to this finding. First, relative prices are not neutral in the growth process. Second, its impact on growth is not very substantial and this is in line with Thirlwall’s argument that international competition is mostly non-price competition.
Conclusions

- Thirlwall’s model fails to explain the Greek economic performance in the last decades.

- The extended model that takes into account not only external but also internal constraints (the twin-deficit hypothesis) and relaxes the assumption that relative prices are neutral in the long-run growth is more accurate in predicting actual growth in Greece.

- The most efficient policy to achieve higher growth in Greece is related to external imbalances and to a less extent to internal imbalances.