LIMG
The Levy Institute Model for Greece

Levy Research program on
The State of the US and World Economies

Gennaro Zezza
Department of Economics and Law
U.C.La.M. (Italy)
and
Levy Economics Institute (U.S.)
Outline

- Motivation
- Data sources and data problems
- Theoretical background
- Econometric approach
- Main findings
- Simulation strategies
Motivation

- The Levy model for the U.S. economy has proved to be a powerful tool for assessing the sustainability of the current growth path, and therefore predict crisis.
- Larger project for replicating the same methodology for European countries.
- Target #1: an **accounting model** to evaluate current trends (need for quarterly data).
- Target #2: an **econometric model** for understanding key linkages.
- Target #3: a **simulation model** for projecting medium term scenarios.
Wynne Godley's approach
Financial balances

- The main financial balances summarize what has been driving growth
- Financial balances also show if current situation is sustainable

- Problem for Greece: official “new” data from 2000 to present depict an unsustainable economy from the beginning
But on a longer time horizon...

- Once financial balances are reconstructed for a longer time span, they show that Greece shared some dynamics with other developed countries.
- Positive net saving for the private sector matched by government deficit.
- Net private saving goes negative in the 1990s, and the current account deteriorates.
- Government deficit not so high in 2006 relative to history.
Greece.
Main financial balances 1988-present

- Government deficit
- Current account
- Pr. sector Investment-Saving

% of GDP

88 90 92 94 96 98 00 02 04 06 08 10 12
Data sources

ElStat (www.statistics.gr)
National accounts
Sectoral non-financial accounts
Labour market (monthly)
  – Problems: only 2000-present; seasonal; breaks in the data

Bank of Greece
Sector financial accounts (stocks and flows)
Price of houses
Stock market index
Data sources #2

Oecd
Quarterly national accounts – longer time span for some variables

Ameco
(http://ec.europa.eu/economy_finance/db_indicators/ameco/)
Longer time span
But only annual data
Preparing the dataset

1. Seasonal adjustments of quarterly data 2000-present
2. Interpolation of annual data 1970-1999
3. Merging new seasonally adjusted data with interpolated data
4. Ensure variables are consistent > measure discrepancies
5. Estimate stocks at costs, by cumulating flows
The accounting model
General principles of SFC models

1. Everything comes from somewhere and goes somewhere: no *black holes* (income for somebody is a payment from somebody else)
2. Debt for someone is a credit for someone else
3. Flows imply stocks: positive saving implies an increase in net wealth
4. Stocks feed back on flows: higher debt implies higher future interest payments; higher wealth allows for higher spending
5. In a theoretical growth model stock/flow ratios converge.
## The Social Accounting Matrix

### Social accounting matrix for the LIMG model

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Production</strong></td>
<td></td>
<td>+PX</td>
<td>+G</td>
<td>+NX</td>
<td></td>
<td>+GDP</td>
</tr>
<tr>
<td><strong>2. Private sector</strong></td>
<td>+VAp</td>
<td></td>
<td>+TRgp</td>
<td>+TRwp</td>
<td></td>
<td>+YP</td>
</tr>
<tr>
<td><strong>3. Government</strong></td>
<td>+NIT  +Ggos</td>
<td>+DT</td>
<td></td>
<td>+TRwg</td>
<td></td>
<td>+YG</td>
</tr>
<tr>
<td><strong>4. Rest of the World</strong></td>
<td>+NITw</td>
<td>+TRpw</td>
<td>+TRgw</td>
<td></td>
<td></td>
<td>+YW</td>
</tr>
<tr>
<td><strong>5. Capital Account</strong></td>
<td></td>
<td>+S</td>
<td>-GDEF</td>
<td>-CA</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td><strong>6. Total</strong></td>
<td>+GDP</td>
<td>+YP</td>
<td>+YG</td>
<td>+YW</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>
The Balance Sheet Matrix

<table>
<thead>
<tr>
<th></th>
<th>Priv. S.</th>
<th>Gov.</th>
<th>RoW</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government debt</td>
<td>+DGp</td>
<td>-DG</td>
<td>+DGW</td>
<td>0</td>
</tr>
<tr>
<td>Net priv. s. liabilities</td>
<td>-PSL</td>
<td></td>
<td>+PSL</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>FA</td>
<td>-DG</td>
<td>-FW</td>
<td>0</td>
</tr>
</tbody>
</table>

FA = Net financial assets of the private sector
DG = Government net debt outstanding
FW = Net foreign financial wealth
Greece. Non-financial corporations
Net financial assets

4qMovAv - % of GDP

Total
Excluding equities
Greece. General government
Net financial assets

4qMovAv - % of GDP

- Market prices
- Estimated at costs
Greece. Household
Net lending

4qMovAv - % of GDP

From sectoral accounts
From financial accounts

01 02 03 04 05 06 07 08 09 10 11 12 13
Econometric strategy and results
Estimation of “behaviour”

› Private expenditure
› Imports of goods – imports of services
› Exports of goods – exports of services
› Relative prices for each category of trade
› Employment
› Endogenous components of government accounts
  – Tax receipts
  – Social benefits and contributions
› Interest payments
Main results from econometrics

› Private expenditure
  – Depends on income and net financial wealth
  – Additional effects from capital gains from the stock market
  – Additional (weak) effects from borrowing

The fall in net financial wealth contributes to explain the decline in private expenditure over disposable income
Main results #2

Exports

- High elasticity of exports of goods to income of trading partners.
- No long-run impact from relative prices. Short-run price elasticity lower than income elasticity

Price elasticity for exports of services possibly higher, but results are ambiguous

Implication: increase in exports through internal devaluation will take a long time. Slowdown in income of major trading partners (Germany, Italy) painful. Some benefits recently obtained from the increase in the price of oil are volatile
Main results #3

› Imports
  – High elasticity of imports of goods to income, both in the long and the short run
  – Smaller price elasticity, significant in the long-run, not significant in the short run
  – Similar results for imports of services

Implication: imports will drop fast with a recession, but import substitution is slow

Implication: should Greece abandon the Euro to revive its economy through a devalued new currency, the impact on trade would not be beneficial in the short run
Simulation model
Simulation strategy: base scenario (July 2013)

- Assumptions
  - Projections for foreign growth and inflation from IMF
  - Projections for changes in government revenues and outlays from Troika (June 2013)

Simulation strategy: compute the implications of planned austerity on GDP, with government revenues generated from the model.

Results: GDP will grow more slowly than projected by the Troika, AND the deficit target will not be met.
Deficit target scenario

› Assumptions
  – We assume that further austerity will be implemented to meet the planned deficit/GDP target

Results: GDP will grow even more slowly than in the base scenario
GDP target scenario

Assumptions

- We compute the amount of fiscal stimulus required to reach the GDP target in Troika projections
- Public deficit is endogenous

Results: public deficit will increase, and the external account will worsen
“Marshall plan” scenario

› Assumptions
  – We assume a transfer of 30bn € from European institutions to the Greek government
  – Equivalent to 2.1bn per quarter starting 2013q3

Results: this is a moderate stimulus. Employment will increase but a larger stimulus is needed for strong recovery
Forthcoming report

> Assumptions for baseline scenario
  - Projections for foreign growth and inflation from IMF
  - No further austerity measures

> Freezing debt scenario
  - Suspension of interest payments

> Introducing new liquid Government IOUs
  - Needs “heroic” assumptions about stable behavior following a major institutional change