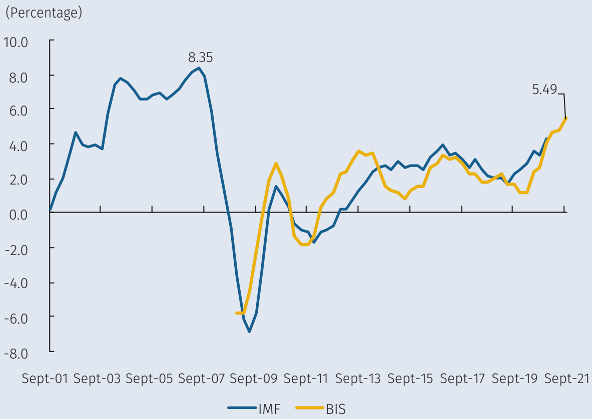
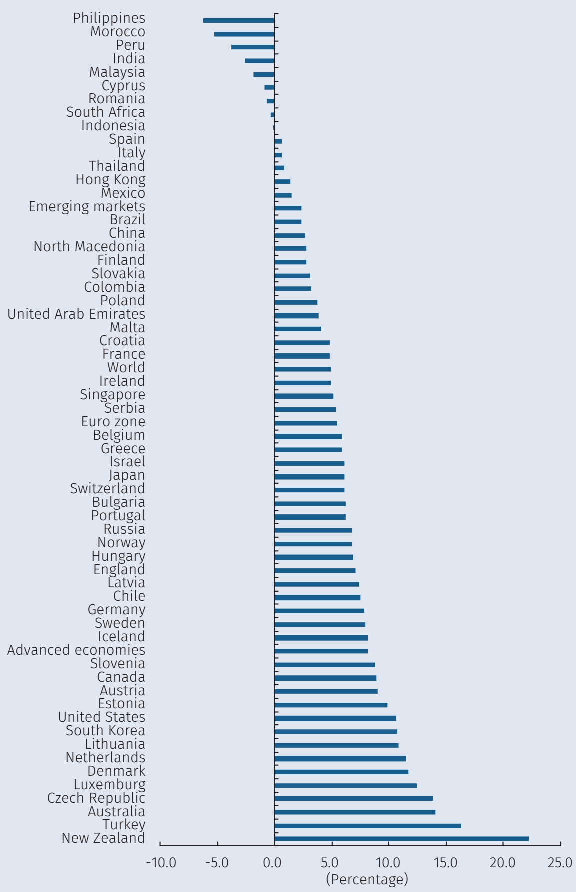
Box 1: Recent Housing Market Performance

Graph B1.1
Real housing prices

A. Global housing price indices
(annual change) a/



B. Annual growth in real housing prices 2021
(period average)



a/ Global price indices represent an aggregate of more than 50 countries
Note: Real price indices were deflected with each country's CPI.
Sources: International Monetary Fund and Bank for International Settlements

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1. The housing market and monetary policy

The inflationary phenomenon accompanying economic recovery following the crisis of COVID-19 has become a source of concern to monetary policy authorities around the world. Annual inflation has reached decade-long highs in many developed economies, primarily due to global supply chain bottlenecks and disruptions. Economic shocks in these countries have persisted longer than expected by their central banks. More persistent deviation from target inflation rates can be expected in this context, increasing the probability of an accelerated withdrawal of monetary stimulus in advanced economies. Possible imbalances generated in other markets, as is the case in numerous countries' housing markets, are also a concern and could exert additional and longer-lasting pressure on inflation.

In contrast to other economic indicators, and as opposed to expectations during a typical recession (International Monetary Fund, 2021), global housing prices increased during the COVID-19 pandemic. According to the Bank for International Settlements (BIS), the global indicator for real housing prices rose in annual terms by 2.6% in 2021 and 4.4% in 2021[1], the largest rate increases in 12 years (Graph B1.1, Panel A). In some cases, housing price increases surpassed those observed prior to the global financial crisis in 2008. In a sample of 58 economies, close to 50 registered real annual growth in housing prices in 2020 and 2021, with developed economies producing the highest increases (Graph B1.1, Panel B).

The dynamic described above could affect inflation, particularly through housing rentals prices[2]. Significant increases in housing prices could motivate homeowners to pursue higher potential returns (rent)[3]. Higher housing prices could likewise limit the potential for new homeowners to enter the market, limiting affordability and putting pressure on rental demand[4]. In addition to inflationary concerns, these conditions could have additional implications for financial stability, associated with a

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1 Data for 2021 corresponds to the average through the third quarter compared to the average for 2020 as a whole.

2 Housing-related services account for 32.80% of overall inflation in the U.S. and 11.55% in the euro zone.

3 Amid global monetary policy that would continue to be normalized.

4 Renters' desire to recover losses and discounts applied in 2020 represent additional factors that could be putting pressure on the U.S. housing market.

probable housing market bubble that could negatively affect the financial system and the economy writ large, as was the case in 2008[5].

In this context, monitoring potential domestic and external imbalances in housing markets are of particular interest to central banks. For example, in the United States, the persistence of high growth in housing prices could increase the risk of higher inflation. Added to other factors, this could precipitate an acceleration in the pace of monetary policy normalization in the U.S. and, as a result, lead to an increase in Colombia's external financing costs earlier than is currently expected by the market and *Banco de la República's* technical staff.

2. International housing prices

In most of the world's economies, increases in housing prices have been driven by both supply and demand factors. Several considerations have contributed to a significant increase in housing demand, including: 1) low interest rates as part of major central bank policies adopted to mitigate the adverse effects of COVID-19; 2) fiscal support from governments intended to support household income; 3) increased savings as a result of reduced household spending on certain services during the pandemic; and 4) a preference for housing with suitable spaces for remote work, which stimulated the purchase of larger houses or second homes.

On the supply side, there have been several significant restrictions associated primarily with scarcity in the labor force and in construction materials. For example, steel and lumber prices in international markets averaged an annual growth in 2021 of 172.4% and 70.4%, respectively. This came amid supply restrictions related to climate factors[6] and production bottlenecks, as well as increased demand for commodities alongside economic recovery and the easing of mobility restrictions. According to the Home Builders Institute (HBI), trained labor scarcity in the construction sector has been a limiting factor in improving the housing supply in the United States. This has coincided with a reduction in housing inventories in the U.S. and other countries, including Canada, New Zealand and Sweden, contributing to a market imbalance[7].

The leading indicators of real housing sales prices in the U.S. registered double-digit annual growth in 2021, surpassing levels from before the 2008 financial crisis, when the deregulation of sub-prime housing loans and other factors provoked a collapse in the financial system (Ocampo, 2009) (Graph B1.2). Given the transmission of housing market price pressures on rentals, which tends to occur in the upward phase for housing prices and extend even beyond this period, housing-related services and its components registered significant growth acceleration in the second half of 2021. This came after a steep decline in 2020 and surpassed growth rates observed in the last decade (Graph B1.3, Panel A). Indeed, based on real estate market information (Zillow's ZORI index), rental prices registered historical highs between 2019 and 2021, increasing 9.9% (an increase of USD 156 on average) (Graph B1.3, Panel B).

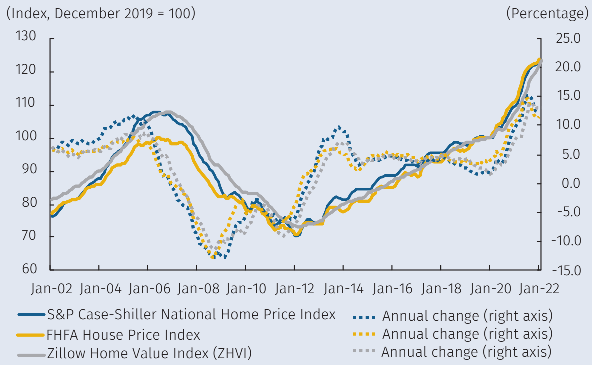
Housing prices in the U.S. are expected to remain high in 2022 but increase at a slower pace than in 2020 and 2021. A smaller imbalance, though without returning to pre-pandemic conditions, would contribute to moderation in growth in this market. On

5 The Federal Open Market Committee (FOMC) most recent meeting minutes signal that increased prices in housing-related services have generated upward inflation pressure. The FOMC considered this a factor that could potentially contribute to an acceleration in the cost of living in the U.S. The European Central Bank (ECB) has signaled its concern with the increased risk of rising prices in the housing market and, through the European Systemic Risk Board, has asked for seven of the 30 countries it monitors to take financial steps to mitigate these risks.

6 Spring and summer are wildfire seasons in Canada and the U.S., limiting operating capacity in the lumber sector. British Columbia, which produces 16.7% of the lumber in North America, experienced flooding at the end of 2021, increasing difficulties in the dispatch of lumber orders from the port of Vancouver (Williams, 2021).

7 The U.S. construction sector has not recovered from the shock of 2008-2009, generating low housing inventory over the last decade. Regional planning requirements and construction regulations have contributed to insufficient inventories in Canada since 2015 (Bank of Canada, 2021). In New Zealand and Sweden, housing construction has encountered barriers in responding to population growth and new household formation, amid land use restrictions (Reserve Bank of New Zealand, 2021; Sveriges Riksbank, 2021).

Graph B1.2
Real housing prices in the United States
(Indices and annual change) a/

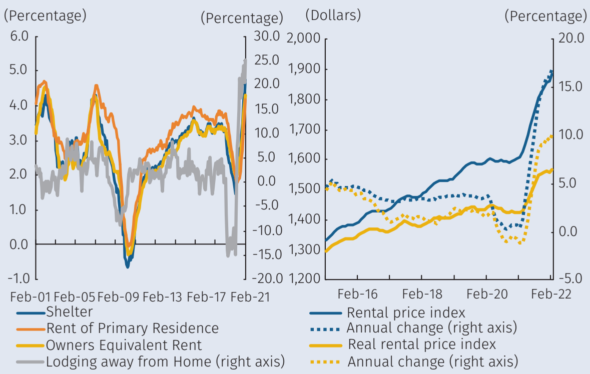


a/ Indices are deflected with the Personal Consumption Expenditures Price Index (PCEP)
Sources: Standard & Poor's, Federal Housing Finance Agency (FHFA) and Zillow; calculations by the authors.

Graph B1.3
Housing rental price indicators

A. Inflation in housing-related services by group

B. Rental price index a/

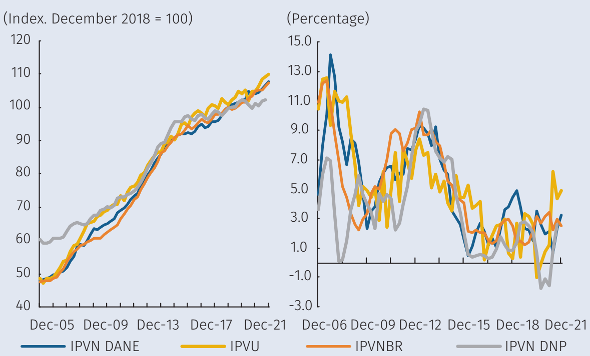


a/ Indices are deflected with the Personal Consumption Expenditures Price Index (PCEP)
Sources: FRED St. Louis and Zillow; calculations by the authors.

Graph B1.4
Housing prices in Colombia

A. Real housing price indices for Colombia

B. Real housing price growth in Colombia (annual change)



Note: Real new housing prices are measured through DANE's IPVN including 30 municipalities, *Banco de la República's* IPVNBR for Bogotá and surrounding municipalities, Medellín, Cali and DNP's IPVN for Bogotá. Real used housing prices are measured through *Banco de la República's* IPVU for Bogotá and Medellín and their surrounding municipalities, and for Cali. All are deflected with the CPI excluding foods.
Sources: *Banco de la República*, DANE and DNP; calculations by the authors.

the demand side, increased Federal Reserve interest rates and their transmission on mortgage rates would represent the main disincentive to housing sales[8]. Sales performance should nonetheless remain strong, though below levels registered in the last two years (Orton, 2022). On the supply side, the housing sales inventory is expected to recover from historically low levels this year, alongside new housing construction and the opening of more real estate availability with the end of the U.S. federal foreclosure moratorium on June 30, 2021. However, supply would not be expected to grow sufficiently to rebalance the housing market, due to persistent costs and input supply problems. According to the FOMC, housing-related services would constitute a potential source of additional inflation pressure.

3. The housing market in Colombia

Similar factors as those mentioned above have favored purchasing demand for housing in Colombia. However, housing prices have not registered significant increases compared to some advanced economies. Since 2016, real new[9] and used[10] housing price indices have registered typical and stable growth. This trend continued in 2021, with new and used housing prices averaging 2.1% and 4.2% annual growth, respectively. These figures were below those registered in other episodes of rising housing prices[11] (Graph B1.4).

In contrast to price performance in advanced economies, this dynamic in Colombia resulted from a greater balance between supply and demand in the country's housing market. As with the rest of the world, Colombia has seen significant growth in housing demand. Several factors have helped mitigate the effects of demand and cost pressures on housing prices. For non-public housing, these include the existence of significant inventory. For public housing, they include the availability of government subsidies and credit at low interest rates.

Public housing sales peaked in 2021, with more than 160,000 units sold. Non-public housing sales also performed very well, with sales of 67,000 units, the highest figure since 2017 (Graph B1.5, Panel A). Housing demand performance has been driven since the beginning of 2020 by the expansion of subsidy programs in 2020, 2021 and 2022[12]. One of these, called *Mi Casa Ya* (My House Now), is aimed at low-income households and provides a monetary subsidy for purchasing new homes (priced between 130 and 150 times the legal monthly minimum wage). The program also offers homebuyers a hedge on credit interest

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8 As of March 31, mortgage rates at 30 and 15 years were much higher than in 2019.

9 From DANE's new housing price index (IPVN for its initials in Spanish) and *Banco de la República's* real new housing price index (IPVNBR).

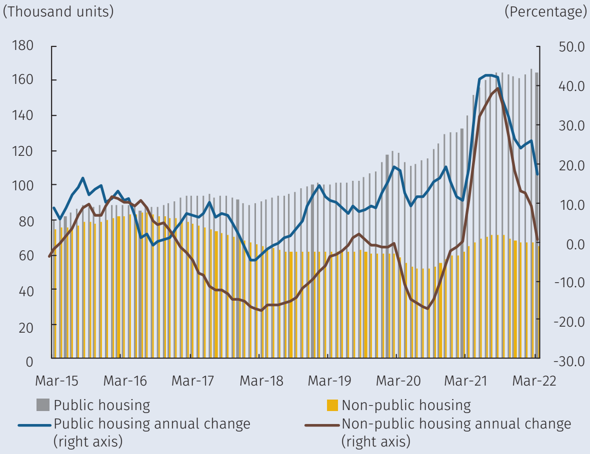
10 From *Banco de la República's* real used housing price index (IPVU).

11 For example, prior to the 2008 crisis real new and used housing price indices registered increases of 11.3% and 11.5%, respectively. The composition of overall sales has changed since that period. Specifically, from 2012-2013 public and non-public housing corresponded to 46% and 54% of overall housing sales, respectively, while in 2021, the proportion was 70% to 30%.

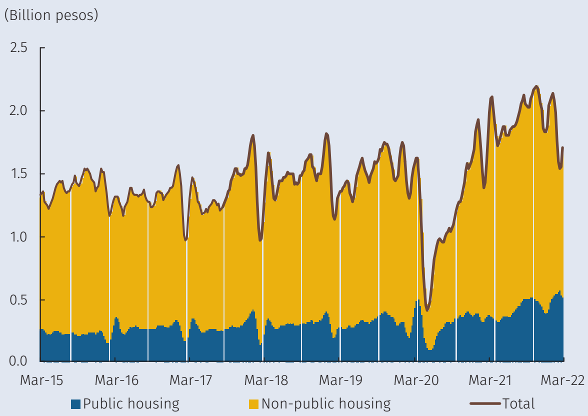
12 The *Compromiso por Colombia* ("Commitment for Colombia") plan, announced by the national government in 2020 in response to the COVID-19 pandemic, made available 200,000 subsidies for the acquisition of housing between 2020 and 2022: 100,000 for public housing through the *Mi Casa Ya* ("My House Now") program and 100,000 subsidies for non-public housing purchases through the FRECH fund.

Graph B1.5

A. Housing sales by segment
(12-month accumulation and annual change)

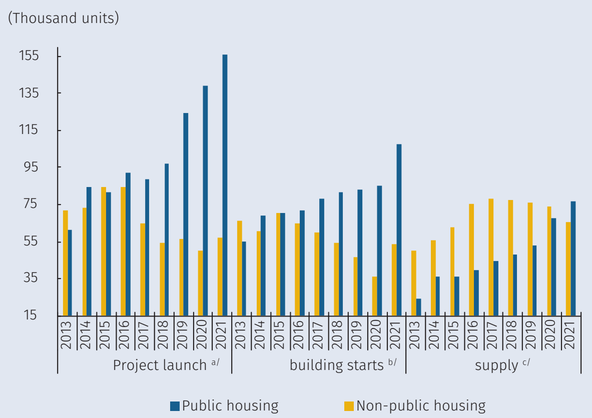


B. Disbursements for housing purchases



Sources: CAMACOL and Financial Superintendent; calculations by the authors.

Graph B1.6
Project launch, building starts and housing supply inventory by segment



a/ Twelve-month accumulation of project units that began sales in 13 regions
b/ Twelve-month accumulation of projects units that began construction in 13 regions
c/ Twelve-month average of project units or stages available in the sales market in 13 regions
Sources: CAMACOL; calculations by the authors.

rates[13]. For its part, Colombia's Reserve Fund to Stabilize the Mortgage Portfolio (FRECH for its initials in Spanish) provides subsidies to applicants who already have approved loans to purchase homes priced up to 500 times the legal monthly minimum wage. This subsidy covers a percentage of the agreed credit interest rate, leading beneficiaries to prefer the finished housing supply. In addition to these subsidies, housing demand has been driven by low interest rates (as is the case in the global context), the desire for more space and comfort, and a recomposition of spending during the pandemic. As a result, credit disbursements for homebuying registered historical highs in 2021 (Graph B1.5, Panel B).

The continuation of *Mi Casa Ya* subsidies contributed to an increase in new housing generation in the public housing sector, where key indicators (building starts and project launch) reached multi-year highs (Graph B1.6). Widely available credit for public housing construction has also contributed to this dynamic, with disbursements that in average annual terms increased 55.8% in 2021. Meanwhile, the non-public housing inventory has increased since 2015 amid reduced demand in the context of deterioration in available income from falling oil prices. This dynamic helped allow the sector meet demand registered since the middle of 2021 originating, in part, in the FRECH subsidies. Despite the fact that in 2021 launches and building starts returned to pre-pandemic levels, construction in this segment had lagged in prior years and remains far from its peak performance registered in 2015 (Graph B1.6).

Improvements in the housing market are reflected in the rotation indicator[14], which determines how many months it would take to sell existing housing supply, keeping the number of available units and the rate of sales constant (Graph B1.7). In 2021, the rotation indicator for public housing returned to its 2019 average of 5.7 months, while the non-public housing indicator fell 15 months prior to the pandemic to 11.6 months. The response of the construction sector to this improved performance has come amid difficulties associated with the pandemic as well as disruptions in global supply chains and an increase in international commodities prices. The Producer Price Index (PPI) for construction materials, suggests that prices for iron and steel, metal, and glass products, all essential construction inputs, grew in 2021 by 45.1%, 19.0% and 9.4%, respectively (Graph B1.8). This could be making financial closings more difficult, especially in the public housing sector[15], and could lead some builders to consider delaying or stopping some projects, which could affect future housing supply.

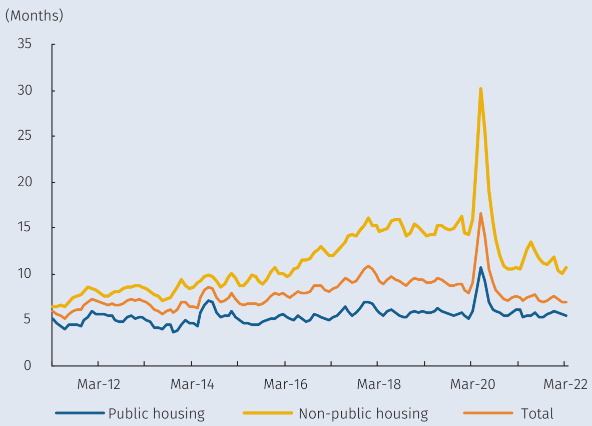
In sum, price behavior in the public housing segment appears to be associated with a generally balanced market and driven by subsidies, a factor that would determine both demand and supply. Moreover, price limits tied to these subsidies (135 or 150

13 For homes with incomes below four times the legal monthly minimum wage, this offers a subsidy of up to 30 times the minimum wage and a credit interest rate hedge of up to 5 percentage points.

14 The rotation indicator is considered to be a useful thermometer of activity in the housing market. A result above 18 months would reflect unfavorable activity, while a rotation indicator below this period would represent a healthy market.

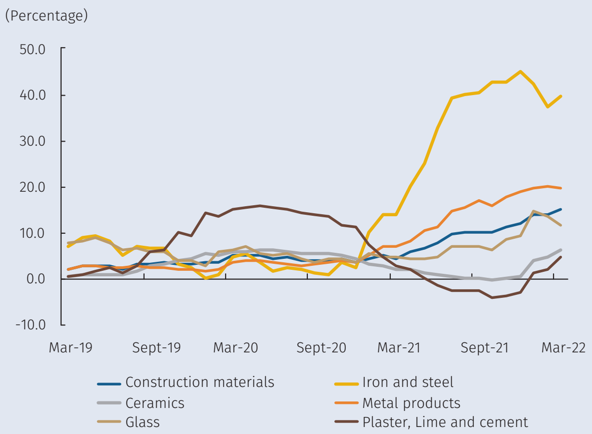
15 Public housing units have a price limit equal to 135 times the legal monthly minimum wage or 150 times for developments in urban areas of more than a million inhabitants, leaving builders with limited room for maneuver.

Graph B1.7
Rotation indicator a/



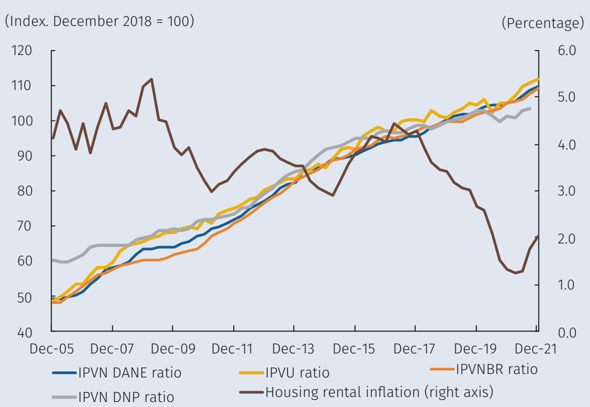
a/ The rotation index is the quotient of the monthly supply inventory and the average quarterly sales. Quarterly sales average is used because monthly data tends to be more volatile.
Sources: CAMACOL; calculations by the authors.

Graph B1.8
PPI for construction materials
(annual change)



Sources: DANE; calculations by the authors.

Graph B1.9
Housing rental inflation and price-rent ratios



Note: ratios correspond to quotient of housing price indices and the CPI for housing rentals
Sources: *Banco de la República*, DANE, DNP; calculations by the authors.

times the legal minimum wage), could restrict the responsiveness of prices to significant demand increases. Meanwhile, the non-public housing market has not presented imbalances that would pressure prices. This is likely because increased demand has to this point been supported by significant inventory accumulation. As a result, the Colombian housing market has not shown any evidence of an imbalance between supply and demand that would pressure prices, as has occurred in other countries.

Moving forward, the evolution of housing prices will depend on the demand side on the continuity of government subsidy programs, the evolution of mortgage credit rates, the behavior of inflation and its negative effects on available income, and political uncertainty and its effect on investment. A lapse or reduction of the *Mi Casa Ya* and FRECH programs, increased debt costs, lower purchasing power, or an increase in the country's risk perceptions could disincentivize housing acquisition. On the supply side, the persistence of high costs on construction materials would represent the main risk to the creation of new housing supply.

The CPI for rental housing grew moderately in 2020 (1.33%) amid weak demand and ample housing availability and remained stable in 2021 at 2.02% (below the average of the last 22 years of 3.38%). Moving forward, it is likely that the annual increase in the CPI for rental housing would be above the target on the forecast horizon, in large part due to its indexation at high levels of projected overall inflation (see Section 2.2.1). Another upside risk to this indicator would be the transmission of increased construction costs on new housing prices (primarily in the non-public housing segment). This would also lead to a tighter used housing market. Additionally, this could increase the expected return on housing investment for renters, which has been on a downward trajectory, as suggested by the ratio between housing price indices and the CPI for rental housing (Graph B1.9).

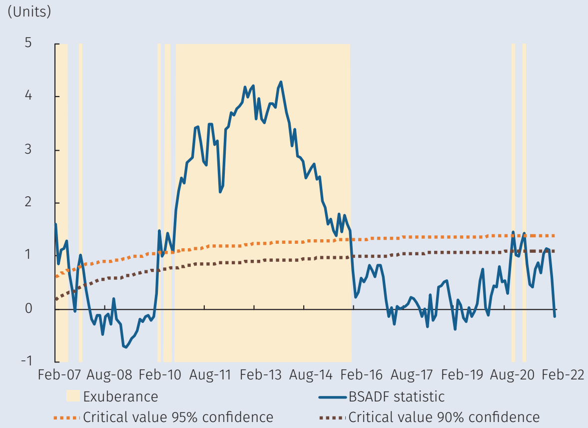
Finally, although currently housing prices in Colombia have not shown significant signs of pressure, it remains important to monitor prices in order to identify early signs of imbalances in this market. A PSY bubble detection procedure was conducted with this in mind (Phillips, Shi and Yu, 2015), allowing for the identification of multiple episodes of exuberance[16] in asset prices. This methodology is based on an augmented Dickey-Fuller test and implies multiple recursive regression calculations that vary by start date, observation number, and end date[17]. The results of this methodology based on the IPVNBR and the IPVU (Graph B1.10) signal that, for both the used and new housing markets, the presence of episodes of exuberance during the global financial crisis of 2008 and the oil boom at the beginning of the last decade, when high growth rates in the housing market were observed. By contrast, the procedure yields no evidence of bubbles or episodes of price exuberance in recent months.

16 An episode of extended exuberance is understood as a period in which housing prices are not explained by market fundamentals but rather non-fundamental components, which could in include speculative factors.

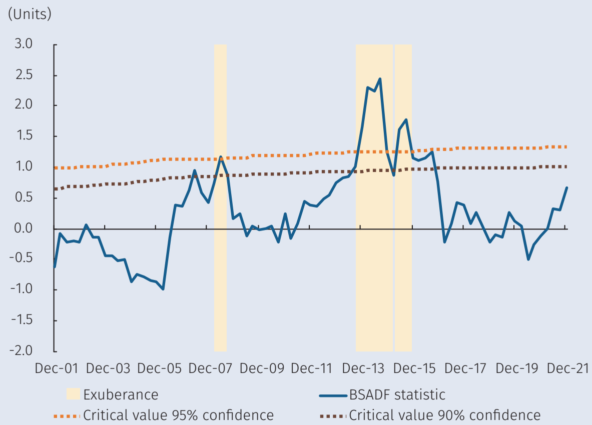
17 The PSY procedure, proposed by Phillips et al. (2015), allows for the evaluation of whether housing prices show explosive behavior in multiple periods, through a recursive unit root ADF test with a rolling window. The test is based on the equation $y_t = \mu + \delta y_{t-1} + \sum_{i=1}^{P} \varnothing_i \Delta y_{t-i} + e_t$, with a null hypothesis (H_0: $\delta = 1$) that the series is a random walk and an alternative hypothesis (H_a: $\delta > 1$) of the presence of a collapsing bubble in multiple periods.

Graph B1.510

A. PSY test results for IPVNBR



B. PSY test results for IPVU



Note: Indices deflected with CPI excluding foods.
Sources: Phillips et al. (2015); calculations by the authors.

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