# Economic Circuit – Elements of macroeconomic Activity Flows

**Prof. Alexandru MANOLE PhD.** *"ARTIFEX" University of Bucharest* **Radu STOICA PhD. Student** *Bucharest University of Studies* **Ihab Jweida SJ JWEIDA PhD. Student** *Bucharest University of Studies* 

#### Abstract

In this paper, the authors describe the flows of macroeconomic activities under the shape of economic circuit. The research methodology approaches the structure of the economic circuit, by emphasizing the characteristics of the activities, economic subjects, activities' objects, localization, transactions, input-output flow component. The economic circuits are represented in several variants, each one having its own set of economic agents, package of transactions it represents, correlations and/or equations. Among the indicators that make the object of this representation, there are emphasized the income, savings, expenses and investments.

**Key words:** *flow, circuit, repartition, activity, transaction, financial* **JEL Classification:** *E20, E23* 

#### Introduction

The National Accounts System represents a macroeconomic method for the quantitative description of economic activities and flows, monetary and material. The NAS measures, through its instruments, tables and accounts, the results of manufacturing activity, its repartition and use.

This continuous movement of real and financial flows is represented as an economic circuit. A model of such circuit brings forward the real and monetary flows, their direction, origin and destination. We shall analyze the circuit models: account, system of equations, matrix.

Inside the circuit, two flows of opposite orientation form a bi-lateral transaction. An economic flow involves a transfer of goods, services (real flows) or money. The money flows designate the circuit of incomes/expenses of economic agents, the money spent by households for goods/services acquisitions, wages paid for the use of production factors. If the balance between these flows is subject to change, the ratio between supply and demand will subsequently modify. This fact produces effects on the degree of usage of

the productive potential, of the prices' stability and the degree of labor force occupation.

Anghelache (2008), Anghelache and Anghel (2016) develop on the statistical instruments used in the measurement of the national economy. The work of Anghelache, Mitruț and Voineagu (2013) is focused on macroeconomic statistics and the contents of the National Accounts System, also Tutulmaz (2014) approaches the macroeconomic accounting from a modern perspective. Colonnello (2016) is preoccupied with cashflow cyclicality and macroeconomic conditions. Ghilardi and Peiris (2014) also focus on capital flows. Grasselli and Huu (2015) analyze the case of inflation within the framework of a dynamic macroeconomic level, including the volatility associated with financial flows, Weiszenbacher (2014) evaluates the macroeconomic stability in the part of Europe Romania belongs to. Petrovsky-Nadeau and Wasmer (2015) approach the state, as economic agents, and the budget, as financial central document on public expenses and incomes at the national level.

### **Research methodology**

The economic circuit represents a simplified model of basic relationships in a competition-based economy. The model presents in a synthetic manner the interaction between economic actors, that is households, companies and the state, un the mechanism of exchange of goods and services, on one hand, and money, on the other hand.

The main components of an economic circuits are the economic activities, the subjects and objects, transactions, evaluation, date/time and localization

Economic activity, here we can consider any operation that pursues, in a direct or indirect manner, the fulfillment of the needs for economic goods and services. Some examples in this respect: the material production, offer of intelligence and services, exchange and consumption, both at intermediary and final level, the primary repartition operations connected to manufacturing activities (wages and social contributions, taxes) and secondary repartitions (redistribution of primary incomes: interests, direct taxes, subsidies). Also, there are considered the financial operations regarding the modification and of the volume and structure of assets and liabilities of companies. Four categories of fundamental activities are considered: creation of incomes, usage of incomes for consumption of goods, for the patrimonial accumulation and offer for credits. These represent the main criteria for aggregating economic transactions. The economic subjects are represented by companies acting in nonfinancial sectors, households, financial and credit institutions, insurance companies, public administration, foreign agents. We emphasize the goods manufactured, the services of production factors and the money as objects of economic activity.

A transfer of activity objects from an economic subject to another represents a transaction. A difference can be made, upon the modalities in which they are concluded, in: unilateral or invisible (without counter-party correspondent, such as taxes) and bi-lateral or market transactions (i.e. a good is exchanged for a price).

Evaluation involves the presentation of all transactions made in the same money measure. Market transactions follow the market price, and the invisible ones are characterized by a price corresponding to a product similar with the one transferred.

The date/time characteristic corresponds to the time period when the transaction occurs.

Localization is important in the calculation of aggregates and allows the national/internal dual measurement of transactions. Internal transactions are concluded within the national borders, while national transactions are developed by national economic agents, inside the country or abroad.

There are two groups of flows in an economic activity. The input flows are represented by entries of production factors, acquired from other economic agents, and the cost of factors influences the expense-related exit flows of the enterprise. This flow includes additional components not directly linked to the definition above (indirect taxes, transfer prices etc.). The outflow of goods and services that result from the activity and are offered to other economic agents generate, in turn, an inflow of money that is to be included in the turnover of that agent.

The complex system of economic flows between economic agents outlines the direct links between them, and the contents of these links is represented by the transfer of goods/services, currency or intelligence.

#### General schema of the economic circuit

One method of representation for economic circuit, including the flows between households and companies, will omit from its structure the state, non-commercial administration or financial entities, in the assumed case of a closed economies. The general schema will outline the links between the households and the companies. A simplified model is designed in the following graphic, taking into account that bold lines represent money flows and the arrow-shaped lines, real flows:

#### General schema of an economic circuit





Source: Anghelache, C., Mitruț, C., Voineagu, V. (2013) - "*Statistică macroeconomică. Sistemul conturilor naționale*", Editura Economică, București

Between the two economic subjects, there are two types of flows:

- goods/services from companies to households;
- instantiations of production factors from households to companies.

Thus, the production factors circulate from households to companies, who in turn pay for them and record the appropriate expenses. The role of the firms is to sell goods and services demanded by households, achieving income that will be aggregated in the turnover. In other words, households receive wages and other form of incomes while providing the necessary production factors, and they pay the monetary value of the price in exchange for goods and services they acquire from the companies

This model of economic flows involves a complex analysis of all groups of economic subjects, together with their corresponding flows, as the incomes are represented by the value of labor, the production of goods and services, the consumption-related expenses. Therefore, some equalities can be designed:

- a. the value of the production = the sum of consumption-related expenses;
- b. the sum of incomes = the sum of consumption-related expenses;
- c. the value of production = the sum of incomes achieved by the production factors.

The model presented does not consider the patrimonial creation that rises of the economic activities, through savings (incomes not fully spent by households) and investments (incomes available at the level of the companies, not subjected to consumption). These correlation allow for the representation of the patrimony modification equation, written under the following form: Income-Consumption = Investment Income-Consumption = Savings

## Graphic model of the economic circuit

# The economic circuit schema: incomes (I) and expenses (C), savings (S) or investments (Iv)





**Source**: Anghelache, C., Mitruț, C., Voineagu, V. (2013) - ,, *Statistică macroeconomică*. *Sistemul conturilor naționale*", Editura Economică, București

The model represented in figure 2 assumes that economies and investments are planned measures. The equality S = Iv exists always from the mathematical viewpoint, as investments are determined as difference between I and C. This idea will be further outlined in the following.

The following equations (the symbols are those stated in the caption of Figure 2) show the equality between input and output flows:

I = C + IvI = C + SIv = S

#### Matrix model of the economic circuit

The presentation of the circuit under the matrix framework follows the general design of the matrix. A crosstab analysis instrument, in this model the row and column headings contain the economic sectors under their dual quality. The cells marked with the "is" characters indicate transactions within a sector, which are not included in computations, and the "n/a" designation outlines that there is a lack of transactions between the respective sectors.

Also, the structure of the model assumes that rows will represent the expenses of the sectors and the columns will store the incomes for them. The

Revista Română de Statistică - Supliment nr. 1 / 2017

overall correlation of the matrix model is the fact that for any sector, the row aggregate total is equal to the total on columns (when considering a closed circuit).

				Figure 3
	Companies	Households	Patrimonial	Total
			modifications	
Companies	is	Ι	n/a	I
Households	С	is	S	C+S
Patrimonial	Iv	is	is	Iv
modification				
Total	C+Iv	Ι	S	X

<b>Presentation</b>	of the	economic	circuit	under	matrix	form

Source: Anghelache, C., Mitruț, C., Voineagu, V. (2013) - "Statistică macroeconomică. Sistemul conturilor naționale", Editura Economică, București

#### Account-based model of the economic circuit

The account-based presentation of the economic circuit follows the traditional approach on account structure, also present in the microeconomic accounting. The specifics of this model are given by the structure of the particular accounts used, which on the right side present incomes, while the left hand side represents the expenses.



#### Account-based presentation of the economic circuit

Source: Anghelache, C., Mitruț, C., Voineagu, V. (2013) - "*Statistică macroeconomică. Sistemul conturilor naționale*", Editura Economică, București

#### Role of the state as economic agent

To include the state as economic agent and therefore design a sector of the national economy for it, we must represent the flows incurred by the state participation in the national economy and its relationships with other economic agents. The labels in Figure 5 have the following explanations: the state receives taxes (from households IQ and firms IF), pays the employees (V<sup>ST</sup>G) and acquires goods for companies (PIsT). The state makes transfers to companies, that is subsidies (S) and to households (Tq). According to this model, economic flows are described by the equation:

 $I_{M} + I_{F} = V^{ST}_{G} + PI_{ST} + T_{g} + S + ES;$ 

where: Est indicates the savings of the state (balance between current incomes and current expenses).



Source: Anghelache, C., Mitrut, C., Voineagu, V. (2013) - "Statistică macroeconomică. Sistemul conturilor naționale", Editura Economică, București

#### **Representation of the foreign economies**

If altering the closed economy model with the foreign countries included as a separate sector (foreign sector), the model of an open economy will be achieved. The specific transactions with the foreign sector are the export (Ex) and import (IM). In the case in which Ex = IM the composition of the flows modifies, but not their value. The modification of the patrimony of the economy is presented by the following equation:

 $S_H + S_F + S_{sT} + S_{FS} - I$ where:  $S_H$  designates the savings of households;

 $S_{E}$  – savings of firms;

 $S_{st}$  – savings of the state;

 $S_{FS}^{SI}$  – savings of the foreign sector.

The graphical model of an economic system including the foreign sector is presented in figure 6.

<sup>1.</sup> Anghelache, C., Mitrut, C., Voineagu, V. (2013) - "Statistică macroeconomică. Sistemul conturilor naționale", Editura Economică, București, pg. 69



Source: Anghelache, C., Mitruț, C., Voineagu, V. (2013) - "Statistică macroeconomică. Sistemul conturilor naționale", Editura Economică, București

#### Conclusions

Each of the variants that allow the presentation of the economic circuit has its own characteristics, depending mainly on the agents and flows they represent. The graphical representation of the economic circuit has the following limit: the number of economic subjects and the number of transactions between them might increase very much. The economic theory favors also, based on sound mathematical foundation, the representation of the model of the circuit under the equation form, but, similar to the previous case, as the number of equations increase, the synthetic links will become more difficult to interpret. The matrix form has its origins into the input-output table methodology, its advantage being the fact that each flow is accounted only once. The account-based presentation of the economic circuit has the advantage to offer an overall image, if the number of sectors and transactions is not too great. When the savings of the foreign sector are positive, the internal material patrimony might be funded through them, if not, some of savings can be used to finance the material patrimony of the foreign sector and not for consumption.

<sup>1.</sup> Anghelache, C., Mitruț, C., Isaic-Maniu, A., Voineagu, V. (2005) - "Sistemul conturilor naționale", Editura Economică, București, pg. 65

#### References

- 1. Anghelache, C. (2008). *Tratat de statistică teoretică și economică*, Editura Economică, București
- 2. Anghelache, C., Anghel, M.G. (2016). *Bazele statisticii economice. Concepte teoretice și studii de caz,* Editura Economică, București
- 3. Anghelache, C., Mitruț, C., Voineagu, V. (2013). *Statistică macroeconomică*. *Sistemul conturilor naționale*, Editura Economică, București
- 4. Colonnello, S. (2016). *Executive Compensation, Macroeconomic Conditions, and Cash Flow Cyclicality*, Halle Institute for Economic Research in its series IWH Discussion Papers with number 6
- Ghilardi, M., Peiris, S.J. (2014). Capital Flows, Financial Intermediation and Macroprudential Policies, International Monetary Fund in its series IMF Working Papers with number 14/157
- Grasselli, M.R., Huu, A.N. (2015). Inflation and Speculation in a Dynamic Macroeconomic Model, Journal of Risk and Financial Management, Volume (Year): 8 (2015), Issue (Month): 3 (July), p. 285
- Mirdala, R., Svrčeková, A. (2014). Financial Integration, Volatility of Financial Flows and Macroeconomic Volatility, University Library of Munich, Germany in its series MPRA Paper with number 61845
- Petrovsky-Nadeau, N, Wasmer, E. (2015). Macroeconomic Dynamics in a Model of Goods, Labor and Credit Market Frictions, Sciences Po in its series Sciences Po publications with number info:hdl:2441/5por5bt92h8l0bc7ls4elmcc0b
- Piroi, M., Paunica, M. (2015). *How Technology can Help in Reducing Romania's* Budget Deficit. In Proceedings of the 15th European Conference on eGovernment 2015: ECEG 2015 (p. 419). Academic Conferences Limited.
- Tutulmaz, O. (2014). Including the monetary part in macro accounting: A modern approach to the macroeconomic accounting, Published in Journal of Economic Development, Environment and People, Volume (Year): 3 (2014), Issue (Month): 4 (December), pp. 87-94
- 11. Weiszenbacher, A. (2014). Macroeconomic Stability Of Central And Eastern European Countries, EURINT journal, Volume (Year): 1 (2014), pp. 263-278