

# *Transmission of Shocks in the Integrated Accounting Framework*

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## Disclaimer

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## Outline

1. Motivation
2. Introducing the Euro Area Integrated Accounts
3. How to Calculate the Cross-Sector Links
4. Empirical Simulations: The EU Excessive Deficit Procedure
5. Conclusions/future work

## 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

Chart 3: Cross-sector balance sheet gross exposures in the euro area financial system in 1999Q1 and in 2009Q2

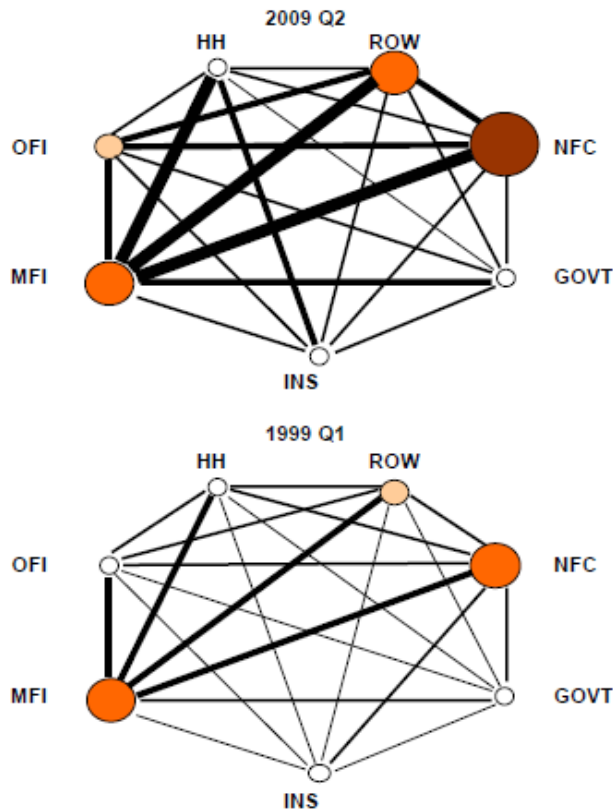
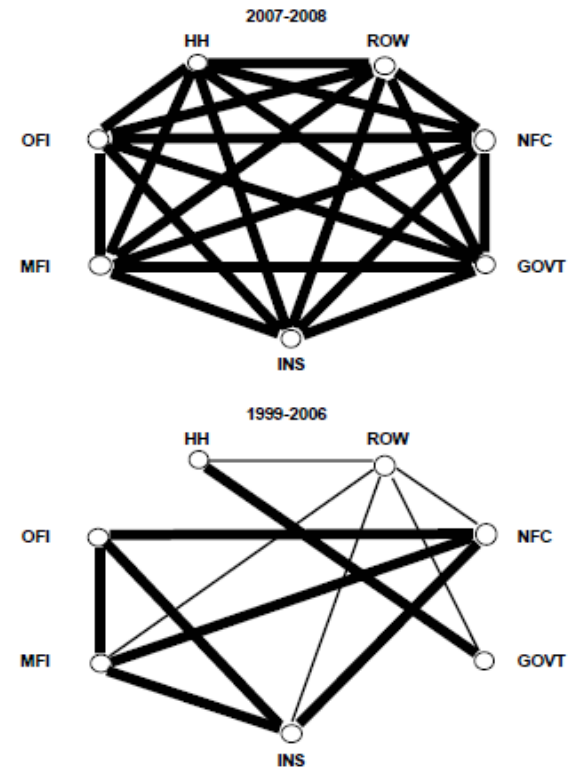
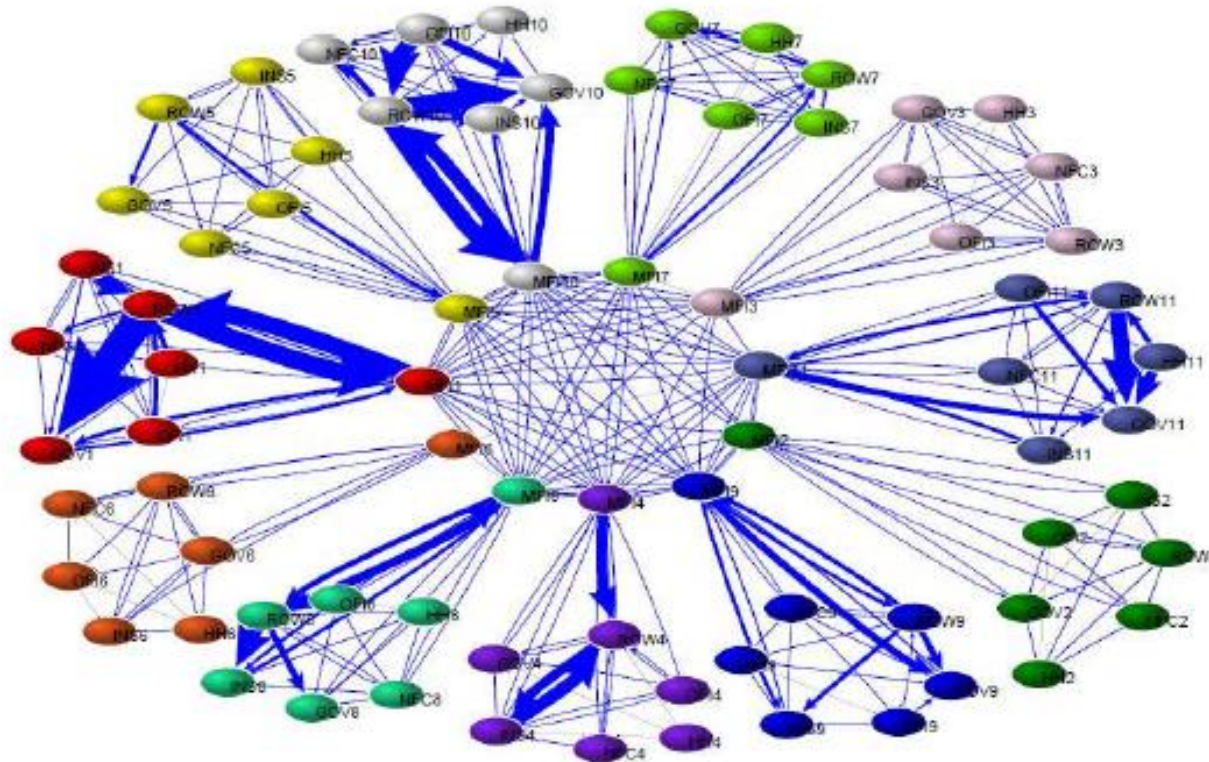


Chart 9: Pair-wise correlations among sector-level distance-to-distress measures in the euro area financial system 1999-2006 and 2007-2008



# 1. Motivation

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



**Figure 3 The euro area Macro Network .** The graph shows the macro network of eleven euro area countries. We used the Kamada-Kawai energy algorithm in separating the components (instrument: debt securities, period: Q1 2012). Size of arrows are used in order to display different weights.

## 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

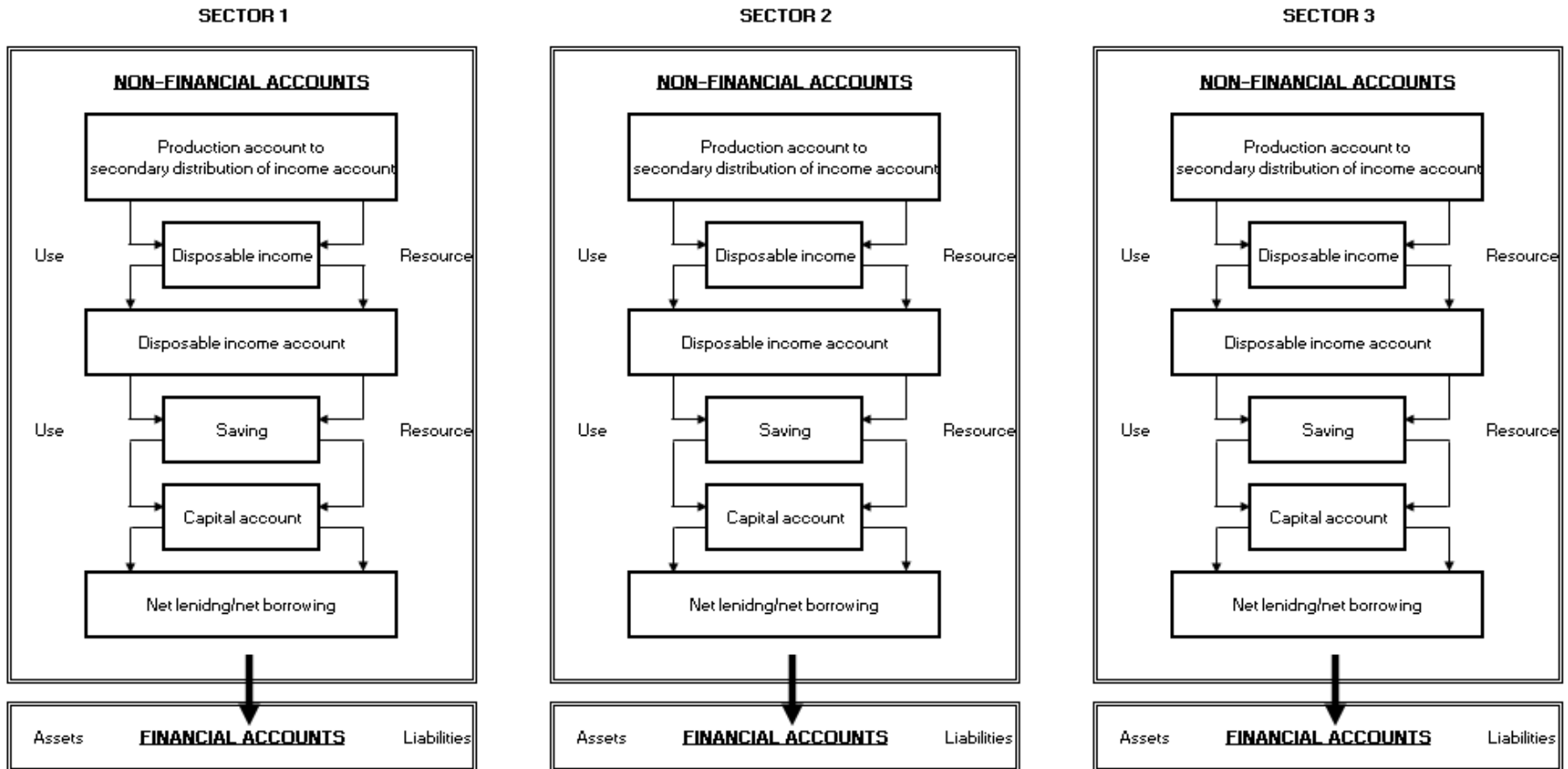
## 2. Introducing the Euro Area Integrated Accounts

- 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.



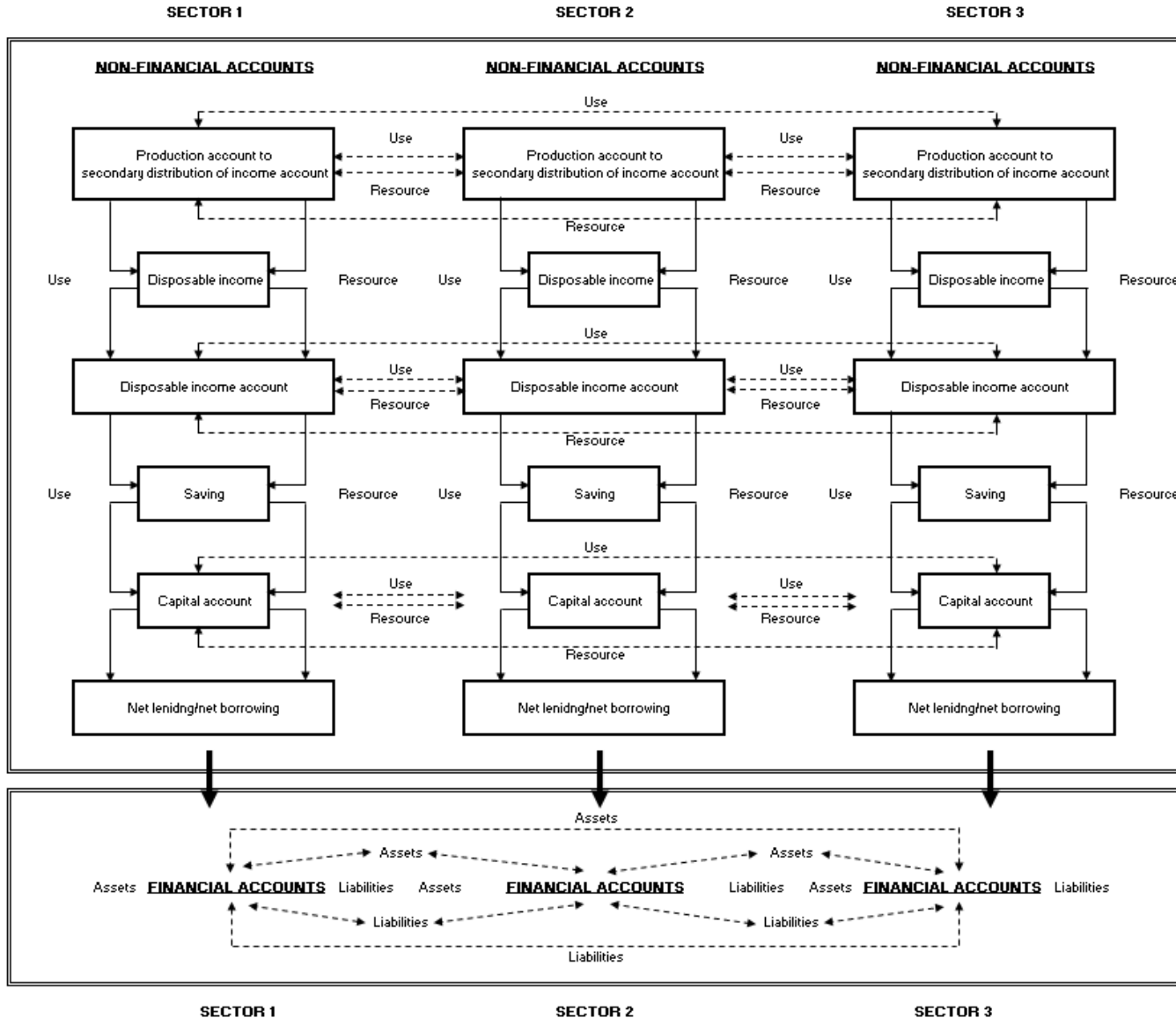
## 2. Introducing the Euro Area Integrated Accounts

### ORGANISATION OF DATA IN INTEGRATED ACCOUNTS



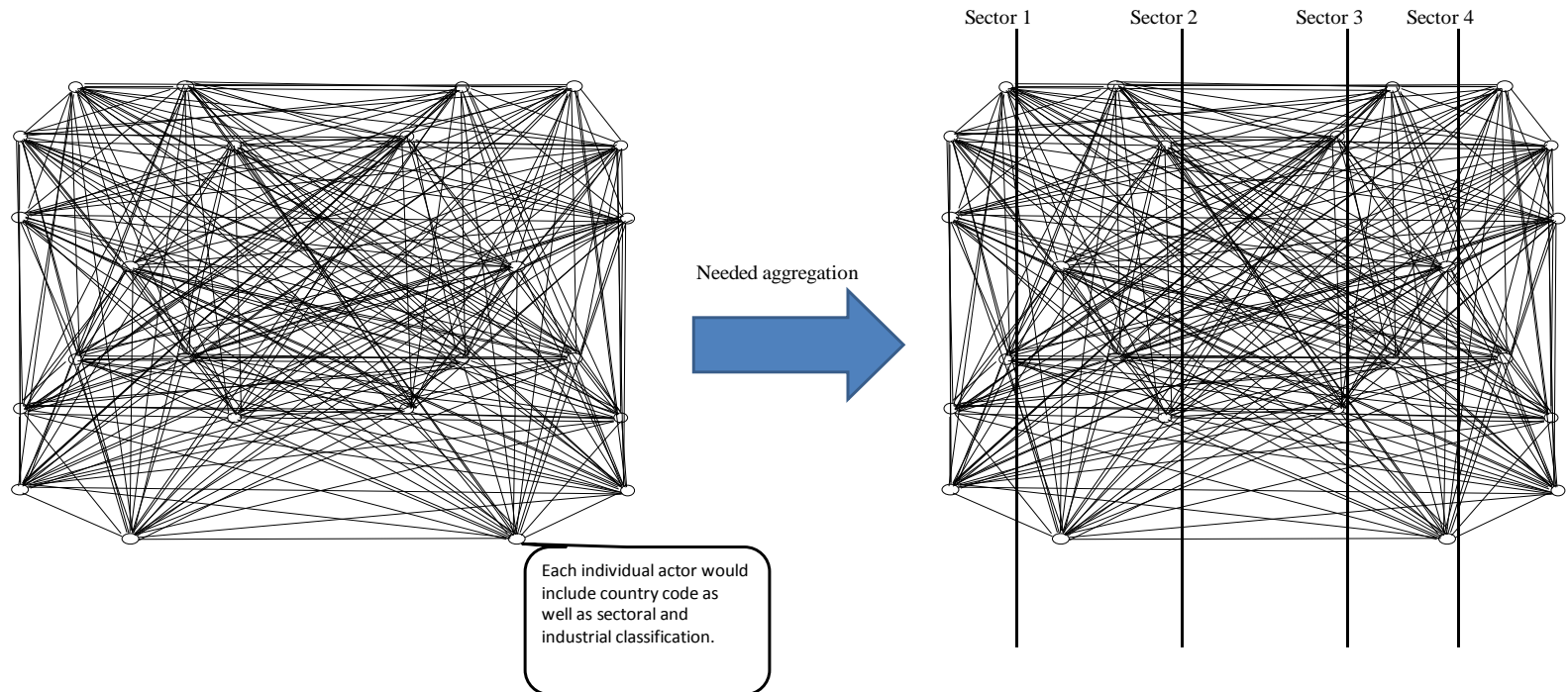
## 2. Introducing the Euro Area Integrated Accounts

### INTEGRATED ACCOUNTS WITH ESTIMATED WHO-TO-WHOM LINKS



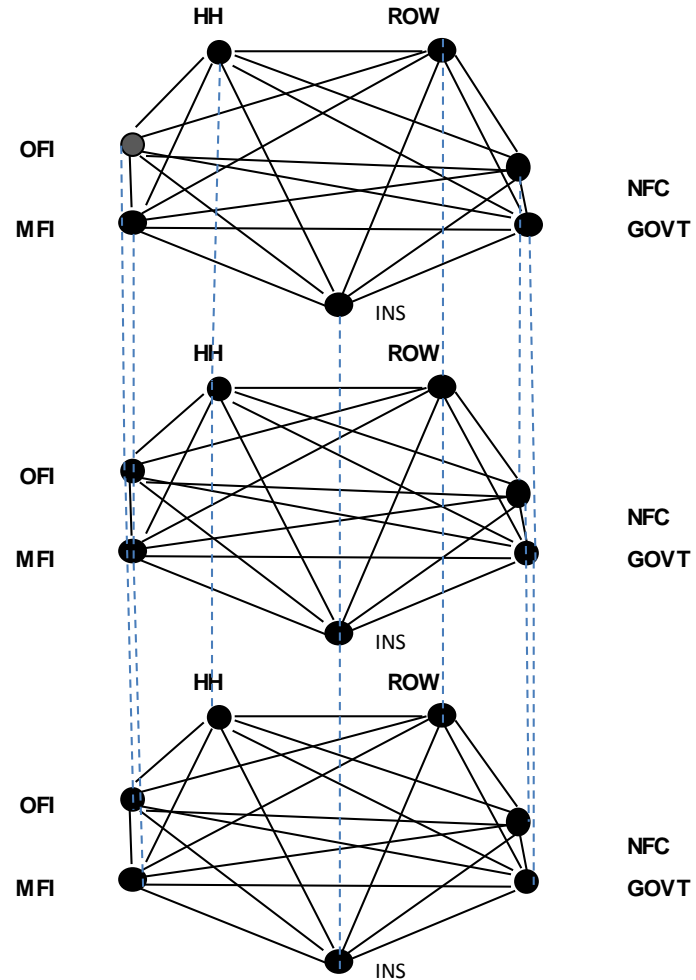
### 3. How to calculate the cross-sector links

In the ideal world, the links could be constructed bottom-up from detailed micro data



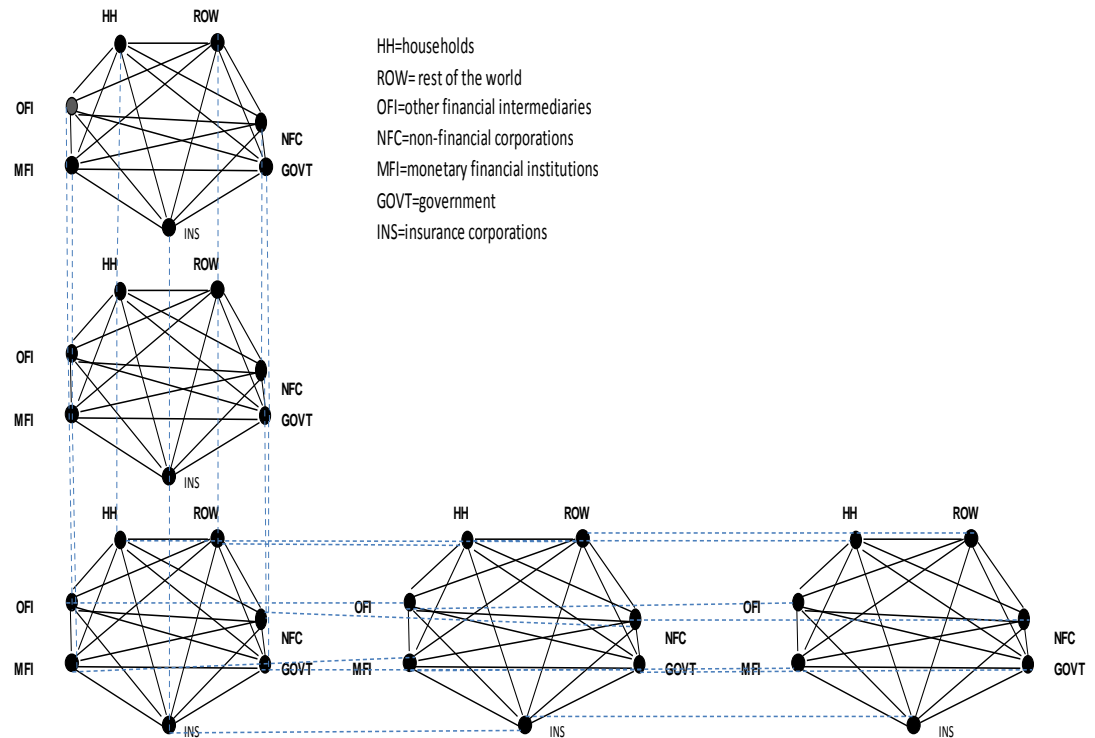
### 3. How to calculate the cross-sector links

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.

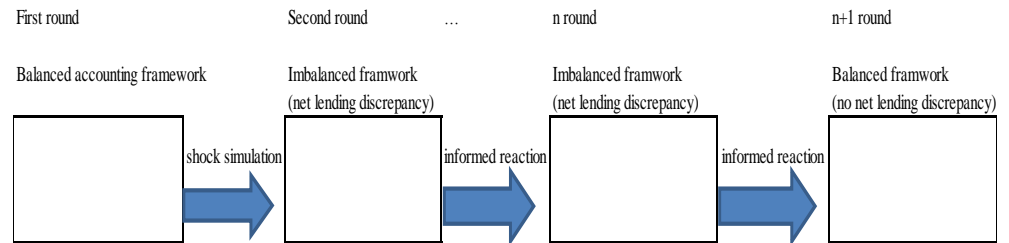


### 3. How to calculate the cross-sector links

#### The who-to-whom matrix

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

#### The Balancing Process

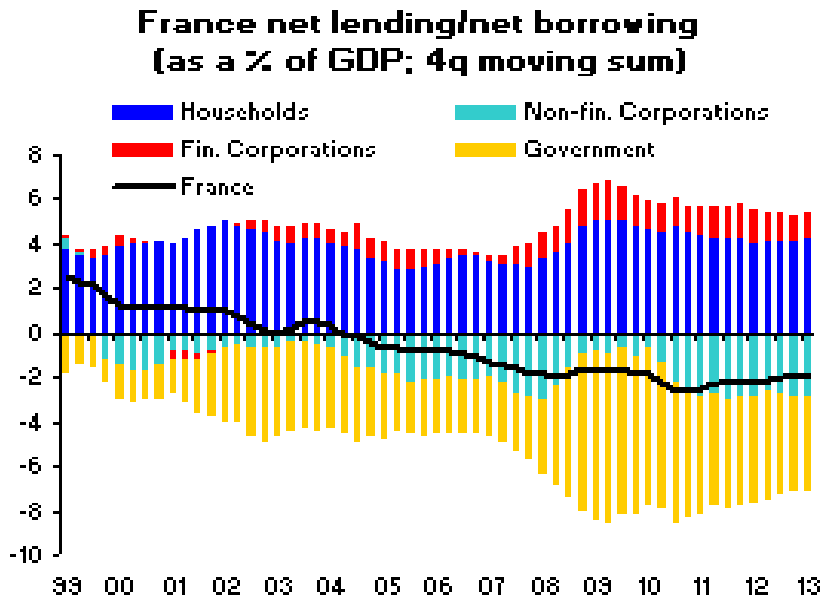


## 4. Empirical Simulations

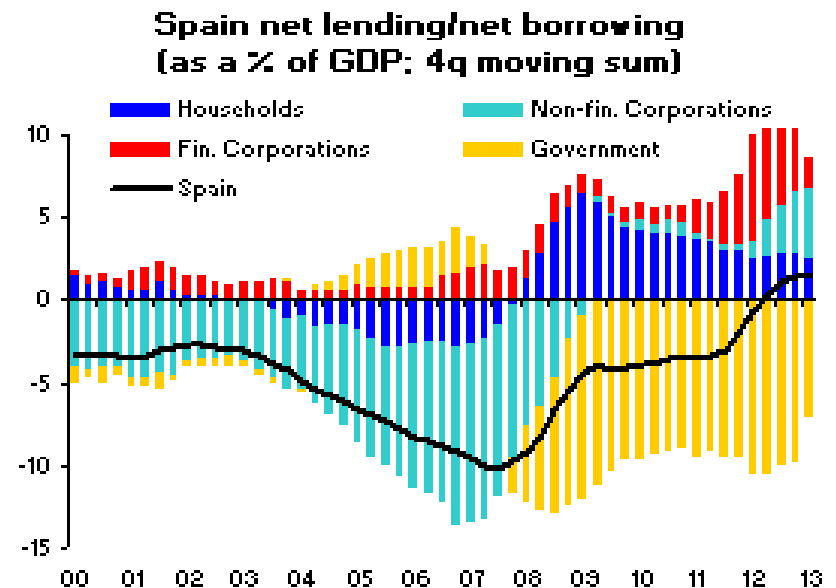
- We consider the system-wide implications of the European Union Excessive Deficit Procedure (EDP)
- Countries which have breached the rule whereby annual government budget deficits must not exceed 3% of GDP must submit a proposal of how they aim at bringing the deficits back to the target
- The proposed 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

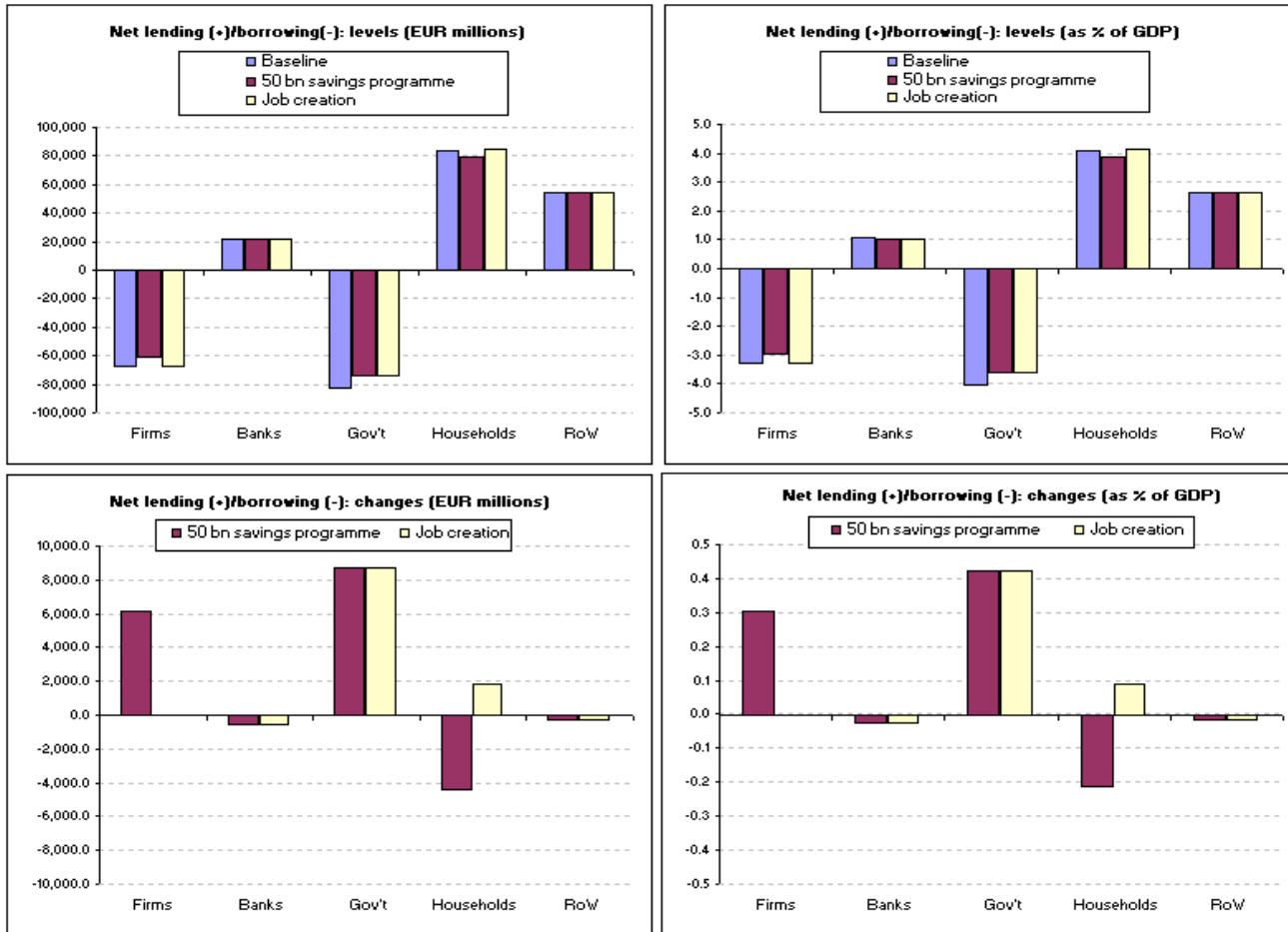


## Net lending positions, Spain

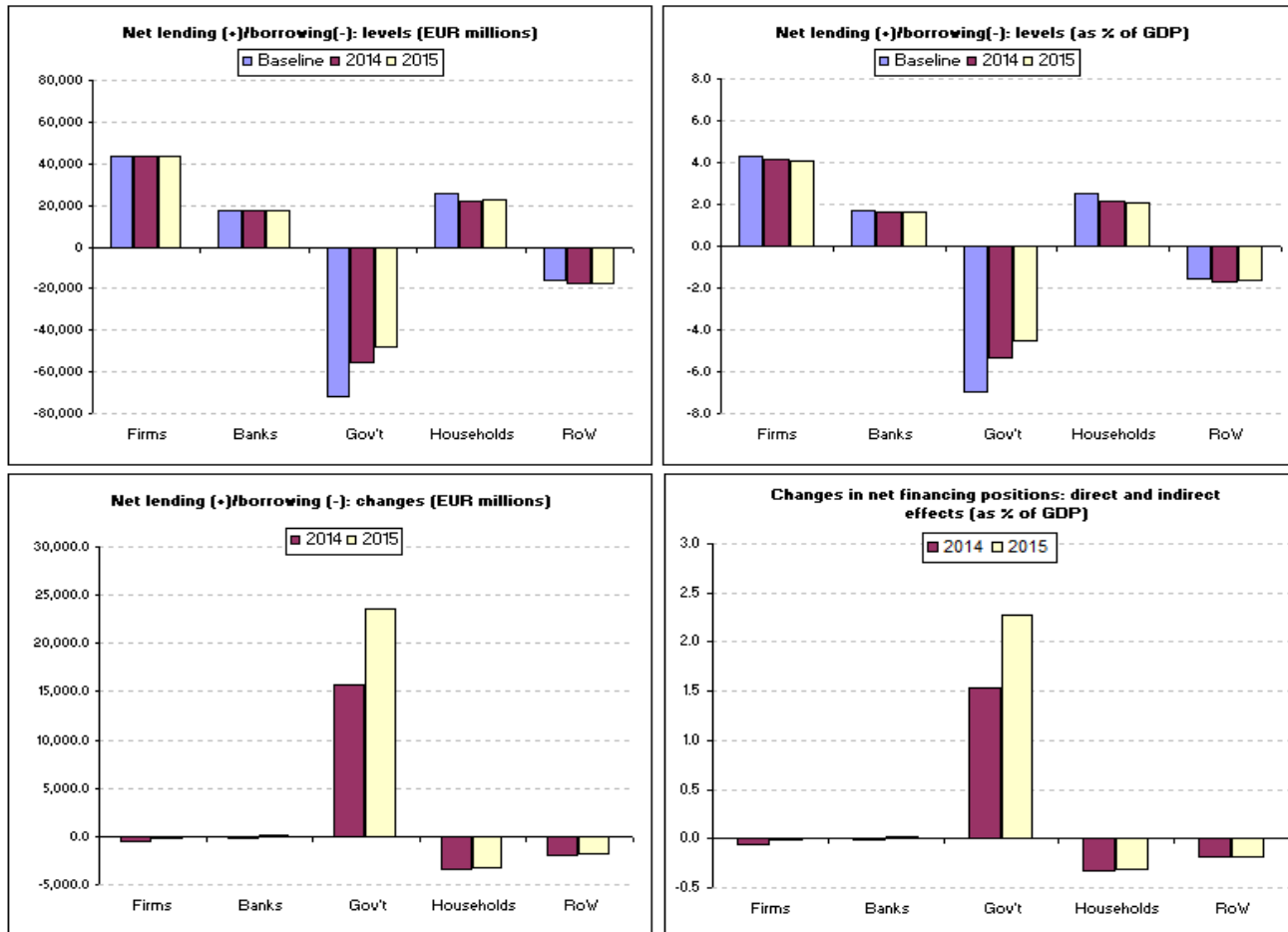




# 4. Empirical Simulations: France



# 4. Empirical Simulations: Spain



## 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