ANALYSIS OF SAVINGS AND INVESTMENT FLOWS BETWEEN THE PRIVATE SECTOR, THE PUBLIC SECTOR AND THE LABOUR MARKET IN THE CONTEXT OF MACROECONOMIC EQUILIBRIUM

Monica Florica DUTCAȘ [5]

Abstract:

The paper identifies and discusses the maximum thresholds for savings-investment balances, providing a methodological basis for formulating effective public policies. One of the key objectives is to transform the quaternary macroeconomic identity into an equation that allows for the establishment of the maximum deficit ceiling in the labour market sector. This is done through calculation relationships that use transfer coefficients between sectors and previously established maximum values for the private, public and foreign sectors.

Thus, the paper not only provides a theoretical perspective on economic flows between sectors, but also proposes a practical framework for evaluating and managing macroeconomic balance, considering savings and investment transfers. This approach is essential for establishing sustainable economic policies and maintaining long-term stability.

Keywords: economic policies, labour market, saving and investment flows

JEL classification: *E24, E61, J08*

Introduction

The research explores the integration of the labour market into an Quaternary macroeconomic identity, extending the traditional model of disequilibrium. It proposes a comprehensive analysis of the labour market from the perspective of economic transactions, using the concepts of saving and investment to restore labour surpluses and deficits. By examining the labour market as a derivative but indispensable component of economic phenomena, the paper introduces quantitative and qualitative relations that establish the equilibrium between the factors involved. The results suggest that the integration of the labour market into the macroeconomic identity offers a unifying perspective, supporting a more rigorous approach to public policies to correct macroeconomic disequilibrium.

Macroeconomic equilibrium is an essential objective for the economic sustainability of a national economy. One of the critical aspects of this equilibrium is the interaction between saving and investing, especially in relation to the labour market. This paper analyses the savings and investment flows between the private sector, the public sector and the labour market, establishing the transfer mechanisms between them and the impact on the macroeconomic equilibrium.

[5] *PhD Student, Centre for Financial and Monetary Research "Victor Slăvescu", Romanian Academy, Bucharest, Romania. Email: monica.dutcas@finders.ro . ORCID: 0000-0003-1326-6636 .*

The economic literature on saving and investment highlights the role of these variables in determining macroeconomic equilibrium. Keynes (1936) emphasized the importance of saving and investing according to future expectations. Keynes (2009) revolutionizes macroeconomic theory by introducing the concept of aggregate demand as the primary determinant of employment and output. Keynes points out that macroeconomic disequilibrium, such as high unemployment and recessions, require government intervention to correct. Keynesianism is later deepened by economists such as Galbraith (1982), who emphasizes state intervention in the economy to correct market failures and reduce inequalities.

The issue of unemployment is extensively addressed in the economic literature, being an essential aspect of macroeconomic disequilibrium. Pissarides (2000, 2009) develops the theory of equilibrium unemployment and analyses its volatility according to wage rigidity, highlighting how disequilibrium between labour demand and supply can lead to persistent unemployment. Shapiro and Stiglitz (1984) introduce the theory of unemployment as a disciplinary mechanism, explaining the existence of a structural level of unemployment as a result of the strategic behaviour of firms, which contributes to the maintenance of disequilibrium in the labour market. In addition, Starr (1993) examines the mechanisms for setting the minimum wage and their implications for employment, showing that social protection policies can have a direct impact on stabilizing the economy and reducing structural disequilibrium.

Krugman (2009, 2021) provides insight into economic crises and their impact on the labour market, highlighting the role of fiscal and monetary policies in combating unemployment and correcting macroeconomic disequilibrium. Ramboll (2019) also assesses European policies for the integration of the long-term unemployed into the labour market as a measure to reduce social and economic disequilibrium.

Mankiw (2009) proposes a modern approach to macroeconomics, highlighting the role of market expectations and rigidities in explaining economic fluctuations. Macroeconomic disequilibrium, such as budget deficits and persistent inflation, are also analysed in ESA 2010, which provides an essential European statistical framework for assessing economic performance and comparability of data between Member States.

Stiglitz (2016) makes significant contributions to the analysis of economic inequalities and the impact of information asymmetries on the labour and capital markets, highlighting how these asymmetries can accentuate macroeconomic disequilibrium.

A series of works from Romanian research analyse macroeconomic dynamics and the impact of economic policies on economic cycles and macroeconomic disequilibrium. Dinga (2016) provides a detailed perspective on economic cyclicality, showing how economic fluctuations can generate long-term disequilibrium. Dobrescu (2006) builds macroeconomic models for the Romanian economy, highlighting the factors that influence economic growth and structural disequilibrium of the national economy.

This approach, of including the labour market in the equilibrium model, it remains original and quite daring, not being found as such in literature.

Description of the problem

Saving and investing are two fundamental components of any economy. The private sector contributes to savings through individual and corporate income, and the public sector through tax collection and social spending. The labour market is directly affected by these flows

through job creation and social protection policies. The essential problem analysed is how these flows adjust so as to maintain macroeconomic balance, avoiding disequilibrium such as budgetary overload or major imbalance of the labour market, unemployment.

The purpose of building a quaternary identity is, of course, to include the labour market, along with the other three sectors (private sector, public sector– as internal sectors – also the external sector) in an identity that has theoretical validity, respectively methodological coherence for the macroeconomic system of a national economy.

Some principled theoretical considerations for the labour market are useful:

- *Saving* represents the surplus supply of labour (expressed monetarily, e.g. by means of the equilibrium wage or the average salary in the economy) manifested at the level of the national economy,
- *Investment* represents the surplus demand for labour (expressed monetarily in the same way as in the case of savings) manifested at the level of the national economy;
- *Labour market* it is an open market, i.e. it is permanently subject to the impact of labour flows, both as inflows (immigration) and as outflows (emigration) from/to the international labour market. In this matter, we consider the following:
  - in the labour supply of course, the part of the supply that comes from labour immigration also enters the national market;
  - in terms of labour demand, it is obvious that it manifests itself only in the national economic area, i.e. it is 'exercised' exclusively by employer's resident (legally) in the national economic area, so it also reflects the part of demand manifested abroad and which, once it receives a response (e.g. through emigration), extracts that quantity from the national labour market;
  - therefore, regardless of the net migration of the labour force, the supply of labour force, respectively the demand for labour force is formed, from the perspective of the present research, exclusively in the national economic framework; moreover, it is relevant in itself, because it is "cleaned" of the impact of supply, respectively external demand (Things happen, moreover, perfectly symmetrically as in the case of supply, respectively the demand for goods and services on the homonymous market)

The standard, three-variable identity of macroeconomic disequilibrium covers, quantitatively, macroeconomic disequilibrium, in the sense of the logical phrase sufficient and necessary. This means that nothing is missing and nothing is redundant in that identity ternary. It follows, therefore, that the introduction of a fourth term in the ternary identity, in order to obtain the quaternary identity, will have the impact of introducing a distortion factor.

Methodology and data

The study uses a logical approach for theoretical conceptualization, and based on this a mathematical formalization for modelling saving-investment flows in the private and public sectors, as well as their impact on the labour market.

The logical foundations of Quaternary identity

At the logical level of substantiating the Quaternary identity macroeconomic disequilibrium, the following are proposed:

(i) as a result of the fact that the labour market is a market derived from the market for goods and services it follows that, in part, part of the supposed impact of the latter market is manifested from the perspective of the labour market, both in terms of labour supply and labour demand; It follows that, both from the perspective of specific savings on the labour market (the surplus of labour supply) and that of the specific investment on the labour market (the surplus demand for labour), which "delivers" the labour market in its presumed identity quaternary of macroeconomic disequilibrium is "extracted" from the market for goods and services, through the well-known channels of the macroeconomic process;

(ii) as a result of the same fact (the derivative character of the market for goods and services), the labour market intermediates part of the impact that the public sector has it within the presumed Quaternary identity. Indeed, saving in the labour market (i.e. the surplus supply of labour) means, from the perspective of the public sector, a reduction in savings (of the receipts to the public budget of direct levies – in the form of income/salary tax, respectively of social contributions – and indirect levies – in particular of value added tax, respectively of excise duty). At the same time, labour market investment (excess labour demand) involves the payment of unemployment benefits as well as other inclusion-specific public expenditure, etc., which means a reduction in public sector investment;

(iii) overall, the idea is outlined that the introduction of a fourth term (additive) in the ternary identity in order to obtain an identity macroeconomic disequilibrium – namely the binomial saving-investment on the labour market – is not likely to have a disruptive effect on the presumed Quaternary identity, but, so to speak, only an effect of redistribution of the "volumes" of savings, respectively investment at the integrated macroeconomic level;

(iv) being a quantitative redistribution relation of the saving relationship-investment between two sectors of the internal/national economy (private sector and the public sector), it follows that the fourth term that generates the quaternary identity will have to be placed in the left member of the ternary identity, so as to preserve the identity between the left and right members (external sector) of the identity in question;

(v) for analytical quantitative calculations, the question of the quantity of redistribution, both of saving, as well as investments, from the private sector (producer of goods and services), respectively from the public sector, to the 'sector' called the labour market.

Figure no.1 shows an image of these reasonings (with $T_{\delta}^{pr\to m}$ the transfer of savings balance-investment from the private sector to the labour sector was noted ; with $T_{\delta}^{p\to m}$the transfer of the savings-investment balance from the public sector to the labour sector).

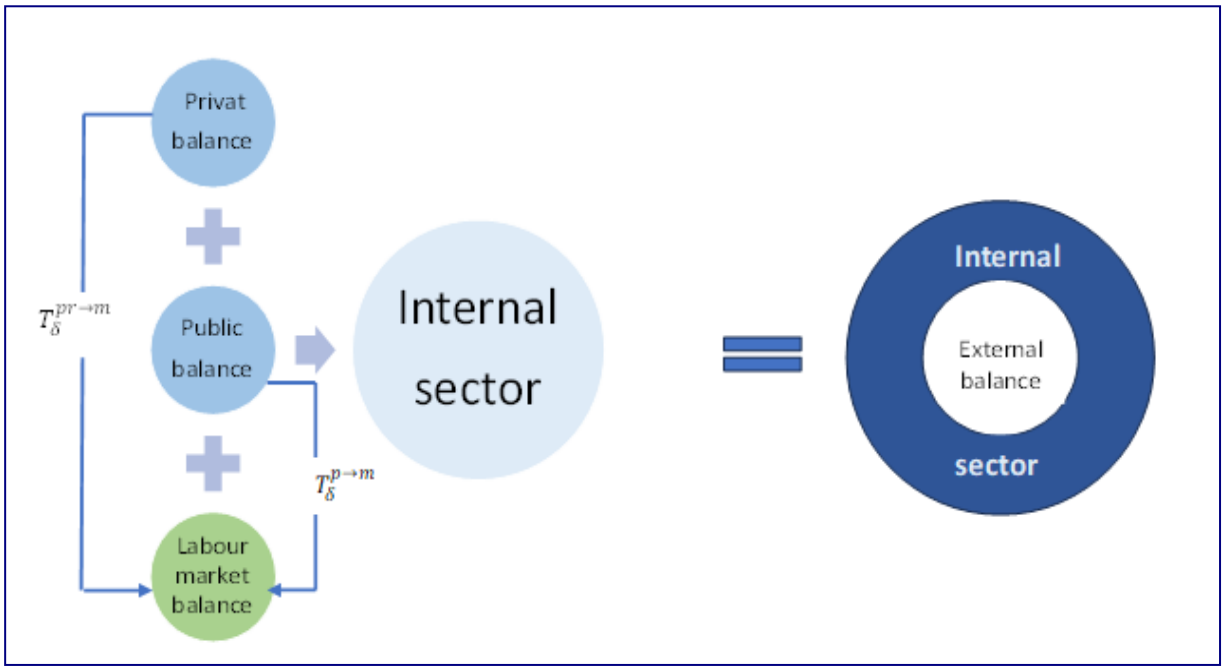

Figure 1. Relationship of savings balances-investment from the perspective of Quaternary identity macroeconomic disequilibrium

Source: own conception & design

From Figure 1 the following can be revealed:

- in *first* that, at the macroeconomic level, the aggregate domestic balance remains, or must remain, 'equal' (in the sense of identical) to the external balance, regardless of how many sub-sectors are identified within the domestic sector. This is an invariant condition of the equilibrium (or general identity) of any open economy;
- in the *second* introduction of the labour market sub-sector aims to increase the degree of analyticity of the aggregate balance of the domestic sector from the perspective of taking into account this important economic market that is the labour market;
- in the *third* labour market balance is a derived balance, just like the labour market it is itself a derivative market; The derivation is made through the two balance transfer flows, from the private sector, respectively from the public sector;
- in the *fourth*, a certain artificial separation of the labour market must be recognised within the internal sector of the relationship between savings and investments. This beneficial and useful fact consists of the following:

➢ Labour market balance it is also preserved in the case of the ternary identity, but there it is dissipated both in the private sector, as well as in the public sector. This means that, in the case of Quaternary identity, the reverse operation must be carried out: the separation, from the balances of the two internal sectors from the ternary identity, of the balance specific to the labour market;

➢ Labour market balance, as interpreted above, has, in a way, a virtual/possible character [1]. This virtual/possible character consists of the following:

– *Saving* – which consists of the surplus supply of labour power – resides, in fact, in unemployment, as it is registered according to legal procedures, and with the verification of the conditions, also legal, for the qualification of a person as unemployed. Turning

unemployment into employment [2] is characterized by uncertainty. Of course, with some modelling efforts, it is possible to arrive at a pattern of unemployment behaviour that, through the associated probability distributions, leads to the reduction of this uncertainty or, at least, associates probabilities (of an objective type) to it, but the virtual/possible nature of the saving character of the sector called the labour market remains indisputable;

- *Investment* – which consists of the surplus demand for labour – resides, in fact, in job vacancies. Understanding by job vacancies both the jobs that have become available as a result of the ending of employment relationships for various reasons, as well as the newly created jobs, there is no certainty that these vacancies will also be filled (frictional unemployment, respectively the natural unemployment rate [3] barriers to this). Therefore, also from the perspective of the investment related to the labour market, the virtual character is obvious and, as in the case of saving, in principle irreducible.

➢ In this way, we arrive at the situation of building an identity macroeconomic (quaternary identity) which will inevitably contain a virtual component – the savings balance-investment of the labour market. But, paradoxically, this component, precisely because of its virtuality, has a great impact both in terms of the predictability of the Quaternary identity, as well as in terms of its controllability, through public policies.

According to figure no. 1 within the internal framework of the national economy there are flows of transfer of savings, respectively investment from the two sectors, public and private, and the question arises of their quantitative determination, so as to maintain the initial identity on the entire economy.

Mathematical transcription of logical reasoning

Mathematically, the reasoning will be expressed: *i) as a formula of quaternary identity, ii) as transfers,* and *iii) as thresholds*

i) ***Quantitative formula of quaternary identity***

The known ternary identity of macroeconomic disequilibrium is as follows:

$$\left(E_i^{pr} - I_i^{pr}\right) + \left(V_i^B - C_i^B\right) = \left(I_i^{ex} - O_i^{ex}\right) \qquad (1)$$

Where:

E_i^{pr} *= saving in the private sector,*

I_i^{pr} *= investment in the private sector,*

V_i^B *= saving in the public sector,*

C_i^B *= investing in the public sector,*

I_i^{ex} *= saving in the foreign sector,*

O_i^{ex} *= the investment in the foreign sector.*

The condition is maintained that the internal (national) balance must remain equal to the external balance, i.e.:

$$\delta_i^N = \delta_i^{ex} \qquad (2)$$

Where:

δ_i^N=*the internal (national) balance,*

δ_i^{ex}= *the external balance.*

For reasons of methodological unity at the level of Quaternary identity, both saving and investing in the labour market will be expressed in terms of value, more precisely monetary.

(δ_i^M)*Savings balance-investment on the labour market, will be calculated as follows:*

$$\delta_i^M = S_i^M - D_i^M \quad (3)$$

Where:

S_i^M *- saving on the labour market, i.e. the excess supply of labour,*

D_i^M *- Investing in the labour market, i.e. the excess demand for labour.*

$$\left(E_i^{pr} - I_i^{pr}\right) + (V_i^B - C_i^B) + (S_i^M - D_i^M) = (I_i^{ex} - O_i^{ex}) \quad (4)$$

from whence:

$$\delta_i^{N^*} = \delta_i^N + \delta_i^M \quad (5)$$

and the general identity, associated with the national economic system, is preserved:

$$\delta_i^{N^*} = \delta_i^{ex} \quad (6)$$

ii) Transfers

For the private sector, savings are estimated by the product of the number of unemployed and the average wage, adjusted by a coefficient that transforms the surplus supply of labour into virtual supply. The transfer of investment is assessed by the ratio of job vacancies to the average salary, also adjusted by a specific coefficient.

- on the private sector:

– Savings transfer ($\widehat{U}_i^M$), in monetary expression:

$$\widehat{U}_i^M = \overline{w}_i \cdot U_i^M \quad (7)$$

Where:

U_i^M= number of unemployed,

$\overline{w}$= average salary in the economy.

– Investment transfer ($\widehat{V}_i^M$):

$$\widehat{V}_i^M = \overline{w}_i \cdot V_i^M \quad (8)$$

Where:

$\overline{w}$= average salary in the economy,

V_i^M = number of job vacancies.

In view of the previous logical reasoning, the transferability of these two quantities must be adjusted by a coefficient (force$\alpha \in [0,1]\mathbb{R}$) that transforms the potential of the numerical excess supply/demand of the labour in a virtual nature of this offer/excess request and we will write:

$$\begin{aligned}\widetilde{U}_i^M &= \alpha_E^{pr} \cdot \widehat{U}_i^M = \alpha_E^{pr} \cdot \overline{w}_i \cdot U_i^M = \alpha_E^{pr} \cdot \overline{w}_i \cdot \alpha_E^{pr} \cdot S_i^M \\ &= \left(\alpha_E^{pr}\right)^2 \cdot \overline{w}_i \cdot S_i^M\end{aligned} \quad (9)$$

$$\tilde{V}_i^M = \alpha_I^{pr} \cdot \hat{V}_i^M = \alpha_I^{pr} \cdot \overline{w}_i \cdot V_i^M = \alpha_I^{pr} \cdot \overline{w}_i \cdot \alpha_I^{pr} \cdot D_i^M = \left(\alpha_I^{pr}\right)^2 \cdot \overline{w}_i \cdot D_i^M \quad (10)$$

Where:

$\widetilde{U}_i^M$= Saving Amount (virtual) that is transferred from the private sector to the labour market sector,

$\tilde{V}_i^M$ = Investment Amount (virtual/possible) that is transferred from the private sector in the labour market sector.

results:

$$\tilde{\delta}_i^{pr \to m} = \overline{w}_i \cdot \left[\left(\alpha_E^{pr}\right)^2 \cdot S_i^M - \left(\alpha_I^{pr}\right)^2 \cdot D_i^M\right] \quad (11)$$

Where:

$\tilde{\delta}_i^{pr \to m}$ = transfer of savings balance-investment from the private sector to the labour sector (expressed in monetary terms).

- on the public sector:

For the public sector, the transferred savings are determined by the tax revenues collected from income tax and social contributions related to the unemployed. The transfer of public investment is estimated by government spending on unemployment benefits and other active employment policies.

Reasoning similarly, the transfer of savings balance-investment from the public sector to the labour sector, ($\tilde{\delta}_i^{p \to m}$expressed monetarily), is calculated by the formula:

$$\begin{aligned}\tilde{\delta}_i^{p \to m} &= \tilde{V}_i^p - \tilde{C}_i^p \\ &= \left(\alpha_I^{pr}\right)^2 \cdot \overline{w}_i \cdot \left[\lambda_E^p + \left(1 - \lambda_E^p\right) \cdot \beta_E^p\right] \cdot D_i^M - \beta_I^p \cdot \left(1 + \lambda_I^p\right) \cdot S_i^M\end{aligned} \quad (12)$$

(iii) The issue of thresholds

As in the case of ternary identity, thresholds are necessary, in particular, for the design of public policy measures regarding the management of the quaternary equation Quaternary identity.

Starting from the situation of the thresholds in the case of the classical, ternary equation:

$$\bar{\bar{p}}_i^d = \lambda \cdot \bar{\bar{d}}_i^{ex} - \bar{\bar{b}}_i^d \quad (13)$$

Where:

$\bar{\bar{p}}_i^d$= the maximum equilibrium balance, relative to private sector GDP,

$\bar{\bar{d}}_i^{ex}$= the mandatory maximum balance (Maastricht Treaty) in relation to GDP, total external public debt,

$\bar{\bar{b}}_i^d$ = the mandatory maximum balance (Maastricht Treaty) relative to GDP of the consolidated general budget,

$$\lambda = \frac{1}{\beta \cdot (1-\alpha) \cdot i},\ \beta \in [0,1]\mathbb{R}, \alpha \in [0,1]\ \mathbb{R} \qquad (14)$$

Where:

β = the coefficient of incurring the contracting of external public debt, as a result of the current account deficit, is considered constant during the analysis period,

α = the coefficient for reducing the trade deficit through non-trade flows from the current account, is considered constant during the analysis period.

For the purpose of setting a maximum ceiling on the savings balance-investment in the labour market sector, the qualitative reasoning already known or used in the case of the ternary equation is used and the quaternary identity of macroeconomic disequilibrium is resumed:

$$\delta_i^{pr} + \delta_i^p + \delta_i^M = \delta_i^{ex} \qquad (15)$$

As the maximum relative values (to GDP) for the private sector are already established from the ternary equation, the public sector and the external sector, it remains to determine, as the only unknown, the maximum value (relative to GDP) of the deficit of the labour market sector. This cannot be done, however, simply by separating the deficit of the labour market sector from the quaternary equation of deficits, because the (more general) deficit of the labour market sector balance is a virtual balance constituted by balance transfers from the private and public sectors, respectively. It is therefore correct to determine the maximum deficit of the labour market sector using these transfers, as they have been established above.

(i) Definition relationships:

$\varphi_i^{pr} = \frac{\tilde{\delta}_i^{pr \to m}}{\delta_i^{pr}}$	(16)
$\varphi_i^{p} = \frac{\tilde{\delta}_i^{p \to m}}{\delta_i^{p}}$	(17)

Where:

φ_i^{pr}= the coefficient of the balance transfer from the private sector to the labour market sector;

φ_i^{p}= the coefficient of the balance transfer from the public sector to the labour market sector;

(ii) Calculation relationships:

Thus, **the macroeconomic deficit equation** will be written, successively:

$$\left(\delta_i^{pr} - \tilde{\delta}_i^{pr\to m}\right) + \left(\delta_i^{p} - \tilde{\delta}_i^{p\to m}\right) + \tilde{\delta}_i^{pr\to m} + \tilde{\delta}_i^{p\to m} = \delta_i^{ex} \quad (20)$$

$$\tilde{\delta}_i^{pr\to m} = \varphi_i^{pr} \cdot \delta_i^{pr} \quad (18)$$

$$\tilde{\delta}_i^{p\to m} = \varphi_i^{p} \cdot \delta_i^{p} \quad (19)$$

$$\left(\delta_i^{pr} - \varphi_i^{pr} \cdot \delta_i^{pr}\right) + \left(\delta_i^{p} - \varphi_i^{p} \cdot \delta_i^{p}\right) + \tilde{\delta}_i^{pr\to m} + \tilde{\delta}_i^{p\to m} = \delta_i^{ex} \quad (21)$$

$$\delta_i^{pr} \cdot \left(1 - \varphi_i^{pr}\right) + \delta_i^{p} \cdot \left(1 - \varphi_i^{p}\right) + \tilde{\delta}_i^{pr\to m} + \tilde{\delta}_i^{p\to m} = \delta_i^{ex} \quad (22)$$

Where: $\delta_i^M = \tilde{\delta}_i^{pr\to m} + \tilde{\delta}_i^{p\to m}$

Substituting the maximum values established in the case of the ternary equation, we obtain:

$$\left(\bar{\bar{p}}_i^d\right)_{aj} + \left(\bar{\bar{b}}_i^d\right)_{aj} + a_i^m = \lambda \cdot \bar{\bar{d}}_i^{ex} \quad (23)$$

Where:

a_i^m = the current deficit of the labour sector,

aj = means value adjusted with the mentioned balance transfers.

It follows: the maximum limit of the relative deficit (to GDP) of the labour sector:

$\bar{\bar{a}}_i^m = \lambda \cdot \bar{\bar{d}}_i^{ex} - \left(\bar{\bar{p}}_i^d\right)_{aj} - \left(\bar{\bar{b}}_i^d\right)_{aj}$	(24)

For an illustration of the application of this methodological proposal, we continued the empirical study on the case of Romania.

The time series that were constructed for the empirical study on the identity and quaternary equation of macroeconomic disequilibrium refer to the period 2012-2022.

The data of the statistical yearbooks used for data collection include data two years ago compared to the year of publication of the yearbook, so this period was imposed.

As for the limitation of the series to 2012, this is explained by the fact that, methodologically, the statistical data from the recent period did not correspond to the data older than those related to 2012.

As we are not talking about statistical tests, which would have required a number of records to verify the conditions of statistical representativeness, the limitation of the time series does not affect the validity of the reasoning and empirical evaluations.

Results

According to its own methodology, the analysis carried out is examined at the level of the net balance (savings minus investment) at the level of each of the sectors, as shown in Table 1.

Table 1

Influence of the 3 sectors on the formation of the internal balance – (RON)

Year	Internal balance	Contributions					
		Private sector		Public sector		Labour sector	
		abs. – thousand.	%	abs. – thousand.	%	abs. – thousand.	%
(0)	(1)	(2)	(3)=(2)/(1)	(4)	(5)=(4)/(1)	(6)	(7)=(6)/(1)
2012	-28432.2	6908.2	-24.3	-22263.3	78.3	-13077.1	46.0
2013	-1041.6	25787.2	-2475.7	-13173.1	1264.7	-13655.7	1311.0
2014	4886.6	25107.9	513.8	-7122.4	-145.8	-13098.9	-268.1
2015	4248	19807.8	466.3	-3432.7	-80.8	-12127.1	-285.5
2016	-16949.9	14030.1	-82.8	-18896.9	111.5	-12083.1	71.3
2017	-30382.7	2276.2	-7.5	-21539.6	70.9	-11119.3	36.6
2018	-55383.4	-16533.5	29.9	-26521.9	47.9	-12328	22.3
2019	-62798.2	-4764.8	7.6	-38723.2	61.7	-19310.2	30.7
2020	-66683.2	47952.7	-71.9	-95801.5	143.7	-18834.4	28.2
2021	-83230.2	14627.7	-17.6	-84103.5	101.0	-13754.4	16.5
2022	-114627	-11713	10.2	-64471.7	56.2	-38442.6	33.5
Total	**-450394.1**	**123486.5**	**-27.4**	**-396050**	**87.9**	**-177831**	**39.5**
Annual average	**-40944.9**	**11226.05**	**-27.4**	**-36004.5**	**87.9**	**-16166.4**	**39.5**

Source: own calculations based on the Statistical Yearbook of Romania, NBR.

The analysis of the table reveals:

•At the level of the entire analysed period, the private sector had a higher saving than investment, while the other two sectors had higher investments than savings (the negative percentage contribution of the private sector, respectively the positive percentage contribution of the other two sectors is explained methodologically: the discrepancies summed internally over the analysed period give a negative magnitude (total investments higher than total savings);

•The negative balance of the public sector, over the analysed period, indicates that the expenditure on unemployment benefits exceeded the savings generated by job vacancies (in the private sector), respectively by the potential of budget revenues from the taxation of personal income (in the public sector). This is an important signal for economic policy decisions (in particular, fiscal-budgetary policy) for the period following the one taken into account in this draft;

•atypical situations occurred at the following moments during the analysis period:

-(2013): all three domestic sectors have very large "leaps" in the kinematics of saving and investment, respectively: enormous net savings in the private sector, enormous

net investment in the public sector, and enormous net investment in the labour sector respectively (note: the public sector and the labour sector have approximately equal net investment);

-(2014): the magnitude of the disequilibrium is about eight times lower than in the previous year, but their algebraic sign remains: very high net savings in the private sector, high net investment in the public sector, respectively very high net investment (but half compared to the private sector) in the labour sector. From a qualitative point of view, the year 2014 replicates, on a smaller scale, the phenomenology of 2013. It should be noted that the labour sector remains, quantitatively, at a net investment comparable to that of the previous year;

-(2015): from a qualitative point of view, we have the same situation as in 2014, only on a slightly smaller scale (not much smaller, however); Interestingly, the net investment in the labour sector remains, this year as well, very close to the value recorded in the previous two years.

Several other opinions formed in this matter are formulated below:

–the existence, concomitant (although, of course, in a frictional way, as shown above) of the unemployed, respectively of the vacancies, by means of appropriate and deterministic forecasting models, to identify appropriate economic policy measures, as an opportunity in time and space, in intensity, as a means of implementation, etc., in such a way as to achieve the meeting between the surplus supply of labour and the surplus of labour demand;

–structure, kinematics and volume of jobs are subtle predictors of investment intention or economic business development, both in the private sector, as well as in terms of the private domain of the state. On these bases, through appropriate models of information processing, public policy can constitute a realistic basis for intervention in the market, both as a reactive function and, especially, as a projective (or pro-active) function;

–in general, on a broader epistemological level, it must be accepted that virtuality (possibly also associated with adequate probability distributions) constitutes, in itself, a predictive field from which directions and ways of intervening in the market can be extracted, in accordance with the economic ideology of the State, respectively with the Government's governing program;

–predictability (this time, potential), which subsists in the virtual character of the savings balance-investment on the labour market, represents an ontological datum that greatly reduces uncertainty [4] on the kinematics of the labour market, on the one hand, respectively the functioning of the quaternary identity themselves, on the other hand;

–difficulties in transferring parts of savings and investment from the private sector, respectively from the public sector, to the labour market sector represents a considerably lower cost compared to the advantages, both theoretical and methodological, brought by the construction of a quaternary identity macroeconomic disequilibrium.

The results indicate that the macroeconomic balance depends on the correct adjustment of the flows between savings and investment according to the dynamics of the labour market, thus avoiding the emergence of structural disequilibrium. Application of the Quaternary equation for data from Romania highlighted discrepancies average annual income of approximately 0.3 billion (in RON). This approach can support economic policies directly aimed at redressing these discrepancies, reducing economic polarisation.

Conclusions

The study demonstrates that the efficient management of savings-investment flows is essential for maintaining macroeconomic balance. The private and public sectors contribute to the stability of the labour market through transfer mechanisms that need to be properly calibrated.

Transforming the Quaternary macroeconomic identity into an operational equation provides a useful tool for setting the maximum ceiling of the labour market deficit. This approach is essential for the development of sustainable public policies, including the adjustment of taxes and public expenditure according to labour market dynamics.

The findings suggest that fiscal and monetary policies should be coordinated more closely with labour market policies in order to effectively address macroeconomic disequilibrium.

The paper demonstrates the usefulness of including the labour sector in the analysis of macroeconomic disequilibrium, by identifying complex and circular causal relationships between it and the other three classic sectors (private, public, external).

The analysed literature provides a solid basis for understanding the fundamental economic mechanisms, focusing on business cycles, labour market and economic policies, but also on their impact on macroeconomic disequilibrium. Studies show that government interventions and appropriate macroeconomic policies can mitigate the negative effects of these disequilibrium and contribute to long-term economic stability. The integration of these perspectives allows the development of econometric models capable of explaining and predicting future economic developments, providing an analytical framework for identifying and correcting macroeconomic disequilibrium.

Developing the logical-mathematical construction regarding the economic growth model, the major risks of disequilibrium macroeconomic problems faced by the national economy, the paper proposes an additional contribution through the equation Quaternary macroeconomic disequilibrium and an analysis of the case of Romania from the perspective of the quaternary equation.

Future Directions

In the future, the analysis can be extended by integrating additional variables, such as the impact of technological innovation on saving-investment flows or the influence of demographic factors on the labour market.

The application of forecasting models can also help to better anticipate macroeconomic disequilibrium and formulate proactive policies to correct them.

Text notes

[1] The conceptual error of being considered a potential balance, which, under certain conditions, can be updated, should not be made. It has a virtual character in the sense that the introduction of the labour market in the domestic sector of the savings balance-investment it is required by methodological (analytical) reasons rather than conceptual (constitutive) reasons.

[2] Conceptually, it represents a change in the structure of the workforce (i.e. the working population).

[3] One could also study the symmetrical problem of a natural rate of jobs by identifying an analogue of the short-term Phillips curve in the case, this time, of "unemployment" of jobs.

[4] According to Knight, uncertainty cannot be associated with any probability distribution.

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