Dealing with the Public Debt Burden

A system dynamics approach to implementing sustainable financial policies in the Italian State

July 2012

Pietro Sorci
PhD candidate in Model Based Public Planning, Policy Design and Management at University of Palermo
1. Introduction: debt background, literature, dynamic problem and involved stakeholders

2. Model: purpose, boundaries, business-like perspective & tests

3. Policies 1&2: producing a surplus to ensure both debt and risk premium reduction, results.

4. Implementation of Financial leverage: amplification of effects of Policies 1 & 2, effects on GDP, surplus, receipts and expenditures

5. Conclusions
Dynamic problem

Public Debt, GDP and Surplus from 2000 to 2010 (in million of Euro)
The model **includes**:
1) Acquisition/payments on debt;
2) Risk premium;
3) Surplus production;
4) Increase in GDP by use of financial leverage;

The model **doesn’t include**:
1) GDP growth;
2) Analysis of value created by public expenditures;
3) Decisional processes;
4) Fiscal and expenditure leverages
Italian debt in 2000-2010 (in million of euro)
Structure-behavior test on loops affecting Risk Premium

- R3 and C2 loops
- R4 loop
- Political Instability
- GDP Growth
- European Conjuncture

Effect of surplus on Risk Premium reduction
Policies recommended 1&2

Policy 1
Reduce the public expenditures by:

a) Abolition of Provinces: - 10.7 billions Euro;

b) Removal of 36% of Parliament members: - 3.5 billions Euro;

c) 33% of reduction on political salaries and benefits: - 8.23 billions Euro;

d) Reduction pensions deputies and senators: - 202.2 millions Euro;

e) Reduction pension public managers: - 9.8 billions Euro

Due to longer fulfillment time policies effects are predicted starting from the end of 2013.

In case of ideal scenario (100% effectiveness) policies will produce a surplus of 50,195 millions euro

Policy 2
Increase during 2012-2020 country receipts by:

a) Application of a China import surcharge: + 576 millions Euro;

b) Patrimonial tax: + 8,435 millions Euro;

c) Tax on higher earnings by firm bureaucracy reduction: + 5,820 millions Euro;

d) Additional 4% VAT on junk food: + 39 mln Euro;

e) Additional 1% VAT on luxury: + 1,520 mln Euro;

f) Additional 4,5% VAT on cigarettes: + 765 millions Euro;

g) Additional 4% VAT on spirits: + 48 mln Euro;

h) Additional 1 eurocent excise duty on fuel: + 400 millions Euro
Policy 3 – The implementation of the Financial Leverage
Results from implementation of Policies 1&2

Debt: 1 - 2 - 3 - 4 - 5 -

1:

Millions
Euro

2100000

1700000

1300000

2000,00
2005,00
2010,00
2015,00
2020,00

Years

11.59
gio 19 lug 2012

Policies 1&2 effectiveness (100%, 80%, 50%, 30%, 0% scenarios)
## Results from implementation of Policies 1&2

<table>
<thead>
<tr>
<th>Policy effectiveness</th>
<th>Value (in million €)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>1,565,830</td>
</tr>
<tr>
<td>80%</td>
<td>1,644,817</td>
</tr>
<tr>
<td>50%</td>
<td>1,763,623</td>
</tr>
<tr>
<td>30%</td>
<td>1,843,046</td>
</tr>
<tr>
<td>0%</td>
<td>1,962,508</td>
</tr>
</tbody>
</table>

### Italian Public Debt in 2020

<table>
<thead>
<tr>
<th>Policy effectiveness</th>
<th>Debt to GDP ratio in 2020</th>
<th>Debt to GDP ratio in 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>98,4%</td>
<td>22,2%</td>
</tr>
<tr>
<td>80%</td>
<td>103,3%</td>
<td>36,2%</td>
</tr>
<tr>
<td>50%</td>
<td>110,8%</td>
<td>57,6%</td>
</tr>
<tr>
<td>30%</td>
<td>115,8%</td>
<td>72,2%</td>
</tr>
<tr>
<td>0%</td>
<td>123,3%</td>
<td>94,6%</td>
</tr>
</tbody>
</table>
Policy 3: when is it convenient to use Financial Leverage

[Graph showing accumulation and interest expected over years.]
Policy 3: Effects of Financial Leverage on GDP

GDP: 1 - 2 -

+ 39,5%

Additional GDP from implementation of financial leverage (millions of Euro)
Policy 3: Effects of Financial Leverage on Receipts

Effect of FL implementation on receipts (millions of Euro)

+ 42%
Policy 3: Effects of Financial Leverage on Expenditures

+ 39.5%
Policy 3: Effects of Financial Leverage on Surplus production

Constant expenditures-to-GDP leverage scenario

Additional surplus from implementation of financial leverage (millions of Euro)

+63.2%
Policy 3: Effects of Financial Leverage on Surplus production

Constant expenditures amount in 2012 scenario

+ 598%

Additional surplus from implementation of financial leverage - Steady expenditures (millions of Euro)
Conclusions & implications for further research

1. Italy is experiencing the absolute necessity to “subject” public organizations to the same budget constraints of private firms.
2. SD can foster the decision makers awareness about dynamics that influence debt and about levers contributing to its reduction.
3. SD allows decision makers to translate into figures effects of planned policies and to validate them.
4. Additional surplus produced by short term policies have a positive effect in both debt and risk premium reduction.
5. SD model validates the implementation of financial leverage in order to amplify positive results obtained by previous policies.
6. Model could be extended by including a) dysfunctions in the decisional process (misleading analysis, political interferences and lack of feedback analysis); b) Relationship between public expenses and value creation.