

Economic resilience in Latin America: features and performance for selected countries in face of COVID-19

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RESUMO: A pandemia de COVID-19 apresenta desafios sem precedentes nos campos da saúde, economia, finanças e na estabilidade institucional para países desenvolvidos e em desenvolvimento. No entanto, especialmente para os países latino-americanos, muitos problemas estão associados a questões estruturais e cíclicas previamente determinadas, o que faz com que a pandemia (e suas consequências) se espalhe mais rapidamente, o que também proporciona dificuldades para a reconversão econômica dessas regiões. O objetivo deste artigo é identificar a capacidade de resiliência econômica de países selecionados da América Latina. Foram consideradas quatro dimensões: i) capacidade produtiva e ambiental, ii) financeira, iii) macroeconômica e iv) infraestrutura socioeconômica para analisar suas condições de vulnerabilidade em face do COVID-19. Adotou-se o método multivariado de Análise de Componentes Principais, no qual apresentou três características principais de resiliência com base nas quatro dimensões especificadas. Ao mesmo tempo, foram mapeadas as principais medidas e o momento das ações durante a crise. A análise dos principais componentes sugere que o desempenho dos países da América Latina sejam chamados de países com maior magnitude macro-financeira; países com maior dependência financeira e, por último, países com maior deficiência estrutural. Os resultados também reforçam as características heterogêneas encontradas nas dimensões do estudo. O artigo sugere que o controle da pandemia no curto prazo está relacionado à capacidade de coordenação dos governos em suas diversas instâncias, além da flexibilidade de políticas econômicas e do apoio à políticas sociais que minimizem os impactos sobre renda, desigualdade e medidas de saúde. Com isso, a capacidade de resiliência dos países dependerá da definição de estratégias de longo prazo que promovam um desenvolvimento econômico mais inclusivo e sustentável.

Palavras-chave: COVID-19; Crise, Países Latino americanos; Resiliência Regional.

ABSTRACT: The COVID-19 pandemic poses unprecedented health, economic, financial, and institutional stability challenges for developed and least developed countries. However, especially for Latin American countries, many problems are associated with structural and cyclical issues previously determined, which has meant that the pandemic (and its consequences) will spread more quickly, which leads us to infer about difficulties for the economic reconversion of these regions. The objective of this article is to identify the capacity of economic resilience for selected countries in Latin America has been considerate four dimensions: i) productive and environmental capacity, ii) financial, iii) macroeconomic and iv) socioeconomic infrastructure in order to analyze its conditions of vulnerability in the face of COVID-19. Adopting a multivariate method of Principal Component Analysis, we identify three main characteristics of resilience based on the four dimensions. At the same time, the main measures and the timing of actions during the crisis were mapped. The principal component analysis suggests that Latin American countries performance into three main components called of Macro financial; Financial dependence and Structural deficiency reinforces the heterogeneous characteristics found in the dimensions of the study. Our paper suggests that the control of the pandemic in the short term is related to the coordination capacity of governments in their various instances, in addition to the flexibility of economic policies and support for social policies that minimize impacts on income, inequality, and health measures. The resilience capacity of the countries will depend on the definition of long-term strategies that promote more inclusive and sustainable economic development.

KEY WORDS: COVID-19; Crisis, Latin America Countries; Regional Resilience;

JEL code: H12; H50; R11;

Área de submissão: 5 - Crescimento econômico e desenvolvimento regional

INTRODUCTION

Since the last financial crisis (2008), countries (and markets) have not experienced such an intense period in terms of instability and uncertainty. The prognosis for the socioeconomic impacts of the COVID – 19 will be worse than the 2008 global financial crisis because of its ubiquity; its underestimation and unpreparedness (specially by the institutions and regulatory frameworks); given the speed of (global) contagion, the uncertain time horizon of duration and mainly because the pandemic will overwhelm many national health systems and cause huge economic and human damage (LUSTIG & MARISCAL, 2020).

Unlike previous capitalist system crises marked by, on the one hand, a historical dynamic of this means of production, on the other, by the rise and macroeconomic and financial mechanisms, in particular, by financial innovations and deregulation of markets (LÉVY & DÚMENIL, 2013), this crisis was caused by a pandemic that will affect all social classes in different ways (AHMED et al., 2020; LABORDE et al., 2020). The expectation is that the situation for developing countries will be more contractionary due to economic and financial restrictions, the bottlenecks of their infrastructure and productive structure, in short, the socio-economic situation already quite unfavourable in the period before the outbreak of the crisis (ECLAC, 2020a; WORLD BANK, 2020a,b; HEVIA & NEYMEYER, 2020).

COVID-19 recession is creating a crisis of inequality which it was large already, it will most likely be even larger as the time it runs its course. Spreading across the world, the pandemic has deepened an economic crisis, unemployment rates will rise substantially and weakened welfare safety nets further threaten health and social insecurity. According to OECD (2020a) Small and Medium Enterprises (SMEs) are the main job-creating firms harmed by the economic COVID-19 pandemic, more so than during the 2008 financial crisis.

Workers at smaller firms already tend to earn lower wages and in many times in informality conditions. According to Bell et al. (2020) aggregate shocks have different effects by size of firms, workers and gender. Many of the most affected industries in the short-run by the COVID-19 shock, such as hospitality and travel, contain a high proportion of female workers. This stands in sharp contrast to previous downturns, where male-dominated industries (such as finance, construction and manufacturing). Many Latin American and Caribbean (LAC) countries also have important tourism sectors, which they will suffer as well as services, SMEs and exports of basic products (FRANZ, 2020).

Major negative economic effects are associated with the loss of employment and wages, which can only be compensated to a limited extent by the much needed income support measures introduced by governments such as guaranteed incomes, tax relief, etc (LUCCHESI & PIANTA, 2020). As stated by these authors, the resulting fall in demand will further slowdown production, while the increase in health expenditure is unlikely to have significant expansionary effects on the economy as a whole. In some countries, such as Latin American case, a deterioration of the financial situation of SMEs could have systemic effects on the formal and informal employment, in tax collection and in the banking sector as a whole (ECLAC, 2020a,b,c). For emerging economies, the spread of COVID-19 are being introduced at the same time as there is a fall in the prices of raw materials (25%) and an increase in sovereign credit spreads (HEVIA & NEYMEYER, 2020).

Historically, Latin America and the Caribbean is the world's most unequal region, even though this inequality has reduced in the 21st century, in most of these countries (BOGLIACINO & ROJAS-LOZANO, 2017). This region has a rich history of severe adverse shocks, including precipitous falls in commodity prices, dramatic tightening of financial conditions, and major natural disasters (WORLD BANK, 2020a, b). These countries present systemic current account deficits are likely experience a sharp drop in capital flows. These shocks often cause strong recessions in this region (OCAMPO, 2017).

But the Covid-19 epidemic brings in a new dimension for Latin American countries because it unmasks the structural problems characteristic of the region, both on the demand side (internal and mondial) in which it was led by the recessionary shock and the preceding period of low economic growth (ECLAC, 2020a; b, WORLD BANK, 2020a) and also on the supply side which it is characterized by the dependence on commodity prices, international technological and financial flows (AKYÜZ, 2020, OCAMPO, 2017). It could have a strong impact on national economies and global growth prospects, on expectations, and even on the financial sector, which may already be under strain by non-performing portfolios.

Corroborating this diagnosis, Ahmed et al. (2020) highlight that COVID-19 could cost the world more than \$10 trillion and for each percentage point reduction in the global economy, more than 10 million people are plunged into poverty worldwide. As stated by these authors, considering that the poorest populations are more likely to have chronic conditions, this puts them at higher risk of COVID-19-associated mortality. Many households do not have the resources to cope with the lockdowns and quarantines needed to contain the spread of the epidemic. Many of them also depend on income transfer, or remittances, which are collapsing as activity shuts down in host countries, with migrant workers among the most affected (WORLD BANK 2020a, p. 06). Many workers are self-employed, and informality is common even among wage earners. Historically, countries like Brazil have shown high levels of inequality, which should be increased in the post-pandemic context (CARVALHO *et al*, 2020; NASSIF PIRES *et al*, 2020).

Latin America remains characterized by a set of very heterogeneous countries in terms of the degree of development and financial integration (MARTINS, 2017; BLANCO, 2013); different duration of adjustment period and alignments of exchange rate, monetary policy regimes, types and persistence of inflation (GIANNELLIS & KOUKOURITAKIS, 2013); level of development and complexity of productive structure (HARTMANN *et al*, 2020; 2016; CIMOLI *et al*, 2010); in terms of the degree of dependence on capital flow (AKYÜZ, 2020, OCAMPO, 2017); demographic and human terms, especially with respect to inequality (OCAMPO, 2017, BOGLIACINO & ROJAS-LOZANO, 2017, ECLAC, 2020a). These features let us to consider that these countries will have different patterns of resilience and, therefore, they presented different types of vulnerabilities to extreme shocks. As crises periodically disrupt the economic activity, a continuously part of the literature was dedicated to understanding the reasons behind the crises, their mechanism, effects and, most of all, the determinants of resilience capacity, and the ability to overcome hardships by adapting and changing.

From this brief contextualization, the objective of this article is to identify the features of economic resilience for 19 selected countries in Latin America having been considerate four dimensions: i) productive, ii) financial, iii) macroeconomic and iv) socioeconomic infrastructure, in order to analyse its conditions of vulnerability in face the COVID-19 shock. Once identified the characteristics of resilience in each studied country, the idea is to verify how these countries have responded to the pandemic in terms of actions and measures to control the pandemic. There are few studies that address the structural problems of LAC countries and their vulnerability using the perspective of regional economic resilience. Therefore, this work also aims to fill this gap.

The main hypothesis is that small LAC countries are more lead to exposure to exogenous shocks and economic vulnerability, having less capacity for economic resilience and it being the most affected by the pandemic in the short term. Faced with this recent scenario and uncertainty caused by this pandemic, the main contribution of this article is: i) to identified the components that most explain the resilience in LAC countries and ii) which most contribute to its vulnerability and iii) identify the capacity of the reaction provide by the central government for LAC against the pandemic.

The approach adopted in this paper is based on general government documents, data and news published on institutional websites and newspapers. It does not consider procedures related to the process of implementing measures by central governments and the federative units. Finally, as the pandemic is still progressing, this work presented information on the design of public and institutional policies that support its operationalization at the moment (June of 2020) and that can contribute to reflection by the policy makers in addressing the Covid-19 pandemic and other future shocks.

The paper is structured as follows: Section 1 discusses relevant literature to understand the general economic and structural characteristics of Latin American countries and also part of the low economic resilience of these countries which affects its vulnerability to shocks. For this purpose, four dimensions of resilience were considered in our analysis: social infrastructure, macroeconomic, productive and financial structure. Section 2 describes the data and provides the summary statistics on the economic resilience. Section 3 describes the empirical methodology and Section 4 details results from the short-term analysis, relating the characteristics of the resilience to the spread of the coronavirus in these countries. Lastly, final remarks will be made.

1. CRISIS, VULNERABILITY AND ECONOMIC RESILIENCE FOR LATIN AMERICAN COUNTRIES.

The coronavirus pandemic can be considered a contractionary shock of an external order - due to the effects of the pandemic worldwide, but also internal, affecting all levels of disaggregation: from sectorial, regional, institutional to political. The impact of COVID-19 crisis is also differentiated within countries, with some regions and cities being harder hit than others. The ability of governments to work in a coordinated manner in its different levels (international, national and subnational), scale and effectiveness of the measures implemented are fundamental for an effective response to the crisis. However, the first impacts of the pandemic in Latin American countries have shown its structural weaknesses and the lack of a joint effort of regional coordination to control this crisis, as will be revealed in this work.

The heterogeneous structural conditions of the LAC countries has been studied since 1940's. Authors such as Furtado (1961a, b), Prebisch (1962), Pinto (2000) and Rodríguez (2009) highlighted the high structural heterogeneity and the international insertion began in the periphery, the low capacity for accumulation and innovation, the high income inequality which makes it difficult to form an internal market vigorous and the strong external restriction to growth (as a result of the high productive specialization) as obstacles to the LAC development.

As stated by Marconi, Rocha & Magacho (2015), since the Structuralist approach of Latin American thinking¹ to the 'New Developmentalism theory'² have reported the limitations of promoting economic development based on a productive trade structure of low value-added products; on the negative effects of currency appreciation in the manufacturing sector caused by exports of commodities (the 'Dutch disease'); the vulnerability of the exchange rate and the effects on the competitiveness and deindustrialization (Ibid. p.472). For Rodríguez (2009, p. 84-85): in the periphery, industrialization took place late and it was featured by more restrictive and disadvantageous economic conditions; by backward and modern productive sectors at the same time, which intensified heterogeneity and specialization.

Akyüz (2020) identifies four factors as being potentially instability in countries characterized by commodity production: the commodities price, exportation level, the

¹See, for example: Prebisch (1962); Furtado (1961 a,b); Pinto (2000); Rodríguez (2009) and for a synthesis of the evolution of ECLAC ideas in LAC countries: Domínguez et al (2019).

²See, for example, Bresser-Pereira (2020; 2009); Bresser-Pereira, Oreiro & Marconi (2015).

international interest rate, and the exchange rate. The interest rate, specially determined by the FED in the United States, and the exchange rate are important driving factors of the commodities price and production, affecting economic dynamics, price vulnerability and the dependence of LAC countries. The structural conditions in Latin America, associated with the effects of the local and international economic situation reflect the low economic performance of these countries in recent years. The pandemic has affected the global economy and the trade between China and Latin America. Exportation from South America to China decreased 24.4% in sectors as mining, commodities and soy. The most affected countries are Argentina, Brazil, Chile, Peru because more than 20% of their exportation is to China (ECLAC, 2020b). In terms of manufacturing, losses will be greater mainly for Brazil and Mexico. The disruption in supply chain may decrease 5.2% of Brazilian manufacturing and 6.5% of Mexican manufacturing, ECLAC (2020b,c).

Productive specialization in the primary sector increases economic losses in crisis contexts. The Latin America countries have been affected by the reduction of output and exportation level, the fallen in manufacturing prices, and the collapse in oil price and as consequence the interruption in the supply chain ECLAC (2020b). The collapse in oil prices can be a relief to the oil-importing Caribbean and Central American economies, it affects fiscal and external accounts of several South American countries, as well as Mexico and Trinidad and Tobago; Chile and Peru suffer from the decline in copper prices OCDE (2020b). Finally, financial volatility, the worsening of financial conditions and large capital outflows have brought a strong depreciation of LAC currencies and the reduction of financial assets in debt and equity markets, affecting the solvency of large LAC companies (Ibid, p.4).

A recent study provided by IMF (2020) proposed the COVID-19 impact have been worsen the inequality, poverty, and wages at the same time it causes the supply chain disruption and it has the negative effects on GDP. According to ECLAC (2020c), the 5.3% drop in GDP and the 3.4 percentage point increase in unemployment would have a direct negative effect on household income and their possibility of having resources enough to satisfy basic needs. According to this report, the poverty rate would increase 4.4 percentage points during 2020, which means an increase of 28.7 million people in poverty. For its part, poverty extreme would grow 2.5 percentage points, which represents an increase of 16 million people (Ibid, p.16).

Another evidence of problematic situation aggravated by COVID-19 crisis in the LAC region is about the labour market. According to ECLAC (2020c, p. 14), the projections anticipate a deterioration in labor indicators in 2020. The unemployment rate would be around 11.5%, an increase of 3.4 percentage points compared to the 2019 level (8.1%). Thus, the number of unemployed in the region would reach 37.7 million, which would imply an increase of close to 11.6 million with respect to the 2019 level (26.1 million unemployed). Caribbean countries would suffer a greater fall due to the tourism sector, which is the source of more than 50% of employment in many of them.

Besides this, a feature of the labor market in LAC region is the informality. As disclosed by ECLAC (2020c), the high rate of labor informality in this area makes very vulnerable to workers to the effects of the pandemic and the measures to face it. The high participation of small and medium-sized enterprises in job creation (more 50% of formal employment) increases the negative effects, since this sector has been hard affected by the crisis. This recessive cycle has implications for gender inequality which will be accentuated by measures such as the closure of schools, social isolation and the increase in the number of sick people, as it will increase the overload of unpaid work for women (Ibid. p. 14-16).

Still fundamental issues for pandemic control refers to the population access to the health system, urbanization and sanitation needs. The expenditure health system as a proportion of GDP took in 2017 11,3% in Cuba and fluctuated around 9% in Brazil, Uruguay, Argentina and Chile, before the COVID-19 crisis. According to ECLAC (2020c), the LAC countries

invested on average 2.2% of GDP in health system in 2018 it is a low level according to World Health organization which defends the minimum budget of 6% of GDP for public health. Moreover, the low levels of the population using the sanitation in 2017 can be assumed the need for further social agenda which have to be implemented with the macroeconomic policies as an alternative to reduce the constraints (ROJAS-LOZANO, 2018).

The features of LAC countries help to understand the distinct patterns of resilience, vulnerability and difficulties facing responses to shocks, such as COVID-19. As much as countries like Brazil, Mexico and Argentina have managed to establish a relatively diversified production base and exportation, improving their insertion in international trade and internal economic development, many authors highlights the importance of the structural change to foster economic development in the long run, improving the sectoral composition of production, increase in this sector's competitiveness, the productivity and exports in products of higher complexity (ALENCAR et al, 2018; MARCONI et al, 2016; CIMOLI et al 2010).

However, the restrictions to develop a productive sector more complex and able to accumulating capabilities to produce more sophisticated goods and a deepening dependence on primary-commodity exports and services (often linked to tourism) have left most LAC economies in a position where minor changes to the global economy have significant effects, especially in a crisis scenario (FRANZ, 2020). According to this author, the drop in global demand, the collapse of commodity prices, and the decrease of international travel (mainly for tourism sector) worsened with the COVID-19 have intensified the crisis in the region.

For this reason, the discussion on regional economic resilience is fundamental. Identifying patterns of resilience is an important effort to protect against and deal with future and unexpected shocks. The regional economic resilience literature is well consolidated in Europe and the United Kingdom (PIKE *et al* 2010; SIMMIE and MARTIN, 2012; DAWLEY *et al* 2010; MARTIN, 2012; FINGLETON *et al*, 2012; MARTIN & SUNLEY, 2015; BOSCHMA, 2015; MARTIN *et al* 2016), but still not widespread in Latin America. In general, the authors cited define regional economic resilience as the ability to understand how regions, in their various scales, scope and conditions (macro and microeconomic) resist disruptive changes, recover, adapt and consolidate (or not) adaptive capacity in the face of natural or induced processes, such as catastrophes, natural disasters, financial crises, technological shocks, pandemics, etc.

So, the literature on economic resilience is important to analyze structural changes and define strategies for productive reconversion which it is essential to make the regions more resistant to contractionary shocks, or even to provide a short-term demand. The difficulty in producing certain goods, inputs and services aimed at coping with COVID 19 (such as respirators) and the restrictions on importing them revealed the urgency of this debate. As stated by Sensier & Devine (2018), it becomes imperative to design strategies for more resilient local industries, which, together with an analysis of the economic and industrial policies undertaken by Governments in their various administrative spheres. It is also important to analyse the processes for adaptation and regions' adaptability to new shocks - especially for regions with greater productive specialization, considered to be more vulnerable (TUPY et al, 2018).

Therefore, the discussion on regional economic resilience must bring together a coordinated effort between economic policy instruments (monetary, fiscal, exchange rate, credit), industrial policy, regional policy and its various stakeholders (governments, public and private banks, firms of different sizes, shareholders). The recession caused by a pandemic is of a particular nature, in which the continuity of operations and the maintenance of the productive capacity of many firms, whose services are not considered essential, is not possible. Thus, the general nature of the halt in activities tends to worsen the conditions for job recovery in the post-crisis period. The adjustment process tends to be slower and the possibilities for rehiring

smaller in cases where a large number of workers are moved simultaneously (NYSTRÖM, 2018).

It's important to highlight the specificity of the ubiquity of this COVID – 19 crisis and its scale. The greater the supply and demand connections between local firms, the greater the spread of the shock. For example, as in part of the LAC countries, which regions with particular economic structure (i.e. mining areas in Chile, Peru, Bolivia, Brazil and Mexico) having a particular firm or sector as an essential element of their productive and employing base, served by a network of diverse suppliers and derived activities that depend fundamentally on this central activity. If that sector/ main firm is hit by the shock, closing or going through a drastic downturn, it can lead to bankruptcy and decline for much of the remaining regional economy.

According to Baldwin & Di Mauro (2020), the manufacturing sector is likely to be severely affected, hit by a “triple coup”. First, with the focus of the crisis on the main global industries - China, Europe and the United States - there is a direct interruption in the global supply, affecting production. This direct effect tends to be amplified by contagion through supply chains, making it difficult and more expensive to acquire imported industrial inputs (Ibid, 2020). This aspect becomes even more serious for LAC countries, highly dependent on the import of industrial inputs.

Therefore, the regional economic resilience literature can contribute to understanding the sectoral and regional dynamics of the crisis in the labor market will be fundamental for the definition of policies and strategies for mitigating damages in the short term. Or, in the same way, to identify and understanding the specifics and barriers of the LAC countries, it seeks to analyse, for example, the possibilities of adapting the local productive structure from the shock, based on the idea of adaptability, that is, the capacity of the regional economy to recombine its productive resources.

Understanding the characteristics of LAC countries allows to identify the factors affecting the adaptation-adaptability relationships, mainly economic-structural, political, institutional including the endogenous and exogenous dynamics. Summarized, the purpose of identifying the resilience patterns is to map these conditions and bottlenecks of LAC countries that enhance their conditions of vulnerability in the face of shocks and, in doing so, contribute to the definition of short, medium-term economic actions and strategies and long term that assist in the economic recovery of the countries through more inclusive and sustainable economic growth in the post-pandemic context.

2. RESILIENCE INDICATORS

The discussion of economic resilience to COVID-19 effects in Latin America will be realized through an ex-ante analysis. This ex-ante resilience discussion will be based on the identification of certain categories of indicators that might reveal some advantages and some fragilities in countries structures to deal with and respond to the Pandemic and its impacts. However, the restriction of available information in the sort-run inhibits a complete coverage of all relevant characteristics inherent to resilience indicator of the LAC countries. Therefore, to measure the degree of resilience of the selected nations, a range of indicators were selected to make it possible to cover key dimensions, based on the available statistics.

The national previous capacity to resist to the early impacts of COVID-19 will be analysed in four different dimensions: socioeconomic infrastructure; macroeconomic conjuncture, financial and banking structure; and productive structure and environmental capacity. Each of these group of variables aims to reflect important features of countries responses related to social and health conditions of populations, institutional capacity to react and implement policies, conditions to keep social distancing and to support affected firms and

households and possibilities to re-orientate and restructure economic activity due to Pandemic context.

There are several aspects that make low (and developing) income populations more heavily contaminated by the COVID-19, such as the use of public transport, the bigger number is of residents per household, lack of access to sanitation basic and to health, difficulty to maintain social isolation without excessive loss of income or employment (AHMED et al., 2020; CARVALHO et al, 2020; NASSIF et al, 2020). So, the indicators of socioeconomic infrastructure (X_1 to X_3) seek to identify the factors that characterize a social vulnerability, through life expectancy, health expenses and mortality due to the lack of basic infrastructure. The coronavirus crisis exposed problems typical on poor countries, such as higher inequality of income, lethality in slums and on the periphery of cities, poor infrastructure and difficulties in accessing basic conditions for survival, famine (RAVAILLON, 2020; LABORDE et al, 2020). In LAC area, health care systems are under pressure, reflecting old bottlenecks before the pandemic, huge debts and fiscal crisis (EICHENGREEN, 2020), austerity policies and lack of resources for the health system (FRANZ, 2020; OECD, 2020a,b; ECLAC, 2020,a,b). Countries with greater social vulnerability tend to be less resilient to crises.

The indicators of macroeconomic dimension as GDP per capita (X_5) has been positively associated with economic resilience and negatively to the economic vulnerability which the less vulnerable countries could be more resilient as an economic success. The vulnerable employment (X_4) and inflation (X_6) variables may be associated with the economic policy implementation as a monetary related to the resilience of a shock-absorbing nature (BRIGUGLIO et al 2009; BRISTOW & HEALY, 2017). The government budget position has been associated with fiscal policy, which is one of the main tools available to the government that explains the resilience of a shock-counteracting nature (BRIGUGLIO et al 2009) represented by General government net lending divided by borrowing (X_7) it can be viewed as an indicator of the financial impact of general government activity on the economy.

In this way, the variables X_8 a X_{10} , refers financial dimension and intend to verify the capacity of the national financial system to provide external resources to firms and households. During economic crisis, firms experiences reductions in their monetary flows, revenues and profits as well as in in the value of their assets and, then, a decrease in the value of possible collaterals (BLANCHARD, 2009). In this sense, the access to the financial system is essential to allow firms to resist at some level to the impacts of the shock, keeping their employees and, in last instance, remaining viable and avoiding bankruptcy (BLANCHARD, 2009; MARTIN & SUNLEY, 2015). This is even more relevant during the Pandemic, in which the economic shutdown exacerbates the disruption in firms' monetary flows, especially those treated as non-essential (BALDWIN & DI MAURO, 2020). The variable (X_8) private credit to GDP (%), can be understood as a proxy for the depth of the national financial sector (BRIGUGLIO, 2016). The credit to deposit ratio (X_9) is a general measure of liquidity in the banking system and the number of bank branches per 100.000 adults (X_{10}) is a measure of financial access.

Lastly, the dimension of productive and environmental capacity (X_{11} to X_{13}) aggregate variables related to the gross domestic expenditure on research and development (R&D) as a percentage of GDP (X_{11}); the production based CO₂ productivity GDP per unit of energy-related CO₂ emissions (X_{12}); and population density per km² (X_{13}). The first indicator X_{11} represents the effort on the part of the governmental sphere to implement industrial and targeted policies in specific sectors, such as technological ones, with the objective of reinforcing innovation in Latin American countries. Thus, it is possible to identify the allocation of human capital on technological activity and the most qualified labor (CABRER-BORRÁS & SERRANO-DOMINGO (2007); AUDRETSCH & FELDMAN (1996); CARLINO *et al* (2001); BODE (2004); BILBAO-OSORIO & RODRÍGUEZ-POSE (2004)).

Regarding variable X_{12} , their objective is related to current levels of economic activity, that is, they also measure the damage caused by economic activity to human health and/or the environment. LAC countries have experienced rapid economic growth and intense industrialization over the years. The result of a dynamic of vigorous investments in issues related to urbanization, infrastructure and the prominence of a new consumer class in these countries, made the concern with sustainability stand out, paying particular attention to the fact that the increase of polluting gases in the atmosphere (HASCIC *et al*, 2010). Finally, the X_{13} indicator is intended to measure the size of the country. In other words, the indicator was used to capture the influence of spatial concentration and its performance related to population dynamism that can favour economic development and the resilience of countries.

The information used for the elaboration of the database is secondary and covers sources such as: World Bank Data (WBD), Organisation for Economic Co-operation and Development (OECD), The International Monetary Fund (FMI), ECLAC Database (2020). In Table 1, it will be possible to view a summary of all dimensions and their variables used in the construction of the resilience indicator. In addition, for better verification of the variables, all descriptive statistics are presented in Annex 1.

Table 1- Description of variables

Dimensions	Variables	Description	Database	Year
Socioeconomic infrastructure	X1	Life expectancy	World Development Indicators (WBD)	2017
	X2	Expenditure health system divided by GDP	World Development Indicators (WBD)	2017
	X3	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (per 100,000 population)	World Development Indicators (WBD)	2016
Macroeconomic Conjunction	X4	Vulnerable employment, total (% of total employment)	World Development Indicators (WBD)	2019
	X5	GDP Per capita (%)	International Monetary Fund (IMF)	2019
	X6	Inflation	International Monetary Fund (IMF)	2019
	X7	General government net lending divided by borrowing (Percent of GDP)	International Monetary Fund (IMF)	2019
Financial and Banking Structure	X8	Private Credit divided by the GDP (%)	World Bank	2017
	X9	Bank Credit divided by Bank Deposits (%)	International Monetary Fund (IMF)	2017

	X10	Number of commercial bank branches per 100.000 adults	International Monetary Fund (IMF)	2017
Productive Structure and environmental capacity	X11	Gross domestic expenditure on R&D: as a percentage of GDP (%)	OECD	2015
	X12	Production-based CO2 productivity, GDP per unit of energy-related CO2 emissions	OECD	2015
	X13	Population density - inhabitants per km2	OECD	2015

Source: Own elaboration.

Regarding the sample selection, two criteria were adopted. We considered the choice of LAC countries that until May 8 had presented at least 10 death by COVID 19, and, secondly, the availability of complete and recent data to compose the factors³. The variables refer to different years, to avoid problem of simultaneity and decrease issues related to the direction of causality.

3. EMPIRICAL DESIGN

The main purpose of this article is to identify the structural characteristics of the selected LAC countries through four important dimensions (socioeconomic infrastructure, economic, financial and productive) in order to identify *ex-ante* patterns of regional resilience between these countries. For this reason, a multivariate statistical analysis technique (Principal Component Analysis - PCA) will be used.

Principal Component Analysis is a widely used method to reduce the dimensionality of multivariate data. The technique allows expressing the information available in a few variables (components). In this way, the reduction in the number of variables will make the analysis and visualization of the data more simplified. However, the PCA method requires a choice between simplicity, with a small number of dimensions (variables) and completeness, that is, more dimensions that can capture a greater amount of information.

The main objective of principal component analysis is to group X_1, \dots, X_{13} variables and create Z_1, \dots, Z_{13} indices that are uncorrelated in the order of their importance and that explain the data variation (COOPER & MANLY, 2008). Therefore, the choice of the method aims to synthesize the variability of information regarding the countries.

The first main component, represented by Z_1 , is the linear combination of the variables $X = [X_1, \dots, X_{13}]$ with the greatest possible variance. The second component Z_2 , is given by the linear combination of X that explains most of the information not captured by Z_1 .

It is noteworthy that the PCA technique seeks to maximize variance, which can be highly sensitive to differences in scale between variables. Therefore, it is common to standardize the data that can be obtained by decomposing the eigenvalue of the correlation matrix. Each eigenvector, indicated by u , represents the direction of one of these main axes. The vector u controls the weights used to form the linear combination of X s, which results in the points of the main component, is represented as follows:

$$Z_i = Xs.u \quad (1)$$

³ According to Coronavirus Research Center database (Johns Hopkins University, 2020). Available at: <https://coronavirus.jhu.edu/map.html>. Access: 08th May 2020 and 12th June 2020.

Each eigenvalue, represented by λ , is equal to the variance of the main component Z_i . The covariance matrix for the main components, represented by D , is a diagonal matrix with $(\lambda_1, \dots, \lambda_i)$ diagonally. The sum of the variances of all the main components is equal to p , which is the number of variables in the matrix X . Therefore, the proportion of variation explained by the first major components is given by:

$$\sum_{i=1}^c \frac{\lambda_i}{p} \quad (2)$$

According to the interpretation of the main components, it is valid to observe loads of these components, which are defined as being the correlations between the original variables X and the main components Z . The load matrix, represented by F , can be calculated as:

$$F = UD^{\frac{1}{2}} \quad (3)$$

where U represents the matrix of eigenvectors and D the covariance matrix of the main components.

In this way, building the resilience main component for selected Latin American countries will help us to identify specific characteristics of resilience and relate them to the capacity of the countries will lead in post crisis.

4. RESULTS

The principal component analysis makes it possible to extract information in a condensed manner regarding the characteristics of the nineteen countries in the sample, considering the thirteen original variables (random vector)⁴. Table 2 shows the results of the PCA based on the percentages of the variance linked to each of the variables, the first component being represented by 27% of the data variability, the second component by 23% and the third by 14%.

Table 2- Proportion of variance explained through Principal Component Analysis (PCA)

Components	Explained Variance	
	Individual	Cumulative
Comp 1	27%	27%
Comp 2	23%	50%
Comp 3	14%	64%
Comp 4	10%	74%
Comp 5	6%	80%
Comp 6	6%	85%
Comp 7	5%	91%
Comp 8	4%	94%
Comp 9	3%	97%
Comp 10	2%	99%
Comp 11	1%	100%
Comp 12	0%	100%
Comp 13	0%	100%

Source: Own elaboration.

⁴ Tests were performed to capture the best adherence of the variables regarding the selected dimensions. The Alpha test, which measures the internal consistency or coherence of a group of selected measurement items, calculated based on the cross correlation between the items, indicated a good consistency (Alpha= 0.7253). As for the Lawley test, we reject the null hypothesis and conclude that there are probably differences in the correlations of the variables (Lawley =135.83;p-value 0.0000). About the tests for multivariate normality, all the tests not rejects the null hypothesis of multivariate normality (Mardia mSkewness = 131.254 (p-value= 0.1130); Mardia mKurtosis = 179.479 (p-value= 0.087); Henze-Zirkler= 0.994 (p-value= 0.0710)).

In the second component, the variability of the random vector accounted for 23% and also represents a strong weight in the representation of the variables. Then, the third component represents only 14% of the data variance. It is worth mentioning that the technique is used when the main concern is the minimum number of new variables (components) important to represent a large portion of the total variance of the original variables. As a basic principle, a minimum number of components is selected that reaches 70% of the total sample variance. Therefore, according to the results of the analysis of main components, there was a preference for the selection of the three main components of greatest weight. Taking into account the great weight of the first three components, which account for 64% of the variability of the set of information, the following will be discussed. Next, the results observed by the first three components, in contrast to the variation found in the other eigenvalues, equal and less than 10%.

According to the results of Table 3, it is observed that Component 1, presents countries with characteristics that match an advanced infrastructure in both macroeconomic and financial dimensions. Variables such as GDP (X5), Expenditure health system (X2) and Gross domestic expenditure on R&D (X11) stand out in relation to the weight between the groups of variables used. In addition, the first component stands out among the others for presenting characteristics of countries with great resilience, that is, that are able to overcome adversity despite the opposite external conditions. Therefore, we can call component 1 as “Macro-financial”. As examples of countries that fit, we have the following countries: Brazil, Chile, Colombia, Ecuador, Panama and Uruguay. However, just as there are positive characteristics of the resilience power of the highlighted countries, they also find characteristic aspects of Latin American countries regarding their inequalities as highlighted by the variables mortality rate (X3), vulnerable employment (X4), inflation (X6). As Rojas-Suarez (2015) reinforces that emerging countries usually do not take advantage of periods with more favourable economic conditions in favor of structural reforms. According to this author, recent evidence was the decline in the prices of commodity exports (2013–2014) which was not mitigated by previous reforms to overcome the savings gap in relation to investment. *The good years of high commodity prices were not used to protect these countries due to sharp drops in commodity prices* (Ibid, p.5).

Table 3- Coordinates of the variables of the four axes of the main components

Variables	Component 1	Component 2	Component 3
X1	0.3812	-0.3378	-0.0696
X2	0.3658	0.1815	-0.2255
X3	-0.2337	0.451	0.0264
X4	-0.0239	0.1511	0.4328
X5	0.3926	0.3078	0.0752
X6	-0.4059	-0.319	0.0294
X7	0.3200	0.3122	-0.0515
X8	0.2602	-0.1564	0.391
X9	0.3192	-0.1672	0.2282
X10	0.0362	-0.1298	0.4995
X11	0.1062	-0.2246	-0.5358
X12	0.1963	0.0713	-0.0726
X13	-0.1540	0.4560	-0.0188

Source: Own elaboration.

In the second component, lower values (weights) of the variables are visualized in the socioeconomic infrastructure and financial dimensions, mainly life expectancy (X1), financial

depth, liquidity and financial access (X8, X9 and X10) and gross domestic expenditure on R&D (X11). The result represents countries with a lower resilience capacity compared to component 1, representing countries with great social and economic inequalities, which can be called Financial Dependence. This component is composed of the countries: Dominican Republic, El Salvador and Haiti. The characteristics presented confirm the behaviour of countries marked by social, institutional and cultural tensions, in addition to situations associated with crime, drug trafficking, wars or guerrilla movements. Also, the structural economic bottlenecks whose restrictions make them dependent on foreign capital. The recurrent dependence on external resources, the worsening of external debt and high indebtedness rates make these countries more vulnerable to adverse external shocks (AKYÜZ, 2020; ROJAS-SUAREZ, 2015, RODRÍGUEZ, 2009).

The last component to be analysed corresponds to 14% of the data variability, providing the characterization of regions with low life expectancy (X1), expenditure health system (X2), gross domestic expenditure on R&D (X11) and production based CO2 productivity (X12). These results indicate that, despite the minimal macroeconomic and financial conditions, countries face a low effort in their Productive and environmental capacity, which can be called Structural deficiency. In this configuration, the following countries stand out: Bahamas, Bolivia, Guatemala, Honduras and Venezuela, markedly, countries with high productive specialization. In addition to the inequalities and conflicts associated with Latin American countries, in this dimension, unlike other components, there is a low investment in R&D. This result seems to reflect the actions of countries that have technological segments of medium and low sophistication and little based on internal R&D expenses to firms in the countries (CABRER-BORRÁS & SERRANO-DOMINGO, 2007; HARTMANN et al, 2016).

Figure 1: Latin American Countries and the Principal Components



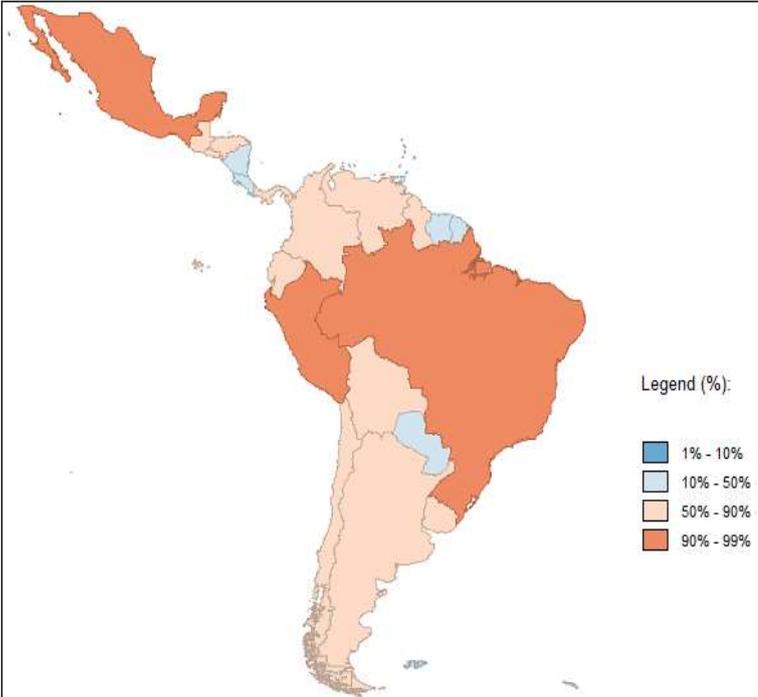
Source: Own Elaboration based on the PCA results.

After the analysis of the three main component analysis and their dimensions of resilience, it is important to compare the main information about the evolution and actions in relation of the government of the selected countries. Considering the evolution of the growth rate of the number of deaths, the analysis of data referring to the period from May 8 to June 12, 2020 shows that countries like Guatemala (1352%); Nicaragua (1000%), Chile (829%), Mexico (438%); Haiti (433%). Bolivia (423%), Brazil (342%), Peru (274%) and Colombia (270%) highlighted among others LAC countries. In terms of absolute numbers of deaths, stand out, respectively, from highest to lowest: Brazil, Mexico, Peru, Ecuador, Chile, Colombia (Figure 2).

In general, most LAC countries reacted quickly to the crisis, with Peru standing out in the first place. Indigenous populations in countries such as Peru, Ecuador, Bolivia and Mexico are very vulnerable to pandemics, as they have more informality, precarious sanitary conditions, lack of social protection and high rates of other diseases (malaria, dengue, tuberculosis, hepatitis, etc.). In addition, the COVID crisis was propagated in the midst of one of the region's biggest migratory crises (OECD, 2020a).

Initially, some coordination efforts between Central Governments were taken together. For example, the Forum for the Progress of South America (PROSUR)⁵ held a meeting in order to establish joint planning and actions in a "coordinated and efficient way" for public health emergency, establishing diverse measures of cooperation. Also, the countries of the Central American Integration System (SICA) met virtually and derived from it approved a 'Contingency Plan Regional', basically for jointly acquire supplies and medical equipment, to make available coordinated communication and response related to health and risk management (OECD, 2020a).

Figure 2 - Percentage map of the number of deaths by COVID-19



Source: Own elaboration, based on Fonte: Coronavirus Research Center database (Johns Hopkins University) at 12th June 2020.

In order to summarize the current panorama of the evolution of the pandemic in LAC and the main measures of containment proposed by the Central Governments, the Table 4 should be considered. From the ECLAC Database (2020), it was found that among the 6 countries with the highest number of deaths on June 12, Brazil and Peru have adopted more measures in terms of Movements, Health, Social Protection and Education. Unlike Peru, Brazil has presented more measures in terms of Economy and Labor. According to these informations, Mexico's situation is very problematic as it is one of the most populous and unequal LAC countries and one of which the pandemic has evolved more, at the same time, it is one of the countries that has least implemented measures (one of the least health expenses).

⁵ The Forum for the Progress of South America (PROSUR) is composed by the Heads of State of Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Bolivia (observer) and Uruguay (special guest). For more details, please check OECD (2020a).

On the other hand, countries such as Honduras, Guatemala, Bolivia and Colombia fit like the worst indicators in terms of inequality, poverty and life expectancy among the countries analysed having made some efforts mainly in terms of emergencial support to Social Protection and Labour (Honduras). Other countries with high poverty incidence such as Haiti, Panama and Honduras have concentrated short-term measures on the Economy, Labor and Social Protection. According to ECLAC Database (2020), the largest number of actions in the Social Protection category refer to cash transfers (applied by 61% LAC countries) followed by food transfers (applied by 42%). Also according to these data, 82% of LAC countries presented Labor Protection Measures. The general scope of the measures adopted by the LAC central governments are summarized in the table 4 (below):

Table 4: General measures announced by the LAC countries in the face of COVID-19*

The countries of the region have implemented immediate measures to contain the virus, protect the workforce and household income	
Restriction measures and traveler monitoring from areas affected by COVID-19.	Total or partial quarantines with labour agreements which include legal measures for teleworking, reduction of working hours, introduction of schedules flexible, early vacations and protection to layoff workers
Flight bans (to and from countries specific) and border closures	Protection of the workforce and income through salary support to compensate for losses of income with advance payments, wage subsidies or through the strengthening of unemployment insurance, suspension or reduction of contribution payments of water, gas and electricity services or funds private pension.
Distance learning and home schooling (with asymmetries in connectivity).	Social protection to reduce social impact in the poorest through subsidies, transfers cash or advance payments, social programs and social protection mechanisms.
Social distancing with closure of restaurants, pubs, cinemas, telework promotion and reduction office hours	Special financial support for SMEs, other companies and the informal sector through renegotiation and improving bank credit conditions
Strengthening the capacity of the health sector in terms of beds, mobile hospitals and supplies doctors; the health infrastructure in the region is fragmented and insufficient (just over two beds per 1,000 people)	
Monetary, fiscal and social measures in order to avoid collapse of the economic system	
Monetary and financial measures to preserve bank liquidity, support trade, and address debt public and private; reduction of central bank interest rates and opening of credit lines specials, issuance of additional loans, extension of terms for repayment of credits (consumers and companies) or extension of mortgages.	
Fiscal measures that include flexibility to redirect state budgets, proceed to tax relief tax, delay the deadlines for filing tax returns or tax exemptions for certain economic sectors; finance ministers should reorganize budgets and seek additional financing to channel resources towards urgent short-term measures. Argentina, Bahamas, Barbados, Belize, Brazil, Chile, Colombia, Guatemala, Honduras, Jamaica, Paraguay, Peru, Trinidad and Tobago and Uruguay have implemented fiscal packages ranging from 0.6% to more than 10% of GDP if they are included state credit guarantees.	
Measures to preserve the productive capacity and create conditions for the reactivation of the activity economic through liquidity mechanisms for companies, in particular for SMEs	
Measures to expand social protection systems to reach underemployed workers or Freelancers, youth, women, boys, girls and the elderly.	

*Note: Updated and more detailed measures can be checked at: <https://www.cepal.org/en/topics/covid-19>.

Source: ECLAC (2020c, p. 28)

In addition to measures of directly cash and food transfer followed the suspension of payment for services basic (water, energy, telephone and Internet) and the increase in the amount of money transfers existing. Most of the actions were taken to business policy, employment and income in this initial stage of the pandemic.

The fiscal and monetary policies have been implemented as an alternative to avoid the economic breakdown in Latin American countries and to provide credit temporarily reducing the costs of the outbreak. As can be seen by table 4 the measures implemented by LAC countries

has been generally marked by monetary policies characterized by reduction of interest rate, the reduction in reserve requirement and creating different credit lines in order to support small and medium-sized businesses and employment.

It should be noted that initially the LAC countries engaged in a joint coordination effort to contain the COVID epidemic. However, as the situation in each country worsened, this joint effort is being dissipated, which has compromised the effectiveness of the emergency measures adopted. A problematic contrast is the Brazilian case, in which the Central Government has been lethargic and catastrophic in making decisions in attendance to emergency demands, operating in an uncoordinated manner and contrary to State instances. The country is going through one of the worst political and institutional crises, impacting, for example, the replacement of 3 Ministers of Health only during the COVID crisis. Finally, it should be noted that the resilience conditions presented in this article are *ex ante* to the pandemic, therefore, political components can worsen these conditions, even in the short term.

CONCLUSION

The COVID-19 crisis highlighted the structural heterogeneities and the economic situation that LAC were already experiencing before the pandemic. Considering these specificities, the aim of this article was built to fill a gap in studies on regional economic resilience for Latin American countries frequently exposed to the diverse shocks. For this, the features of economic resilience for selected LAC countries had identified in order to analyse its “*ex ante*” situation in the face of COVID 19 pandemic. Also, the main measures applied by their Central Governments have been identified.

As general result, it was found that, as predicted, there is a clear pattern of less resilient countries and their vulnerability to shocks. Although these countries are being served in the short term by emergency policies, their structural characteristics will compromise their ability to recover in the medium and long term. In addition, in order to exacerbating external dependence (and debt), increasing their vulnerabilities to shocks. On the other hand, countries supposedly more resilient, like Brazil (with the political crisis) and Mexico (lack of actions), have been affected by the lack of coordination of emergency policies in the short term. For the long term perspective, these countries will also tend to be affected, especially due to their vulnerability to crises, indebtedness, problems of deindustrialization and reprimarization of the exportation, loss of competitiveness, absence/ ineffectiveness of structural reforms, etc.

Also, it was verified that the indicators of socioeconomic infrastructure measured by life expectancy, health expenses and mortality level have been worsened by previous austerity policies and lack of resources for the health system get worse the social vulnerability, intensifying the economic one. The macroeconomic dimension shows that the expansionary fiscal policy is positively related to economic resilience and negatively to the economic vulnerability and the less vulnerable countries are more resilient as a result of the resilience of a shock-absorbing and the resilience of shock-counteracting nature. The evidence of financial dimension strengthens the capacity of the national financial system to provide resources to firms and households and ensure the access to the financial system is essential to allow firms to resist at some level to the impacts of the shock, keeping their employees and avoiding bankruptcy. About the dimension of productive structure and the resilience of countries, it is important to reinforce the importance of this moment to improve countries' public policy agendas for questions of productive, technological and scientific development after the pandemic.

The fragility of the countries is visible, which puts at risk all discussions about the productive and technological base. Thus, the role of the State in increasing the country's productive capacity and trying to minimize the impacts generated by the economic crisis due to the pandemic must be made a priority in policies conducted in the short and medium term in the countries under study. In addition to the vulnerability and low resilience in most countries,

the characteristics seen in the selected dimensions, point to a rather pessimistic scenario in the long run, if government measures are not taken.

Also, this paper reinforces that the control of the pandemic in the short term is related to the coordination capacity of governments in their various instances, in addition to the flexibility of economic policies and support for social policies that minimize impacts on income and inequality, in addition to health measures. It is also necessary that the LACs government deepen the conditional cash transfer programmes, income support and social protection to the poorest to the unemployed and underemployed workers and the opening of credit lines specials, tax relief and additional loans to the SMEs. The resilience capacity of the countries will depend on the definition of long-term strategies that promote more inclusive and sustainable economic development. Further, the innovation policies and diversification process can lead to the productivity growth and productive reconversion building up the structural changes in the long term.

Finally, the coronavirus crisis could be the chance to LAC countries stimulate the debate, to guide and implement strategies of more sustainable and inclusive economy, revitalizing industry, preserving vital biodiversity systems and tackling climate change. As stated by Pikety (2020), the Covid-19 crisis can accelerate the adoption of a new, more equitable and sustainable development model under certain conditions in terms of a clear change in priorities, with monetary and fiscal working to the benefit of the real economy and used to serve social and ecological goals.

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ANNEX 1

Table A.1– Descriptive statistics for all variables

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
X1	19	74.4561	3.6418	63.66	80.04
X2	19	6.8421	1.9998	1.2	9.5
X3	19	3.0421	5.3203	0.1	23.8
X4	19	37	14.5665	14.01	72.27
X5	19	-1.2849	7.7278	-32.135	4.349
X6	19	504505.9	219906	-0.065	95854
X7	19	-3.3801	2.274	-10.007	0.089
X8	19	45.6769	22.271	13.385	108.6072
X9	19	96.9947	41.6145	39.72511	211.6899
X10	19	16.5779	9.08	2.6354	40.75032
X11	19	0.2068	0.1738	0	0.6
X12	19	5.8552	2.7633	1	12.38
X13	19	81.2273	106.4315	3.57	385.42

Source: Own elaboration.

Table A.2 – Correlation Matrix

Variables	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13
X1	1												
X2	0.3266	1											
X3	-0.808	0.0465	1										
X4	-0.15	-0.07	0.2367	1									
X5	0.1293	0.5747	0.0274	0.0528	1								
X6	-0.155	-0.683	-0.075	-0.023	-0.967	1							
X7	0.2287	0.4085	0.069	0.1147	0.669	-0.706	1						
X8	0.4326	0.1944	-0.301	0.0043	0.243	-0.167	0.034	1					
X9	0.51	0.166	-0.375	0.1503	0.193	-0.185	0.195	0.502	1				
X10	0.1025	-0.112	-0.162	0.1877	0.097	-0.018	-0.204	0.341	0.065	1			
X11	0.4043	0.3125	-0.317	-0.362	-0.124	-0.01	-0.086	-0.163	0.017	-0.224	1		
X12	0.2768	0.2745	-0.056	0.0678	0.189	-0.219	0.152	-0.066	0.345	-0.201	-0.082	1	
X13	-0.579	0.0676	0.7094	0.1288	0.115	-0.11	0.269	-0.232	-0.341	-0.221	-0.331	0.06	1

Source: Own elaboration.