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https://doi.org/10.3390/buildings14010267

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The Effects of Economic Sector GDP on Low-Income Housing Supply, Colombia's Regions Case

Carlos Felipe Urazán-Bonells [1], Hugo Alexander Rondón-Quintana [2] and María Alejandra Caicedo-Londoño [1,*]

[1] Facultad de Ingeniería, Universidad de La Salle, Bogotá 111711, Colombia
[2] Facultad del Medio Ambiente y Recursos Naturales, Universidad Distrital Francisco José de Caldas, Bogotá 110321, Colombia; harondonq@udistrital.edu.co
* Correspondence: macaicedo@unisalle.edu.co; Tel.: +57-3178896874

Abstract: The regions with the best economy have a greater capacity to develop low-income or social-impact housing, thus contributing to the reduction of poverty and, therefore, to the fulfillment of Sustainable Development Goals. This is observed in fewer people living in extreme poverty and with fewer unmet basic needs. This present article analyzes the correlation between the development in the main economic sectors in different regions (departments) of Colombia and the supply of low-income housing. Nevertheless, the most remarkable relation that was found was between the economic development of the regions (GDP) and the supply of non-social housing (more expensive commercial value) (Spearman's Rho: 0.9). This means that there is an imbalance between regional economic capacity and the low-income housing supply because the regions with higher economic potential should have a less demanding population, that is, people living in poverty. These correlations are better when they go hand in hand with activities that are mostly developed in an urban environment, such as manufacturing, construction, real estate, and finance and insurance. On the contrary, these correlations are worse with industries such as mining and agriculture that mostly operate in rural areas. The analysis between low-income housing and economic sectors' GDP yields low correlations, but these are worse for rural industries. Also, the investigation shows a positive change in the correlations' trend for the year 2021, the beginning of the post-pandemic economic recovery.

Keywords: low-income housing; Gross Domestic Product (GDP); unmet basic needs (UBN); Sustainable Development Goals (SDG)

Citation: Urazán-Bonells, C.F.; Rondón-Quintana, H.A.; Caicedo-Londoño, M.A. The Effects of Economic Sector GDP on Low-Income Housing Supply, Colombia's Regions Case. *Buildings* **2024**, *14*, 267. https://doi.org/10.3390/buildings14010267

Academic Editor: Yung Yau

Received: 28 November 2023
Revised: 9 January 2024
Accepted: 12 January 2024
Published: 18 January 2024

1. Introduction

The unmet basic needs (UBN) are indicators that identify the levels of poverty in the regions. The trend in Latin America, and therefore in Colombia, is that in its regions (or departments) with the best economic level (measured from the Gross Domestic Product, GDP per capita), they have the lowest index of extreme poverty or UBN.

The UBN are measured in different socioeconomic aspects, including the material condition of the housing, the lack of basic public services, and overcrowding. These aspects are related to the need to generate low-income housing for the population with the greatest needs, and thus contribute to reducing their UBN and helping them overcome the condition of poverty. Additionally, the generation of low-income housing contributes to compliance with the Sustainable Development Goals (SDG). A review of the 17 SDG [1] shows that one of the common elements between No. 1 "No Poverty", No. 6 "Clean Water and Sanitation", and No. 11 "Sustainable Cities and Communities" is to generate satisfactory housing for the poorest communities. Whether it is new home ownership, improved home ownership, or rental housing, it must be provided with the minimum quality standards in order to help improve the indicators for these three SDG.

The construction of housing for low-income households is one of the options to help reduce poverty in a developing country such as Colombia, according to the Colombian

Ministry of Housing, City, and Territory (2022) [2]. Low-income or social interest housing (VIS, in Spanish) has the social function of being the lowest-priced: "VIS has the elements that ensure habitability and that meet the quality standards of urban, architectural, and construction design. Their maximum value is equal to one hundred and thirty-five current legal monthly minimum salary (135 SMLM) (SMLM: in spanish: Salario Minimo Legal Mensual, which amount to 1.163 million Colombian pesos (COP) in 2023)." Housing units that, due to their sale price, exceed the VIS value, are called "no-VIS housing" and are not intended to favor low-income households.

The hypothesis posed by this article is that the regions with the highest level of income in Colombia are those with a tendency to develop fewer VIS housing units because they have a lower percentage of the population in extreme poverty and with fewer housing needs. This is supported by high correlation values and negative signs (Spearman's rho < -0.7) for the 33 departments of Colombia (Table 1). In order, the highest correlations of GDP are with the percentage of UBN inhabitants, percentage of inhabitants in extreme poverty, percentage of overcrowding UBN inhabitants, percentage of housing for UBN inhabitants, and percentage of basic public services for UBN inhabitants. The rho values for the first three indicators are close, which could mean that the majority of inhabitants with UBN are in extreme poverty and live in overcrowded conditions. Also, another observation is that the coverage of home public services is relatively well-distributed at the national level, which is why the correlation between the GDP of the departments is not so strong with the number of people lacking these services (rho = −0.75).

Table 1. Rho value for the correlation between Colombian regions' GDPs per capita, UBN conditions, and inhabitants in extreme poverty.

Percentage of UBN Inhabitants	Percentage of Inhabitants in Extreme Poverty or Misery	Percentage of Overcrowded UBN Inhabitants	Percentage of Housing for UBN Inhabitants	Percentage of Basic Public Services for UBN Inhabitants
−0.84	−0.82	−0.80	−0.75	−0.75

A huge social problem is the relationship between economic growth and low-income housing. This is exposed by entities such as the Inter-American Development Bank (IDB) by stating that the housing sector, in Latin America and the Caribbean (LAC), has historically been affected by the economic situation in this territory, as recently demonstrated in the COVID-19 pandemic, and is related to the fulfillment of the SDG. For the IDB, it is clear that the development of the housing sector is a fundamental tool for sustainable and resilient growth in LAC [3].

2. Literature Review

2.1. The Importance of Low-Income Housing Development in Order to Reduce Poverty

It is important to highlight that the good economic situation of the region has contributed to the reduction of the number of households with housing in poor conditions and that Latin America and the Caribbean are the developing regions with the highest level of urbanization in the world. This fact is related to the increase in human settlements and poverty, and that housing development is essential for reducing social, economic, and environmental gaps. Additionally, it is even more worrying when you read the numbers: "If we add to this the high levels of poverty, labor informality and the slowdown in mortgage financing, we conclude that the probable scenario for the coming years is an expansion of precarious settlements in our region, beyond 17.7% of the population urban society that in 2020 lived in marginal neighborhoods" [4].

In another document, the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) highlights the relationship between urban population growth, economic opportunities, and the housing construction sector: "Population growth presents

a negative relationship with economic development. That is, accelerated population enlargement presents an opportunity cost in relation to economic development since rapid growth in the labor factor means that more capital has to be used to equip the increase of the labor force, which results in slower growth of capital per worker", and "The construction sector includes both the creation of new homes and the recovery and rehabilitation of those that are disused and/or deteriorated. Its development not only impacts the most vulnerable population. In addition to alleviating poverty, this is a sector of great relevance within the economy, due to the impact it generates on other sectors. On the one hand, it demands from other industries the inputs used in construction works, inducing dynamism in the latter" [5].

According to the Ministry of Labor (Republic of Colombia) (2023) [6], about 70% of inter-municipal migrants, for lack of work reasons, arrived in the following departments: Bogotá, Cundinamarca, Valle del Cauca, Antioquia, Santander, Risaralda, Meta, Atlántico, and Tolima. Eight of these nine regions are on the list of those ten with the best GDP per capita since 2015 [7].

Figure 1 shows the strong and positive relationship between the growth of GDP per capita and the GDP of the construction sector for a sample of 20 Latin American countries between the years 1990 and 2020. The correlation between these variables is strong and positive. The growth of the construction sector influences the behavior of the GDP since its *p*-value is less than 0.01. The model exposed in the document finds that a 1 percentage point increase in the growth of the construction sector leads to an increase of 0.06 percentage points in the GDP per capita growth rate [5].

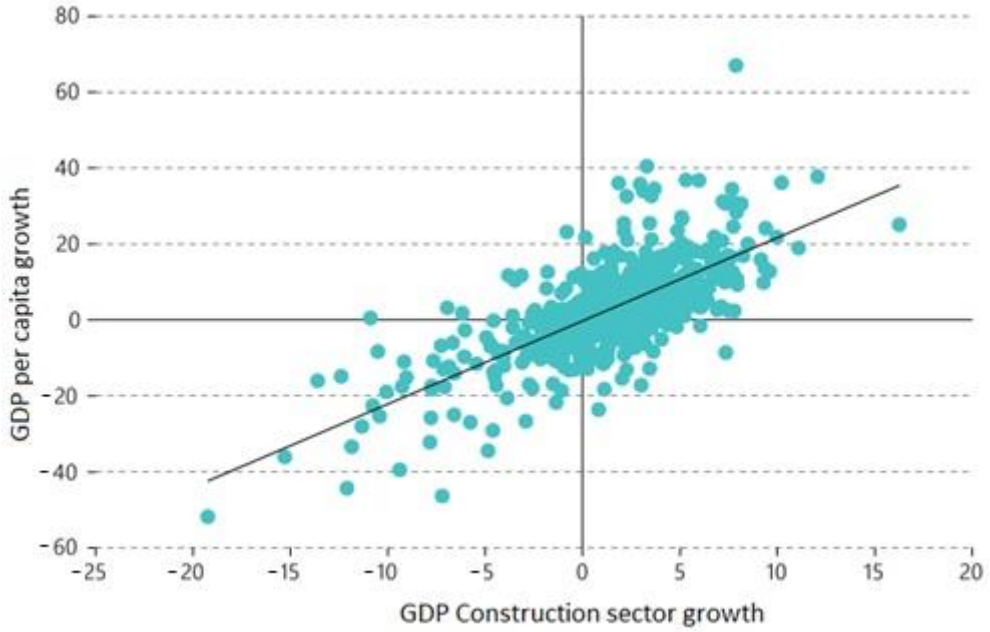

Figure 1. GDP per capita and GDP construction sector growth, in percentage (20 Latin America and Caribbean countries, between 1990 and 2020). Source: ECLAC (2022b).

In Colombia's case, when there is an economic crisis, low-income housing (VIS) is built the most. In order to sustain the construction and real estate sectors, a solvent demand is needed, which requires a population that possesses enough money to buy housing in the middle and upper social stratification segments. When there is a crisis, the housing demand reduces and that is why the State gives subsidies to leverage that demand, and it does so in low-income segments [8].

Now, regarding Latin America and the Caribbean, the importance of producing more quality social housing for the population classified as poor stems from the growth of the urban population coming from rural areas. The ECLAC presents projections for the population increase of the region in each of its countries [9]. According to the general data

for Latin America and the Caribbean, the turning point between a higher percentage of the population living in urban areas compared to rural areas occurred in 1960. Since then, the difference has steadily been increasing and is projected to remain this way at least until the year 2050 (Figure 2). In the case of Colombia, the distribution of the population is very similar to the data below (Figure 3). Reviewing the population distribution figures for Colombia in 2023, they differ slightly from the projection in Figure 3 but maintain the same relationship: an urban population of 74% and a rural population of 26%, according to information from the National Statistics Department [10].

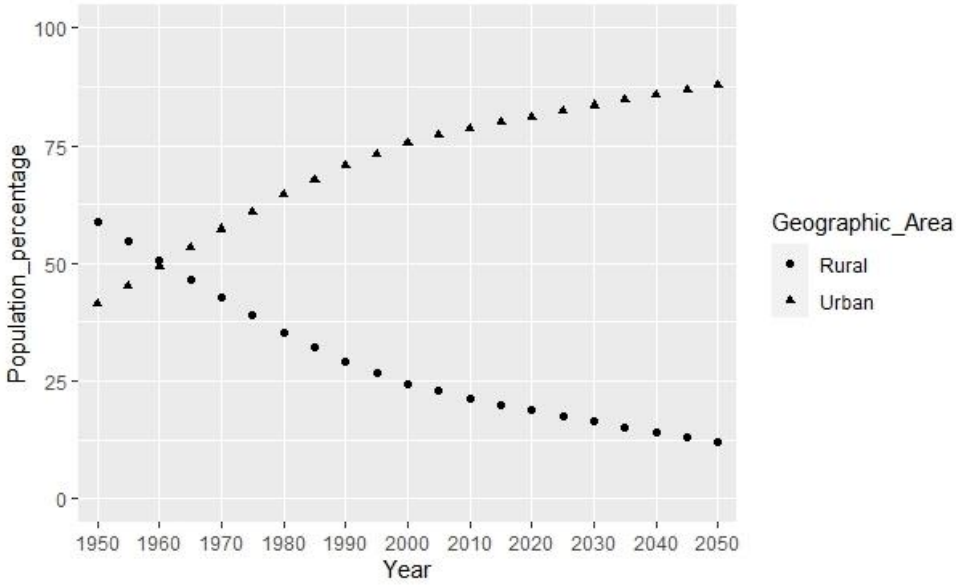

Figure 2. Population percentage distribution in urban and rural areas. Latin America and the Caribbean. Source: ECLAC (2022c).

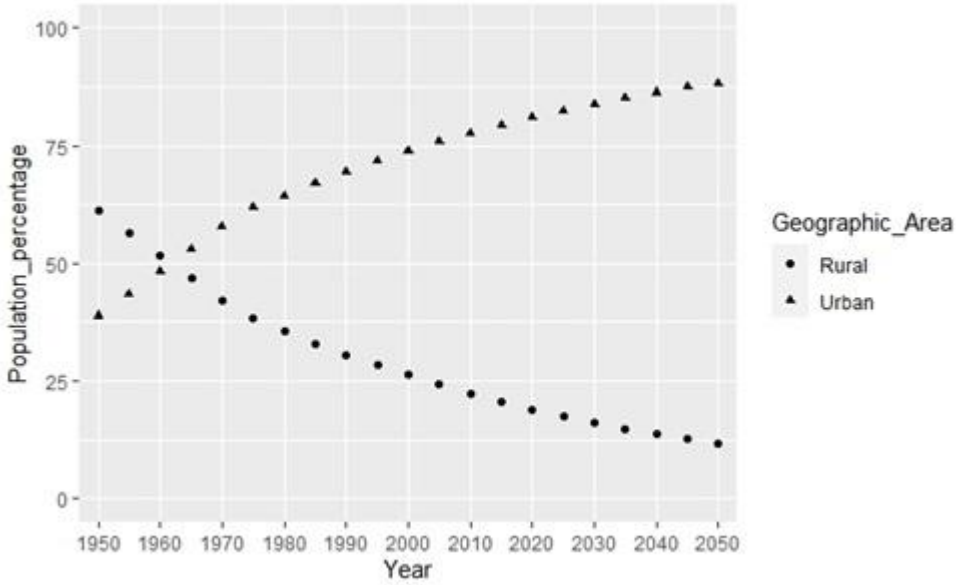

Figure 3. Population percentage distribution in urban and rural areas, Colombia. Source: ECLAC (2022c).

The above suggests that the so-called "urbanization phenomenon" will continue in Colombia and Latin America, generating a greater number of migrants from rural to urban areas. Most of this migration occurs under conditions of poverty, and as a result, families arrive in the municipalities to occupy housing with very poor material conditions and

without basic public utilities. Unfortunately, many of the causes of migration are linked to violence and lack of economic and job opportunities in many rural areas [11–13]. In the case of Colombia, although the population living in poverty has decreased since the early 2000s, indicators continue to be higher in rural areas than in urban areas [14]. It is also noteworthy that in recent years, there have been many people living in poverty who have migrated from Venezuela to Colombia, mostly to major cities [15].

A review of the state of the art to explore the relationship between poverty and social housing shows that, according to Chiodelli (2016) [16], the great proliferation of informal human settlements in the major cities of so-called developing countries began after World War II. This informal growth of cities led to poverty, creating what can be described as a "planet of slums" [17]. For several years, government agencies failed to take significant action to address this issue. Only in the 1960s, and with greater force in the 1970s, did various government and multilateral agencies initiate housing policies consistently and with clear objectives to improve the housing conditions of poor households in the cities to reduce the reality of urban poverty. Over the years, it has been shown that the location of low-income housing in the urban periphery (generated largely by the effects of rural–urban migration) results in transportation issues on work or study days due to increased commute time and costs. It also brings restrictions to urban development [18].

The first initiatives to improve social housing focused on having the community itself actively participate in the construction or enhancement of their precarious housing. However, the 1980s proved that self-built housing was not a good idea due to the quality of the construction process. From then on, housing policies focused on the fact that the State should intervene even more with new housing projects and provide households with financial planning, financial assistance through subsidies, and even rental housing options. The latter option has not been given due consideration by many governments in poor countries, but it is an option for regulating social housing [19]. In the 1990s and 2000s, agencies such as the World Bank, the Inter-American Development Bank, and UN-Habitat have been very active in promoting policies for social housing valuation and land regulation [20]. Such housing policies strengthened the legal ownership of informal housing as a mechanism to reduce the state of poverty of households by increasing their net worth through home ownership [21–23].

Between 1995 and 2009, housing conditions in Latin America improved by reducing the number of households in the housing deficit from 8% to 6%. Similarly, the proportion of occupants living in housing built with precarious materials fell from 12% to 8.8%. These improvements in the housing deficit correspond to an era of economic growth, measured in per capita income. However, criticism must be made of the lack of consistency between public policies for urban development and housing development. This disconnect has led to housing projects not being a solution to the quality of life of the inhabitants [24].

Providing new housing or improving existing housing for lower-income households who cannot afford non-VIS housing is not solely about the actual building. Housing also implies providing basic public services and utilities such as water, sewage, roads, energy, and adequate public space [25,26]. This connotes that social housing in a country contributes to achieving SDG.

Some studies conclude that generating housing invigorates the economy by increasing the GDP [27].

2.2. The Role of Low-Income Housing in the Building Housing Sector

Continuing the study of Latin America, the analysis of the evolution of the economy and social housing in Argentina, Brazil, Chile, and Colombia concludes that in the last 50 years, there has been a lack of response from governments to the problem of social housing. Then, there was the expansion of informal settlements and the increase in the social housing deficit. Later, governments wanted to increase financing to reduce the social real estate crisis; finally, the construction sector participated in an important offering of social housing located in the urban peripheries [28].

The Colombian Chamber of Construction (Camacol) (Available in: https://camacol.co/, accesed on 3 December 2023) (considered to be the top consulting agency in Colombia for the building industry) has recently stated that "if the social housing sector is reactivated, the expected growth of the economy could be doubled" [29].

The social housing policy in Colombia in recent years has been based on government subsidies to low-income families for the purchase or improvement of social housing. This financial aid encouraged the supply of social housing by construction companies, mainly in the regions of the country that had the greatest demand, that is, regions with greater economic movement and the presence of migrant households. Furthermore, the regions or departments of Colombia with the best economy (Cundinamarca, Antioquia, Valle del Cauca, and Atlántico) are those that have received the most internal migration due to armed conflict; this is owed to having better employment opportunities, which is why they have developed more social housing projects, reaching low housing deficit rates and the greatest offerings of social housing [30].

The relationship between the construction industry and the economic legal monthly minimum wage has been consistently exhibited in developing countries [31], even in the United States of America [32,33]. Other articles focus on the relationship between the new market housing construction and the low-income housing market [34]. This present study was performed through a statistical validation of the correlation between indicators, employing a nonparametric method. The resulting value of each correlation allowed for establishing whether our hypothesis was satisfied, and it determined most of our conclusions for this study.

Another model suggests that urban growth cannot be solely explained by the per capita income or wage income variable; therefore, housing supply should be correlated with population growth. This study was conducted with information from 2001–2016 for the metropolitan areas of the U.S.A. [35].

Bramley and Pawson (2002) [36] establish that demographics, employment, poverty, income, the attractiveness of the area, and the amount of housing stock or housing for rent are the variables that explain the behavior of urban areas with low demand for housing (United Kingdom, UK).

Other documents relate the impact of policies on low-income housing, like Ha (1994) [37] in Korea, Ikejiofor (1998) [38] in Nigeria, Choguill (1993) [39] in Bangladesh, and Yang et. al. (2021) [40] in the U.S.A.

Housing policies with a focus on subsidies for new and existing (but legalized) housing continue to this present decade (2020) and pertain to cases such as Colombia, Chile, Uruguay, and South Africa, among others [16]. Housing policies in Latin America share similarities and can also be individually analyzed on a global scale [28]. It is also important to note that housing policies in developing countries are often implemented differently from those in developed countries [41].

Summarizing, Latin America mainly results in (a) an analysis of housing policies over the last decades [16,19,20], (b) a comparative analysis between countries in the region or between developed and developing countries [28,41], (c) an analysis of the relationship between housing production and urban public utilities [25,26], (d) a review of the spatial characteristics of informal housing and qualitative deficit [18,42–44], and (e) an analysis of the relationship between social housing production and urban poverty reduction [21–23,27].

Camacol analyzed the behavior of the building industry's GDP, both at the national and regional levels, but they do not relate it to the supply of VIS. They have also studied the participation of 60 subsectors of the economy in the demand for goods and services related to the construction industry; however, they do not relate this information to the number of housing units that are built [45]. More recently, another publication presented a GDP projection for the construction industry but does not correlate other economic industries with housing supply, nor is it analyzed by region [46,47].

The objective of this study was to establish whether there is a significant correlation, statistically speaking, between the supply of social interest housing (VIS) in a region

(per department in Colombia) and socioeconomic and demographic variables such as the general GDP of the department, the main industry-specific GDPs, and the general population of the department. This is based on the hypothesis that the regions with the highest level of income, in Colombia's case, are those with a tendency to develop fewer VIS housing units because they have a lower percentage of the population in extreme poverty and with fewer housing needs.

After a search for technical articles on social housing demand modeling, we found a correlation analysis between housing production, deficit, and regional socioeconomic variables, such as GDP, as well as population.

The state of the art makes clear the relationship between poverty and housing conditions, and therefore, a contribution to the SDG. But there are no publications on the analysis of the relationship between indicators at the regional level in any country in Latin America. This study analyzes whether the areas or departments in Colombia with greater economic development are related to a higher number of VIS housing units in the period between 2015 and 2021, making a reading of the contribution to the SDG from the social building economic sector according to the regional social and economic condition in Colombia.

This study is based on the trend that well-developed regions that receive an important migrant population, such as the migration from rural to urban areas due to social and economic conflicts, are linked to poverty; due to this, it requires a decent housing solution to reduce the UBN of the population and to help improve the indicators of the SDG [13,48–51].

3. Method

The information used in this study was obtained from the most reliable organizations and governmental agencies in Colombia. All the information used is official for Colombia. It was obtained from the most recent reports published by the National Administrative Department of Statistics (DANE) [7] and the Colombian Chamber of Construction (Camacol) [52].

The data management method used was the statistical correlation between variables.

The correlation procedure used was non-parametric: Spearman's rho. The correlation establishes the incidence between two variables but does not define whether the principle of causality applies. If the rho value is $\geq$0.5, there is a statistically significant correlation between the two variables. If the rho value is $\geq$0.7, the correlation is considered strong.

The analysis of the correlation method used is detailed below. The application of correlation has been used to define whether the behavior in the variation of general and sectoral GDP has an influence on the development of social housing in the regions of Colombia; and thus, establish if it is a basis for modeling future projections.

The first step was to establish whether to use parametric or nonparametric methods to validate the correlations. One of the most commonly used parametric tests is the Pearson correlation coefficient. An important aspect to consider is that in order to apply this method, the normal distribution of the variables to be correlated must be verified beforehand. The resulting coefficient (r) measures the strength or intensity of the linear relationship between two variables. To establish whether or not there is a statistically significant correlation, the normality test was initially performed using the "Shapiro–Wilk" command in R Studio, which calculates the *p*-value. The normality of the data distribution can be validated if the *p*-value is $\geq$0.05 [53].

The test was applied to the following variables (results are shown in Table A1):

1. Number of licensed VIS units reported for Colombia as a whole and for each of the 33 departments, 2015–2021.
2. Number of licensed non-VIS units reported for Colombia as a whole and for each of the 33 departments, 2015–2021.
3. Departmental GDP for the manufacturing industry, 2015–2021, for each of the 33 departments.
4. Departmental GDP for the construction industry, 2015–2021, for each of the 33 departments.
5. Departmental GDP for the real estate industry, 2015–2021, for each of the 33 departments.

6. Departmental GDP for the finance and insurance industry, 2015–2021, for each of the 33 departments.
7. Departmental GDP for the mining industry, 2015–2021, for each of the 33 departments.
8. Departmental GDP for the farming, livestock, forestry, and hunting and fishing (agriculture) industry, 2015–2021, for each of the 33 departments.
9. Overall GDP or total departmental GDP, 2015–2021, for each of the 33 departments.

It is important to note that the housing unit indicator refers to licensed housing, i.e., housing units that potentially will be built, whether new or improved, according to the need to license the projected construction. This indicator does not factor in rental housing solutions or VIS or non-VIS constructions that have been developed without a license. It also does not disregard those that, after being licensed, have not been partially or completely built.

The result indicates that there is no normal distribution for any of the variables analyzed in the 2015–2020 period in any of the 33 departments (shown in Table A1).

Since there was no normal distribution for the variables, we performed a nonparametric correlation test, the Spearman test. We executed the following command using the R Studio statistical software program:

Chart.Correlation (selected data group, method = "spearman").

The value or result provided by the Spearman correlation test is rho, whose value measures the intensity of the correlation between two variables, and its limits are $(-1, 1)$. If the value is close to one unit, the correlation is good and directly proportional between the two variables. If the value is close to one unit, but is negative (-1), the correlation between the two variables is also good but is inverse. If the value is close to zero, it is considered that there is no significant correlation between the variables [54].

We then proceeded to calculate the value of the Spearman correlation (rho) with the data shown in Table A2, and with these results, we correlated the number of VIS units/year and the number of non-VIS units/year with:

a. The general economic performance of the country's departments (measured based on the overall GDP).
b. The economic performance for the main economic industries in Colombia (GDP by industry).

The conclusions were established regarding the hypothesis or assumption and concluded that there is a tendency to develop a greater number of social housing units in regions where there is greater economic development, especially in areas where the industrial and service industries are more prevalent.

For this study, the global GDP was used. However, it was previously proven that the general GDP and the GDP per capita would have a similar behavior. For this, the Spearman correlation test was carried out. The relationship between general GDP and GDP per capita in the departments results in a rho value between 0.75 and 1.0, with an average value of 0.93 (Table A2).

4. Results

The Rho values of the correlations between the number of VIS low-income housing units and the global GDP for the economic sectors studied are in Figure 4.

Similarly, Figure 5 contains information for the development of higher commercial value housing or non-VIS housing.

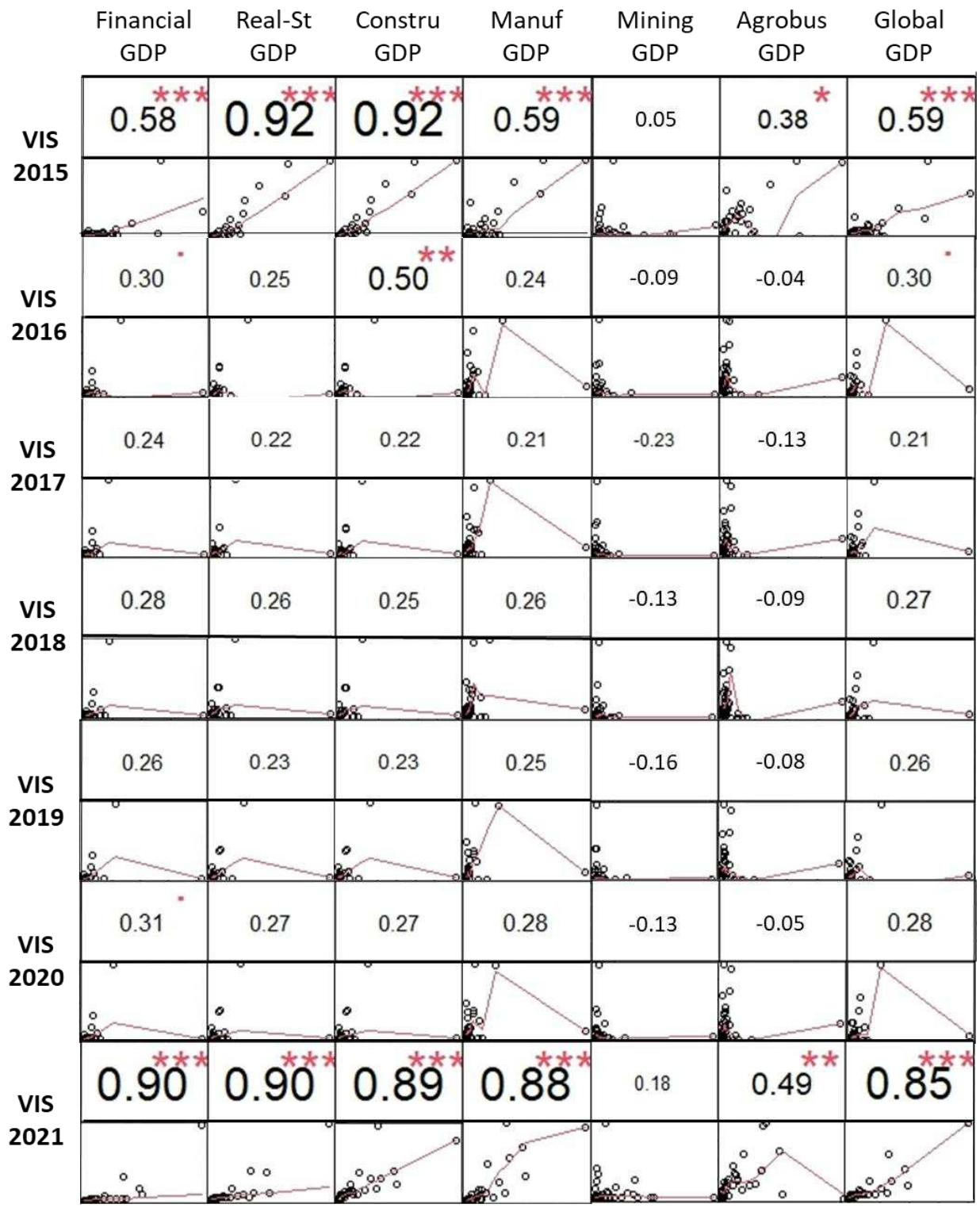

Figure 4. Rho values for the correlation between the number of VIS housing units and global and economic sectors GDP from 2015 to 2021. * Low correlation range, ** Median correlation range, *** High correlation range.

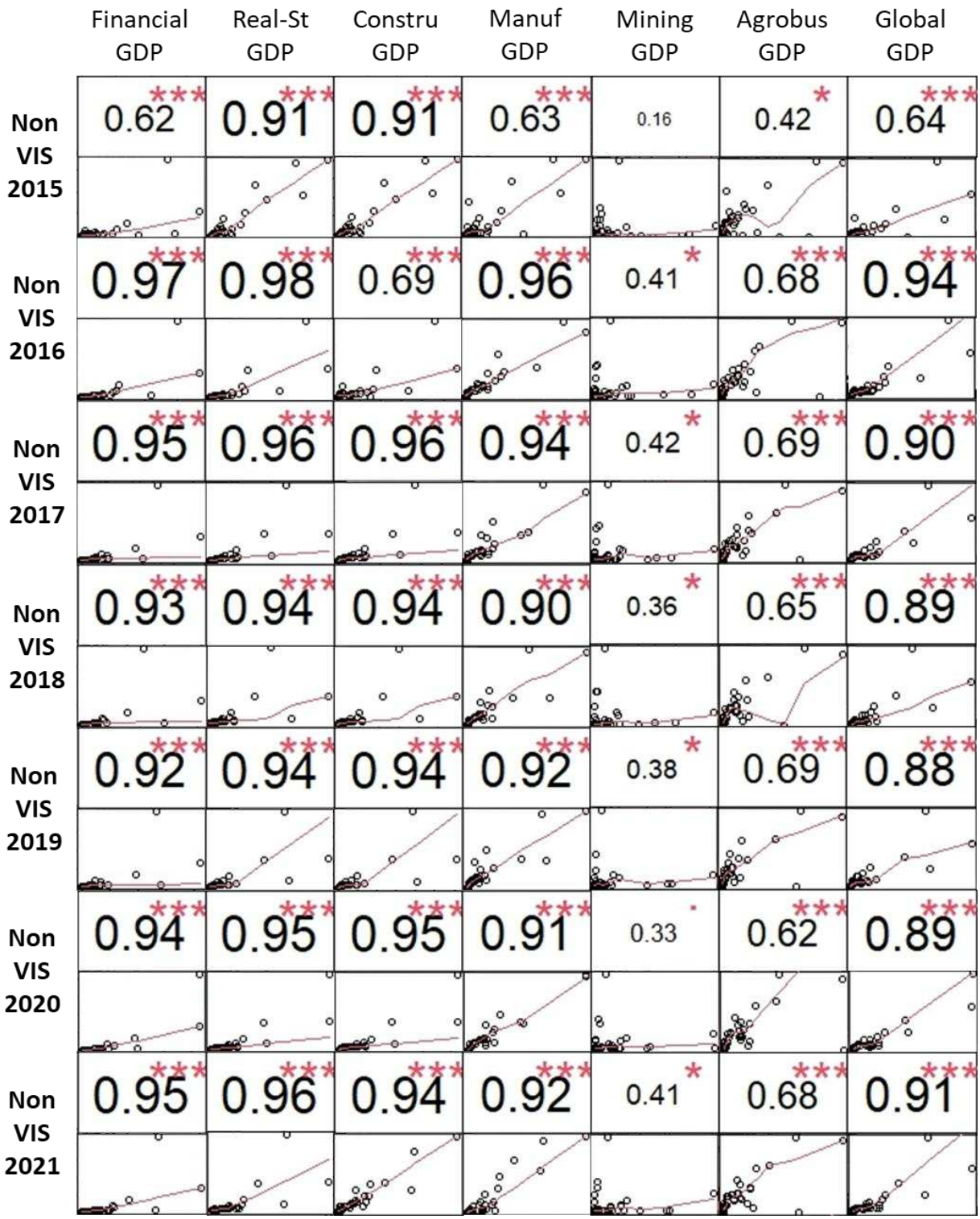

Figure 5. Rho values for the correlation between the number of non VIS housing units and global and economic sectors GDP from 2015 to 2021. * Low correlation range, *** High correlation range.

4.1. Correlation between the Finance and Insurance Industry's GDP and Number of Housing Units

First of all, the name of the economic sector in the corresponding column in Figures 4 and 5 has been abbreviated to "Financial".

The financial and insurance sector tends to show more significant correlations with the development of non-VIS housing units than with VIS. This means that as the sec-

tor's economy grows, so does the number of high-cost homes (non-VIS) at a very similar annual rate.

4.2. Correlation between the Real Estate Industry's GDP and Number of Housing Units

First of all, the name of the economic sector in the corresponding column in Figures 4 and 5 has been abbreviated to "Real-St".

The real estate sector shows a behavior similar to that of the financial and insurance sector. The rho values for VIS housing before 2021 are not significant (rho $\leq$ 0.5) between the years 2016 and 2020 (71% of the period studied).

In the case of non-VIS homes, the correlation is very high, with rho values greater than 0.9 throughout the period studied. As with the financial and insurance sector, it can be concluded that as the sector's economy grows, so does the number of high-cost homes (non-VIS) at a very similar annual rate.

4.3. Correlation between the Construction Industry's GDP and Number of Housing Units

First of all, the name of the economic sector in the corresponding column in Figures 4 and 5 has been abbreviated to "Constru".

Similar to the two previous economic sectors or industries, the trend of the correlations for VIS housing is that the rho value is not significant in most cases (rho < 0.3 in 57%). Only in 2016 does it reach a value of 0.5, and in 2015 and 2021, the values are close to 0.9.

Therefore, it is determined that the construction sector has no impact on the development of VIS housing units. Although the economic sector is directly linked to housing development, low-income housing is not its major component.

For the development of non-VIS housing units, the rho value increases significantly, with values that exceed 0.9 in 85% of the years studied because, in 2016, it was 0.69, a value that is also considered to have a high statistical correlation.

In general, it can be stated that the economic sector of construction registers a significant correlation with the development of non-VIS housing.

4.4. Correlation between the Manufacturing Industry's GDP and Number of Housing Units

First of all, the name of the economic sector in the corresponding column in Figures 4 and 5 has been abbreviated to "Manuf".

In this correlation, the results are similar to those found for the three previous industries. For VIS housing, only the records for the years 2015 and 2021 show a rho greater than 0.5, and the others do not exceed a value of 0.28 in the other years, which means that there is no statistical significance between the manufacturing sector and the development of VIS housing.

In the case of non-VIS housing, the rho values exceed 0.9 in 85% of the years studied because, in 2015, it was 0.63, a value that is also considered to have a high statistical correlation.

From the data for the manufacturing industry, it is deduced that this economic sector shows a relatively significant incidence with the development of non-VIS housing.

4.5. Correlation between the Mining Industry's GDP and Number of Housing Units

The mining industry presents non-significant correlations with rho values less than 0.42 in all cases.

For low-income housing, or VIS, the highest rho is 0.18 in 2021. But in the other years' records, there are even negative or inverse correlations, and some that are practically equal to 0.0.

In the case of non-VIS homes, the rho values are closer to a correlation, but it is not considered significant because their values are between 0.16 and 0.42.

From the data, it is interpreted that the development of the mining industry has no relevance or impact on the behavior of VIS social housing in Colombia. It is important to remember that the mining industry is developed in rural areas, and it is probably one of the reasons why it does not show a significant correlation with either VIS or non-VIS housing.

4.6. Correlation between the agrobusiness Industry's GDP and Number of Housing Units

First of all, the name of the economic sector in the corresponding column in Figures 4 and 5 has been abbreviated to "Agrobus".

In the case of the agrobusiness sector development, the correlation with the behavior of the generated housing units is better than with the mining sector but does not reach the levels of the previous economic sectors.

In the case of VIS housing, the highest rho values are 0.38 and 0.49 for the years 2015 and 2021. But they are not significant ($\leq$0.5) and only represent 57% of the data. The others are close to 0.0.

For non-VIS housing, the trend is that the rho values are between 0.6 and 0.7, presenting a significant correlation with this type of home, but not as much as with other sectors, such as financial and insurance, real estate, construction, and manufacturing.

4.7. Correlation between Global GDP and Number of Housing Units

Having developed the data analysis for Colombia's 33 departments, there are only significant rho values ($\geq$0.5) in the years 2015 and 2021. This means that in the period analyzed, there is no tendency towards a correlation between the production of VIS units and the general behavior of the economy, presenting a very strong and positive change in 2021 (rho = 0.85).

The correlation between overall GDP and the number of non-VIS units between 2015 and 2021 presents significant rho values for the entire period. Values were above 0.88 for 86% of the years analyzed. This validates the correlation between higher economic growth and a higher number of high-cost housing units (non-VIS). Unlike the analysis for VIS housing, there is a good correlation between economic development and the behavior of the number of non-VIS housing units.

Figure 6a–g complements the analysis and allows us to observe the dispersion of the points representing the 33 departments in each of the 7 years under study. Graphically, there is no trend towards linear behavior. Throughout the analyzed period, year by year, most departments (80%) show a tendency towards a GDP below COP 25,000 thousand million and less than 5000 low-income housing units. Only 20% of the departments register GDP values between COP 20,000 and 25,000 thousand million and between 5000 and 100,000 units of low-income housing. This means that there are only a few regions in Colombia that have a significant number of low-income housing production, and they are those with the best economy.

The relationship between the GDP of each department and non-VIS housing is presented in Figure 7a–g. The graphs show a greater linear trend in the data than the graphs for VIS units. Only some departments (20%) register high values for non-VIS housing units and a high GDP.

The rho values to correlate the variables in the graphs in Figures 6 and 7 are available in the last columns of Figures 4 and 5.

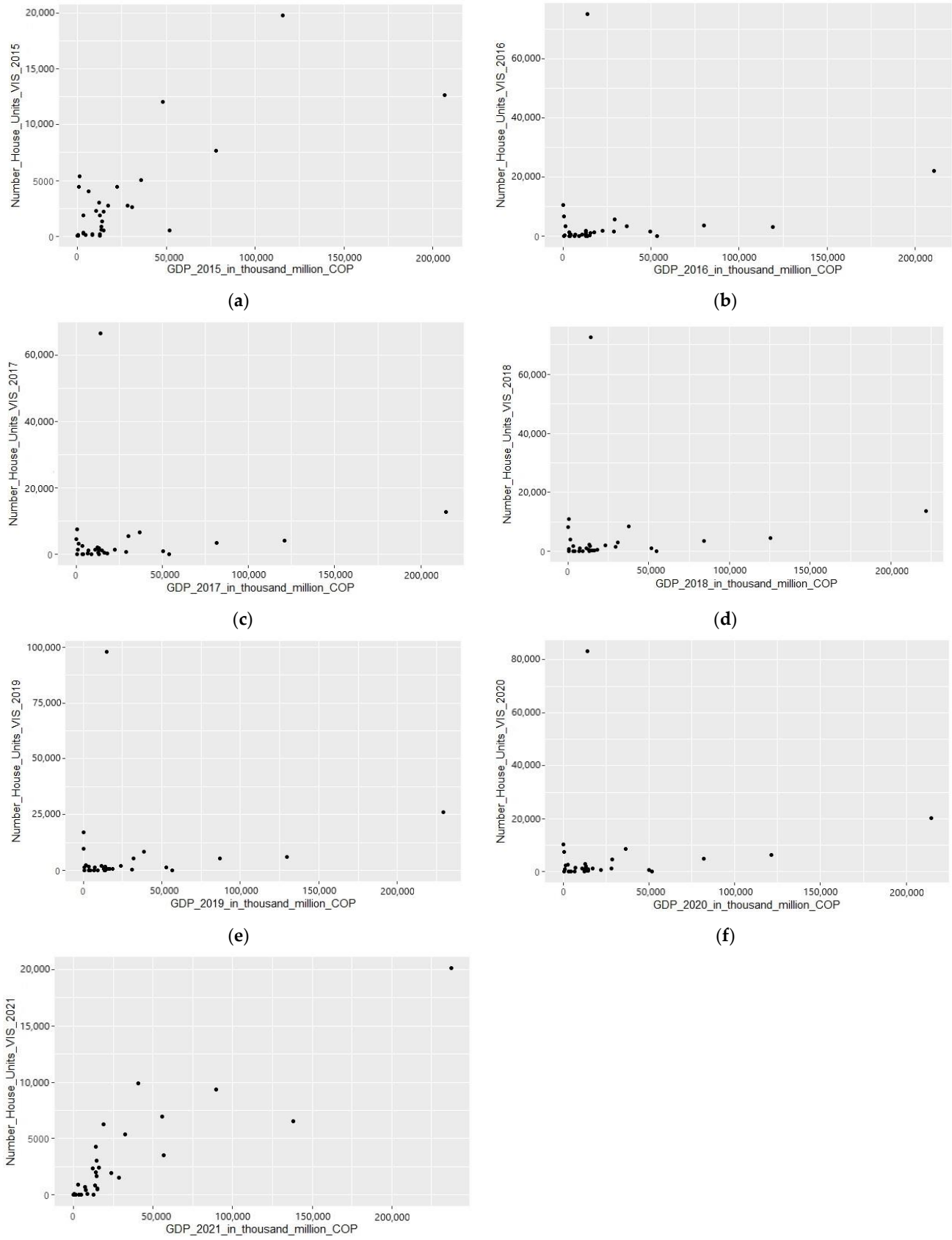

Figure 6. Colombia's 33 departments: number of VIS housing units vs. GDP. (**a**) 2015; (**b**) 2016; (**c**) 2017; (**d**) 2018; (**e**) 2019; (**f**) 2020; and (**g**) 2021.

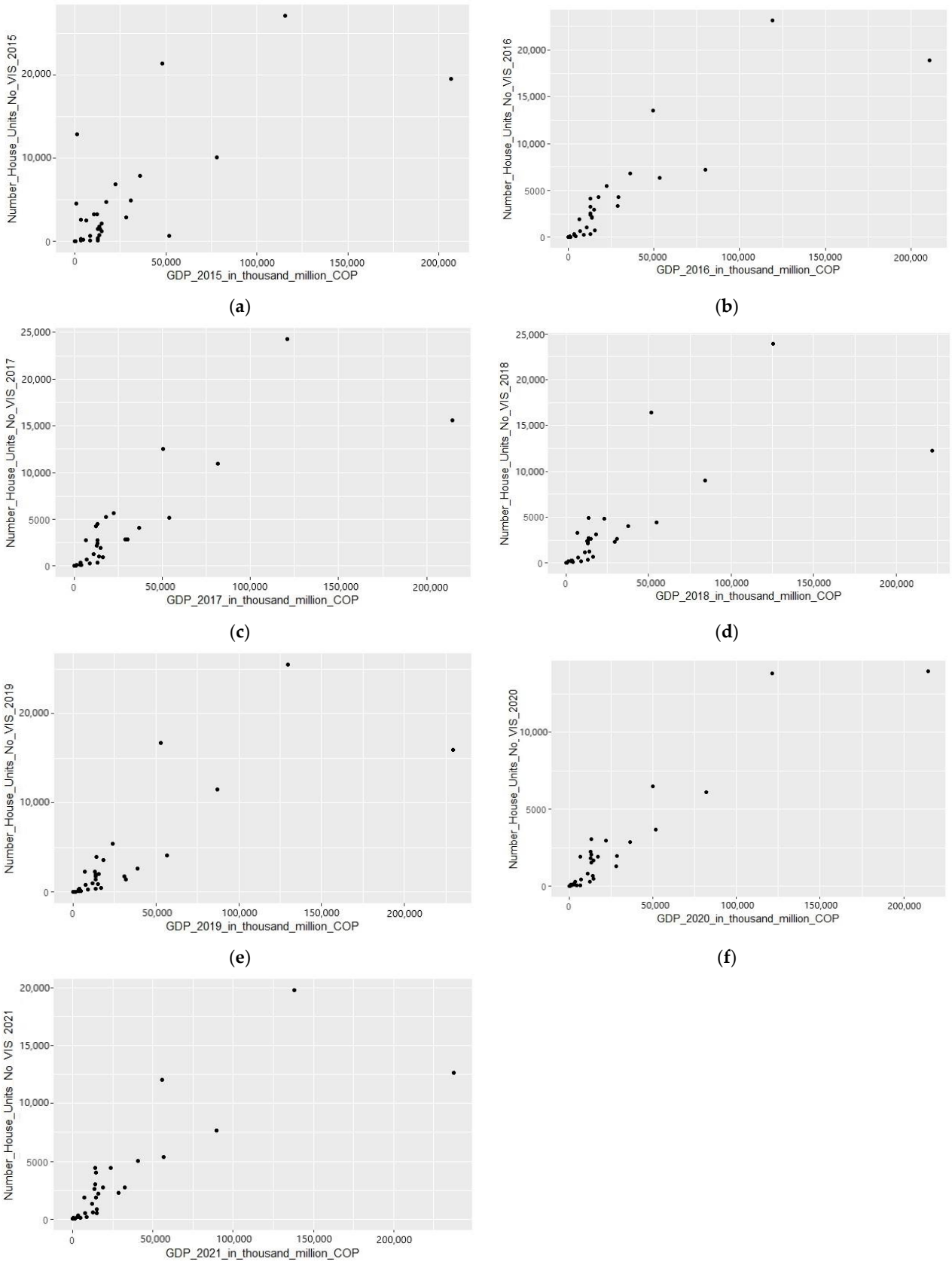

Figure 7. Colombia´s 33 departments: number of non-VIS housing units vs. GDP. (**a**) 2015; (**b**) 2016; (**c**) 2017; (**d**) 2018; (**e**) 2019; (**f**) 2020; and (**g**) 2021.

4.8. Low-Income (VIS) Housing

According to Figure 4, the rho values with some significance are for the years 2015 and 2021. For the period from 2016 to 2020, no significant correlation is proposed for any of the GDPs, neither for the global nor for the sectoral ones.

From the above, it is concluded that the development of low-income housing in Colombia does not depend on the economic behavior of the country.

4.9. Non-VIS Housing

From Figure 5, it is concluded that for the development of non-VIS housing, there is a good correlation with the economic performance of the country, both globally and by sector. The agrobusiness sector presents a good correlation with rho values close to 0.7. The mining sector is the only one that does not register statistically acceptable correlations (rho $\leq$ 0.5). The other economic sectors (manufacturing, construction, real estate, and finance and insurance) tend to register high correlations with the development of this type of housing (rho $\geq$ 0.9).

In conclusion, economic development, measured by GDP, either overall or with industry-specific data, shows a better correlation with the development of non-VIS housing units. This is because non-VIS housing units are the most built-in Colombia in terms of units and saleable areas. They are also the most economically profitable for the construction industry, considering that they are not social housing and are more expensive.

4.10. Correlation between the Number of Victims of Internal Displacement in Colombia and the Number of VIS Housing Units

In this case, the number of internal displacement victims in Colombia was correlated for each of the 33 departments with the respective number of licensed VIS housing units per department between 2018 and 2020.

Spearman's rho yielded values of -1.0 and 1.0 for 45% of the departments, 12% of which were negative values. Only 9% (three out of thirty-three) of the departments registered a null rho value, proving that there was no VIS development in those regions. The other 54% of departments yielded a rho of 0.5 and 0.5, 21% of which were negative.

We can conclude from this assessment that there is no correlation that could indicate that the departments with a greater number of migrant victims have had a greater increase in the number of VIS housing units.

As a further analysis, the Spearman and Pearson correlation coefficient was performed using the aggregate data of all 33 departments for the available years 2018–2020. The results were rho = 0.5 and r = 0.02. These data suggest that it is not possible to establish a significant correlation between the number of licensed VIS housing units in the country and the number of forcibly displaced victims.

5. Discussion

As stated by various authors [5–8], in circumstances in which there is a greater economic boom, the production of social housing should be greater to alleviate the condition of poverty that is generated by the job opportunities generated by cities with better economies. However, the results obtained show that there is a greater relationship with the development of housing for families with higher incomes.

Some studies conclude that generating housing invigorates the economy by increasing the GDP [27], which, according to the results obtained, is related to the generation of non-VIS housing, validating that statement since the reference does not emphasize low-income housing.

Other studies [35,36] establish that demographics, employment, poverty, income, the attractiveness of the area, and the amount of housing stock or housing for rent are the variables that explain the behavior of urban areas with low demand for housing and that housing supply should be correlated with population growth. Nevertheless, this study analyzes economic performance through GDP, not urban population growth. However,

the approach of the references can be supported because the correlation was validated with sectors of economic activities with an urban tendency and by the fact that population growth is generally related to economic growth.

The relationship between social housing production and urban poverty reduction [21–23,27] in Latin America's case is supported by the results obtained since economic development is related to the generation of housing (not VIS), and economic development can be linked to the reduction of poverty in cities.

Several of the studies on housing development in Colombia [45–47] do not specify the figures for VIS nor do they correlate general housing values with different economic sectors. Consequently, the results obtained in this present study are a contribution to the state of the art on the topic analyzed for Colombia.

As can be seen in the development of the results, the hypothesis is not fulfilled globally for the period analyzed. Strong correlations (rho $\geq$ 0.7) are constant for the development of non-VIS housing units. For the VIS units, although the trend is towards positive correlations that indicate that if the global or sectoral economy improves, so does the number of housings being developed, the value of the coefficient indicates that it is not in similar proportions.

Although the review of the literature expresses the hypothesis that has been raised, in the case of Colombia and its regions or departments, for recent years, the hypothesis must be reconsidered towards a relationship between economic development and the number of non-VIS housing, but not for all economic sectors, only for activities related to urban development.

6. Conclusions

The economic standing of the departments in Colombia, measured through the overall GDP for the 2015–2021 period, has a very good statistical correlation with the number of non-VIS units, which hold the highest commercial value.

Conducting a correlation analysis using the general GDP of each department as an economic indicator should have similar results if replaced by the GDP per capita since the correlation between these two indicators is very high.

At the economic-specific level, this correlation is higher with activities that are mostly developed in an urban environment, such as manufacturing, construction, real estate, and finance and insurance. The correlation is lower with industries such as mining and agriculture, which mostly operate in rural areas.

Conversely, the correlation of economic performance over the same period with the number of VIS social housing units offered is not good, except for the year 2021, which shows a significant increase in the number of registered housing units compared to previous years.

The industry-specific analysis for VIS housing yields low correlations, but these are especially dismissible for more rural industries, such as mining and agriculture.

Given their low correlation, the above confirms the hypothesis that more low-income housing units are offered in departments with a stronger economy due to their low level of poverty and unmet basic needs (UBN).

It is also clear that regions with better economies develop the non-VIS housing market more (high rho values), especially in those that have better numbers in urban economic sectors like manufacturing, construction, real estate, and finance and insurance, and have less relationship in those regions where the economic development has been better in rural activities like mining and agriculture.

Then, the behavior of the non-VIS housing market (more expensive) is linked to the main economic sectors, but VIS social housing develops constantly, regardless of the situation of the main economic sectors.

The development of this research had as limitations the dependence on secondary information, which, despite being from official sources, has a degree of uncertainty in the data. Additionally, the databases are not updated to the year 2023.

The next step of this research is to analyze the correlation of the variables over a period of time, that is, correlating GDP for a 3-year period with low-income housing production for the following 3 years to identify if there is cause and effect in that period. Likewise, the period can be extended to a period of 5 years to know if the correlation improves or not.

Another future analysis that could be important is to repeat this same procedure a few years later to find out if the behavior of these correlations is maintained, or if there have been changes that can be explained.

Author Contributions: Conceptualization, C.F.U.-B. and M.A.C.-L.; methodology, H.A.R.-Q.; software, C.F.U.-B.; validation C.F.U.-B., H.A.R.-Q. and M.A.C.-L.; formal analysis, H.A.R.-Q.; investigation, C.F.U.-B. and M.A.C.-L.; resources, C.F.U.-B. and M.A.C.-L.; data curation, M.A.C.-L.; writing—original draft preparation, C.F.U.-B.; writing—review and editing, C.F.U.-B.; visualization, H.A.R.-Q.; supervision, H.A.R.-Q.; project administration, M.A.C.-L.; funding acquisition, M.A.C.-L. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Results of the normality test "Shapiro Wilk Test" to the variables studied.

Analisys Data	*p*-Value	Normally Distributed
Number_House Units_NoVIS_2015	3.31×10^{-7}	NO
Number_House Units_NoVIS_2016	2.52×10^{-4}	NO
Number_House Units_NoVIS_2017	2.57×10^{-4}	NO
Number_House Units_NoVIS_2018	8.88×10^{-5}	NO
Number_House Units_NoVIS_2019	2.52×10^{-5}	NO
Number_House Units_NoVIS_2020	7.55×10^{-5}	NO
Number_House Units_NoVIS_2021	5.02×10^{-7}	NO
Number_House Units_VIS_2015	5.02×10^{-4}	NO
Number_House Units_VIS_2016	5.29×10^{-8}	NO
Number_House Units_VIS_2017	4.01×10^{-8}	NO
Number_House Units_VIS_2018	5.05×10^{-8}	NO
Number_House Units_VIS_2019	6.12×10^{-8}	NO
Number_House Units_VIS_2020	5.30×10^{-8}	NO
Number_House Units_VIS_2021	4.35×10^{-7}	NO
Departmental_Manufacturing_GDP_2015	3.52×10^{-5}	NO
Departmental_Manufacturing_GDP_2016	3.87×10^{-5}	NO
Departmental_Manufacturing_GDP_2017	4.50×10^{-5}	NO
Departmental_Manufacturing_GDP_2018	4.73×10^{-5}	NO
Departmental_Manufacturing_GDP_2019	4.66×10^{-5}	NO
Departmental_Manufacturing_GDP_2020	5.70×10^{-5}	NO
Departmental_Manufacturing_GDP_2021	4.99×10^{-8}	NO
Departmental_Construction_GDP_2015	6.45×10^{-4}	NO
Departmental_Construction_GDP_2016	4.76×10^{-4}	NO

Table A1. *Cont.*

Analisys Data	*p*-Value	Normally Distributed
Departmental_Construction_GDP_2017	1.93×10^{-4}	NO
Departmental_Construction_GDP_2018	1.03×10^{-4}	NO
Departmental_Construction_GDP_2019	1.42×10^{-4}	NO
Departmental_Construction_GDP_2020	1.89×10^{-7}	NO
Departmental_Construction_GDP_2021	1.39×10^{-7}	NO
Departmental_Real_State_GDP_2015	2.53×10^{-7}	NO
Departmental_Real_State_GDP_2016	2.69×10^{-7}	NO
Departmental_Real_State_GDP_2017	2.81×10^{-7}	NO
Departmental_Real_State_GDP_2018	2.85×10^{-7}	NO
Departmental_Real_State_GDP_2019	2.91×10^{-10}	NO
Departmental_Real_State_GDP_2020	2.95×10^{-7}	NO
Departmental_Real_State_GDP_2021	3.11×10^{-10}	NO
Departmental_Financial_Insurance_GDP_2015	4.79×10^{-8}	NO
Departmental_Financial_Insurance_GDP_2016	4.71×10^{-8}	NO
Departmental_Financial_Insurance_GDP_2017	4.65×10^{-8}	NO
Departmental_Financial_Insurance_GDP_2018	4.70×10^{-8}	NO
Departmental_Financial_Insurance_GDP_2019	4.75×10^{-8}	NO
Departmental_Financial_Insurance_GDP_2020	4.74×10^{-8}	NO
Departmental_Financial_Insurance_GDP_2021	4.72×10^{-11}	NO
Departmental_Mining_GDP_2015	3.75×10^{-6}	NO
Departmental_Mining_GDP_2016	3.36×10^{-6}	NO
Departmental_Mining_GDP_2017	3.31×10^{-9}	NO
Departmental_Mining_GDP_2018	3.09×10^{-6}	NO
Departmental_Mining_GDP_2019	1.95×10^{-6}	NO
Departmental_Mining_GDP_2020	1.25×10^{-9}	NO
Departmental_Mining_GDP_2021	2.42×10^{-9}	NO
Departmental_Agrobusiness_GDP_2015	2.10×10^{-2}	NO
Departmental_Agrobusiness_GDP_2016	1.83×10^{-2}	NO
Departmental_Agrobusiness_GDP_2017	2.30×10^{-2}	NO
Departmental_Agrobusiness_GDP_2018	2.01×10^{-2}	NO
Departmental_Agrobusiness_GDP_2019	1.86×10^{-2}	NO
Departmental_Agrobusiness_GDP_2020	1.95×10^{-2}	NO
Departmental_Agrobusiness_GDP_2021	1.43×10^{-5}	NO
Departmental_Global_GDP_2015	1.24×10^{-5}	NO
Departmental_Global_GDP_2016	1.21×10^{-5}	NO
Departmental_Global_GDP_2017	1.18×10^{-5}	NO
Departmental_Global_GDP_2018	1.08×10^{-5}	NO
Departmental_Global_GDP_2019	1.06×10^{-5}	NO
Departmental_Global_GDP_2020	9.73×10^{-6}	NO
Departmental_Global_GDP_2021	9.13×10^{-9}	NO

Table A2. Spearman test Rho value between GDP and GDP per capita (2015 to 2021).

Department	rho	Department	rho
COLOMBIA	0.9642857	GUAVIARE	1.0000000
AMAZONAS	0.9642857	HUILA	1.0000000
ANTIOQUIA	1.0000000	LA_GUAJIRA	0.9642857
ARAUCA	0.8928571	MAGDALENA	0.9642857
ATLANTICO	0.8928571	META	0.8928571
BOGOTA	0.9642857	NARINO	1.0000000
BOLIVAR	0.9642857	NORTE SANTANDER	0.8928571
BOYACA	1.0000000	PUTUMAYO	0.7857143
CALDAS	1.0000000	QUINDIO	1.0000000
CAQUETA	1.0000000	RISARALDA	1.0000000
CASANARE	0.8928571	SAN_ANDRES	0.9642857
CAUCA	1.0000000	SANTANDER	0.9642857
CESAR	0.8928571	SUCRE	0.9642857
CHOCO	0.9642857	TOLIMA	1.0000000
CORDOBA	1.0000000	VALLE	1.0000000
CUNDINAMARCA	0.6071429	VAUPES	0.7500000
GUAINIA	0.7500000	VICHADA	1.0000000

Table A3. Number of licensed VIS house units, by department.

Department	# House Units VIS 2015	# House Units VIS 2016	# House Units VIS 2017	# House Units VIS 2018	# House Units VIS 2019	# House Units VIS 2020	# House Units VIS 2021
AMAZONAS	122	170	0	0	0	0	102
ANTIOQUIA	19,755	3252	4129	4407	6141	6241	6564
ARAUCA	92	564	63	86	6	4	4
ATLANTICO	5038	3538	6635	8366	8496	8629	9899
BOGOTA	12,632	22,147	12,840	13,600	26,006	20,161	20,104
BOLIVAR	2737	5823	5632	3099	5579	4664	5387
BOYACA	4405	1975	1454	1954	2012	578	1915
CALDAS	1871	1770	1339	436	602	1340	1692
CAQUETA	301	6	1	107	11	0	0
CASANARE	623	25	33	233	50	14	29
CAUCA	2210	458	1156	316	782	893	2398
CESAR	526	1057	636	438	836	334	494
CHOCO	243	34	0	0	0	0	0
CORDOBA	896	74,985	66,561	72,421	97,729	83,068	587
CUNDINAMARCA	12,044	1679	1087	1049	1291	535	6986
GUAINIA	75	6818	7567	10,926	17,010	7488	0
GUAVIARE	97	385	1508	702	1479	868	2
HUILA	4460	0	0	0	200	239	2042
LA_GUAJIRA	183	0	0	0	205	3	92

Table A3. *Cont.*

Department	# House Units VIS 2015	# House Units VIS 2016	# House Units VIS 2017	# House Units VIS 2018	# House Units VIS 2019	# House Units VIS 2020	# House Units VIS 2021
MAGDALENA	1328	665	1456	1119	2201	1136	2387
META	2293	1588	776	1525	389	1114	1558
NARINO	2643	1077	2031	472	687	3049	874
NORTE SANTANDER	2986	147	598	2218	403	329	4266
PUTUMAYO	200	1416	2539	1813	1854	2677	909
QUINDIO	1878	0	302	0	11	217	698
RISARALDA	4000	737	1865	1901	1893	1965	3013
SAN_ANDRES	45	3433	3225	4041	2340	2380	
SANTANDER	5393	0	0	0	0	0	3498
SUCRE	521	661	1293	1143	1296	1549	408
TOLIMA	2757	1343	238	564	726	1151	6286
VALLE	7640	3622	3500	3535	5467	4952	9371
VAUPES	52	10,595	4576	8335	9754	10,358	3
VICHADA	33	0	0	1	2	0	42

#: Number of.

Table A4. Number of licensed non-VIS house units, by department.

Department	# House Units No VIS 2015	# House Units No VIS 2016	# House Units No VIS 2017	# House Units No VIS 2018	# House Units No VIS 2019	# House Units No VIS 2020	# House Units No VIS 2021
AMAZONAS	40	65	19	14	29	55	122
ANTIOQUIA	27,074	23,120	24,251	23,875	25,446	13,829	19,755
ARAUCA	194	140	105	118	117	51	92
ATLANTICO	7869	6795	4069	3999	2674	2858	5038
BOGOTA	19,512	18,857	15,562	12,281	15,969	13,946	12,632
BOLIVAR	2867	4289	2856	2624	1391	1987	2737
BOYACA	6887	5474	5665	4814	5436	2964	4405
CALDAS	1553	2415	2461	2757	1788	2085	1871
CAQUETA	293	353	334	253	363	298	301
CASANARE	747	381	401	342	414	322	623
CAUCA	2149	2920	1935	2658	2002	1698	2210
CESAR	1218	740	951	678	501	511	526
CHOCO	154	155	136	193	121	120	243
CORDOBA	1792	2059	1058	1261	876	704	896
CUNDINAMARCA	21,347	13,532	12,573	16,409	16,734	6497	12,044
GUAINIA	14	27	48	34	35	38	75
GUAVIARE	155	95	56	15	21	93	97
HUILA	4524	2150	2797	2162	1451	1567	4460
LA_GUAJIRA	689	244	248	188	275	82	183

Table A4. *Cont.*

Department	# House Units No VIS 2015	# House Units No VIS 2016	# House Units No VIS 2017	# House Units No VIS 2018	# House Units No VIS 2019	# House Units No VIS 2020	# House Units No VIS 2021
MAGDALENA	1505	1083	1262	1210	997	824	1328
META	3291	3311	2841	2293	1789	1327	2293
NARINO	4973	3230	4294	2369	2329	2254	2643
NORTE SANTANDER	3302	2547	2221	2358	2007	1813	2986
PUTUMAYO	447	300	170	276	292	176	200
QUINDIO	2581	1900	2804	3270	2320	1934	1878
RISARALDA	2562	4159	4499	4954	3974	3048	4000
SAN_ANDRES	93	61	117	178	55	53	45
SANTANDER	12,897	6314	5168	4398	4096	3705	5393
SUCRE	683	694	668	635	842	429	521
TOLIMA	4789	4264	5283	3102	3636	1911	2757
VALLE	10,113	7228	10,971	8986	11,543	6135	7640
VAUPES	15	31	23	30	32	29	52
VICHADA	8	7	11	6	8	5	33

#: Number of.

Table A5. Global GDP in COP thousands of millions, by department.

Department	General GDP 2015	General GDP 2016	General GDP 2017	General GDP 2018	General GDP 2019	General GDP 2020	General GDP 2021
AMAZONAS	593	614	630	648	666	615	677
ANTIOQUIA	115,446	119,046	120,973	125,173	129,672	121,300	137,977
ARAUCA	4534	4272	4168	4293	4596	4565	4757
ATLANTICO	35,716	36,347	36,779	37,610	38,690	36,173	40,643
BOGOTA	206,478	210,683	214,484	221,652	229,314	214,485	237,244
BOLIVAR	28,105	29,285	30,271	30,804	31,920	28,623	32,610
BOYACA	22,165	22,341	22,574	23,237	23,732	21,709	23,518
CALDAS	12,514	12,821	13,043	13,395	13,798	13,174	14,604
CAQUETA	3350	3427	3454	3525	3596	3387	3634
CASANARE	13,305	12,938	12,960	13,291	13,493	12,245	12,396
CAUCA	14,622	14,975	14,876	15,139	15,614	14,630	16,019
CESAR	14,570	15,676	16,123	16,090	16,646	14,256	14,828
CHOCO	3571	3765	3482	3202	3341	3264	3508
CORDOBA	13,657	13,731	13,920	14,196	14,774	13,915	15,269
CUNDINAMARCA	48,055	49,601	50,409	51,551	52,890	49,779	55,575
GUAINIA	307	307	304	313	322	293	334
GUAVIARE	8666	676	692	693	715	683	742
HUILA	677	13,636	13,212	13,369	13,754	13,144	14,221
LA_GUAJIRA	8666	8891	8996	8977	8955	6684	8857
MAGDALENA	13,805	10,869	10,990	11,248	11,525	10,832	12,112

Table A5. *Cont.*

Department	General GDP 2015	General GDP 2016	General GDP 2017	General GDP 2018	General GDP 2019	General GDP 2020	General GDP 2021
META	10,514	28,904	29,022	29,404	30,800	28,105	28,788
NARINO	30,712	12,760	12,441	12,643	13,064	12,501	13,698
NORTE SANTANDER	12,230	13,041	12,940	13,347	13,550	12,804	14,157
PUTUMAYO	12,534	3450	3386	3393	3284	2830	3080
QUINDIO	3481	6624	6736	6793	6968	6550	7338
RISARALDA	6381	13,027	13,202	13,551	13,969	13,185	14,649
SAN_ANDRES	12,656	1305	1343	1373	1416	1139	1442
SANTANDER	1253	53,175	54,065	54,942	56,515	51,681	56,567
SUCRE	51,999	6807	6982	7108	7366	6928	7667
TOLIMA	17,381	17,708	17,936	18,120	18,512	17,237	18,828
VALLE	78,074	80,022	81,447	84,172	87,023	81,835	89,872
VAUPES	233	236	239	248	257	237	258
VICHADA	529	529	541	556	581	554	600

Table A6. Agrobusiness sector GDP in COP thousands of millions, by department.

Department	Agrobus GDP 2015	Agrobus GDP 2016	Agrobus GDP 2017	Agrobus GDP 2018	Agrobus GDP 2019	Agrobus GDP 2020	Agrobus GDP 2021
AMAZONAS	96	94	98	102	104	113	114
ANTIOQUIA	6153	6363	6567	6678	6897	7024	7459
ARAUCA	748	767	840	866	885	902	957
ATLANTICO	330	353	375	392	405	411	436
BOGOTA	12	12	13	13	13	13	13
BOLIVAR	1196	1218	1280	1335	1374	1449	1469
BOYACA	2143	2186	2405	2449	2528	2571	2574
CALDAS	1274	1211	1262	1281	1311	1328	1305
CAQUETA	460	498	509	504	526	541	533
CASANARE	1220	1427	1525	1528	1555	1583	1686
CAUCA	1693	1766	1852	1826	1884	1903	1997
CESAR	1256	1169	1243	1276	1326	1343	1376
CHOCO	582	619	651	637	668	687	707
CORDOBA	1543	1478	1496	1529	1557	1595	1613
CUNDINAMARCA	6300	6592	7112	7277	7471	7594	7896
GUAINIA	25	26	29	30	30	32	32
GUAVIARE	326	140	144	146	147	149	157
HUILA	129	2266	2275	2319	2368	2439	2441
LA_GUAJIRA	326	332	374	375	387	391	392
MAGDALENA	2112	1591	1706	1706	1744	1744	1746
META	1576	2464	3050	3053	3123	3185	3431

Table A6. *Cont.*

Department	Agrobus GDP 2015	Agrobus GDP 2016	Agrobus GDP 2017	Agrobus GDP 2018	Agrobus GDP 2019	Agrobus GDP 2020	Agrobus GDP 2021
NARINO	2361	1730	1841	1887	1916	2006	2013
NORTE SANTANDER	1767	1220	1248	1271	1299	1323	1330
PUTUMAYO	1199	191	181	186	187	192	197
QUINDIO	191	973	1017	1027	1056	1057	1121
RISARALDA	934	828	839	849	887	898	925
SAN_ANDRES	845	15	14	15	15	17	17
SANTANDER	15	3928	4191	4301	4452	4471	4557
SUCRE	3793	656	695	694	702	729	752
TOLIMA	2737	2744	2776	2734	2783	2840	2937
VALLE	4329	4394	4416	4558	4674	4856	4913
VAUPES	17	18	18	19	19	19	18
VICHADA	172	173	173	177	182	186	192

Table A7. Mining sector GDP in COP thousands of millions, by department.

Department	Mining GDP 2015	Mining GDP 2016	Mining GDP 2017	Mining GDP 2018	Mining GDP 2019	Mining GDP 2020	Mining GDP 2021
AMAZONAS	1	1	1	1	1	1	1
ANTIOQUIA	2430	2593	2187	2200	2188	2611	2960
ARAUCA	1704	1530	1404	1509	1691	1724	1677
ATLANTICO	96	102	105	105	113	92	99
BOGOTA	322	338	333	334	333	222	221
BOLIVAR	677	731	709	723	821	721	771
BOYACA	2109	1962	1812	1784	1661	1432	1158
CALDAS	141	192	188	165	165	205	205
CAQUETA	16	16	14	14	13	11	11
CASANARE	6351	5981	5974	6177	6177	5263	4865
CAUCA	392	320	228	166	167	120	123
CESAR	4985	6177	6380	6113	6338	4579	4113
CHOCO	913	967	654	334	370	429	428
CORDOBA	201	225	220	237	298	353	334
CUNDINAMARCA	489	481	477	447	395	292	234
GUAINIA	33	29	22	19	21	12	22
GUAVIARE	3639	2	2	2	2	2	2
HUILA	3	906	844	835	824	790	760
LA_GUAJIRA	3639	3585	3418	3325	3166	1424	2853
MAGDALENA	1015	43	40	38	38	31	36
META	39	14,824	13,976	13,955	14,888	13,226	12,377
NARINO	16,456	645	226	120	119	77	77
NORTE SANTANDER	486	401	390	395	326	294	197

Table A7. *Cont.*

Department	Mining GDP 2015	Mining GDP 2016	Mining GDP 2017	Mining GDP 2018	Mining GDP 2019	Mining GDP 2020	Mining GDP 2021
PUTUMAYO	395	1190	1183	1097	957	653	694
QUINDIO	1366	25	25	24	24	16	17
RISARALDA	27	52	47	46	46	45	43
SAN_ANDRES	45	1	1	1	1	1	1
SANTANDER	1	2145	2166	2341	2232	1866	1780
SUCRE	2367	42	47	47	48	47	46
TOLIMA	720	593	656	597	596	537	491
VALLE	160	151	128	132	141	92	109
VAUPES	1	1	1	1	1	1	1
VICHADA	2	2	2	2	2	1	1

Table A8. Financial and insurance sector GDP in COP thousands of millions, by department.

Department	Finan Ins GDP 2015	Finan Ins GDP 2016	Finan Ins GDP 2017	Finan Ins GDP 2018	Finan Ins GDP 2019	Finan Ins GDP 2020	Finan Ins GDP 2021
AMAZONAS	15	15	15	15	16	16	17
ANTIOQUIA	5517	5687	5992	6237	6660	6828	7171
ARAUCA	61	60	60	60	63	64	66
ATLANTICO	1469	1500	1579	1647	1753	1791	1817
BOGOTA	17,123	17,717	18,722	19,404	20,600	21,070	21,794
BOLIVAR	648	669	702	722	765	782	805
BOYACA	401	411	430	448	475	485	502
CALDAS	388	397	417	433	455	466	482
CAQUETA	84	86	90	93	99	101	104
CASANARE	175	165	173	178	188	191	196
CAUCA	259	252	263	270	286	292	301
CESAR	256	264	277	287	303	310	318
CHOCO	61	63	66	67	72	73	75
CORDOBA	338	322	322	325	347	355	367
CUNDINAMARCA	582	602	632	652	694	710	735
GUAINIA	6	6	6	6	7	7	7
GUAVIARE	138	13	13	14	15	15	16
HUILA	14	364	383	397	420	430	444
LA_GUAJIRA	138	134	140	144	151	154	161
MAGDALENA	355	281	295	305	323	329	338
META	273	434	454	469	493	501	513
NARINO	425	351	370	385	407	417	429
NORTE SANTANDER	342	379	398	412	438	448	463
PUTUMAYO	371	53	55	57	61	62	64
QUINDIO	52	190	200	208	222	227	235

Table A8. *Cont.*

Department	Finan Ins GDP 2015	Finan Ins GDP 2016	Finan Ins GDP 2017	Finan Ins GDP 2018	Finan Ins GDP 2019	Finan Ins GDP 2020	Finan Ins GDP 2021
RISARALDA	186	457	478	495	522	533	550
SAN_ANDRES	445	35	37	38	40	41	42
SANTANDER	34	1237	1303	1360	1443	1470	1516
SUCRE	1200	164	172	179	189	194	199
TOLIMA	454	464	484	501	529	541	557
VALLE	2853	2945	3112	3236	3456	3523	3599
VAUPES	3	2	3	3	3	3	3
VICHADA	11	10	9	9	10	10	11

Table A9. Real state sector GDP in COP thousands of millions, by department.

Department	RealSt GDP 2015	RealSt GDP 2016	RealSt GDP 2017	RealSt GDP 2018	RealSt GDP 2019	RealSt GDP 2020	RealSt GDP 2021
AMAZONAS	12	25	24	24	25	25	26
ANTIOQUIA	19,967	11,790	10,578	11,097	11,613	11,790	12,287
ARAUCA	134	167	154	159	164	167	173
ATLANTICO	5916	2887	2620	2732	2830	2887	2950
BOGOTA	19,243	31,480	29,022	30,138	31,047	31,480	32,062
BOLIVAR	4688	2134	1951	2027	2092	2134	2169
BOYACA	2819	1403	1265	1322	1375	1403	1458
CALDAS	1767	956	879	910	941	956	975
CAQUETA	98	276	255	265	273	276	281
CASANARE	318	383	356	370	379	383	396
CAUCA	2618	791	721	753	777	791	809
CESAR	562	836	767	795	821	836	848
CHOCO	31	78	73	76	78	78	80
CORDOBA	1422	527	493	510	523	527	539
CUNDINAMARCA	10,815	2523	2242	2359	2473	2523	2615
GUAINIA	8	10	9	10	10	10	10
GUAVIARE	12	34	32	33	34	34	36
HUILA	484	840	781	810	829	840	859
LA_GUAJIRA	53	397	364	379	391	397	406
MAGDALENA	458	746	685	711	736	746	764
META	672	971	902	933	960	971	1003
NARINO	355	1125	1030	1074	1110	1125	1153
NORTE SANTANDER	841	1326	1226	1270	1311	1326	1354
PUTUMAYO	29	158	148	153	156	158	160
QUINDIO	341	804	736	765	794	804	822
RISARALDA	1819	1047	966	1003	1035	1047	1071
SAN_ANDRES	16	63	63	65	67	63	64

Table A9. *Cont.*

Department	RealSt GDP 2015	RealSt GDP 2016	RealSt GDP 2017	RealSt GDP 2018	RealSt GDP 2019	RealSt GDP 2020	RealSt GDP 2021
SANTANDER	9535	4420	4133	4257	4346	4420	4545
SUCRE	587	414	389	400	409	414	422
TOLIMA	1890	1151	1059	1099	1133	1151	1176
VALLE	13,646	11,353	10,545	10,922	11,200	11,353	11,661
VAUPES	0	10	10	10	10	10	10
VICHADA	4	25	23	24	25	25	26

Table A10. Construction sector GDP in COP thousands of millions, by department.

Department	Const GDP 2015	Const GDP 2016	Const GDP 2017	Const GDP 2018	Const GDP 2019	Const GDP 2020	Const GDP 2021
AMAZONAS	12	21	23	24	24	25	25
ANTIOQUIA	20,435	9933	10,296	10,578	11,097	11,613	8566
ARAUCA	141	146	150	154	159	164	164
ATLANTICO	6128	2483	2539	2620	2732	2830	1828
BOGOTA	20,069	27,584	28,334	29,022	30,138	31,047	6832
BOLIVAR	4530	1820	1885	1951	2027	2092	2432
BOYACA	2954	1183	1225	1265	1322	1375	1874
CALDAS	1717	843	868	879	910	941	768
CAQUETA	98	240	249	255	265	273	290
CASANARE	307	339	349	356	370	379	326
CAUCA	2644	661	692	721	753	777	1044
CESAR	556	731	747	767	795	821	689
CHOCO	32	66	68	73	76	78	131
CORDOBA	1377	468	483	493	510	523	687
CUNDINAMARCA	11,017	2002	2129	2242	2359	2473	2454
GUAINIA	8	9	9	9	10	10	40
GUAVIARE	12	348	30	32	33	34	44
HUILA	483	30	760	781	810	829	1054
LA_GUAJIRA	55	348	356	364	379	391	601
MAGDALENA	468	717	682	685	711	736	633
META	638	667	873	902	933	960	1019
NARINO	354	843	1008	1030	1074	1110	915
NORTE SANTANDER	864	983	1211	1226	1270	1311	1173
PUTUMAYO	30	1119	144	148	153	156	218
QUINDIO	349	141	700	736	765	794	428
RISARALDA	1811	666	923	966	1003	1035	669
SAN_ANDRES	17	860	61	63	65	67	29
SANTANDER	9276	59	4013	4133	4257	4346	3198
SUCRE	617	3853	381	389	400	409	599
TOLIMA	1989	978	1019	1059	1099	1133	1233

Table A10. *Cont.*

Department	Const GDP 2015	Const GDP 2016	Const GDP 2017	Const GDP 2018	Const GDP 2019	Const GDP 2020	Const GDP 2021
VALLE	14,011	9630	10,049	10,545	10,922	11,200	3249
VAUPES	0	9	10	10	10	10	20
VICHADA	4	22	23	23	24	25	47

Table A11. Manufacturing sector GDP in COP thousands of millions, by department.

Department	Manuf GDP 2015	Manuf GDP 2016	Manuf GDP 2017	Manuf GDP 2018	Manuf GDP 2019	Manuf GDP 2020	Manuf GDP 2021
AMAZONAS	11	34	38	37	34	25	12
ANTIOQUIA	19,853	9041	9677	10,346	10,189	7212	21,810
ARAUCA	134	316	224	175	191	159	140
ATLANTICO	5992	2951	3127	2812	2426	1722	6613
BOGOTA	19,680	10,576	10,855	10,873	9729	6970	20,226
BOLIVAR	4274	3360	3531	3173	3291	2385	5198
BOYACA	2981	2335	2403	2580	2544	1912	3086
CALDAS	1639	966	925	944	902	710	1977
CAQUETA	99	449	407	397	346	286	104
CASANARE	298	537	395	404	410	316	369
CAUCA	2642	1442	1252	1308	1340	1016	2691
CESAR	563	751	674	700	705	585	627
CHOCO	31	210	187	183	171	128	33
CORDOBA	1341	1168	1077	943	975	707	1555
CUNDINAMARCA	10,680	4118	3947	3831	3539	2516	11,815
GUAINIA	7	46	44	48	46	35	9
GUAVIARE	53	76	78	57	55	49	12
HUILA	12	1741	1280	1167	1162	930	534
LA_GUAJIRA	53	644	739	676	661	541	58
MAGDALENA	485	1066	867	826	738	548	527
META	464	1628	1375	1458	1410	1025	755
NARINO	652	1336	1159	1147	1154	932	384
NORTE SANTANDER	355	1598	1323	1407	1248	1011	881
PUTUMAYO	860	301	242	263	233	197	32
QUINDIO	30	744	717	620	569	398	374
RISARALDA	336	952	890	897	881	698	2005
SAN_ANDRES	1723	44	43	39	38	30	18
SANTANDER	16	6027	5593	4822	4914	3338	10,028
SUCRE	8327	688	693	685	729	605	614
TOLIMA	1897	1505	1582	1533	1485	1132	1872
VALLE	13,729	3394	3581	3899	3804	2729	14,710
VAUPES	0	27	26	28	28	20	0
VICHADA	4	52	58	58	63	47	4

References

1. United Nations Development Programme UNDP. Los ODS en Acción. 2022. Available online: https://www.undp.org/es/sustainable-development-goals (accessed on 1 December 2022).
2. Ministry of Housing, City and Territory. Republic of Colombia. 2022. Available online: https://www.minvivienda.gov.co/viceministerio-de-vivienda/vis-y-vip (accessed on 10 October 2022).
3. Inter-American Development Bank (IDB). El Sector Vivienda: Motor de Recuperación Económica y Desarrollo Sostenible. 2021. Available online: https://blogs.iadb.org/ciudades-sostenibles/es/dia-mundial-del-habitat-2021/ (accessed on 10 October 2022).
4. Economic Commission for Latin America and the Caribbean (ECLAC). La Vivienda y la Ciudad Son Motores Para la Reac-tivación Económica, la Disminución de Brechas Sociales y Ambientales e Instrumentos para una Recuperación Transformadora. 2022. Available online: https://www.cepal.org/es/comunicados/la-vivienda-la-ciudad-son-motores-la-reactivacion-economica-la-disminucion-brechas (accessed on 10 October 2022).
5. Economic Commission for Latin America and the Caribbean (ECLAC). Efectos Socioeconómicos de la Construcción de Viviendas en la Reactivación Pos-COVID-19: Inversión y Empleo Sectorial en Chile, Colombia, el Ecuador, México, el Perú y la República Dominicana, Documentos de Proyectos (LC/TS.2022/157). 2022. Available online: Chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://repositorio.cepal.org/server/api/core/bitstreams/00226e9b-9915-4170-8831-8d80497154db/content (accessed on 3 November 2023).
6. Ministry of Labor. Republic of Colombia. 2023. Available online: https://www.mintrabajo.gov.co/empleo-y-pensiones/movilidad-y-formacion/grupo-de-gestion-de-la-politica-de-migracion-laboral/ii-poblacion-objetivo/trabajadores-migrantes-internos (accessed on 3 December 2023).
7. National Department of Statistics DANE. Republic of Colombia. Regional GDP. 2023. Available online: https://www.dane.gov.co/index.php/estadisticas-por-tema/cuentas-nacionales/cuentas-nacionales-departamentales (accessed on 1 February 2022).
8. Urban Studies Institute IEU, Universidad Nacional de Colombia. Mayor Venta de VIS Puede Indicar Crisis en el Sector de la Construcción. (Higher VIS Sales May Indicate Crisis in the Construction Sector). 2020. Available online: http://ieu.unal.edu.co/en/medios/noticias-del-ieu/item/mayor-venta-de-vis-puede-indicar-crisis-en-el-sector-de-la-construccion (accessed on 1 December 2022).
9. Economic Commission for Latin America and the Caribbean (ECLAC, UN). Base de Datos y Publicaciones Estadísticas CEPALSTAT. 2022. Available online: https://statistics.cepal.org/portal/cepalstat/dashboard.html?indicator_id=33&area_id=400&lang=es (accessed on 1 December 2022).
10. National Department of Statistics DANE. Republic of Colombia. Special: International Day of the Population. 2023. Available online: https://www.dane.gov.co/files/indicadores-ods/doc-ODS-DiaMundialdelaPoblacion-jul2023.pdf (accessed on 3 December 2023).
11. United Nations International Chidren´s Emergency Fund UNICEF. Migración en América Latina. 2018. Available online: https://www.unicef.org/uruguay/comunicados-prensa/migraci%C3%B3n-en-am%C3%A9rica-latina (accessed on 1 December 2022).
12. Economic Commission for Latin America and the Caribbean (ELAC, UN). Acerca de Migración Interna. 2022. Available online: https://www.cepal.org/es/temas/migracion/acerca-migracion-interna (accessed on 1 December 2022).
13. Banco de la República de Colombia (Bank of the Republic of Colombia). El nexo entre Desarrollo y Migración Interna en Colombia. 2022. Available online: https://www.banrep.gov.co/es/el-nexo-desarrollo-y-migracion-interna-colombia (accessed on 1 February 2022).
14. Economic Commission for Latin America and the Caribbean (ECLAC, UN). Dinámica de la Pobreza en Colombia en el Siglo XXI. 2022. Available online: https://www.cepal.org/es/publicaciones/47796-dinamica-la-pobreza-colombia-siglo-xxi (accessed on 1 February 2022).
15. United Nations Development Programme UNDP. Migración en Colombia y Respuestas de Política Pública. 2022. Available online: https://www.undp.org/es/latin-america/publicaciones/migracion-en-colombia-y-respuestas-de-politica-publica (accessed on 1 February 2022).
16. Chiodelli, F. International Housing Policy for the Urban Poor and the Informal City in the Global South: A Non-diachronic Review. *J. Int. Dev.* **2016**, *28*, 788–807. [CrossRef]
17. Sengupta, U.; Murtagh, B.; D'ottaviano, C.; Pasternak, S. Between enabling and provider approach: Key shifts in the national housing policy in India and Brazil. *Environ. Plan. C Politi Space* **2018**, *36*, 856–876. [CrossRef]
18. de Duren, N.R.L. The social housing burden: Comparing households at the periphery and the centre of cities in Brazil, Colombia, and Mexico. *Int. J. Hous. Policy* **2018**, *18*, 177–203. [CrossRef]
19. Gilbert, A. Rental Market and Rental Policies in Less Developed Countries. In *The International Encyclopedia of Housing and Home*; Elsevier: Amsterdam, The Netherlands, 2012; pp. 35–45. [CrossRef]
20. Molina, I.; Czischke, D.; Rolnik, R. Housing policy issues in contemporary South America: An introduction. *Int. J. Hous. Policy* **2019**, *19*, 277–287. [CrossRef]
21. Donoso, R.E.; Elsinga, M. Management of low-income condominiums in Bogotá and Quito: The balance between property law and self-organisation. *Int. J. Hous. Policy* **2018**, *18*, 312–334. [CrossRef]
22. Gonzalez, C.G. Squatters, Pirates, and Entrepreneurs: Is Informality the Solution to the Urban Housing Crisis? *Univ. Miami Inter-Am. Law Rev.* **2009**, *40*, 239–259. Available online: http://www.jstor.org/stable/25593614 (accessed on 1 December 2022).

23. Balchin, P.N.; Stewart, J. Social housing in Latin America: Opportunities for affordability in a region of housing need. *J. Hous. Built Environ.* **2001**, *16*, 333–341. [CrossRef]
24. Rojas, E. "No time to waste" in applying the lessons from Latin America's 50 years of housing policies. *Environ. Urban.* **2019**, *31*, 177–192. [CrossRef]
25. Trallero, M. The Upgrading Links between Urban Services, Housing, Tenure Security and Governance. Specialization Thesis, Escola de Camins, UPC Barcelona-Tech, Barcelona, Spain, 2014; 75p. Available online: https://upcommons.upc.edu/bitstream/handle/2099.1/24221/Memory.pdf (accessed on 1 December 2022).
26. Bonells, C.F.U.; Torner, F.M. El rol de los servicios urbanos en la legalización predial y la generación de calidad urbana y valor del suelo. Aplicación al caso de Cúcuta (Colombia). *Hábitat Y Soc.* **2015**, *8*, 113–145. [CrossRef]
27. Aliu, I.R. Sustainable housing development dynamics in the Global South: Refl ections on theories, strategies and constraints. *Bull. Geogr. Socio-Econ. Ser.* **2022**, *56*, 83–100. [CrossRef]
28. Murray, C.; Clapham, D. Housing policies in Latin America: Overview of the four largest economies. *Int. J. Hous. Policy* **2015**, *15*, 347–364. [CrossRef]
29. Colombian Chamber of Construction CAMACOL. With the Reactivation of Social Housing, the Expected Growth of the Economy could be Doubled. 2023. Available online: https://camacol.co/actualidad/noticias/con-la-reactivacion-de-la-vivienda-social-se-podria-duplicar-el-crecimiento (accessed on 3 December 2023).
30. Ordóñez Aparicio, L. *El Mercado Global y la Ciudad de los Pobres: La Política de Vivienda Social en Colombia, 2010–2018*; Universidad de Los Andes: Bogotá, Colombia,, 2019; Available online: http://hdl.handle.net/1992/34094 (accessed on 15 February 2023).
31. Arku, G. The housing and economic development debate revisited: Economic significance of housing in developing countries. *J. Hous. Built Environ.* **2006**, *21*, 377–395. [CrossRef]
32. Oluku, U.; Cheng, S. A Regional Analysis of the Relationship Between Housing Affordability and Business Growth. *Econ. Dev. Q.* **2021**, *35*, 269–286. [CrossRef]
33. Anthony, J. Economic Prosperity and Housing Affordability in the United States: Lessons from the Booming 1990s. *Hous. Policy Debate* **2018**, *28*, 325–341. [CrossRef]
34. Mast, E. JUE Insight: The effect of new market-rate housing construction on the low-income housing market. *J. Urban Econ.* **2023**, *133*, 103383. [CrossRef]
35. Rodríguez-Pose, A.; Storper, M. Housing, urban growth and inequalities: The limits to deregulation and upzoning in reducing economic and spatial inequality. *Urban Stud.* **2020**, *57*, 223–248. [CrossRef]
36. Bramley, G.; Pawson, H. Low Demand for Housing: Incidence, Causes and UK National Policy Implications. *Urban Stud.* **2002**, *39*, 393–422. [CrossRef]
37. Ha, S.-K. Low-income housing policies in the Republic of Korea. *Cities* **1994**, *11*, 107–114. [CrossRef]
38. Ikejiofor, U. Tyranny of inappropriate policies. *Cities* **1998**, *15*, 429–436. [CrossRef]
39. Choguill, C.L. Housing policy trends in Bangladesh. *Cities* **1993**, *10*, 326–336. [CrossRef]
40. Yang, T.; Pan, H.; Zhang, X.; Greenlee, A.; Deal, B. How neighborhood conditions and policy incentives affect relocation outcomes of households from low-income neighborhoods—Evidence from intra-city movement trajectories. *Cities* **2021**, *119*, 103415. [CrossRef]
41. Fernandez, R.; Aalbers, M.B. Housing Financialization in the Global South: In Search of a Comparative Framework. *Hous. Policy Debate* **2019**, *30*, e0194. [CrossRef]
42. Marcos, M.; García, D.M.; Módenes, J.A. Who needs housing in Latin America? Co-residence in housing deficit estimates. *Rev. Bras. De Estud. De Popul.* **2022**, *39*, e0194. [CrossRef]
43. Marcos, M.; Módenes, J.A. The demographic component of urban housing needs in latin america: The case of Buenos Aires. *Doc. D'analisi Geogr.* **2021**, *67*, 265–292. [CrossRef]
44. Londoño, D.E.; GarcíaCardona, A.A.; Ospino, E. Guidelines for sustainable social interest housing Study Case: Medellín (Colombia). *Opcion* **2019**, *35*, 314–346. Available online: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85073409032&partnerID=40&md5=e86ddff9b88352f424f92b46a1b5606d (accessed on 1 December 2022).
45. Colombian Chamber of Construction CAMACOL; Servicio Nacional de Aprendizaje SENA. *Proyecto de Investigación del Sector de la Construcción de Edificaciones en Colombia*; CAMACOL: Bogotá, Colombia; SENA: Antioquia, Colombia, 2015; 244p, ISBN 978-958-98413-1-0.
46. Colombian Chamber of Construction CAMACOL. Los Pasos Hacia la Reactivación de la Economía Colombiana. Informe Económico No. 109. 12p. 2020. Available online: https://camacol.co/sites/default/files/descargables/Informe%20Econ%C3%B3mico%20109%20VF_%20Formato%202.pdf (accessed on 1 February 2022).
47. Colombian Chamber of Construction CAMACOL. Proyección Sectorial: PIB Edificador 2022. Informe económico No. 112. 12 p. 2021. Available online: https://camacol.co/sites/default/files/descargables/Informe%20Econ%C3%B3mico%20112%20VF_%20Formato.pdf (accessed on 1 February 2022).
48. National Department of Statistics DANE, Republic of Colombia. Migración Interna en Colombia a Partir del Censo General 2005. 2006. Available online: https://www.dane.gov.co/files/censos/presentaciones/migracion_interna.pdf (accessed on 1 February 2022).

49. El Tiempo. Las Cifras que Demuestran por qué Colombia es un País de Migraciones. 2023. Available online: https://www.eltiempo.com/colombia/otras-ciudades/especial-con-datos-sobre-las-migraciones-internas-en-colombia-264990#:~:text=En%20territorios%20como%20Magdalena,%20Sucre,del%20Choc%C3%B3,%20Nari%C3%B1o%20y%20Cauca (accessed on 3 December 2023).
50. Murad, R. Estudio Sobre la Distribución Espacial de la Población en Colombia. 2003. Available online: https://repositorio.cepal.org/bitstream/handle/11362/7186/1/S0311812_es.pdf (accessed on 1 February 2022).
51. Ramírez, C.; Zuluaga, M.; Perilla, C. Perfil migratorio de Colombia. Organización Internacional para las Migraciones OIM. 2010. Available online: https://www.cancilleria.gov.co/sites/default/files/planeacion_estrategica/Transparencia/estudio_oim_con_el_apoyo_de_colombia_nos_une_y_otras_entidades.pdf (accessed on 1 February 2022).
52. Colombian Chamber of Construction CAMACOL. Construction in Data. 2023. Available online: https://camacol.co/informacion-economica (accessed on 3 December 2023).
53. Ramachandran, K.M.; Tsokos, C.P. Goodness-of-Fit Tests Applications. In *Mathematical Statistics with Applications in R*; Elsevier: Amsterdam, The Netherlands, 2015; pp. 371–408. [CrossRef]
54. Hauke, J.; Kossowski, T. Comparison of values of Pearson's and Spearman's correlation coefficients on the same sets of data. *Quaest. Geogr.* **2011**, *30*, 87. [CrossRef]