# Flow of Funds Accounts Based on European System of Accounts

Łucja Tomaszewicz University of Lodz
Joanna Trębska Academy of Management
Poland

# Main aims

- To present flow of funds accounts (FFA) in the meaning of social accounting matrix (SAM),
- To construct SAM for Poland integrated with FFA,
- To calculate some coefficients and multipliers for Poland based on input-output techniques (following Klein 1983, 2003),
- To make some exemplary comparisons with coefficients calculated for Hungary and Italy.

# FFA for Poland

- follow the form of European System of Accounts (ESA 95).
- Values of financial transactions are aggregated to twenty one instruments of financial market (forms of financial assets) and six institutional sectors, among which there are five subsectors of financial corporations and three subsectors of general government.
- Changes of liabilities and changes of financial assets are presented in two separate tables.

# Applied scheme of SAM with a disaggregation of accumulation account

| | | | | USES | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | Total |
| RESOURCES | 1 | Production account | | I | | II | | | |
| | 2 | Means of production | Primary incomes | III | | | | | |
| | 3 | Current account | Institutional sectors | | | | | | |
| | 4 | Capital account | Institutional sectors | | | | | | |
| | 5 | Financial account | Financial assets | | | | | | |
| | Total | | | | | | | | |

Two ways of constructing sub-matrices that present changes of financial assets and liabilities:

- direct use data from financial accounts,
- registering only positive flows.

Other possible way of presenting data for FFA in SAM:

- Pyatt 1991, Green, Murinde 2003
- Tsujimura, Mizoshita 2003

Following Klein (1983, 2003):

$\mathbf{A}^T = [a_{ij}]$ – sub-matrix 5,4 showing financial assets,

$\mathbf{L}^T = [l_{ji}]$ – sub-matrix 4,5 of liabilities,

$\mathbf{K}^T = [k_{hj}]$ – matrix consisting of non-financial assets (or capital transfer),

where:

- $i = 1,2,\ldots,m$ – the number of the form of financial asset or liability,
- $j = 1,2,\ldots,n$ – the number of institutional sector,
- $h = 1,2,\ldots,s$ – the number of category of non-financial asset (or capital transfer) distinguished in SAM.

# Model FFA based on input-output techniques

$$\mathbf{l} = \mathbf{D}\mathbf{w}, \quad (1)$$

$$\mathbf{w} = \mathbf{C}\mathbf{l} + \mathbf{k} = \mathbf{a} + \mathbf{k}, \quad (2)$$

where:

- **l** – vector of issue of liabilities,
- **w** – vector of net worth of particular sectors (sum of financial and nonfinancial assets by institutional sectors),
- **k** – vector of non-financial capital,
- **D** = $[d_{ij}/w_j]$– matrix of coefficients showing the *i*–th liability contructed by the *j*–th sector as a fraction of this sector's net worth,
- **C** = $[a_{ji}/l_i]$ – matrix of coefficients representing the *j*–th sector's anquiring of the *i*–th financial asset as a fraction of total issue of liabilities of the *i*–th form.

Vectors **w**, **l** or **a** as a function of **k**:

$$\mathbf{w} = (\mathbf{I} - \mathbf{CD})^{-1}\mathbf{k}, \tag{3}$$

$$\mathbf{l} = (\mathbf{I} - \mathbf{DC})^{-1}\mathbf{Dk}, \tag{4}$$

$$\mathbf{a} = [(\mathbf{I} - \mathbf{CD})^{-1} - \mathbf{I}]\mathbf{k}, \tag{5}$$

# Elements of matrix D for Poland for 2010

| Sector Liabilities | households; non-profit institutions | financial corporations | non-financial corporations | general government | rest of the world |
|---|---|---|---|---|---|
| monetary gold and SDRs; currency | 0,000 | 0,014 | 0,000 | 0,000 | 0,002 |
| deposits | 0,000 | 0,297 | 0,000 | 0,000 | 0,085 |
| securities other than shares | 0,000 | 0,201 | 0,037 | 0,667 | 0,239 |
| loans | 0,236 | 0,091 | 0,008 | 0,335 | 0,040 |
| shares and other equity | 0,000 | 0,180 | 0,006 | 0,000 | 0,076 |
| insurance technical reserves | 0,000 | 0,148 | 0,000 | 0,000 | 0,005 |
| other accounts receivable/payable | 0,002 | 0,024 | 0,208 | 0,030 | 0,200 |

# Coefficients of financing accumulation by external sources based on matrix for Poland, Italy and Hungary (liabilities per unit of net worth)

| Country / Sector | Poland | | Italy | Hungary |
|---|---|---|---|---|
| | 2008 | 2010 | | |
| households, non-profit institutions | 0,752 | 0,238 | 0,506 | -0,209 |
| financial corporations | 0,737 | 0,955 | 0,445 | 1,031 |
| non-financial corporations | 0,222 | 0,259 | 0,328 | 2,316 |
| general government | 0,705 | 1,031 | 1,769 | 2,137 |
| rest of the world | -0,553 | 0,646 | 0,114 | 0,983 |

# Elements of matrix C for Poland for 2010

| Assets / Sector | monetary gold and SDRs; currency | deposits | securities other than shares | loans | shares and other equity | insurance technical reserves | other accounts receivable/payable |
|---|---|---|---|---|---|---|---|
| households; non-profit institutions | 0,798 | 0,513 | 0,003 | -0,010 | 0,548 | 0,896 | 0,011 |
| financial corporations | 0,110 | 0,138 | 0,508 | 0,596 | 0,666 | 0,031 | 0,028 |
| non-financial corporations | 0,034 | 0,240 | 0,099 | 0,121 | 0,529 | 0,063 | 0,798 |
| general government | 0,026 | -0,073 | 0,014 | 0,082 | -0,596 | 0,009 | -0,025 |
| rest of the world | 0,033 | 0,182 | 0,376 | 0,210 | -0,147 | 0,000 | 0,188 |

# Elements of multipliers matrix $(I-CD)^{-1}$ for Poland for 2010

| Sector | households, non-profit institutions | financial corporations | non-financial corporations | general government | rest of the world |
|---|---|---|---|---|---|
| households, non-profit institutions | 1,108 | 0,593 | 0,046 | 0,465 | 0,261 |
| financial corporations | 0,274 | 1,625 | 0,092 | 0,958 | 0,435 |
| non-financial corporations | 0,142 | 0,481 | 1,252 | 0,602 | 0,465 |
| general government | 0,027 | 0,035 | 0,004 | 1,053 | 0,020 |
| Total economy | **1,551** | **2,735** | **1,394** | **3,077** | **1,181** |
| rest of the world | 0,130 | 0,359 | 0,098 | 0,541 | 1,293 |
| Total | **1,680** | **3,094** | **1,492** | **3,618** | **2,475** |

# Elements of multipliers matrix $(I-DC)^{-1}D$ for Poland for 2010

| Sector<br>Liabilities | households; non-profit institutions | financial corporations | non-financial corporations | general government | rest of the world |
|---|---|---|---|---|---|
| monetary gold and SDRs | 0,000 | 0,001 | 0,000 | 0,000 | 0,000 |
| currency | 0,004 | 0,023 | 0,001 | 0,014 | 0,009 |
| deposits | 0,093 | 0,514 | 0,036 | 0,367 | 0,235 |
| securities other than shares | 0,103 | 0,443 | 0,090 | 0,859 | 0,410 |
| loans | 0,304 | 0,316 | 0,034 | 0,485 | 0,160 |
| shares and other equity | 0,071 | 0,343 | 0,036 | 0,453 | 0,233 |
| insurance technical reserves | 0,041 | 0,243 | 0,014 | 0,145 | 0,071 |
| other accounts receivable/payable | 0,064 | 0,211 | 0,281 | 0,294 | 0,356 |

# Next steps

I. Simulation analyses showing macroeconomic effects of increasing in chosen expenditures (e.g. capital uses of a given sector) on resources on all accounts distinguished in SAM taking into consideration feedbacks effects among production accounts and income redistribution registered on current and capital accounts of all institutional sectors.
II. Enclosing the deterministic model based on SAM (with flow of funds accounts) to econometric multisectoral macromodel.
III. Introducing the effects of changes of interest rates, prices and wages related to the rate of investment and saving, which influence demand and supply on financial markets by making coefficients of matrices **C** and **D** variables.
IV. Deeper comparative cross-section-time analyses doable owing to construction of a dynamic database of FFA coefficients.
V. Using revaluation accounts following ESA 1995 (real holding gains/loses) for explanation of changes of propensity to invest in material or financial form, which have direct influence to a position of financial market.