# Purchase Applications Payment Index – Frequently Asked Questions

March 7, 2022

- What is the Purchase Applications Payment Index (PAPI)?
  - The Mortgage Bankers Association's Purchase Applications Payment Index (PAPI) measures how new mortgage payments—consisting of principal and interest—vary across time relative to income. Higher index values indicate that the mortgage payment to income ratio (PIR) is higher than in a month where the index is lower.
- Why do we use an index?
  - An index is used to simplify the measurement of changes in the underlying data series over time. The percentage difference change in the index values between two periods represents changes to the monthly PIR between those points in time. For example, in March 2012 (our "base" or "benchmark" period) MBA sets the PAPI to 100. After that month, the PAPI either moves up or down according to the percentage change in PIR during that month relative to the base month. An index of 110, for example, means there has been a 10% increase in the payment to income ratio since the reference period; similarly, an index of 90 means a 10% PIR decrease.
- As the PAPI increases, what does this mean for affordability?
  - As the PAPI increases, the payment to income ratio for new mortgage applications increases. This indicates that homebuyer affordability has decreased.
- What is special about the PAPI?
  - As opposed to other affordability indexes that make multiple assumptions about mortgage underwriting criteria to estimate mortgage payment level, PAPI directly uses MBA's Weekly Applications Survey (WAS) data to calculate mortgage payments.
  - Since WAS data is collected at the loan level, we can analyze payment data at various points in the payment distribution. For example, we can examine the median payment, the payment at the 25$^{th}$ percentile (where, for a given month, 25% of WAS mortgage payments are lower and 75% are higher), or at any other payment level.
  - The PAPI also avoids making restrictive assumptions about payment levels that borrowers can afford (i.e., a qualifying ratio of mortgage P&I to income). By using WAS data, the PAPI leverages borrower "revealed preferences"—that is, loan payment levels on mortgages that borrowers applied to and thus assess that they can afford.
- For what dates is the PAPI index available?
  - The PAPI index is available monthly from July 2009. Each month MBA will add the previous month's data to the series and will provide updated results at the end of the third week of the month.
- What Weekly Applications Survey (WAS) data does the PAPI use?
  - The PAPI uses loan level applications data for 30-year fixed-rate purchase mortgages. Data is available with a state identifier, and as such MBA will produce PAPI indexes for the nation, and by state, Census Region, and Census Division. The loan level application data includes the loan amount. To calculate the monthly payment, MBA will use the WAS 30-year fixed-rate effective mortgage rate. Note that data are not seasonally adjusted.
- In addition to being able to look at the state in which the loan application is made, what additional variables does the WAS provide for granular views?
  - The WAS provides details on whether the loan was a conventional or a government loan. This is included in the PAPI data from January 2012 onward. Moreover, the PAPI also can provide a breakdown of the non-conventional loans into FHA, VA and RHS starting in 2015.
- The PAPI uses the mortgage payment relative to income. What income data is MBA using?

    - The PAPI uses usual weekly earnings data from the U.S. Bureau of Labor Statistics' Current Population Survey (CPS). Usual weekly earnings represent full-time wage and salary earnings before taxes and other deductions and include any overtime pay, commissions, or tips usually received. Note that data are not seasonally adjusted. Further details are available on the St. Louis Fed's economic data website, FRED, and on the BLS CPS website.
    - CPS usual weekly earnings data is available for all workers ages 16 and over, and by sex, race/ethnicity, and quartile. Data is quarterly. For example, CPS data for 2021 Q4 was released by BLS in the second half of January 2022.
    - For the PAPI we use the 25th, 50th (median) and 75th percentile income for all earners, and the 25th and 50th percentile earnings for Black/African American and Hispanic earners. (Note that the 25th percentile means that 25% of earners in a group earn less, and 75% earn more.).
    - Note that the payment to income ratio is for the mortgage payment relative to the CPS earnings—that are the earnings for an individual (not a household). For consistency across time, we assume that the number of earners in a household remains constant.
- The CPS income data allows us to look view data by race/ethnicity. Is the WAS data also available by race/ethnicity?
    - The WAS data does not provide details on race and ethnicity. As such, the payment to income ratios used in the PAPI differ by race/ethnicity based on the denominator and not the numerator.
- If income data is quarterly, how do you measure income in the months before the quarterly income data is updated?
    - To answer this, we illustrate for 2022 Q1. Income data for 2021 Q4 was released in January 2022, and 2022 Q1 data will not be released by the U.S. Bureau of Labor Statistics (BLS) until April 2022.
    - For January and February 2022 PAPI updates we thus use an alternate source—the monthly BLS Employment Situation Report. For example, when released on March 4, 2022, Table B in the Employment Situation Report showed that weekly earnings had increased by 0.83% from November 2021 to February 2022. We thus multiply all the 2021 Q4 earnings values by 1.0083 to get updated income estimates for 2022 Q1.
    - Note that in April 2022 we will recalculate the January and February index levels using the quarterly earnings data by race/ethnicity and quartile.
- What factors drive the index up or down?
    - The PAPI increases as mortgage application loan amounts increase, as the interest rate on the mortgages increase, and/or as earnings decline (other things equal). The PAPI decreases (other things equal) if loan amounts decrease, interest rates decline or earnings increase.
- Can we compare the mortgage payment relative to rent levels using the MBA's Weekly Applications Survey data?
    - MBA compares the 25th percentile and median WAS payment level data to rents for each quarter since July 2009. MBA is doing this comparison at the national level. The rent data series is the U.S. Census Bureau's Housing Vacancies and Homeownership (HVS) survey's median asking rent. The HVS data is quarterly, and as such, the mortgage payment to rent ratio will be updated quarterly.
- Will the methodology change at any point?
    - The PAPI is a relatively new data series. MBA plans to monitor feedback and watch the index move and depending on the outcome there may be changes to the methodology.
- Who do I contact if I have questions?
    - If your questions concern the PAPI or the related data or methodology, please contact MBAResearch@mba.org with technical questions. If you are a member of the media, please call (202) 557-2700 and ask for the Public Affairs department.