Economic Growth and Services Sector in Ibero-American Countries (1960-2010)

Crecimiento económico y sector de servicios en los países iberoamericanos (1960-2010)

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Abstract

The organizations of the service sector have been little studied; despite the fact that they have a great influence on the economic activity of the Latin American countries (in the labor force -mainly). The purpose of this research is to analyze growth in Ibero-American countries (1960-2010) through an econometric model of panel data by means of variables from the services sector. We want to test the hypothesis that the service variables have positive and statistically significant effects on the economical growth. The empirical evidence from the results obtained in this study suggests that two of the variables of the sector (business services and government services) have positive effects on economic growth in these countries. This is explained primarily by the growth of financial intermediation services (income and business activities) and secondly by the growth of government services (public administration and defense, education, health and social work). In general terms, in this study there is statistical evidence that supports the hypothesis of Ghani and Kharas, (2010), who proves that services cause growth in a globalized and technologically developed world. In this sense, Ghani, (2011), also affirms that services be a driver of sustained growth in organizations.

Sectoral studies, Economic Growth, Iberoamerican Countries, Econometric Models

Resumen

Las organizaciones del sector servicios, han sido poco estudiadas; a pesar de que éstas tienen gran influencia en la actividad económica de los países de Iberoamérica (en la fuerza laboral -principalmente). El objetivo de esta investigación es analizar el crecimiento en países de Iberoamérica (1960-2010) a través de un modelo econométrico de datos de panel por medio de variables del sector servicios. En este sentido, se pretende contribuir en forma general a los estudios de crecimiento económico en Iberoamérica, con el propósito de implementar políticas públicas que potencialicen el desarrollo del tercer sector. En esta dirección, se desea probar la hipótesis de que las variables del sector servicios tienen efectos positivos y estadísticamente significativos en el crecimiento. Los resultados obtenidos en este estudio, sugieren que dos variables del sector (servicios de negocios y servicios de gobierno) presentan efectos positivos en el crecimiento económico en países de Iberoamérica. Lo cual está explicado en primer término por el crecimiento de servicios de intermediación financiera (rentas y actividades de negocios) y en segundo término por el crecimiento de los servicios gubernamentales (administración pública y defensa, educación, salud y trabajo social). En términos generales, en este estudio existe evidencia estadística que apoya la hipótesis de Ghani y Karas, (2010), quienes prueban que los servicios causan crecimiento en un mundo globalizado y tecnológicamente desarrollado. Por otro lado, Ghani, (2011), también afirma que los servicios son un motor fundamental en el crecimiento sostenido de las organizaciones.

Estudios sectoriales, Crecimiento Económico, Iberoamérica, Modelos Econométricos

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Introduction

The wide variety of organizations in the countries of Latin America, interdependencies and interrelations, have led to significant changes in social, economic, cultural and political dynamics.

In the economic field, organizations, distributed in three sectors (primary, secondary and tertiary) follow different logics; because their environments, competitiveness and ways of operating are dissimilar.

Classical economists, from Adam Smith to Karl Marx, were interested in services (which differed from the production of goods), with the purpose of defining productive work.

Kaldor (1966), argued that there was a negative relationship between the growth of labor productivity in the economy in general and the rate of growth of employment in the non-manufacturing sector, because most of the economic activity that did not belong to the manufacturing sector, such as agriculture and many service activities, were subject to diminishing returns.

The importance of the tertiary sector in economic development has increased in recent decades, having an important impact on economic activity in the generation of jobs; Today about 70 percent of the world's product is generated by the tertiary sector, concentrating 45 percent of employment (World Bank, 2014).

In addition, this expansion of the services sector has led to a significant increase in its contribution to GDP, which can be explained in large part by the rapid development of modern commercial services, finance, insurance and communications (Ghani, 2011).

At the end of the 20th century, the branches of activity of the tertiary sector contributed about 90% of the new jobs created in Latin America and the Caribbean, in the 1990s, and at the end of this they represented 55% of total employment.

Despite its great weight in the labor market, employment in tertiary activities has been studied less than agricultural employment and much less than manufacturing.

Currently, there are different proposals for classification of services, where the organizations of the sector become specialized, including being multinational or transnational. Rubalcaba (1997, p. 29 et seq.) Cites the following: - Distribution services, production services, social services, personal services (Browning and Singelmann). - Marketable services, services provided on site, durable services and non-durable services (Nusbaumer). - Permanent and temporary services, reversible and irreversible services, private and collective provision services, non-commercialized and commercialized services (Ochel and Wegner).

In this sense, a question arises: is it sustainable? the fact that services cause growth. The answer suggests a resounding yes, because the globalization of services is only the tip of the iceberg (Blinder, 2006). Services are the largest sector worldwide, which brings together more than 70% of global production.

The "Services Revolution" has altered the characteristics of this sector. Now services can be produced and exported at low costs (Bhagwati, 1984). The old idea that services were non-transportable, non-marketable and non-scalable has been overcome by a series of impersonal modern services that move across borders on the internet, are digitized, stored electronically and escalated by a gigantic global business. Developed countries can argue that services cause growth, because there is a large space for dissemination and convergence (see Ghani and Kharas, 2010).

The objective of this research is to analyze economic growth in Latin American countries through panel data, with service variables (1960-2010). The Latin American countries included in this study are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Venezuela. The use of panel data is proposed, because through this technique it is possible to capture the unobservable heterogeneity between the countries of study, as well as in time, since this heterogeneity cannot be detected with time series studies, nor through cross-cut models.

The group of study countries are considered for the feasibility of the information of the services sector included in the 2015 database of the Groningen growth and development center for 10 sectors (GGDC, 10-Sector database).

The hypothesis to be tested in this study is the following: the variables of business services (Financial intermediation, Income and Business activities, (excluding owner income) and the variables of government services (Public Administration and Defense, Education, Health and Social Work) have a positive association with economic growth in Latin American countries.

Another purpose in this study is to contribute in general to economic growth studies in Latin American countries, with the purpose of implementing public policies that enhance the development of the services sector.

Regarding the general structure that this work presents, it begins with an introduction, to continue with the literature review where the most relevant approaches of the tertiary sector are presented, thirdly it refers to the econometric methodology. Fourth, the model is presented, in which the service variables and their influence on economic growth are defined. In the fifth the results of the econometric estimation are presented, in the sixth the conclusions and the final reflections of the study are included, in the seventh the annexes are added, including the tables of the econometric estimates, Finally, the references are presented.

Literature review

The notion of a tertiary sector arose with the interest of classifying economic activities, in the first instance by items that did not belong to the primary sector (agriculture, livestock, forestry, fishing, mining) or the secondary sector (manufacturing, construction), is say residual.

In order to clarify the concept, later there were attempts to characterize it around common elements. Thus, emphasis was placed on some characteristics of tertiary activities that would differentiate them from primary and secondary schools: for example, that they would be intangible, non-transferable and perishable and could not be stored, and that they would also have a high labor intensity due to the limitations to replace labor by capital and technology.

Although these specifications help to understand the differences between many services, on the one hand, and the primary and secondary sectors on the other, they are not valid for all activities commonly grouped as tertiary.

Furthermore, as the most recent technological changes increased the heterogeneity of the latter, the mentioned characteristics serve less and less to distinguish the tertiary sector from other sectors. In particular, it should be noted that many services are increasingly transferable (for example, financial, medical and educational services, and also services to companies such as administrative support (back offices), data processing and consulting).

This makes the boundaries between marketable products, which traditionally come mainly from the primary and secondary sectors, and non-marketable, which are mostly generated traditionally by the tertiary and construction sectors, are increasingly diffuse.

In addition, new technological resources create economies of scale, for example in education, they can partially replace the teacher. At the same time, many services are no longer perishable (thanks to storage devices) and the product (knowledge and others) serves to accumulate human capital. Finally, there are numerous services that make more and more intensive use of capital and technology (for example, satellites in communications). In addition to the above, electronic commerce has currently gained ground, with no limits on its development.

In this way, the most recent trends make it difficult to define tertiary activities through a set of common characteristics. At the same time, they deepen heterogeneity (especially regarding the use of physical capital, technology and human capital) in tertiary activities. Therefore, instead of trying to impose in a conceptual way a non-existent homogeneity to this set of activities, it is important to differentiate it to a greater extent.

Baumol (1967), based on the study after the financial crisis of 1929 in the United States, distinguished two sectors: one progressive in which technology and innovations make it possible to increase GDP per capita, and another where the level of productivity of the work is stationary by the nature of the production process.

This article has been widely criticized for the structure that services have today, but it is a benchmark in the study of the sector.

In most of the later literature, one of the most cited definitions is that made by Hill (1977), who defines services as a change in the condition of a person or a good as a result of the activity of another economic unit.

Hill argued that the services belonged to a logic other than goods, particularly because of the impossibility of accumulating inventories; A service must be consumed when it occurs, which would result in the need for interaction between producer and consumer of the service. Bhagwati (1984) expands this definition by noting the existence of two types of services: those that require physical proximity between the user and the provider and those where proximity is not a requirement.

Demirgüc-Kunt and Levine (1999), have found statistical evidence to support the hypothesis that an expansion in the supply of financial, education and health services, produce a higher rate of economic growth in countries.

Niño (2005) states that sectors such as telecommunications, infrastructure, energy, transportation, financial, business and professional, are promoters of the increasing productivity of both services and goods. Niño's thesis shows that these service sectors have high knowledge intensity and feed a circuit of greater demand due to their high productivity.

Eichengreen and Gupta (2009) conduct an empirical study of the growth of the services sector and per capita income in sixty countries from 1950-2005. They identify two waves of growth in this sector, one in countries with low income and another in countries with high income.

The second wave is very relevant in middle-income and high-income countries, because they are democracies, they have a lower tendency to suppress the dissemination of information and communications technology[1].

In this direction, other important feature is that they are countries relatively close to the main financial centers, so they have a comparative advantage in the provision of these services, they are countries open to trade, in this sense they are in a great position to specialize and export those services where they have a comparative advantage, capitalizing on the opportunities offered by these subsectors.

At the end of the seventies, with the exhaustion of the development phase called "Fordist-Keynesian", a new capitalist production model began, where knowledge, information, technologies and innovations became the essential inputs , which gave way to the demand for more specialized services and, with it, to a process of outsourcing from the emergence of companies that provide services to others, that is, outsourcing.

According to Kox and Rubalcaba (2007), outsourcing is only explaining a small part of the growth of commercial services. There are reasons behind this. First, the information technology (IT) revolution in the 1970s led to the application of new forms of technology, which resulted in the creation of new services (Internet, studies of market and consulting). Second, Beyers and Lindahl (1996) state that the need for specialized knowledge is by far the most important factor behind the demand for service production[2]. Third, as Kox (2001) observes, the services provided by commercial service providers are superior to previous internal service activities of outsourcing companies.[3]

Serrano (2011), points out that organizations in the services sector or activities carried out by them are very old, essentially mentioning transport, forms of communication and technological transformations. We assume that the first idea relates more to the question of the total capitalist model, since it was believed that in order to achieve "economic growth and development" the industrial sector and, secondly, services should be strengthened[4].

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[1] In two recent articles, Buera and Kaboski (2008, 2009) find that the relationship between the proportion of services with respect to GDP and the logarithm of per capita income follows a linear relationship..

[2] This also explains why the growth of business services began in the late 1960s and not before.

[3] Kox and Rubalcaba (2007), find that business services in the European Union have generated knowledge and productivity spills for other industries.

[4] Serrano (2011) argues that trade is much more important, since it is not influenced by the other sectors, but that it serves the other sectors more by providing services that allow them to function. On the other hand, Mateo and Carner (1988) warned that the services sector, in the first industrial revolution, gave rise to the nascent industry, especially in the case of transport, communications and the new banking.

In this direction, economists alluded to the phenomenon of deindustrialization; which meant that organizations in the primary and secondary sector underwent transformations in various countries; changing, the labor force, which moved to the commerce or tertiary sector.

Hence it will be called as outsourcing of the economies[5]. Mateo and Carner (1988) already glimpsed him in the late 1980s. On the other hand, despite mitigating this phenomenon - and having a large workforce, organizations in this sector did not impact economic growth in the eighties.

Under another approach, trade in services can play an important role in the dissemination of technology because many branches of services such as financial services, computer and information processing or management advice services - are knowledge intensive.

Some papers suggest that services act as intermediate consumptions and, therefore, facilitate other economic activities. In François' (1990) model, business services coordinate and direct specialized operations within them and their importance grows as business size increases and production processes become more complex.

To analyze the role of trade in services, an approach has been used that consists in examining specific industrial branches thoroughly.

Mattoo et al. (2001), for example, focus on branches as prominent as financial services, telecommunications and transport.

They argue that an efficient and well-regulated financial sector leads to an efficient transformation of investment savings, which ensures that resources are dedicated to those activities that report the highest returns.

In summary, the relationship between public services (sector organizations) and economic growth; as well as the integration of these organizations into public policies, it can be seen in the Maroto-Sánchez
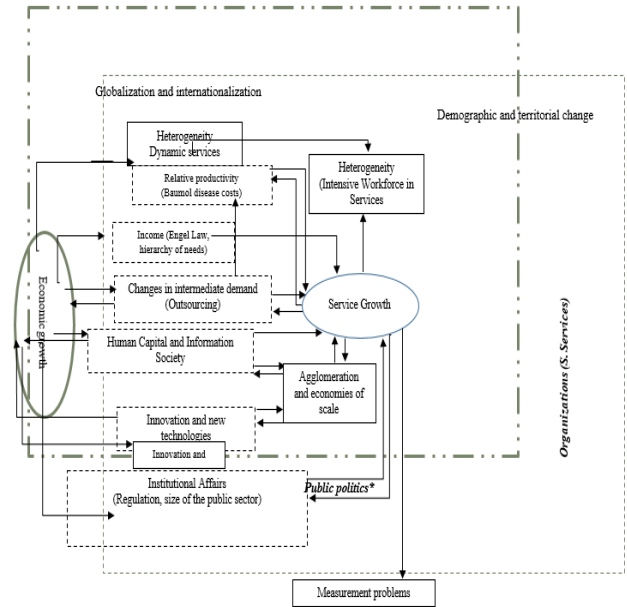
International institutional policies (UN, OECD, WB) *

Figure 1 Relations between services and economic growth: a summary

Methodology

The main objective of applying and studying panel data, in econometric models, is to capture unobservable heterogeneity, either between economic agents, countries or organizations, as well as over time, since this heterogeneity cannot be detected even with Time series studies or cross-sectional studies. This technique allows a more dynamic analysis to be made by incorporating the temporal dimension of the data, which enriches the study, particularly in periods of major changes.

Regarding the specific individual effects, it is said that these are those that unequally affect each of the study agents contained in the sample and that are invariable over time and directly affect the decisions taken by said units. The panel data methodology is divided for study in two sections: fixed effects model and random effects model. The fixed effects model will be designated as:

$$y = \begin{bmatrix} i & X \end{bmatrix} \begin{bmatrix} \alpha \\ \beta \end{bmatrix} + u \qquad (1)$$

Where, where i is a vector of ones of order (n X 1), α is a scalar and the betas the parameters. This representation is commonly known as a fixed effects model.

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contribution to the wealth of a territory rests on this activity (tertiary).

The fixed effects are those ordered in the α-ith origin for each group. Generally, it is assumed that the vector u is homoscedastic and is not autocorrelated. One possibility of explaining the data with the fixed effects model considers that there is a different constant term for each individual, and assumes that the individual effects are independent of each other. With this model it is considered that the explanatory variables affect the cross-cutting units equally and that these are differentiated by their own characteristics, measured by means of the intercept.

The random effects or error component model. Instead of assuming a given set of constants (unknown) α1, ..., αp, for the p groups, it assumes that a single ordinate at the origin α and the ordinates at the origin differentials are integrated into the term of the disturbance. The model is constructed similarly to the model of equation (1), but the assumptions about u are: uit = αi + εit, where αi are obtained randomly from an N $(0, \sigma^2)$ and εit proceed, also randomly, of an N $(0, \sigma^2)$. The αi are now increments (positive or negative) of the ordinate in the common origin α. (See Johnston, 1992).

Some of the advantages and disadvantages of using panel data are listed in Baltagi (2001). Among the advantages is the control over individual heterogeneity; more variability, less collinearity between the variables, more degrees of freedom and greater efficiency; better adaptation to the study of adjustment dynamics; better ability to identify and measure effects that are not detectable in pure cross-sectional data or in time series. Among the disadvantages, the panel data presents the problem of data collection, distortions due to measurement errors and the short time dimension that is generally found in the series. Despite the limitations, taking into account the advantages presented by the panel data, there are a lot of issues that must be raised to maintain certain assumptions and choose the best estimation method.

The model

In this study, the relationship between variables of the services sector and economic growth in 9 Latin American countries is analyzed and explained.

Average annual data series are used for the decades 1961-1970, 1971-1980, 1981-1990, 1991-2000 and 2001-2010; and a panel (9 by 5).

In the implementation of the model, the statistical significance of the following determinants of economic growth in Latin American countries will be tested: business services variables: (Financial intermediation, Income and Business activities, (excluding owner income) and service variables of Government (Public Administration and Defense, Education, Health and Social Work).
In this work, the per capita growth rates depend on the following variables. The initial value of GDP per capita is considered for its statistical significance in the studies by Worz (2004), whose negative association with respect to growth indicates convergence[6].

Investment (given as the Investment / GDP ratio) is considered by the strong positive effect on economic growth found in De Gregorio and Lee (2003).

The variables of financial intermediation, income and business activities, (excluding owner income) are examined for the statistical significance that under

A regional econometric analysis obtained Demirgüc-Kunt and Levine, (1999).

The variables of government services (Public Administration and Defense, Education, Health and Social Work) are studied by the statistical significance that Ghani obtains under a regional econometric analysis (2011).

The general model used in the present study is given as:

$$\overset{\bullet}{y}_{it} = \alpha_i + \beta_1(y_0)_{it} + \beta_2(ki)_{it} + \beta_3(s_i)_{it} + \varepsilon_{it} \qquad (2)$$

Where i represents the index of the ith country, t denotes the period of time and is the specific intercept term for the ith country.

It is assumed that the error terms are distributed identically and independently with zero mean and constant variance.

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[6] The convergence hypothesis states that in certain circumstances, backward countries will tend to grow faster than rich countries, in order to close the gaps between the two groups..

The dependent variable is given as:

$\dot{y}$ = Real GDP growth rate per capita.
The independent variables are:
y_0 = Real GDP per capita (initial value).
k_i = Investment as a percentage of real GDP per capita (average).
The service variable (S) is specified as:
S_1 = Business services / GDP
S_2 = Government services / GDP.

The data source for the GDP per capita variables come from (Madisson Project 2013), the Investment comes from PWT 7.1 (Penn World Tables), the specialization variables come from the (Groningen Growth and Development Center for 10 sectors (GGDC10)). Regressions were made under the STATA V 9 program.

Results

For the two regressions, the coefficients of determination range between 10% and 21%. Regarding the two variables of services studied, business services and government services, (S1 and S2,) respectively have a positive association with growth, although only the variable of government services (S2) is statistically significant at 10%. The sign of the parameter of the variable of the initial value of GDP per capita has the expected negative sign in regression one, which indicates convergence. Investment as a percentage of real GDP per capita has a positive association with growth and is statistically significant at 10% in the two regressions.

All the previous findings are consistent with those obtained through cross-section regressions obtained from Gregorio and Lee (2003). They study the growth of countries in Latin America, the Caribbean and East Asia from 1960 to 2000. They find that at least 50% of the growth of these two regions is explained by investment, population growth and the quality of Human resources Institutional factors such as the rule of law, government consumption, macroeconomic stability and the degree of openness, explain the other half of the differences in growth between these regions.

In addition, these findings are also consistent with those obtained by Ghani (2011), who tests the hypothesis that services cause growth in a globalized and technologically developed world.

Conclusions

The performance of the economic growth of Latin American countries in the sixties, seventies, eighties, nineties, two thousand and two thousand and ten, has been shown in the results obtained from the empirical model of this study, where the effects of the variables of business services (Financial intermediation, Income and Business activities, (excluding owner income)) and government services (Public Administration and Defense, Education, Health and Social Work) present a positive association with the growth of income countries average in the average six decades.

In relation to the estimated results for Latin American countries, there is statistical evidence that strongly supports the validity of the hypothesis presented in this study, that is, the service variables have a positive association in economic growth. In this sense, the present study supports the hypothesis of Eichengreene and Gupta (2009), who affirm that there is a positive association between the services and the percapita gross domestic product of the countries, in addition that this is a regularity of growth for the economies in developing.

Finally, it can be affirmed that trying to increase the competitiveness of Latin American countries will necessarily imply increasing the development and growth of the high knowledge and human capital services sector; revving public policies in this regard, for the benefit of organizations in this sector.

That is, through the articulation and implementation of public policies that promote the national production of high-tech services and high specialization, it will be possible to increase the productivity, competitiveness and growth of economic activity between countries.

The findings and evidence in this study, allow the opening of new research on the sector in more specific subjects, such as the approach of the extractive sector and the construction sector, including public policies, the impact on the organizations included in these items and the way organizations in these sectors are influenced by internal and / or external factors in the countries of Latin America.

Annexes

	Coefficient	Standard error
Natural log of GDP Percapita	-0.0034	0.0071
Investment**	0.0012	0.0007
Business Services / GDP	0.00550	0.0505
Constant	0.0167	0.0549
Haussman		
Chi²	0.2110	
R² within groups	0.10	
R² between groups	0.55	
R² general	0.12	
Observations	45	
Sigma u	0	
Sigma e	0.0124	
Rho	0	

** Statistically significant at 10%

Table 1 Regression (1) random effects
Source: *Own Elaboration*

	Coefficient	Standard error
Natural log of GDP Percapita	0.0103	0.0160
Investment**	0.0025	0.0013
Government Services / GDP **	0.2700	0.1506
Constant	-0.1722	0.1768
Haussman		
Chi²	0.23	
R² within groups	0.21	
R² between groups	0.49	
R² general	0.34	
Observations	20	
Sigma u	0.018	
Sigma e	0.010	
Rho	0.74	

** Statistically significant at 10%

Table 2 Regression (2) random effects

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