Endogenous Money and Regional Growth: The Case of Baixada Fluminense - Rio De Janeiro

Claudio De Carvalho Marouvo
Master in Production Engineering
Universidade Estadual do Norte Fluminense Darcy Ribeiro - UENF.
Adress: Rua Visconde de Sepetiba, 935, sala-819 - Niterói - Rio de Janeiro - Brasil
Zip Code: 24020-206
Phone: (55) (21) 2719-6451
E-mail: cmarouvo@hotmail.com

Alcimar Das Chagas Ribeiro
Associate professor
State University of North Fluminense Darcy Ribeiro - UENF
Adress: Rua Eloisa de Sousa Machado, 78 – São João da Barra – Rio de Janeiro - Brasil
Zip Code: 20800-000
Phone: (55) (22) 2724 – 1239,
E-mail: alcimar@uenf.br

1. Introduction

Much of the economic literature is characterized by studying the behavior of real variables in the economy (production, employment, wages, etc. As determinants of regional development, and the monetary and financial variables have been neglected. But more recently, several publications have rescued an old debate, *i.e.* whether or not the currency matters, as a determinant of economic development.

Works with character analysis of the regional economy, always guided by models which see money as neutral (at least at the regional level) or, at best, as if it had a perfect mobility between regions, *i.e.*, if there were profitable projects these resources would be allocated in these places. So the money that flows intraregional would be seen as mere reflections of the different development levels of regions and their institutions. The currency and financial flows have been considered more as a result of regional differences, rather than as a factor that may have influenced this difference, this is a consequence and not a cause.

The consideration of non-neutrality of money is crucial, since monetary variables may contribute to the broadening or narrowing of the gap in development between regions of a country.

According to the post-Keynesian theory, the currency is endogenous to the economic system, and is inserted into the economy through loans provided by banks, and are, therefore, of crucial importance for development. Despite the importance of the demand for credit, banks play a major role in determining levels of investment income and, when considered as neutral, but not as important economic actors.

It is in this context that the present study investigates whether currency by major credit operations has a relevant role in the context of regional development, specifically in the Lowlands. It is checked whether the growth, by varying the GDP sector, has induction of endogenous coin as part of the process.

2 Literature Review

The method of Shift-Share Analysis: brief description

The main goal of traditional shift-share methodology is to determine, first, the degree of influence of regional specialization in their growth and the variable under study (credit), and secondly, the importance that other factors have had on regional growth differential, either positively or negatively.

This methodology allows decomposing the evolution of a local variable in relation to the evolution of the regional average of two components: the structural effect, proportional and differential effect, regional location. Application of structural-differential method in this study is to identify, within the regional perspective, the reason why certain regions and sectors grow (or decrease) faster when compared to other units.

So given region may present greater economic growth than others due to the existence of a more efficient production structure on account of the presence of the most dynamic sectors. Therefore, the composition of bank credit in a particular sector of the economy will present variations according to the region in which it operates.

Haddad (1989) considers the structural-differential method an analytical way of generating relevant information for the organization of additional theoretical research on specific regional problems. The method can be used to identify distinct performances regional differentials.

The structural-differential method is based on a simple identity and not a behavioral model, not aims to generate theoretical interpretations, but describe structural variations. Following the same line of thought, Brown (1969) notes that "the structural-differential method is an identity formed by addition and subtraction of simultaneous growth rates, which are grouped to define the components (...) is always possible to add new variables to the model and define other components (...) ".

Other contributions to the method are structurally differential of Stilwell (1969), Chalmers (1971), Edwards, Harniman and Morgan (1978), Esteban-Marquillas (1972) and Herzog and Olsen (1977).

It is the traditional shift-share methodology that determines the degree of influence of regional specialization in the growth of the variable under study, and secondly, the importance of other factors has been specifically regional growth differential, both positively and negatively. This methodology allows decomposing the evolution of a variable from one municipality to the evolving regional average of two components: the structural effect, a proportional mix of the economy, and the differential effect, or regional location. Using structural-differential method is substantiated, especially the contributions of Souza (2009), Souza and Souza (2004) and Haddad (1989).

The shift-share methodology favors the calculation of differential and structural effects. The definition is facilitated when the same part is the growth rates of the type of credit for the city and region. It determines the growth rate for the type of credit i from a municipality j as:

$$c_{ij} = \frac{\left(c_{ij}^{t} - c_{ij}^{o}\right)}{c_{ij}^{o}} \qquad (1)$$

c_{ij}^{o} = Is the credit granted in the base year, and

c_{ij}^{t} = Loans at year end.

The percentage growth general type of credit i is calculated by dividing the change in credit between the terminal years (C_i^t) and the base year (C_i^0) credit by the total credit in the base year, i.e.:

$$c_i = \frac{(c_i^t - c_i^0)}{c_i^0} \qquad (2)$$

Based on the type of credit rates, municipal (C_{ij}) and regional (C_i), and total loans by type of loan in the region in the base year (C_{ij}^0), determine the differential effect:

$$D_{ij=} C_{ij}^0 (c_{ij} - c_i) \qquad (3)$$

In the equation above (3), we obtain a positive result when the type of municipal credit grows at a rate higher than the regional (Cij> C i) indicating that there are internal factors acting positively on the city. A likely reason for the superior performance is the presence of specific locational advantages for the activity. To ascertain the dynamics of one type of credit i municipal towards the region as a whole, it is estimated the structural effect:

$$P_{ij=} C_{ij}^0 (c_i - c) \qquad (4)$$

When the result of equation (4) is positive, it means that the growth of credit type region (Ci) exceeds the expansion of types of credit combined (aggregates) (c), where c = [(C t - C 0) / C0]. Thus, the type of credit is considered the main performance and can be linked to new types of design, innovative products or processes. When he is well represented in the city j, it can take advantage of regional expansion and growth is attributed to external factors.

The sum of the differential effect (Dij) with the structural effect (Pij) results in the total effect (Tij). Thus the result will be positive when the two effects are positive when a positive or overcome the negative effect. The overall effect for all types of credit equals ΣiTij the result of the sum of differential effects (Σi Dij) and the structural effects (Σi Pij), namely:

$$\Sigma_i T_{ij} = \Sigma_i D_{ij} + \Sigma_i P_{ij} \qquad (5)$$

Souza (2009, p. 121), mentions that: "From this analysis, one can follow a policy of regionalization d and investments and incentives for different economic activities, according to its dynamism, so as to maximize the rate of growth [...]."

There are many criticisms of traditional shiftshare analysis methodology. Firstly, as it is not a statistical method, it is not possible to test the statistical validity of the results. Moreover, it is noted that because the data is taken from a starting point and an ending period the results are influenced by years which decides to use. In other words, the analysis does not involve a dynamic component in its development, making it impossible to verify as the evolution of the variable. To correct these problems, according to Souza and Souza (2004), Esteban-Marquillas (1972) introduced a variable initial theoretical (C ij0 *) in place of the base year (Cij0). The level of credit theoretical, or expected, can be defined as that which would occur with the kind of credit i when the municipality j adopts the regional proportion resulting from the ratio between the observed type of credit and total credit in the region:

$C_{ij}^{0*} = C_j^0 \left(\frac{C_i^0}{C^0}\right)$ (6)

C_j^0 = The total credit of municipality j in the base year;

C_i^0 = The total loans of the type of credit i in the region in the base year, and

C^0 = The total loans (aggregate) in the base year.

Thereafter, the author has eliminated the competitive position of the structural influence, since the ratio used in the calculation is the region, and called the result of competitive position pure:

$$D_{ij}^{'} = C_{ij}^{0*}\left(C_{ij} - C_i\right) \quad (7)$$

The influence of structural dynamics differential allocation or effect (Aij) was defined by Esteban-Marquillas (1972) as the difference between Dij and D'ij:

$$A_{ij} = D_{ij} - D_{ij}^{'} \quad (8)$$

If we use the definitions of Dij and D'ij above and rearrange the equations, we arrive at another expression for the allocation effect:

$A_{ij} = \left(C_{ij}^0 - C_{ij}^{0*}\right)\left(c_{ij} - c_i\right)$ (9)

If the result of the first member of equation (9) is positive (C ij 0> C ij0 *), states that the municipality j is specialized in the type of credit i. If the second member of the expression is positive (c ij> ci), it states that the municipality already has a competitive advantage in the type of credit i. The authors Souza (2009), Herzog and Olsen (1977) presented four combinations to effect allocation.

According to the authors of the proposition table above shows that a positive allocation indicates that the municipality j specializes in credit type i (+) and it has competitive advantage (+) (4), or that the municipality is not specialized in the type of credit i (-) and has no competitive advantage (-). In case a negative allocation occurs in specialized type of credit i (+) but with lower credit growth region (-) (2) or with no expertise in the credit i (-), but with the growth of credit in the region above the (+) (3). Thus, the dynamic type of credit is important for the county (specialized) and is higher than the growth rate in the region (it has competitive advantage).

A second problem presented by the structural-differential method is the fact of not taking into account the structural changes between major differences in the interpretation of the effects when the time interval between them is long. According to Haddad (1989), to minimize the problem, Stilwell (1969) proposed calculating the proportional variation reversed (Rij), given the slant of the inverse of the difference in growth rates of credit, type of credit multiplied by the municipality i j period-end (C ij t). Then:

$$R_{ij} = C_{ij}^t \left(\frac{1}{c} - \frac{1}{c_i}\right) \quad (10)$$

In the calculation of equation (10) it is captured structural change in the period and it indicates that when the variation exceeds the variation reversed proportional calculated, the structure of credit in the region is modified to become expert in the area.

According to Souza (2009), "Stilwell changed both effects (structural and differential) to obtain the modified proportional variation (Mij = Rij - Pij),so that: VLTij Pij = Pij + + Dij = Rij - Pij + (Dij - Mij) = Mij Pij + + (Dij - Mij) or: VLTij Mij = Pij + Dij + '".

In the latter formula, the net total (VLTij) equals the structural effect (Pij) plus the modified proportional change (M ij) and the modified differential variation (Dij ').

Herzog and Olsen (1977) combined the modifications Esteban-Marquillas and Stilwell to assess the total net change (SOUZA, 2009). Structural changes in the municipality may change the allocation of the effect signals when, for example, a variable analyzed competitive advantage specializes in period. To eliminate the problem, the authors developed calculating the modified allocation effect (Aij '), which includes data terminal year used credit and credit theoretical terminal in the same way that credit initial theoretical, but using data from the year end. Thus, the effect allocation is modified:

$$A_{ij}^{'} = \left[\left(C_{ij}^{t} - C_{ij}^{0}\right) - \left(C_{ij}^{t*} - C_{ij}^{0*}\right)\right]\left(c_{ij} - c_{i}\right) \quad (11)$$

or

$$A_{ij}^{'} = \left[\left(C_{ij}^{t} - C_{ij}^{t*}\right) - \left(C_{ij}^{o} - C_{ij}^{0*}\right)\right]\left(c_{ij} - c_{i}\right) \quad (12)$$

Equation (11) highlights, especially, the real growth of credit in the period (Cijt - Cij0) and the expected variation (Cijt * - Cij0*). Equation (12) makes explicit specialization terminal year (Cijt – Cijt*) and the initial base year or (Cij0 - Cij0 *). When the result is positive the credit has regional competitive advantage (c ij> ci) and specialization year terminal is greater than the base year or, in the case of equation (11), when the real growth surpasses the expected.

However, one should be careful in interpreting the results so as not to confuse the specialized credits in the year following final credits toward specialization. They are also positive when there is competitive advantage (see Table 2). The combination of competitive advantage (+) and allocation effect (+) modified allocation effect can generate positive or negative results (see Table 2). When the modified allocation effect is positive, it indicates that credit became more specialized in the final year of the period.

Yet, a negative result generates two possible credit performances. The first one occurs when the result of the effect on module modified allocation outperforms the original allocation effect, and it means that credit is no longer specialized terminal year. A second result follows from the result of the modular effect allocation can be modified below the original allocation effect, and it represents a worsening of credit in terms of performance, but it remains specialized terminal year. It should also highlight the positive effect of the modified allocation for credits with competitive advantage (+) and negative allocation effect, being unskilled. The claims are to be considered skilled in the final year if the result of the effect of modified allocation is greater than that obtained for the original allocation module effect. When credit has no competitive advantage (-), but the original allocation effect is positive, a positive effect modified allocation indicates that the situation of credit worsened. Nevertheless, if the result of Aij is negative, the credit has improved year end, compared to the initial year.

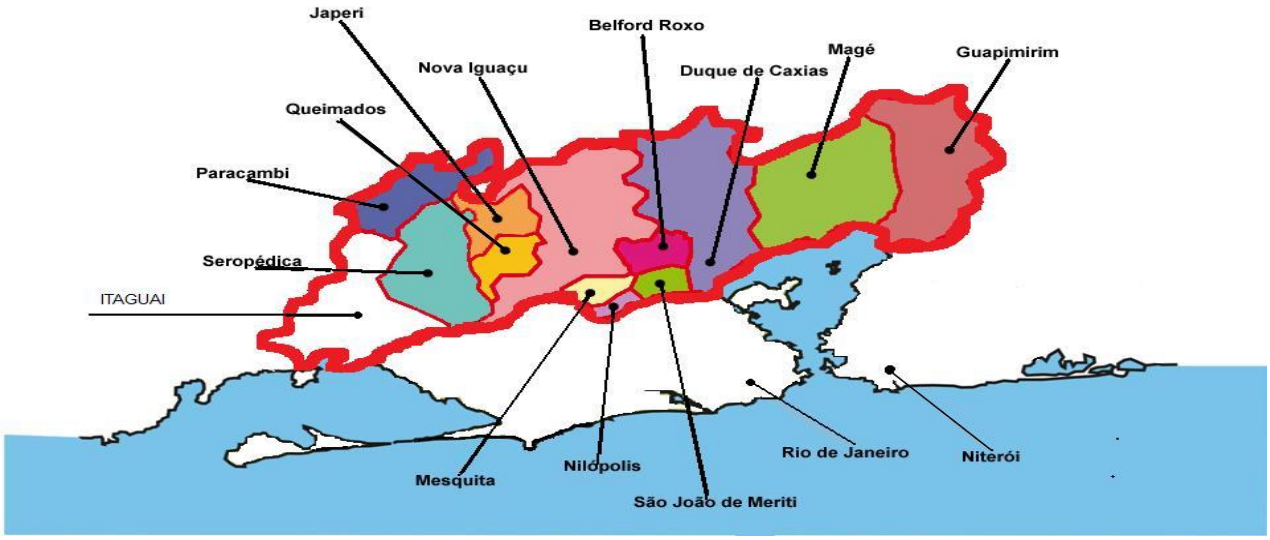
3 Characterization of the region under analysis: The Lowlands Region

Aiming to systematize some information about the area of evaluation, the following table presents the municipalities, their origin, year of creation, GDP per capita, population, and map location.

Municipalities of the Baixada Fluminense - Origin and Year of Installation Municipality	*Source*	***Year established***	*GDP / Per capita (2009) R$*	*Population (Thousand)*
Nova Iguaçu	Vila de Iguacu	-	11,046	796
Itaguaí	Vila de Itaguaí	-	28,479	109
Mage	Vila da Estrela	-	7544	227
Duque de Caxias	Nova Iguaçu	1 944	29,501	855
Nilópolis	Nova Iguaçu	1 947	9433	157
St. John Meriti	Nova Iguaçu	1 947	8514	459
Paracambi	Itaguaí	1 960	8837	47
Burnley	Nova Iguaçu	1 990	8785	138
Belford Roxo	Nova Iguaçu	1 993	8279	469
Guapimirim	Mage	1 993	8257	51
Japeri	Nova Iguaçu	1 993	5792	95
Seropédica	Itaguaí	1 997	8573	78
Mosque	Nova Iguaçu	2001	7928	168

Source - Site IBGE-Cidades-12/12

Map of the location of the Lowlands.



4. Results and Discussions

The economy of the State of Rio de Janeiro, in the last four decades, presents significant loss of relative share of its Gross Domestic Product-GDP, compared to the same indicator of the country. The industrial sector in its overall structure, is dynamic and presents a standard of productivity and innovation that is relevant, but when separated the mining industries of the manufacturing industry, it stresses the importance of mining, due to the oil activity in developed Norte Fluminense. Consequently, the processing industry loses importance, as the d the agricultural sector, while the service sector evolves primarily by the dynamics of the commercial and financial sector.

However, in the last ten years there has been growing expectation of a possible transformation in the economy of Rio de Janeiro captained by decentralized investments toward the interior. Fundamentally, projects in the oil and port infrastructure are irrigating, among others, the region of Norte Fluminense.

Given this situation changes, this study investigated the behavior of the economic structure of the region Lowlands, from the perspective of the evolution of GDP across industries, as well as the role of money in the process.

Initially observing the industry, due to its importance in the induction of other businesses, it was found that the region does not present a profile industry. But in two municipalities (Belford Roxo and Duque de Caxias), the dominance of the sector showed the occurrence of specialized competitive advantage, indicating that municipalities are specialized in this sector, since the growth rate was higher than the rate of regional growth. In Belford Roxo materializing specialized competitive advantage occurred in 2003 based on 2001, in 2007 based on 2005 and 2009 based on 2007. Between 2005 based on 2003, specializes occurred competitive disadvantage, depending on the sector have grown at a rate lower than the rate in the region. In the municipality of Duque de Caxias, the materialization of competitive advantage specializes occurred in 2003 based on 2001 and on 2005 based on 2003 and 2007 based on 2005. In 2009 based on 2007, specializing occurred competitive disadvantage, the level of GDP growth in the sector lower region. The assessment of credit, especially loans and lines of discount and financing, failed to fit into competitive advantage specialized, since the pattern of growth was below the region. In this case, actions are characterized exogenous growth and industry specialization.

The service sector, on a general assessment also does not propel the region positively. Of the twelve counties, it was found that the pattern of competitive advantage and specializes in Belford Roxo periods in 2005 based on 2003 and 2009 based on 2007, while in the base period 2003 to 2001 competitive disadvantage specialized prevailed between 2007 and 2005 base predominated competitive disadvantage unskilled. The municipality Guapimirim had competitive advantage specializes only in the period 2003 based on 2001, the city of Mesquita during 2007 based on 2005 and 2009 based on 2007, the municipality of Nova Iguaçu during 2007 based on 2005 and 2009 based on 2007; the town of Queimados in the period 2007 to 2009 based São João de Meriti period in 2009 based on 2007. Anyway, it is noted that, more recently, the industry showed a pattern of improvement.

No lists of credit to the sector in these municipalities, there is a more proactive role of the currency. In Guapimirim the loan and discount met the standard of competitive advantage specialized, indicating a possible role of endogenous credit growth in the sector. In Mesquita, we observed the same movement, where the loan and discount met the standard of competitive advantage and specializes in Queimados, where the process repeated.

Finally, the non-agricultural sector also presents a more significant economic dynamics in the region. In evaluating the standard of competitive advantage specialized, only a few municipalities had, in a certain

period, such condition satisfactory. The municipality of Guapimirim reached the standard of competitive advantage in specialized period of 2009 based on 2007, after registering a competitive disadvantage specializing in previous periods. The rural credit did not show a relevant role.

The municipality of Itaguai only showed the pattern of competitive advantage in specialized base period 2005 2003, where credit also hit the same pattern, indicating that the currency acted endogenously. In the other periods presented competitive disadvantage rural credit specialist, inhibiting a more dynamic sector.

In Japeri, there was a framework for competitive advantage in the industry specializing in the periods of 2003 based on 2001 and 2009 based on 2007, but the rural credit specialized presented competitive disadvantage, indicating that the industry has evolved over the periods recorded as a function of exogenous actions.

The municipality of Mage specializes presented competitive advantage in the period 2007 to 2005 base, where rural credit specialized presented competitive disadvantage. Nova Iguaçu, also reaches the standard of competitive advantage specializes in the periods of 2003 and 2009 base 2001 base 2007 with the rural credit presenting competitive disadvantage not specialized and non-specialized competitive advantage.

Conclusively, it appears that the economic sectors do not present a dynamic sustainability for the region. The pattern of competitive advantage specializes occurs sporadically and, in general, not coincidently with the credit, indicating that stocks are more present exogenous than endogenous actions. In this case, the emphasis is on the lack of planning for regional development.

5 Final Considerations

This study evaluated the economic dynamics of the municipalities of the Lowlands, the metropolitan area of Rio de Janeiro, taking into account the role of money as an endogenous process. Method was used to decompose shift-share industry sectors in the municipalities of the region, checking the main types of credit and, ultimately, in assessing the creditworthiness currency played a key role in the regional development process.

We sought to assess whether the bank credit affected the growth of the municipalities of the region and is rescued both the macroeconomic discussion where the orthodox theory has reference to an exchange model that leads to a general equilibrium. In this, the currency, especially credit, is available as an exogenous variable, *i.e.*, it is seen as a mere intermediary item that increases business efficiency, or it is endogenous, where the money supply is created by market forces, according to economic needs, expressed by the demand for money.

In the consolidated analysis confirmed that, in a few cases, the financial system influenced the degree of development of the region. It was seen that the municipalities analyzed did not have a consolidated growth, *i.e.*, mostly fluctuated as the national economy, demonstrating that this approach exogenous monetary-credit did not allow a sustainable development of the region. In this case, a new approach is required where the availability of credit may affect endogenously economic systems, with a work toward more decentralized projects with real possibilities for leveraging local comparative advantages. It is understood that the debate over a possible bank disintermediation process, via funds, taking loans to smaller regions, could meet the credit needs sector, aiming at the development site. So, it would benefit local productive if they could finance their growth and production, which does not occur today due to the uncertainty that is generated by the remoteness and the centralization of the banking system in large centers, generating an increased risk in return for loans.

References

BROWN, H. J. (1969). Shift and share projections of regional economic growth: and empirical test. Journal of Regional Science, v.9, n.1, p.1-17.

CHALMERS, J. A. (1971). Measuring changes in regional industrial structure: a comment on Stilwell and Ashby. Urban Studies, v.8, n.3, p.289-291.

EDWARDS, J. A., HARNIMAN, K. F., MORGAN, J. S. (1978). Regional growth and structural, adaptation: a correction to the Stilwell modification. Urban Studies, v.15, p.97-100.

ESTEBAN-MARQUILLAS, J.M. (1972). A reinterpretation of shift-hare analysis. Regional and Urban Economics, v. 2,n. 3, p. 249-55.

IBGE: Instituto Brasileiro de Geografia e Estatística: http://www.ibge.gov.br/home/.

HADDAD, P.R. (Org.) (1989). Economia regional: teorias e métodos de análise. Fortaleza: BNB, p. 249-286.

HERZOG, H. W.; OLSEN, R. J. (1977). Shift-Share Analysis Revisited: The Allocation Effect and the Stability of Regional Structure. Journal of Regional Science, v. 17, n. 3, p. 441- 454.

SOUZA, N. de J. de; SOUZA, R. B. de L. de. (2004). Dinâmica estrutural- diferencial da Região Metropolitana de Porto Alegre. Revista de Economia (Curitiba), v. 30, n. 2, p.121-144.

STIWELL, F.J.B. (1969). Regional growth and structural adaptation. Urban Studies, v. 6, p.162-178.