American Enterprise Institute Housing Market Indicators

Tobias Peter
Edward Pinto
American Enterprise Institute

Abstract

The American Enterprise Institute Housing Market Indicators (HMIs) provide analysts a holistic view of the single-family housing market. The indicators cover home prices and supply, mortgage risk, measures of affordability, land prices, and new construction sales. The HMIs deliver reliable data at fine geographic levels to address the local nature of housing markets. Due to innovative methodologies, the data have minimal latency. The HMIs come with interactive visualization tools, and most data, aggregated to fine levels of geography, are available to download, allowing for data-driven decisionmaking and analysis by governments, the private sector, and consumers.

The American Enterprise Institute (AEI) Housing Center has amassed one of the deepest and most robust sets of housing market indicators (HMIs) available. Through utilizing numerous data sets, the HMIs provide analysts a holistic view of the single-family housing market. The data are unprecedented in their availability at fine levels of geography and their minimal latency. All data can be accessed at no cost and can be downloaded from the AEI Housing Center's website.

The following exhibit presents an overview of the HMIs:

Exhibit 1

Overview of Housing Market Indicators

Interactive Explorer	Key Indicators	Additional Features	Geography	Frequency	Price Tiers	Purpose
Home Prices and Supply	Home Price Appreciation, Months' Supply	Interactive maps and price tier cutoffs	National, largest 40 metros	Monthly	Overall and four price tiers	Real-time data on Home Price appreciation and months' supply for 40 metros.
National and Metro Housing Market Indicators	Home Price Appreciation, Months' Supply, Mortgage Risk Index, New Construction Share of Sales, Average Sale Price	Reports for each metro and interactive maps	National, largest 60 metros	Quarterly	Overall and two segments (entry-level & move-up)	A more comprehensive analysis of the housing market in 60 metros (but slightly less recent and only for two market segments).
Mortgage Risk Index	Mortgage Risk Index	Time series data on credit scores, CLTVs, DTIs, and other key metrics	National	Monthly	Overall, first-time and repeat buyers	Comprehensive resource for mortgage origination and risk data for agency loans.
The State of the Housing Market	County and State data on: Home Price Appreciation, Months' Supply, New Construction, Mortgage Risk Index, Entry-Level Price-to-Income Ratio	Housing market metrics (supply, new construction, leverage, etc.) and how they affect entry-level affordability	State and county, some metro indicators	Annual	Varies by indicator	A multitude of housing market indicators at the county and state levels. These data are aggregated to derive trends on the state of the housing market.
The Carpenter Index	Share of Entry-level Sales Affordable to the Average Carpenter Household	Metro rankings, affordability heat map, change in affordability, and other affordability metrics	Largest 100 metros	Annual	Entry-level	"They can build it, but can they afford it?" The study ranks housing affordability in the entry-level market for 100 metros for blue-collar workers.
Best and Worst Metros to Be a First-Time Homebuyer (FTB)	Price-to-Income Ratio for over 3 million FTB Purchases	FTB statistics on home prices, income, price/ sq. ft., and sq. ft. of living area	Largest 50 metros	Annual	First-time buyers	This study ranks 50 metros based on their affordability for first-time homebuyers.
New Construction—still in development	New Construction Share of Sales	TBD	National, State, County, ZIP Code, Census Tract	Quarterly	Overall and three price tiers (combines med-high and high)	Real-time new construction data at the census tract level and above.
Land Price and Land Share	Change in Land Share and Land Prices	Interactive maps on land prices, land shares, and changes over time in these indicators	ZIP Code (census tract, county, metro, state, and nation are available for download)	Annual	None	The change in land share has been found to be highly predictive of house price boom/bust cycles.
Market Trends Report—in development	TBD	TBD	110+ million U.S. property addresses	Updated as data become available	Overall and four price tiers	Provides trends affecting the market price and intrinsic value of the subject property, the subject's neighborhood, and its broader market areas.

CLTV = combined loan-to value ratio. DTI = debt-to-income ratio. FTB = first time homebuyer. TBD = to be determined.
Source: American Enterprise Institute Housing Center, www.aei.org/housing

Several features distinguish HMIs from other data sources. First, as mentioned, HMIs provide a holistic picture of the housing market; they measure demand (the number of home sales and the level of mortgage risk of these sales), supply (new construction sales and remaining months of existing inventory for sale), and home price trends. Second, HMIs deliver reliable data at fine geographic levels to address the local nature of housing markets. For instance, the number of new construction sales is available at the ZIP Code and census-tract level. Third, due to innovative methodologies, the data have minimal latency. For example, home price appreciation (HPA) data are available for the previous month, while trends in underwriting are available in near real-time. Fourth, since borrower access to credit (leverage) has a profound impact on market trends, many indicators are divided into four leverage-based price tiers, rather than into tertiles, quartiles, or quintiles. Fifth, HMIs come with interactive visualization tools, and most data, aggregated to fine levels of geography, are available free-of-charge to download.

Underlying Data

The primary data for HMIs are national public records data from First American via DataTree.com. The authors utilize the deed file, which provides information about the sale and mortgage, as well as the tax assessor file, which provides information on the characteristics and location of the structure. We limit the data to single-family home sales from 2012 forward, but in the coming months, previous years will be added. Other datasets used, such as Optimal Blue rate lock data, are described below.

Price Tiers

A defining feature of HMIs is that the data are segmented into dynamic, leverage-based price tiers. Housing trends are driven by lending standards and the availability of supply, which may not map neatly onto evenly sized price tiers.[1]

HMIs divide homes into four flexible price tiers that are set quarterly at the metro level. The low and low-medium tiers consist of sales at or below the 40th- and 80th-percentile of Federal Housing Administration (FHA) sales prices, respectively. The medium-high tier consists of sales at or below 125 percent (to account for an 80 percent loan-to-value [LTV]) of the government-sponsored enterprise (GSE) loan limit, and the high tier consists of all other sales.

Within the lower two price tiers—often referred to as entry-level—around 30 percent are financed with FHA loans. As seen in exhibit 2, these tiers have by far the highest mortgage risk with a mortgage risk index (MRI) of 14–15 percent. (The MRI measures how the loans originated in a given month would perform if subjected to severe stress—more on MRI later). The medium-high tier has only a 10 percent FHA share and an MRI of about 9 percent as it consists of higher-priced homes and borrowers with generally lower loan-to-value ratios or debt-to-income ratios or higher credit scores. The high price tier is largely outside the reach of government lending due to loan limits. This tier only represents about 6–8 percent of the share of all sales, and it is very low risk.

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[1] Lending standards vary depending on borrowers' credit profiles, house prices, and competition among government housing finance agencies. Prices are set by the marginal buyer: borrowers who receive additional leverage drive up prices for all borrowers. In this way, extending extra leverage to some borrowers has spillover effects for entire neighborhoods (Davis et al., 2020).

Exhibit 2

National Price Tiers by Guarantor Type, Market Share, and Mortgage Risk Index: 2019

Percent of loans
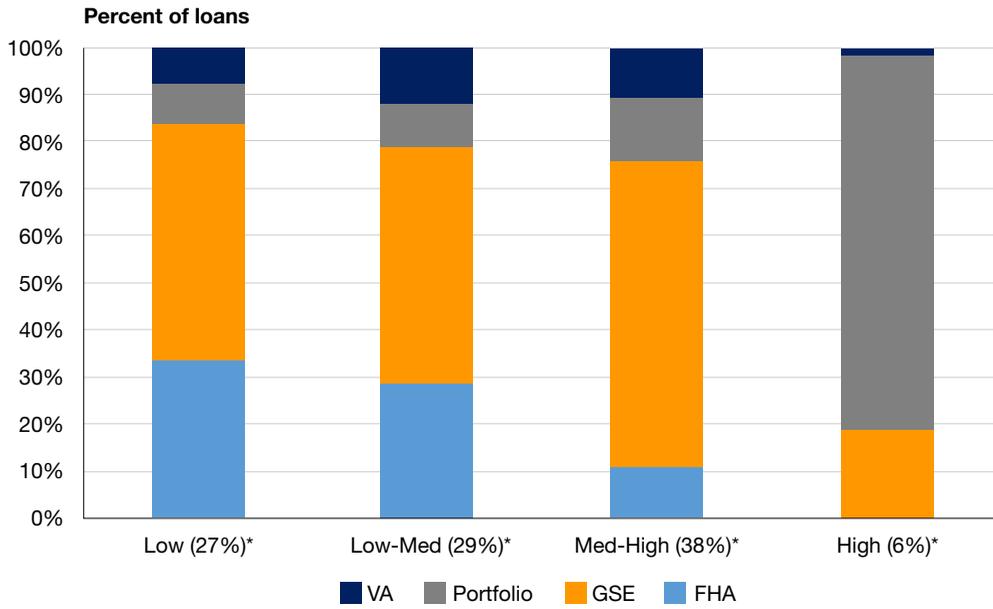
2019	Price Tier			
	Entry Level		Move-up	
	Low	Low-Med	Med-High	High
Mortgage Risk Index	15.5%	14.3%	8.9%	3.1%
Market Share*	27%	29%	38%	6%

FHA = Federal Housing Administration. GSE = government sponsored enterprise. VA = U.S. Department of Veterans Affairs

*Market share of all institutionally financed home sales in 2019 by tier.

Note: Data excludes Rural Housing Service. In 2017, Rural Housing Service loans made up 3 percent of the low tier, 2 percent of the low-medium tier, and a negligible amount of the two upper tiers.

Source: American Enterprise Institute Housing Center, www.aei.org/housing

House Price Appreciation Housing Market Indicators

The AEI HPA Index differs from the most widely known home price indexes (HPI), which are either repeat sales pair (for example, S&P CoreLogic Case-Shiller HPI or Federal Housing Finance Agency [FHFA] HPI [Calhoun, 1996]) or hedonic (for example, Zillow Home Value Index [Hryniw, 2019]) indexes. AEI creates a "quasi" sales pair consisting of one actual sale and a second reference "sale" as measured by the home's estimated sale price using an automated valuation model (AVM). AVM approximates a property's sale price at a given point in time. The current AVM used is from December 2018. AVMs come from First American DataTree LLC (DataTree.com) and, on average, provide accurate and unbiased estimates (Davis et al., 2020). The HPA Index's results are similar to price indexes from the FHFA HPI and Case-Shiller HPI, which confirms this approach's validity.

AEI's quasi-repeat sales index approach comes with several benefits. Unlike a true repeat sales model, it includes virtually all existing homes sold for which an AVM is available.[2] This process results in a large sample size, which can be used to construct separate indexes by price tier and at fine geographic levels and with much less latency. For example, the AEI HPAs released in May are for the prior month (April). The Case-Shiller HPI released in May is for March; however, the data are a 3-month rolling average of January, February, and March. Also, by requiring only one AVM at a given point in time, this methodology is a cost-effective way to produce an HPA index. Notably, the HPA Index is incorporated into our other HMIs.

The HPA Index data are found at the Housing Center's HPA Index and Months' Remaining Inventory interactive data explorer. The data are available monthly for the largest 40 metro areas in the United States. The listings and sales data are provided by Zillow Group Inc. (Zillow).

Land Price and Land Share Housing Market Indicators

The price of land represents a net market value for a variety of factors such as size and shape of the lot, access to jobs, type of street, commute, schools, crime, weather, neighborhood, amenities, and more. Land share, or land price expressed as a percentage of a residential property's value, is a particularly useful indicator for public policy research. Previous work (Davis et al., 2017) found that the increase in the land share of house value prior to the Great Recession was a significant predictor of the decline in house prices during the bust (the "canary in the coal mine").

While land prices and shares are a crucial component in assessing house price risk, reliable and accurate data are hard to come by and generally have only been available for relatively small subsets of the country (Davis et al., 2017; Nichols, Oliner, and Mulhall, 2013). Due to a new working paper, this is no longer the case (Davis et al., 2019a). Davis et al. use millions of appraisal records that separate total property value into the value of land and the depreciated value of the structure, making land data available for nearly the entire country for the first time.

As Davis et al. acknowledge, appraisals anchored to tax assessments and limited to GSE financed sales can potentially bias the results. Therefore, the data likely understate the amount of home price appreciation[3] and, by extension, the amount of increase in land prices.

To overcome these potential biases from anchoring, the AEI Housing Center only relies on land prices and shares for 2012 as a stake in the ground. We then enhance these data using AEI's constant-quality HPA index.[4] The 2012 land values are then rolled forward in time using various AEI metrics and assumptions.[5]

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[2] New home sales are excluded for two practical reasons: due to a lagging assessment, the AVMs for new homes are often missing. We also exclude interfamily sales and sales that occur within 6 months of each other.

[3] When appraisers anchor their estimates to tax assessments, this may understate house price appreciation because (1) the rate of tax assessments may be capped to prevent rapid tax increases in high home-price growth environments, and (2) low tax assessments are likely to go unchallenged, while high ones are challenged (Lutz, Molloy, and Shan, 2011).

[4] Other benefits are that since the AEI constant-quality HPA Index is based on all financed sales, we include a larger part of the market than the GSE financing in the Davis et al. (2019a) dataset. Finally, since the AEI constant-quality HPA Index is updated monthly, AEI-adjusted land prices and land shares may also be updated monthly.

[5] To read the detailed methodology, see https://www.aei.org/wp-content/uploads/2020/03/Land-Price-Interactive-QA-FINAL.pdf.

The AEI-adjusted data are available on the Land Price and Land Share Indicators interactive data explorer on the AEI Housing Center's website. The interactive data explorer features land prices, land shares, land share change, and land panel data. The data are available at census-tract, county, metro, state, and national levels and are downloadable.

For instance, the Housing Center's map of the Washington, D.C. metro highlights how land share varies across the region. Land makes up a larger share of the total value in the District of Colombia (D.C.) and wealthier suburbs in Maryland and northern Virginia than in more distant suburbs and exurbs. Since 2012, however, land shares have risen more in the less affluent parts of the metro, such as Prince George's County and southeast D.C. (not shown).

Exhibit 3

Land Share by ZIP Code in the Washington, D.C. Core-Based Statistical Area: 2019
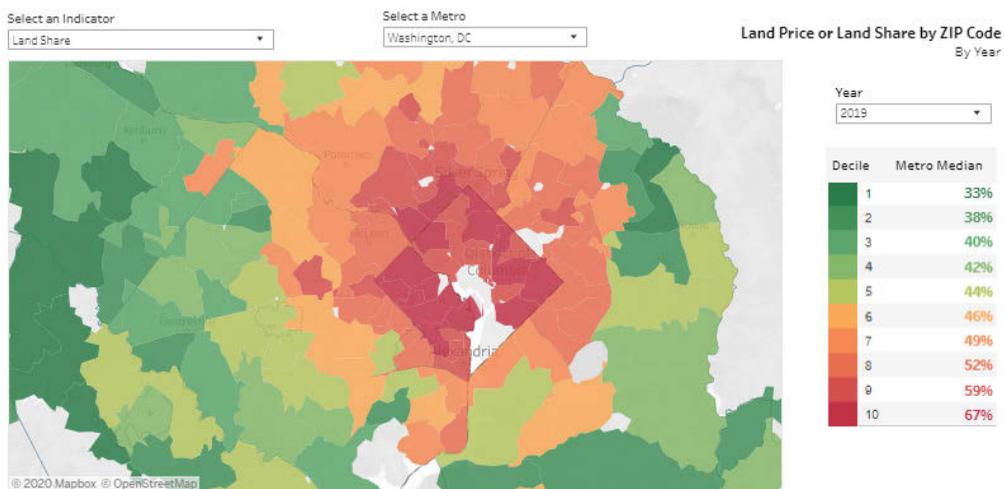
Source: American Enterprise Institute Housing Center, www.aei.org/housing

New Construction Housing Market Indicators

Another innovative aspect of the AEI HMIs is its methodology for identifying new construction home sales in near real-time at the property level. Granular and timely data on new construction trends are particularly relevant for policy analysts given dramatic home price increases and the lack of new homebuilding in recent years.

The AEI data are available monthly. They have minimal latency because the underlying data come from the county public records data (deed and assessor files) and listings data from Zillow, which are frequently updated. The key field to identify a newly constructed home is the home's "year built" variable in the county assessor file. If the "year built" is missing, the authors check the home's seller name from the county deed file. If the seller matches a name in a list of over 400

builders or it includes a generic keyword that helps identify smaller builders (such as "Builder" or "Construction"), then the sale is most likely a new construction that has not yet been assessed.[6]

We have verified the accuracy of our methodology through extensive random sampling and checking newly constructed and existing homes using Zillow data, Google Street View, and satellite images. We find around 2 percent false positives and around 1 percent false negatives. Moreover, the process yields similar results to the totals published in the U.S. Census Bureau's new home sales data, providing further confirmation that the AEI methodology is sound.

The nature and methodology of the new construction data offer benefits compared to the Census Bureau's data that may be of interest to researchers. Aggregated AEI data are available at the census-tract/ZIP Code level. Pivotally, the AEI data represent a comprehensive count of properties, rather than relying on estimation from survey data. Moreover, since homes are segmented by new construction status, analysts can identify how new homes differ from the existing housing stock by location, price, square footage, and more. One can also plot the data to observe trends in new construction sales over time.

Exhibits 4 and 5 illustrate changes in new construction activity in the Seattle metro. Between 2012 and 2019, entry-level new construction sales in King County have fallen from over 1,100 sales to just under 200. In Snohomish County, they have fallen from 1,200 in 2012 to 600 in 2019. In Pierce County, by contrast, they have only fallen from 1,100 to 800.

Exhibit 4

Entry-Level New Construction Sales Heat Map in the Seattle, WA Core Based Statistical Area
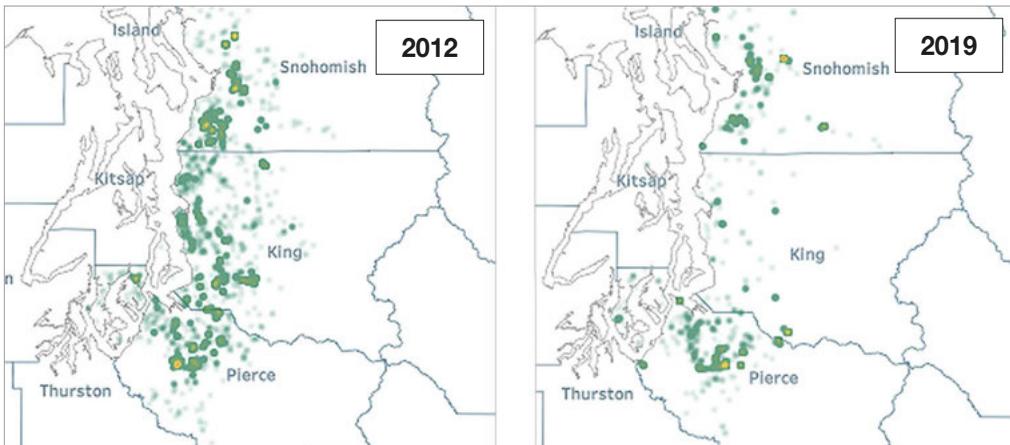
Source: American Enterprise Institute (AEI) Housing Center, www.aei.org/housing

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[6] In the case that "year built" or seller name are missing, listings data are checked for a "year built" or "land use code," which helps determine the new construction status of the home. Only the first sale of a home is counted as a new construction.

Exhibit 5

New Construction Sales in the Seattle, WA Core Based Statistical Area

County	Segment	2012	2013	2014	2015	2016	2017	2018	2019
Entire Metro	Overall	6,303	7,076	6,736	7,116	7,824	7,922	7,717	6,843
	Entry-level	3,363	3,415	2,584	2,622	2,438	1,955	1,910	1,635
	Move-up	2,940	3,661	4,152	4,494	5,387	5,968	5,807	5,207
King, WA	Overall	3,107	3,630	3,494	3,592	3,877	3674	3,313	3,015
	Entry-level	1,126	1,201	795	721	508	229	148	184
	Move-up	1,981	2,430	2,699	2,871	3,369	3,446	3,165	2,831
Pierce, WA	Overall	1,306	1,796	1,744	1,727	1915	2,038	2,242	1,675
	Entry-level	1,084	1,436	1,286	1,309	1,305	1,163	1,242	856
	Move-up	222	360	458	418	610	875	1,000	819
Snohomish, WA	Overall	1,890	1,650	1,498	1,796	2,033	2211	2,162	2,153
	Entry-level	1,154	779	503	592	625	563	520	596
	Move-up	737	871	995	1,204	1,407	1,647	1,641	1,558

Source: American Enterprise Institute Housing Center, www.aei.org/housing

All summary data are available upon request, and heat maps are available in the State of the Housing Market interactive data explorer.

National Mortgage Risk Index and Housing Market Nowcast

The National Mortgage Risk Index (NMRI) tracks demand and underwriting standards. It illuminates the buildup of risk in the mortgage market to prevent a repeat of the housing crash by fostering transparency. The risk-rated NMRI dataset covers 99 percent of the agency market and consists of over 43 million loans that are released monthly as mortgage-backed security data by GSEs and Ginnie Mae.

NMRI measures how loans originated in a given month would perform if subjected to the same stress as in the financial crisis that began in 2007. This is similar to stress tests routinely performed to ascertain an automobile's crashworthiness or a building's ability to withstand severe hurricane-force winds.

The expected stressed default rates come from Davis et al. (2019b) and measure stress by dividing loans into 320 risk buckets defined by credit score, combined LTV ratio (CLTV), total debt-to-income ratio (DTI), and more for four loan types. Then, for each risk bucket, the authors calculate the share of loans originated in 2007 that defaulted by December 31, 2018.[7]

Risk rating loans in NMRI and Nowcast is objective and transparent. Every month, loans are risk rated against a known stress event (the 2007–08 financial crisis). By tracking actual underwriting, analysts can monitor changes in mortgage risk. Many loan characteristics such as credit score, DTI, and CLTV are available for download online at the AEI Housing Center's MRI interactive data explorer.

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[7] The original methodology was first developed by AEI with expected stressed default rates that were based on Freddie Mac primary owner-occupied, 30 year fixed rate, fully amortizing, fully documented loans originated in 2007 Loan Performance data through 2012. This methodology was later adopted and refined in Davis et al. (2019b).

Since NMRI data are released with a lag, the AEI Housing Center has also developed a new dataset to measure risk in real-time using mortgage rate lock data from Optimal Blue. After extensive historical analysis of Optimal Blue data going back 7 years, the AEI Housing Center concludes that while the Optimal Blue data only cover roughly one in three loans in the U.S., they follow similar trends to NMRI.[8] As a result, the rate lock data are used to construct the Housing Market Nowcast, which provides an advanced look at borrowing trends that will not be available in the NMRI data until 3 months later. These data are particularly valuable during a fast-changing environment, such as the COVID-19 pandemic. Weekly reports are available on the Housing Center's Nowcast page.

Tracking Affordability with the Housing Market Indicators

In an era of generally declining housing affordability, the AEI Housing Center has developed two interactive data explorers to track housing affordability at the metro level. The first is The Carpenter Index, which measures if the workers who build homes can afford to buy a home of their own. The Index compares housing affordability in the largest 100 metros across the nation. The report concludes that in two-thirds of the 100 largest metros, entry-level or starter homes are still affordable for the average carpenter household—a proxy for a blue-collar worker—in 2018.

The Best and Worst Metro Areas to Be a First-Time Homebuyer (FTB) is the Housing Center's second housing affordability interactive data explorer. The report ranks the largest 50 metro areas for FTB affordability. Cities are evaluated by observing the ratio of home prices to buyer income for over 2.5 million FTB sales from 2013 to 2018. In 2018, Pittsburgh was the most affordable metro, while San Jose was the least affordable one.

These affordability interactive data explorers are useful because they take local conditions into consideration. The key to understanding affordability is observing its two key components: house prices and income or wages. Metros with higher house prices need higher wages to be affordable. Moreover, the indexes utilize data specific to blue-collar workers and data from individual FTB purchase transactions, providing a far more accurate picture than taking simple averages for wages and purchase prices in an entire metro area.

Other Housing Market Indicators

The State of the Housing Market

For those interested in state and county data, the State of the Housing Market is a comprehensive interactive report that features HMIs for the 50 states and nearly every county. The annual data includes housing affordability, months' supply of available homes for sale, new construction, mortgage risk, and outcomes for low-income and minority buyers.

The report has a special focus on housing affordability and the drivers of growing house price appreciation. For instance, there are data examining how house prices have risen faster than

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[8] We checked credit score, DTI, LTV, sale price, and note rate by loan type and observed that the data follow very similar trends to the ones observed in the NMRI. There are slight level differences, however, due to the lower coverage of the Optimal Blue data.

incomes in the majority of counties from 2012 to 2019. Additionally, there are data examining the positive correlation between mortgage risk and a census tract's minority share of the population.

National and Metro Housing Market Indicators

The National and Metro HMIs is another far-reaching interactive data explorer that provides HMIs for the nation's 60 largest metro areas. The quarterly data include house price appreciation, months' supply, mortgage risk, new construction, and average sale prices, among others. There is an emphasis on differences between entry-level and move-up market segments. A key finding is that entry-level markets tend to have fewer months' supply remaining and higher HPA compared to the move-up segment in the same metro.

Conclusion

Housing markets are inherently local, making them notoriously difficult to analyze due to the lack of accurate and reliable data at fine geographic levels. The AEI Housing Center aims to fill this void by compiling a variety of HMIs. All historical data are available to housing researchers and the public for download or upon request.

While each indicator is useful in its own regard, collectively, HMIs present a holistic picture of the housing market, allowing for data-driven decisionmaking and analysis by governments, the private sector, and consumers.

Acknowledgments

Authors

Edward J. Pinto is a resident fellow and the director of the AEI Housing Center at the American Enterprise Institute.

Tobias J. Peter is a research fellow at AEI and the director of research of the AEI Housing Center.

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