Determinants of Housing Price: The Case of Bucaramanga (Colombia)

Jhon Alexander Bueno

Abstract

The housing prices in the city of Bucaramanga (Colombia) experienced a constant increase from 2006, raising fears that a housing bubble could happen in the growing city. Stiglitz (1990) explains a bubble as a constant increase in the price of a financial asset that is not justified by economic fundamentals. The purpose of this study was to find out if the increasing housing price in Bucaramanga from 2007-2014 could be attributed to a housing bubble, or could be explained as the result of other factors. Quarterly data for this period was used to analyze the response of house prices to changes in national and local economic fundamentals. House prices data for the city allowed a multiple regression analysis of several economic factors (area licensed for construction, construction cost, Gross Domestic Product (GDP), mortgage interest, unemployment, inflation) to establish the main determinants of its behavior. The study found that house prices for Bucaramanga varied significantly in their response to Gross Domestic Product (GDP) trend. Hence, GDP was found to be the only significant predictor of housing prices among the independent variables selected for the study.

Keywords: *Housing price, housing bubble*

Introduction

Background of Study

Colombia's housing price experienced a deep drop from 1995 until the end of 1999 during the country's last financial crisis. Prices slowly recovered but did not show a consistent increase until 2006. From that year henceforth, prices have increased by a total of 160%, while purchasing power has only increased by 50% (Ahumada, 2015).

One of the classical definitions of "bubble" was given by Stiglitz (1990), who explained it as a constant increase in the price of a financial asset that is not justifiable by economic fundamental factors. Thus, the problem with the constant increase in housing prices in Colombia brings about the fear of a "housing bubble". This is a justifiable fear, especially when considering the devastating effects of the last housing bubble on the US economy.

An early study of the determinants of housing price in Colombia published by the Central Bank (Banco de la República) in 2004, when housing prices were stabilizing after the financial crisis, showed that housing price was very elastic to area licensed for building and construction cost, and to mortgage interest rate in lower degree (Clavijo, Jana, & Muñoz, 2004).

Headlines announcing record increases in housing prices in the Colombian market and the possibility of the existence of a housing bubble have flooded local newspapers in the last few years. Probably the one with the highest impact was the declaration of Robert Schiller, the Yale economist and Nobel Laureate who predicted the collapse of the US housing market, who said in an interview in 2013 that he suspected housing bubbles brewing in emerging markets including Colombia (Schmidt & Castellani, 2013).

As a result, the Central Bank (Banco de la República) published a paper for the Colombian Federation for Development (Fedesarrollo) analyzing the behavior of housing price against the fundamentals that determine it. The study included land price as an offer factor as well as other

demand factors. Even though the study warns about historical maximums reached on *housing price/rent price* ratio and a similar behavior to that observed in the housing crisis in the 90's, the final conclusion of the authors is that housing prices could be explained as a normal answer to the fundamentals of the economy from the offer, specifically land price. The authors also concluded that if factors other than land price are used, house price is then shown misaligned (Salazar, Steiner, Becerra & Ramirez, 2013).

Another paper published later in the same year by a group of researchers of the Central Bank of Colombia (Banco de la República) found that traditional methods to detect housing bubbles suffer serious limitations and are not able to detect explosive bubbles when sample data include other bubbles that have been bursting. Since those methods could be inappropriate for the Colombian case, they applied a non-traditional method to the Colombian housing market that does not present the mentioned limitation and, in fact, allows detecting the starting and final date of the bubble. The method, developed by Phillips, Wu, and Yu (2008) was used to accurately predict the Hong Kong housing bubble while academic literature was denying it. The test on the Colombian housing market was able to detect a housing bubble between March and April 1998 and another recent one that began in June 2012. Even though the findings contrasted other papers studying the behavior of the Colombian housing market by implementing standard bubble detection tests, the authors were unable to test the robustness of their results since they only could deflate the Housing Price Index using Housing Rental Price Index and Consumer Price Index but could not use Household Income Index or Land Price Index due to lack of monthly data (Gómez, Ojeda, Rey & Sicard, 2013).

A recent report from the Colombian Construction Chamber – CAMACOL (Salcedo, Ortega, & Sarmiento, 2014) analyzing the behavior of housing prices per city found that the excessive price problem was not pervasive in all cities in Colombia. According to the authors, only two cities (Bogota and Bucaramanga) were found having Housing Price Index way above the average, as shown in Figure 1.
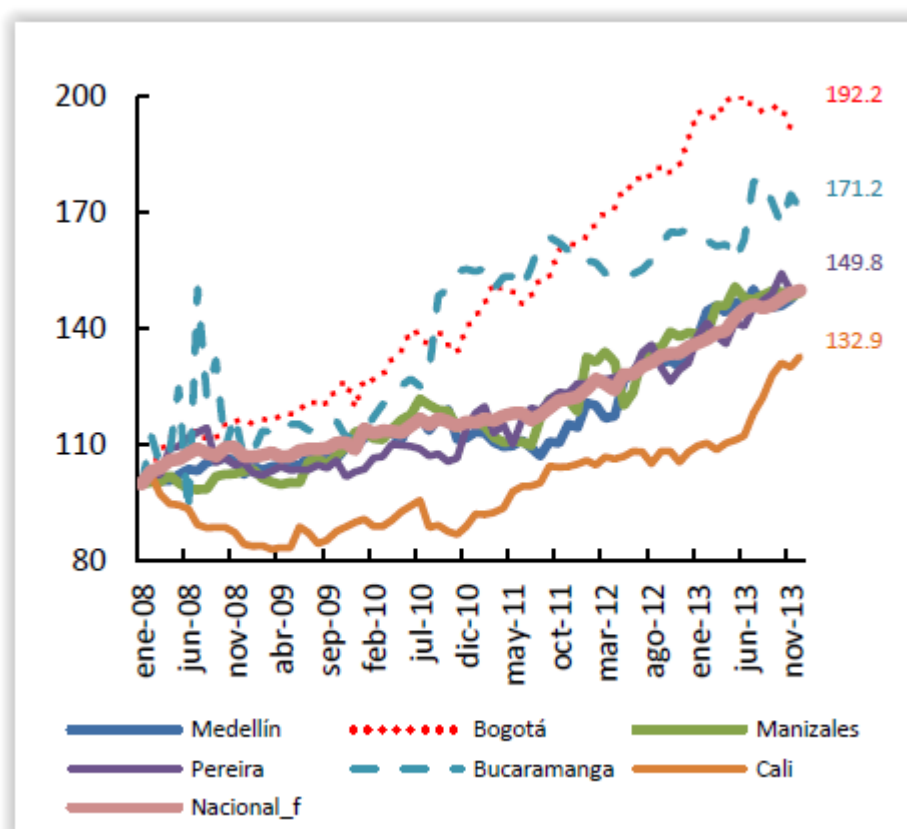

Figure 1. Housing Price Index (Fisher Index) per city compared to national average (Nacional_f). CAMACOL(2014).

The case of Bogota city was analyzed by the Planning Secretary of Bogota District in a research report published by Cediel and Velasquez (2013a). The authors used the same method developed by Phillips, Wu, and Yu (2008) to predict the Hong Kong housing bubble, and used later on by Gómez et al. (2013) to suggest the existence of a housing bubble in Colombia as mentioned before. Their results confirmed, for the specific case of Bogota city, the findings of Gómez et al. (2013) for data collected from government agencies (DANE and DNP). Housing prices showed an explosive behavior from December 2008 for New Housing Price Index, and from June 2012 for Housing Price Index. They also found that the explosive behavior for housing price was different for each city area. Most areas showed the same behavior from the beginning of 2005 to the beginning of 2012. Even though the findings were the same, the authors did not claim that a housing bubble actually exists in Bogota but pointed to the need for further research.

An additional study from the same government agency found that housing price for high class housing in Bogota could not be explained by the fundamentals of the economy (Land price and Gross Domestic Product). Therefore, the existence of a housing bubble was confirmed for high class housing. For middle class housing, since a deficit in housing was not found, the authors explained high prices as the result of market speculation practices from investors. For low class housing, a housing deficit was found as the most probable explanation for high prices. The authors pointed out that the consequences of the detected housing bubble are expected to be mild since only 50% of the housing in Bogota is paid for using borrowed funds (Cediel & Velasquez, 2013b).

Research Problem

The case of housing price in Bucaramanga (Colombia) deserves careful consideration because of the following reasons:

a. Even though the size of Bucaramanga's economy is smaller than those of cities like Bogota, Medellin or Barranquilla, it still shows a much higher Housing Price Index than them from 2007 as shown in Figure 2.
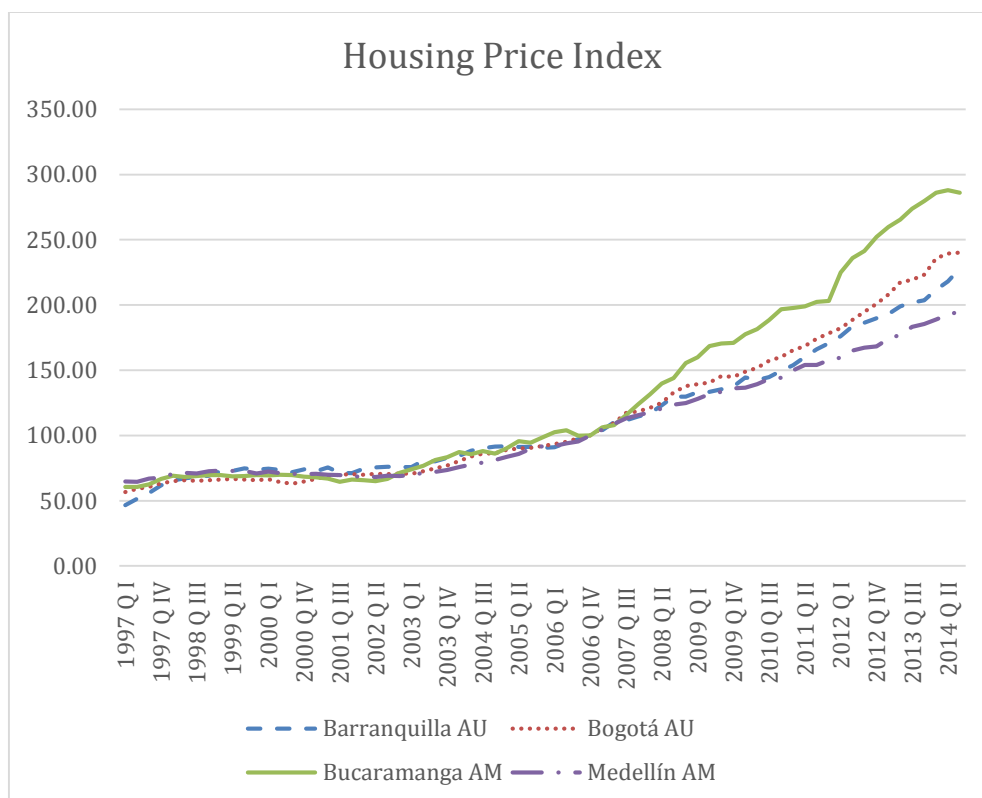

Figure 2. Housing Price Index (DANE Index) for four cities in Colombia. Data taken from National Administrative Department of Statistics (DANE).

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b. The behavior of the GDP for housing market in Santander state (where Bucaramanga city is located) has been higher than the national average since 2006, showing an important activity for the sector in the last 10 years.

c. Although construction cost is one of the fundamental drivers of housing price that could explain the high housing prices in the city, the variation of the Construction Cost Index for Bucaramanga has been lower than the national average from the beginning of 2013.

Even though the health indicators of the housing market in Bucaramanga city show symptoms of overheating, government authorities kept on justifying the behavior of the high prices by pointing to the fundamentals of the economy (Celedon, 2013).

Robert Schiller, quoted by Schmidt and Castellani (2013), after expressing his suspicion on a bubble brewing in Colombia, said, "There's always a way to argue for any price increase," and he added: "People like to think that this is a stable and steady increase. I was saying things about the U.S. just like this in 2005 and I got angry responses."

Then, the question that arises is: ***Can the high housing price trend in the city of Bucaramanga (Colombia) be explained from the economic fundamentals, so a housing bubble can be discarded?***

Significance of Study

This study is significant for several reasons. First, finding the determinants of house prices is very important, as house prices are a good indicator of the economic health of a country and its financial stability.   Next, though several studies intended to explain the behavior of house prices have been performed in the past about the Colombian case but no study analyzing the case of Bucaramanga city has been published so far. Furthermore, due to historical maximums reached recently, and a clear overheating of house prices, a study that finds out if the current behavior of house prices in Bucaramanga can be explained from the economic fundamentals is required. A recent research study (Cediel & Velasquez, 2013b) analyzing the case of the capital city of Colombia (Bogota) warned about the existence of housing bubbles for certain economic segments of the market. The case of Bucaramanga requires consideration since the Housing Price Index is currently much higher than the one of Bogota. Finally, investigating the possible existence of relationships between traditional and non-traditional economic indicators and house prices will help understand what may be the reason for house prices behavior and, therefore, help policy-makers make informed decisions.

Literature Review

Related research works or publications

An early study published by Peek and Wilcox (1991) analyzed different series of house pricing data collected in the U.S. between 1950 and 1989 and the factors that could account for movements in real house prices. They found that house pricing declines with increases in mortgage rate, rises with both cyclical and more permanent income increases, and increases relative to construction cost increases. Demographic factors were also found as significant determinants of house pricing.

Another extensive study intended to identify the differences in the way house prices react to local economic factors was performed by Lamb (1999). The study analyzed data collected for a period of 30 years (1960-90) in the U.S. House price change was separated into components representing rent change and change in the user cost of housing capital. The author used a regression analysis of those components and found that regional house prices varied significantly as a response to population shifts, employment and income trends. The author also found that the determinants that are significant to regional housing prices changed during the period of time studied.

Capozza et al. (2002), in a study done using data from 69 U.S. metropolitan areas for the period 1979-1995, found that high real income, population growth and real constructions costs show a high serial correlation with housing prices.

Tsatsaronis and Zhu (2004) studied the behavior of housing prices in developed countries and the importance of a number of macroeconomic factors affecting them. Their most interesting result was the prevalence of inflation as common factor in the determination of real house prices regardless of the differences in individual country housing markets.

In an attempt to contrast the behavior of house prices in developed economies with that of developing countries, Vizek (2010) analyzed sample data from 1997 to 2009 for three developed EU countries (Ireland, Spain, and the U.K.) and four post-transition EU countries (Bulgaria, Croatia, the Czech Republic, and Estonia). The purpose of the study was to detect house price determinants for Eastern European countries. The results suggested that, in the long run, interest rate explained house prices behavior in both groups of countries, while income is significant only for developed EU countries. In the short run, house loan changes explain the behavior of house prices, only for the case of post-transition EU economies.

Égert and Mihaljek (2007) also performed a study on house prices in order to find if its behavior was being driven by conventional fundamental determinants such as GDP per capita, real interest rates, housing credit and demographic factors. Their findings confirmed their hypothesis as housing prices could be explained well by those factors.

Another interesting and recent study is the one done by McQuinn and O'Reilly (2008), who also tested housing price data for the Irish market finding a long-run relationship with the amount individuals can borrow. The study worked on the assumption that borrowing levels depend on disposable income levels and current interest rates.

Algieri (2013), in a more recent study, analyzed house prices data from the five main Euro area countries (Germany, France, Italy, Spain, and the Netherlands) and from the Anglo-Saxon economies (the United Kingdom and the United States) for the 1970-2010 period. He used a multivariate unobserved component model to catch those price movements that are not fully explained by economic fundamentals. He found that real income, long-run interest rates, stock prices and inflation had an important role in explaining real house prices.

Research Model

Based on the literature review, the independent variables chosen for this study are: Area licensed for construction, construction cost, Gross Domestic Product (GDP), mortgage interest, unemployment, and inflation. The dependent variable is housing price.

Figure 3 summarizes the research model of this study that incorporates the major potential determinants affecting housing price.
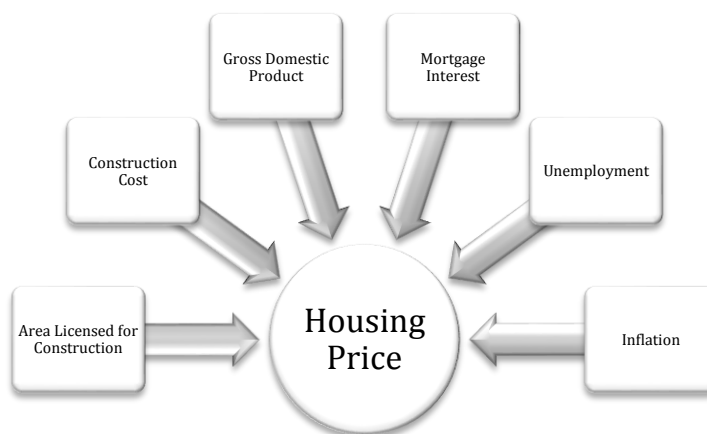

Figure 3. Research model of housing price

Hypotheses of Research

Hypotheses drawn in this study are the result of common factors found in the literature review.

Area Licensed for Construction:

Clavijo, Jana, and Muñoz (2004) indicated that housing price was very elastic to area licensed for construction in Colombia. This is a relevant factor to be considered since the shortage of area licensed for construction in Bucaramanga has been one explanations to high housing prices provided by local government authorities (Celedon, 2010).
Hence, the following hypothesis is included in the study:

H_1: Area licensed for construction is significantly negatively related to housing price.

Construction Cost:

One of the classic fundamentals of the economy intensively mentioned as a determinant of house prices in academic literature is construction cost (Peek & Wilcox, 1991; Capozza et al., 2002; Clavijo, Jana, & Muñoz, 2004).
Hence,

H_2: Construction cost is significantly positively related to housing price.

Gross Domestic Product (GDP):

Gross Domestic Product (GDP) was found to be one of the main determinants of housing price in several scholarly works (Égert & Mihaljek, 2007; Vizek, 2010; Cediel & Velasquez, 2013b; Algieri, 2013;). A series of data of Gross Domestic Product (GDP) has been used as a proxy for wealth. The variable is expected to be positively related to house price because income growth improves house affordability.
Hence,

H_3: Gross Domestic Product (GDP) is significantly positively related to housing price.

Mortgage Interest:

Mortgage Interest Rate is another fundamental of the economy that affects Housing Price according to the literature review (Peek & Wilcox, 1991; Clavijo, Jana, & Muñoz, 2004; Égert & Mihaljek, 2007; McQuinn & O'Reilly, 2008; Vizek, 2010; Algieri, 2013).
Hence,

H_4: Mortgage interest is significantly negatively related to housing price.

Unemployment:

Lamb (1999) found that regional house prices varied significantly as a response to employment among other factors. Therefore, unemployment rate will be included as one possible determinant of house price.
Hence,

H_5: Unemployment is significantly negatively related to housing price.

Inflation:

Tsatsaronis and Zhu (2004) found inflation as a common factor in the determination of real house prices in a cross-country study. Algieri (2013) also found inflation among the factors explaining real house prices.

A series of data containing the percent variation of Consumer Price Index in two periods of time (represents the observed inflation in the same period) was taken as a measurement of inflation.

Hence,

H_6: *Inflation is significantly positively related to housing price.*

Research Methodology

Procedure of Data Collection

The National Administrative Department of Statistics, commonly referred to as DANE (for its acronym in Spanish), is the Colombian Administrative Department responsible for the planning, implementation, analysis and diffusion of the official statistics of Colombia.

Data used in this study was collected from the DANE website since it is publicly available. Data is provided in MS Excel format in the website.

Sample Selection and Measures

The period of time selected for the study includes the first quarter of 2007 until the third quarter of 2014. Quarterly data was used for all variables included in the analysis.

The most recent studies of house prices for the Colombian market included data up to 2012 (Cediel & Velasquez, 2013). However, the last two years of data may provide a new insight since house prices showed a steep increasing trend totalizing 160% for the period of study (Ahumada, 2015). This provided the justification for the sample selection.

As a result of the literature review, the following independent variables were chosen for the study:
- Area licensed for construction
- Construction cost
- Gross Domestic Product (GDP)
- Mortgage interest
- Unemployment
- Inflation

Data Analysis Techniques

This study used a quantitative approach. The quantitative data analysis was performed using PASW version 21.

Multiple Regression Analysis (Veal, 2005) was used to study the individual influence of area licensed for construction, construction cost, Gross Domestic Product (GDP), mortgage interest, unemployment, and inflation on housing prices in the city of Bucaramanga (Colombia).

Results of Study

The value of $R^2=0.98$ as shown on Table 1 indicates that the chosen independent variables explain 98% of the variance in house prices. Meaning that house prices can be adequately predicted based on the given model.

Table 1. Model summary table for multiple regression analysis showing R and R^2 values.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.990ᵃ	.980	.975	8.97448

a. Predictors: (Constant), Inflation, Mortgage Interest, Area Licensed for Construction, Unemployment, Construction Cost, Gross Domestic Product

The significance level of the overall F of the model is less than 0.001, thus the model is considered significant, as shown on Table 2.

Table 2. Analysis of variance table reporting how well the regression equation fits the data.

ANOVAᵇ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	95389.003	6	15898.167	197.391	.000ᵃ
	Residual	1932.992	24	80.541		
	Total	97321.994	30			

a. Predictors: (Constant), Gross Domestic Product, Inflation, Area Licensed for Construction, Unemployment, Mortgage Interest, Construction Cost

b. Dependent Variable: Housing Price

The multiple regression coefficients shown on Table 3 evidence that Gross Domestic Product (GDP) was significantly and positively related to house prices ($\beta=0.81$, $p < 0.001$). H_3 was consequently supported by the results.

On the other hand, unemployment was significantly and positively related to house prices ($\beta = 0.106$, $p = 0.027$), and inflation was significantly and negatively related to house prices ($\beta = -0.078$, $p = 0.031$). Hence, H_5 and H_6 were not supported by the results.

Additionally, area licensed for construction ($\beta = -0.065$, $p = 0.067$), construction cost ($\beta = 0.234$, $p = 0.117$), and mortgage interest rate ($\beta = -0.031$, $p=0.644$) are considered marginal. Therefore, H_1, H_2, are H_4 were not supported by the results.

Table 3. Multiple regression coefficients table with necessary information to predict housing price and determine statistical contribution to the model from selected independent variables.

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-492.274	78.717		-6.254	.000		
	Area Licensed for Construction	-7.595E-5	.000	-.065	-1.916	.067	.709	1.409
	Construction Cost	1.005	.618	.234	1.627	.117	.040	24.952
	Gross Domestic Product	.004	.001	.810	4.348	.000	.024	41.961
	Mortgage Interest	-2.155	4.602	-.031	-.468	.644	.194	5.151
	Unemployment	4.787	2.033	.106	2.355	.027	.408	2.451
	Inflation	-462.507	201.810	-.078	-2.292	.031	.710	1.409

a. Dependent Variable: Housing Price

Discussion

As an answer to the research question of whether the high housing price trend in the city of Bucaramanga (Colombia) could be explained from the economic fundamentals, the result of this study showed Gross Domestic Product (GDP) as the only significant predictor of housing prices out of the six chosen independent variables (Area licensed for construction, construction cost, Gross Domestic Product (GDP), mortgage interest, unemployment, and inflation).

These results contradict the findings of early (Clavijo, Jana, & Muñoz, 2004) and late (Salazar et al., 2013) studies performed on the Colombian market that could explain the behavior of housing prices from fundamentals of the economy included in this study like area licensed for building and construction cost, and mortgage interest rate.

Even more, the results of this study partially contradict the recent findings of Cediel and Velasquez (2013b) showing that housing price behavior for the capital city of Colombia (Bogota) could not be explained by fundamentals of the economy like Gross Domestic Product and land price.

Then, is it valid to conclude that there is no housing bubble in Bucaramanga because only one of the fundamentals of the economy (Gross Domestic Product - GDP) was found to be a significant predictor of housing price? Shiller (2007) suggests that when it seems impossible to explain the boom in the housing market in terms of fundamentals like rents or construction cost, a feedback mechanism or social epidemic that makes people see housing as good investment opportunity may be the best explanation for increasing housing prices trend. In an earlier study (Case & Shiller, 1988), home buyers were surveyed in cities experiencing a housing boom and the researchers found that their high expectations about future price were the basis of the real estate boom, and therefore, the cause of an excess in demand that pushes house prices up. This could be the reason why the only factor explaining the high trend in house prices is the good performance of the Colombian economy (GDP). However, generalizations should be made with caution.

Conclusion

House prices in several cities of Colombia have soared extraordinarily rapidly in recent years, and their increase went so highly above the historical average that they do not seem to be fully explained by economic fundamentals like the case of Bogota (Cediel & Velasquez, 2013b).

A handful of studies have been done for the capital city of Colombia (Bogota) in the last few years but, there seems to be no study published for the case of Bucaramanga where the highest values for the Housing Price Index have been found since 2007. For this reason, the purpose of this study was to find whether the high housing price trend in the city of Bucaramanga (Colombia) could be explained from the economic fundamentals.

Results from a multiple regression analysis using area licensed for construction, construction cost, Gross Domestic Product (GDP), mortgage interest, unemployment, and inflation as possible determinants of housing price revealed that only Gross Domestic Product (GDP) is a significant predictor of housing price.

Future Scope of Research

Further research could be conducted including information about population since a new demographic census is planned to take place in 2016. Also, house buyers' sentiment could be surveyed and included as one of the factors that could influence the behavior of house prices in a housing boom as suggested by Shiller (2007).

Limitation of Study

A recent study denying the presence of a housing bubble found land prices as the only economic factor able to explain house prices behavior in the capital city of Colombia (Salazar et al., 2013). Unfortunately, there is no data available about land prices for Bucaramanga city. Therefore, it couldn't be included as part of this study.

Another important limitation of this study is the absence of demographic factors as part of the independent variables chosen. Several authors referenced in the literature review found population as one of the drivers of house prices (Lamb, 1999; Égert & Mihaljek, 2007; Capozza, Hendershott, Mack & Meyer, 2002). However, the National Department of Statistics (DANE) only provides a yearly projection of population based on the last census done in 2005 which also makes GDP per capita not the most reliable source for real income.

For these reasons, the results of this study need to be interpreted and inferred cautiously.

About the Author

Jhon Alexander Bueno is a lecturer at the Faculty of Business Administration.

References

Ahumada, O. (2015, April 5). Estratos 3 y 6, los más perjudicados con alzas de la vivienda. *El Tiempo*. Retrieved from http://www.eltiempo.com/economia/sectores/precio-de-vivienda-en-colombia-aumento-un-160-en-diez-anos/15516155

Algieri, B. (2013). House price determinants: Fundamentals and underlying factors. *Comparative Economic Studies, 55*(2), 315-341. doi: http://dx.doi.org/10.1057/ces.2013.3

CAMACOL (2014). Heterogeneidad Inter e Intra Regional de los Precios de la Vivienda Nueva: Evolución Reciente y Tendencias de Largo Plazo. Retrieved from http://camacol.co/internas/heterogeneidad-inter-e-intra-regional-de-los-precios-de-la-vivienda-nueva-evolución.

Capozza, D., Hendershott, P., Mack, C., & Mayer, C. (2002). Determinants of Real House Price Dynamics (Working Paper No. 9262). *National Bureau of Economic Research*. Retrieved from http://www.nber.org/papers/w9262

Case, K., & Shiller, R. (1988). The Behavior of Home Buyers in Boom and Post-Boom Markets (Working Paper No. 2748). *National Bureau of Economic Research*. Retrieved from http://www.nber.org/papers/w2748

Cediel, D., & Velasquez, C. (2013a). Burbuja Inmobiliaria en Bogotá? *Observatorio Dinámicas Del Territorio, 12*. Retrieved from http://www.sdp.gov.co/portal/page/portal/PortalSDP/InformacionTomaDecisiones/Estadisticas/ObservatorioDinamicasTerritorio/2013

Cediel, D., & Velasquez, C. (2013b). Burbuja Inmobiliaria en Bogotá. *Observatorio Dinámicas Del Territorio, 13*. Retrieved from http://www.sdp.gov.co/portal/page/portal/PortalSDP/InformacionTomaDecisiones/Estadisticas/ObservatorioDinamicasTerritorio/2013

Celedon, N. (2010, October 31). ¿Qué sustenta los altos precios de vivienda en el área metropolitana? *Vanguardia Liberal*. Retrieved from http://www.vanguardia.com/historico/80677-que-sustenta-los-altos-precios-de-vivienda-en-el-area-metropolitana

Celedon, N. (2013, March 26). Polémica por precios de la vivienda en Bucaramanga. *Vanguardia Liberal*. Retrieved from http://www.vanguardia.com/economia/local/201614-polemica-por-precios-de-la-vivienda-en-bucaramanga

Clavijo, S., Jana, M., & Muñoz, S. (2004). La vivienda en Colombia: Sus determinantes socio-economicos y financieros. *Borradores De Economía, 300*. Retrieved from http://www.banrep.gov.co/es/borrador-300

Égert, B., & Mihaljek, D. (2007). Determinants of house prices in central and eastern europe. *Comparative Economic Studies, 49(3)*, 367-388. doi: http://dx.doi.org/10.1057/palgrave.ces.8100221

Gómez, J., Ojeda, J., Rey, C., & Sicard, N. (2013). Testing for Bubbles in Housing Markets: New Results Using a New Method. *Borradores De Economía*, 753. Retrieved from http://www.banrep.gov.co/en/borrador-753

Lamb, V. R. (1999). *Determinants of house price change, 1960--1990* (Doctoral dissertation. Retrieved from ProQuest Dissertations & Theses Global. (304517433).

McQuinn, K., & O'Reilly, G. (2008). Assessing the role of income and interest rates in determining house prices. *Economic Modelling, 25(3),* 377. Retrieved from http://search.proquest.com/docview/211672390?accountid=39909

Peek, J., & Wilcox, J. A. (1991). The measurement and determinants of single-family house prices. *AREUEA Journal*, *19*(3), 353. Retrieved from http://search.proquest.com/docview/211124503?accountid=39909

Phillips, P. C. B., Wu, Y., & Yu, J. (2008). *Explosive behavior in the 1990s nasdaq: When did exuberance escalate asset values?*. Rochester: Social Science Research Network. doi: http://dx.doi.org/10.2139/ssrn.1091830

Salazar, N., Steiner, R., Becerra, A., & Ramirez, J. (2013). The Land Price Effects on the Housing Price in Colombia. *Revista Ensayos Sobre Política Económica (ESPE), 31*(70). Retrieved from http://www.banrep.gov.co/es/espe70-1

Salcedo, M., Ortega, K., & Sarmiento, V. (2014, April 18). Heterogeneidad Inter e Intra Regional de los Precios de la Vivienda Nueva: Evolución Reciente y Tendencias de Largo Plazo. Retrieved from http://camacol.co/internas/heterogeneidad-inter-e-intra-regional-de-los-precios-de-la-vivienda-nueva-evolución

Shiller, R. (2007). Understanding Recent Trends in House Prices and Home Ownership (Working Paper No. 13553). *National Bureau of Economic Research*. Retrieved from http://www.nber.org/papers/w13553

Schmidt, B., & Castellani, M. (2013, September 5). Shiller Warns of Housing Bubble After 225% Surge: Brazil Credit. Bloomberg Business. Retrieved from http://www.bloomberg.com/news/articles/2013-09-05/shiller-warns-of-housing-bubble-after-225-surge-brazil-credit

Stiglitz, J. E. (1990), "Symposium on Bubbles." *Journal of Economic Perspectives*, *4*(2).

Tsatsaronis, K. & Zhu, H. (2004) What Drives Housing Price Dynamics: Cross-Country Evidence. *BIS Quarterly Review, March 2004*. Retrieved from http://ssrn.com/abstract=1968425

Veal, A. J. (2005). *Business Research Methods: A Managerial Approach* (2nd ed., pp. 281-283). Sydney: Pearson.

Vizek, M. (2010). Short-run and long-run determinants of house prices in eastern and western european countries. *Privredna Kretanjua i Ekonomska Politika, 20(125)*, 27-60. Retrieved from http://search.proquest.com/docview/858457964?accountid=39909