

## **Regional Accounting and Regional Development**

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**Abstract:** The paper deals to the critical analysis of the social account model's implementation on regional level. The analysis is realized on two steps. The first consists of literature review regarding Czamanski's model. The second is focused on the analysis of the updated regional accounting model. The analysis covers the theoretical and practical approaches and points out the model's strengths and weaknesses. Finally, the model can be used as a good investigation instrument in order to quantify the regional economic progress and welfare.

**Keywords:** Regional flows; regional welfare; goods and services flows; financial flows; regional progress.

**JEL Classification:** R10; R13; R15

### **1. Introduction**

In 1973, regional accounting or regional accounts was/were defined and implemented in order to quantify regional development (Czamanski, 1973). This model is based on a development of the input-output analysis as in P. Batey and A. Rose's approach and operates with a special matrix SAM (social accounting matrix).

SAM is built in order to point out all regional economic transactions, according to the System of National Accounts. The difference consists of applying this matrix from national to regional level. SAM presents an image of a regional economy for each year. This image is a static one and thus represents a challenge for the model.

SAM is built like a classic matrix which covers on its rows and columns the classical economic actors: households, companies, public sector and third countries. These actors are used under their double hypostasis: buyers and sellers. Moreover, the expenditures are quantified on the columns and the revenues from sales are pointed out on the rows.

An advantage of SAM is that it can be extended as much as needed by adding new rows and columns (Robinson, Cattaneo & El-Said, 2001). The general scheme of SAM under an updated approach takes into consideration the net investment, as well

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(Mitra-Kahn, 2008). In order to see the differences, Table 1 was built as:

**Table 1. Scheme of SAM**

	Companies	Households	Public sector	Other	Net investment	Total revenues
Companies		C	$G_F$	$(X-I)_K$	Inv	$C+G_F+(X-I)_K+I$
Households	W		$G_H$	$(X-I)_C$		$S+G_H+(X-I)_C$
Public sector	$T_F$	$T_H$				$T_F+T_H$
Other	$(X-I)_K$	$(X-I)_C$				$(X-I)_K+(X-I)_C$
Net investment		$S_H$	$S_G$			$S_H+S_G$
Total expenditures	$S+T_F+(X-I)_K$	$C+T_H+(X-I)_C+S_H$	$G_F+G_H+S_G$	$(X-I)_C+(X-I)_K$	Inv	

Abbreviations: T – taxes; S – wages; I – imports; E – exports; S – savings; Inv – investment; C – consumption; G – governmental sector.

Index: F – firms; H – households; G – governmental sector; C – goods consumption; K – capital.

The use of SAM was improved in time by new developments. One of them was realised in direct connection to the regional economic systems (Round, 1986). Other development was based on the rethinking of the Input-Output Analysis (Sonis & Hewings, 1988).

As a result, SAM is able to describe all intraregional connections between regional economic actors using the role of different income categories. Moreover, SAM characterises and quantifies different regional multipliers.

## 2. Literature Review

Social account approach attracted specialists in order to implement it in different research areas and to improve the mathematical description.

An interesting application of the model was used in order to explain and to quantify the impact of the climate changes on Western Australia. The authors took into consideration 71 experiments connected to the winter rainfall. The main conclusion was that approximately 70% of the observed trend is congruent with the SAM trend in that region. Moreover, the authors concluded that other forcing factors have to be invoked to fully account for the observed rainfall reduction (Cai & Cowan, 2006).

The social accounting matrix (SAM) was applying to estimate the water footprint of Huesca region, in Spain. According to this research, the water footprint covers the water needed for the production of the goods and services consumed by the inhabitants plus the direct consumption in the households. Using the SAM approach, the authors built an open input-output model. The matrix in this model was able to

quantify the water embodied in the production of goods, the water imported from and exported to other countries, and the agrarian water use. The first conclusion was that the agrarian water use represents the greatest water consumer (Cazcarro, Duarte & Sánchez, 2010).

An interesting research was that which used Social Accounting Matrices (SAM) and their application to the investigation of spatial economic interactions and flows patterns. Simple and extended SAMs are implemented in connection to the spatial employment impacts of the Common Agricultural Policy. A distinct part of the analysis is focused on the structure, assumptions and characteristics of interregional SAMs and takes into consideration recent developments in SAM construction and model applications (Skuras & Psaltopoulos, 2016).

A literature review regarding the SAM matrix was realized in order to analyze different methods of building regional SAMs, according to General Equilibrium Models with spatial characteristics. A distinct part of the paper was a case study on Colombian regions. The authors were focused on the feasibility of the construction of such models (Angel, García & Norman, 2017).

SAM matrix was used in order to analyze the urbanization projects and to forecast the new urban life cycle. The model taken into consideration covers: heterogeneous land developers, housing consumers and planning agencies. The analysis supported a proposal scenario in which the prevalent central city oriented metropolitan areas would be replaced by a multitude of sprawling cities (Czamanski & Broitman, 2017).

The improvement of the management in the enterprises from the food industry in Moldova is an interesting Ph.D. thesis which introduces into analysis the SAM approach. The author realized a synthesis of the economic concepts in the energetic management from food industry. The next step was to propose models and systems of energetic management able to decrease the consumption of energetic resources and to improve the environment (Gribincea, 2017).

### **3. A Critical Point of View**

After almost 25 years, S. Czamanski proposed an updated approach of his regional accounting model (Czamanski, 1997).

For the beginning, the author recognises that the standard regional accounting model is not able to satisfy the quantifying of the regional development. This is why the new proposed model covers the long-term potential growth of a regional economy. The whole analysis is based on the changes in invested capital, human capital, natural resources, infrastructure and environmental factors.

The matrix of the model points out the main flows and changes in the analysed variables. Each entry in the matrix has two definitions. First is the flow of goods,

second is the monetary equivalent of the same flow (see Figure 1).

The author of the paper made some changes in the original text of the table, in order to improve the meaning of the approach in the model.

The whole model is built on this matrix. Unfortunately, Czamanski remains the prisoner of the input-output approach. As a result, he doesn't give up to the linear interdependencies between the industries, economic sectors and economic actor.

On the other hand, welfare is not dimensioned only by goods and services, even that it depends directly on the income level. The welfare means not only consumption, income and higher savings, but also other elements that cannot be earned with money. Income represents only an approximation of the individuals' welfare. We use the term of individuals for all classic economic agents in the matrix.

Moreover, we don't agree the approach that money can contribute, even indirectly, to greater happiness (Landsburg & Feinstone, 1997). The real economic environment points out enough situations when an increase in aggregate income does not lead to a higher standard of living for citizens. The increase in the duration and intensity of work done by each individual or the increase in the retirement age bring more money but not more wealth.

Some goods' production (as weapons) does not affect the individuals' welfare. This output supports the increase in the aggregate income but not in welfare. The same effect has the additional production of lower quality goods. This is why we agree the approach that welfare is directly related to consumption, not to production (Nordhause & Tobin, 1972).

	Business	Households	Governments	Rest of the world	Intergenerational transfers		
					Investments	Regional endowment	
Business	Intermediate goods and services	Personal consumption	Current governmental purchases of goods and services	Net exports; Dividends and interest from rest of the world	Net domestic private investments; Public investments.	Technical progress; Depletion of non-renewable resources, renewable resources, soil resources; Degradation of the environment	<i>Adjusted net regional/national product (NRP)</i>
Households	Wages, salaries, other labor income; Net personal interest; Proprietor's income; Rental income; Business transfers		Net interest paid by governments; Transfer payments less social security contributions			Increase in human capital	
Governments	Corporate taxes; Social security taxes; Indirect taxes; Surplus of government enterprises less subsidies	Personal taxes; Local taxes				Increase in value of subsoil resources	
Rest of the world			Transfer payments		Net investment or disinvestment in the rest of the world		
Savings	Retained earnings <i>NRP</i>	Personal savings <i>Personal income</i>	Governments' surplus or deficit on current account				
Changes in wealth					<i>Net increase in assets</i>	<i>Net increase in endowment</i>	<i>Net increase in wealth</i>

The welfare's level may vary a lot if the increase in the average and aggregate income is doubled by an unfair distribution of income in two countries which have the same average income. The same effect can have the government policy differences in income distribution and redistribution.

The above SAM is not able to take into consideration the transactions related to the underground economy or the idea that the output increasing is not always equal to the consumption increasing.

Finally, the matrix takes into consideration the externalities only under the regional endowment.

#### 4. Conclusion

It is no doubt that the social accounting approach is a very interesting and useful. It made a further step in the regional analysis at the moment when it was launched. The model succeeded in being more flexible and complex than the Leontief's input-output approach.

The connection to the Leontief's approach represents the great challenge for SAM. SAM remains dependent to input-output model and it assumes input-output approach's limitations.

The idea of using the double flows (goods and money) to express the economic connections between the classic economic agents is interesting.

Unfortunately the wealth analysis is not equally compelling. On the other hand, the mathematical approach used in social accounting matrix and the model represents a good challenge for the specialists in regional sciences.

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