Transmission of Shocks in the Integrated Accounting Framework

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1. Motivation

- We augment the integrated (national) accounts to include transmission of shocks across sectors
- We do this by estimating the who-to-whom links for both non-financial and financial accounts
- This allows for economy-wide policy simulations and analysis of risk transmission
- See Castren and Kavonius (2009, 2013) and Castren and Rancan (2014) for applications in financial accounts only
1. Motivation

Castren and Kavonius (2009); links using financial accounts balance sheets
1. Motivation

Castren and Rancan (2014); cross-border links using financial accounts balance sheets
1. Motivation

- The resulting framework in this paper is a large-scale static general equilibrium model that captures the economy-wide effects of saving, consumption and investment decisions taken by each individual sector.
- This model provides a useful addition to the tools for macroeconomic policy simulation, as it includes the complete set of accounts and is internally consistent.
- While it lacks the long-run dimension of the dynamic general equilibrium models, its strength is its completeness and versatility. In this vein, our model allows for simulation of far more detailed and accurate scenarios.
2. Introducing the Euro Area Integrated Accounts

- The integrated accounts are a quarterly accounting system, encompassing the non-financial and financial accounts, including balance sheets.
- The data are compiled according to the European System of Accounts (ESA95) which is the European application of the System of National Accounts 1993 (SNA93).
- The system has four key dimensions: the sequence of the accounts, the uses/liabilities and resources/assets dimension, the institutional sectors, and time.
2. Introducing the Euro Area Integrated Accounts

**Organisation of Data in Integrated Accounts**

**Sector 1**
- **Non-Financial Accounts**
  - Production account to secondary distribution of income account
  - Disposable income
  - Savings
  - Capital account
  - Net lending/net borrowing

**Sector 2**
- **Non-Financial Accounts**
  - Production account to secondary distribution of income account
  - Disposable income
  - Savings
  - Capital account
  - Net lending/net borrowing

**Sector 3**
- **Non-Financial Accounts**
  - Production account to secondary distribution of income account
  - Disposable income
  - Savings
  - Capital account
  - Net lending/net borrowing

**Financial Accounts**
- Assets
- Liabilities
2. Introducing the Euro Area Integrated Accounts
3. How to calculate the cross-sector links

In the ideal world, the links could be constructed bottom-up from detailed micro data.
3. How to calculate the cross-sector links

In the application used in this paper, each aggregate transaction is broken down to a who-to-whom table which are then linked with each other through the accounting framework.
3. How to calculate the cross-sector links

- In the future, each aggregate transaction will be broken down to a separate who-to-whom table which are then linked with each other.
- The horizontal who-to-whom tables in the lower part of the graph describe additional inter-linkages between transactions, stocks and prices.
3. How to calculate the cross-sector links

The who-to-whom matrix

$$V_{ass, lia} = \begin{bmatrix}
V_{1,1} & V_{2,1} & \cdots & \sum_{i=1}^{n} V_{i,1} \\
V_{1,2} & V_{2,2} & \cdots & \sum_{i=1}^{n} V_{i,2} \\
V_{1,3} & V_{2,3} & \cdots & \sum_{i=1}^{n} V_{i,3} \\
\vdots & \vdots & \ddots & \vdots \\
\sum_{i=1}^{n} V_{1,i} & \sum_{i=1}^{n} V_{2,i} & \cdots & \sum_{i=1}^{n} V_{i,i}
\end{bmatrix}$$

The Balancing Process

First round
Second round
\(\ldots\)
n round
\(n+1\) round

Balanced accounting framework
Imbalanced framework
(\text{net lending discrepancy})
Imbalanced framework
(\text{net lending discrepancy})
Balanced framework
(\text{no net lending discrepancy})

\begin{itemize}
  \item Shock simulation
  \item Informed reaction
  \item Informed reaction
\end{itemize}
4. Empirical Simulations

- We consider the system-wide implications of the European Union Excessive Deficit Procedure (EDP)
- Countries which have breached the rule whereby annual government budget deficits must not exceed 3% of GDP must submit a proposal of how they aim at bringing the deficits back to the target
- The proposed actions cover both expenditure and revenue side measures and their implementation is typically spread over a period of three years
- We consider France, Italy and Spain, which all submitted their updated plans to EU Commission in spring 2014.
4. Empirical Simulations

Net lending positions, France

Net lending positions, Spain
4. Empirical Simulations: France
4. Empirical Simulations: Spain

![Graphs showing empirical simulations for Spain](image-url)
4. Empirical Simulations

- In France, the fiscal measures are biased towards favouring the corporate sector at the expense of the household sector, with the idea that the former is expected to compensate the latter at a later stage via increased job creation.
- In Spain, the household sector is the biggest loser of the consolidation measures while the corporate sector will be only slightly affected.
4. Empirical Simulations

- Our empirical examples on the EU EDP highlight important aspects related to the structural differences of the euro area financial systems across countries.
- We also uncover the distributional impacts across sectors of the particular fiscal consolidation measures that governments decide to take.
- The numbers we arrive at are similar than those proposed by the respective governments in their own EDP proposals.
- However, these proposals do not include any estimates of the impact of the fiscal consolidation measures on the other sectors.
Conclusions/future work

• We introduced a framework to analyse economy-wide spillover effects of saving, consumption and investment decisions taken by individual sectors.

• The framework is based on the integrated accounts, and unlike in our previous work we concentrate on the non-financial part of these accounts.

• The transaction links between individual sectors that allow for the spillover effects were established by calculating who-to-whom tables.

• This framework complements the toolkit that can be used for economic policy simulations. By adding the spillover dimension across sectors, it creates a full-scale static general equilibrium model that is balanced and internally consistent.
Thank you for your attention