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ANALYSIS

Population Growth and Inflation

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Abstract

This analysis investigates the relationship between population growth and inflation. Panel models demonstrate a strong association between population growth and inflation in both cross-country data and across a sample of U.S. metro areas. The metro area results are highly robust, including an instrumental variable approach and long-run models using decadal changes over 90 years of data. The metro area analysis suggests that the housing market is the main mechanism through which population growth affects inflation, likely because of regulatory and physical constraints that keep land and housing relatively inelastic in many places. There is suggestive evidence that the relationship between population growth and inflation is nonlinear, with population declines having a stronger effect than population growth. This is consistent with relatively permanent housing stock that declines only slowly in response to declining population. Overall, these results suggest that slowing population growth can be a headwind for inflation and help explain why inflation has remained stubbornly weak in some places.

Population Growth and Inflation

BY ADAM OZIMEK

Population growth has slowed in the U.S. and in many other countries in recent years. What is more, declining fertility rates across the globe make it likely this trend will continue and population growth will slow further. At the same time, inflation has slowed in many countries as well, and not just relative to rapid 1970s levels but compared with the 1990s. These twin trends are exemplified most strongly over the last two decades in Japan, where population has flatlined and inflation remains stubbornly low despite policymakers' efforts (see Chart 1). A similar pattern is emerging in the U.S., with population growth slowing to rates not seen since the Great Depression and inflation remaining below target for what will soon be approaching a decade (see Chart 2). The timing may not be coincidental: Population growth drives both supply and demand in a variety of ways, raising the possibility for it to affect inflation.

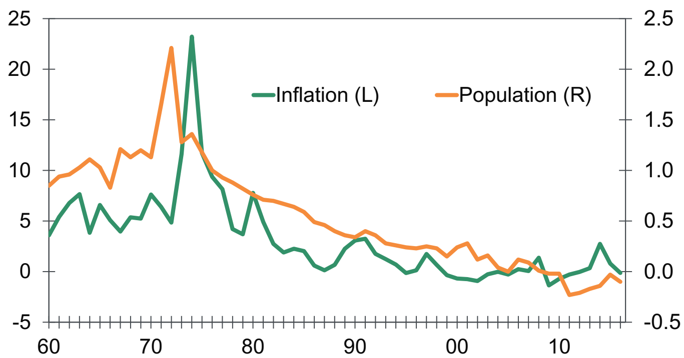
This analysis examines the hypothesis that population growth is an important driver of inflation using three different empirical approaches. First, a cross-country panel regression demonstrates that there is a strong association between inflation and population growth. However, this is at best suggestive, as the relationship is sensitive to model choice when controlling for unemployment. Next, a panel of annual U.S. metro areas from 1971 through 2016 is used to verify the association. The results are consistent with the cross-country data, and far more robust, including an instrumental variable approach. Finally, a very long-run model of inflation and population establishes that the relationship holds in 90 years of decadal changes for a sample of U.S. metro areas.

With a strong association and plausible causality established, the analysis examines the housing market as a potential channel through which population growth is driving inflation. Population growth affects both supply and demand for labor and capital, but while capital and labor markets in the U.S. remain relatively flexible, land is often inelastic. This is especially evident in response to population declines, as housing stock is unlikely to be torn down and instead must slowly depreciate. The metro area model provides support for this theory, showing that population affects shelter inflation more strongly than headline inflation, and that controlling for contemporaneous shelter inflation removes the effect of population on headline inflation.

These results suggest that inflation headwinds are likely to remain and may even strengthen as population growth across the

Chart 1: Slow Population and Inflation in Japan

% change yr ago



Sources: Japan Statistics Bureau, Census Bureau, Moody's Analytics

Chart 2: U.S. Population and Inflation Low Now

% change yr ago

Sources: BLS, Census Bureau, Moody's Analytics

Table 1: Population Growth Strongly Related to CPI Internationally

Regression models

Variable (b/p)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Population growth	0.65	0.32	0.45	0.05		0.51
	0.00	0.02	0.03	0.74		0.00
Lagged CPI growth		0.59		0.62	0.59	0.55
		0.00		0.00	0.00	0.00
Unemployment rate			-0.38	-0.20		
			0.00	0.00		
Population growth positive					0.26	
					0.07	
Population growth negative					2.00	
					0.07	
Constant	0.02	0.01	0.15	0.08	0.01	0.01
	0.00	0.01	0.00	0.00	0.01	0.03
Adjusted R-Squared	0.54	0.72	0.58	0.81	0.72	0.72
Sample	1,456	1,456	683	683	1,456	1,456
Countries	27	27	19	19	27	27
Time period	1962-2015	1962-2015	1980-2015	1962-2015	1962-2015	1962-2015
Metro area trend						X

Note: All models include country- and yr-fixed effects and exclude outliers.
Sources: Government statistics offices, Moody's Analytics

globe slows further. Stubbornly low inflation may therefore be more resistant to stimulative monetary and fiscal policy and tight labor markets than in the past.

International evidence

The relationship between demographics and inflation has been examined in a country-level analysis before. However, the research has tended to focus on the effects of aging.

For example, Juselius and Takats (2015) use a panel of 22 countries from 1955 to 2010, but explore only dependency ratios and age shares of the population. Among the many controls they consider, including the output gap and the real interest rate, they do not include population growth. Using a sample of countries where longer-run inflation and population data are available, the relationship between the two can be estimated.[1]

Panel models are estimated using annual data for 27 countries from 1962 to 2015. The results provide strong evidence of an association between population growth and inflation. In all models, a country-fixed effect controls for persistent differences in inflation and population growth at the country level, and a time-fixed effect controls for shared global economic conditions. A 1-percentage point decrease in population growth is associated with a 0.65-percentage point decrease in inflation (see Table 1, Model 1), or 0.32 percentage point if controlling for lagged inflation (see Table 1, Model 2). The results are also robust to metro area-specific trends (see Table 1, Model 6) and to the use of OECD countries only (see Appendix Table 1).

Table 1, Model 5 shows that a declining population has a larger coefficient than a growing one, indicating a nonlinearity and stronger effects for shrinking places. This result will be explored and discussed later with U.S. metro area data.

However, while the association between population growth and inflation is strong, the results are inconclusive about causality. For 19 of the 27 countries, unemployment rate data are available from 1980 to 2015. This smaller panel dataset cuts the sample size in half but suggests the effect of population is sensitive to modeling assumptions when controlling for the business cycle. In a model without lagged inflation as an independent variable (an autoregressive 1 term), population remains statistically significant with a coefficient comparable to the longer sample models even when controlling for unemployment. However, in a model with an AR1 term, the inclusion of unemployment leaves population growth insignificant. As a result, the international data are only suggestive.

Metro-level evidence

One issue with cross-country data is that at the country level, monetary policy is an important omitted variable that drives much of the variation in inflation over time. To reduce the confounding influence of monetary policy and other national policy differences, it is therefore useful to look at subnational data that will hold much more constant between units of observation.[2] U.S. metro area data are useful to this end, as the Bureau of Labor Statistics publishes consumer price index data for a sample of U.S. metro areas, some of which have data going back to 1914. For 23 metro areas, annual CPI estimates exist from 1970 through 2016, allowing the creation of a panel of 1,058 observations of inflation growth matched to population growth from the Census Bureau.[3]

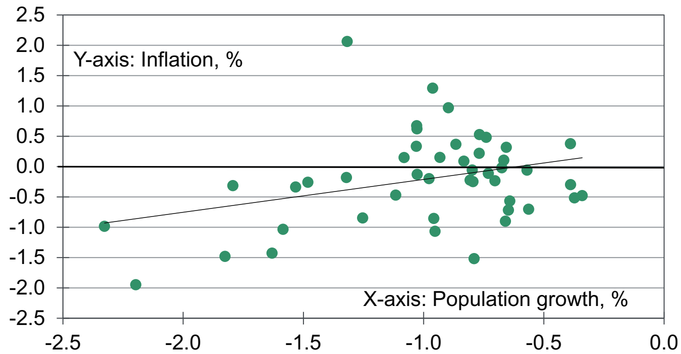
1 Countries were selected based on data availability and an average rate of inflation below double digits.

2 Regional heterogeneity in the impact of monetary policy suggests that its influence can only be minimized by looking at subnational data, and not removed entirely. For example, see Beraja, Fuster, Hurst and Vavra, 2017.

3 The total sample 47 years x 23 metro areas provides 1,081 observations. However, the use of year-to-year growth rates means losing 23 observations from 1970, reducing the sample to 1,058.

Chart 3: Inflation, Population Growth in Detroit

Population and inflation for Detroit, % chg minus % chg for U.S.



Sources: Census Bureau, BLS, Moody's Analytics

Chart 4: Inflation, Population Growth in Denver

Population and inflation for Denver, % chg minus % chg for U.S.

Sources: Census Bureau, BLS, Moody's Analytics

A clear visual relationship between inflation and population growth is apparent in many metro areas after subtracting annual U.S. population and inflation growth to abstract from nationwide trends. For example, population and inflation differences from the U.S. average over time are both strongly correlated in Detroit (see Chart 3) and Denver (see Chart 4), despite very different population trends over time in these metro areas.

A panel regression confirms that the relationship between annual population growth and annual inflation is statistically significant, with a 1-percentage point decline in population growth associated with a 0.33-percentage point decline in inflation (see Table 2, Model 1), which is consistent with the international AR1 model coefficient of 0.32. The results are also remarkably consistent with Liu and Westelius (2016), who find a coefficient of 0.3 using population and inflation data from Japanese prefectures.

Including the previous year's inflation growth as an additional control reduces this to a still-significant 0.28 (see Table 2, Model 2), which is also consistent with the international AR1 model. The results are also remarkably consistent with Liu and Westelius, who find a coefficient of 0.3 using population and inflation data from Japanese prefectures.

These models include year- and metro area-fixed effects, which means any U.S.-wide factors or persistent metro area factors are controlled for. The results are also robust to the inclusion of metro area-specific linear trends (see Table 2, Model 6).

One challenge to interpreting population growth as causing higher inflation is that de-

Table 2: Population Growth Strongly Related to CPI at Metro Level

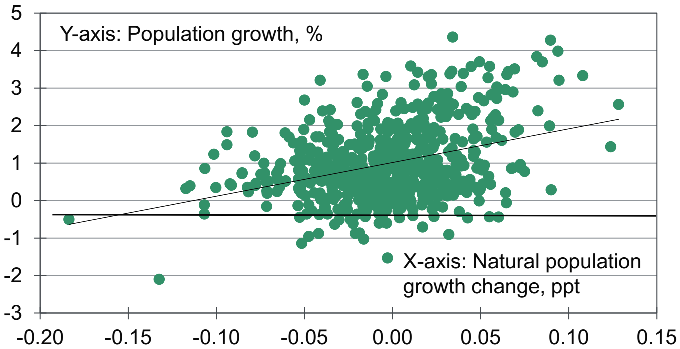
Regression models

Variable (b/p)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Population growth	0.33	0.28	0.30	0.28		0.36	0.36
	0.00	0.00	0.00	0.00		0.00	0.00
Lagged CPI growth		0.33		0.35	0.33	0.30	0.33
		0.00		0.00	0.00	0.00	0.00
Unemployment rate			-0.31	-0.21			
			0.00	0.00			
Population growth positive					0.24		
					0.00		
Population growth negative					0.59		
					0.00		
Constant	0.03	0.02	0.06	0.04	0.02	0.02	0.01
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjusted R-Squared	0.91	0.92	0.75	0.79	0.92	0.93	
Sample	1,058	1,035	621	621	1,035	1035	621
Metro areas	23	23	23	23	23	23	23
Time period	1971-2016	1972-2016	1990-2016	1990-2016	1972-2016	1972-2016	1983-2016
Metro area trend						X	
Instrumental variable							X

Note: All models include metro area- and yr-fixed effects, outliers excluded; IV model missing decennial census yrs because of missing birth/death data.
Sources: Census Bureau, BLS, Moody's Analytics

Chart 5: Natural Pop. Growth Rate a Good IV

Variables from first stage metro panel IV regression



Sources: Census Bureau, Moody's Analytics

Table 3: Population Growth and Inflation in the Very Long Run

Regression models

Variable (b/p)	Model 1	Model 2
Population growth	0.10	0.14
	0.01	0.00
Lagged CPI		-0.44
		0.00
Constant	-0.22	-0.27
	0.00	0.00
Adjusted R-Squared	0.99	0.99
Sample	153	136
Metro areas	17	17
Time period	1930-2010	1930-2010

Note: All models include metro area- and yr-fixed effects.

Sources: Census Bureau, BLS, Moody's Analytics

mand shocks may be driving both because of migration between metro areas. This concern can be mitigated somewhat, although not fully, with a model that controls for metro-level unemployment rates. Despite shortening the sample period to begin in 1991, the population growth coefficient in a model controlling for the metro-level unemployment rate is largely unchanged (see Table 2, Model 3). These results are far more robust than the international models, where the inclusion of unemployment made the population and inflation relationship sensitive to model specification. However, the two datasets are surprisingly consistent in identifying the relationship between unemployment and inflation: In an AR1 model, the coefficient on unemployment is -0.21 for the metro panel and -0.2 for the cross-country panel.[4] The Phillips curve for metro areas is similar to the Phillips curve for countries.

The greatest threat to interpreting these results as demonstrating the causal effect of population growth is due to the likelihood that metro area net migration rates are affected by labor demand shocks, which also affect inflation. However, the natural component of population growth, births minus deaths, is in large part determined by the age structure of the population, fertility rates, and mortality rates, all of which are more likely to vary based on the unfolding of trends determined well before contemporaneous demand shocks. This makes the change in the natural population growth rate a potentially useful instrument for population growth that is more plausibly exogenous.[5]

The first stage regression and a scatterplot show (see Chart 5) that change in natural population growth is a strong predictor of overall population growth. The instrumented fixed effect regression is statistically significant and close in value to the un-instrumented models (see Table 2, Model 7). This provides further evidence that population growth is causing inflation at the metro area level.

Finally, the metro area models also show that a declining population has a stronger effect on inflation than a growing population (see Table 2, Model 5). In other words, shrinking is more deflationary than growing is inflationary. This is consistent with the international model results, and can potentially help explain why countries such as Japan with shrinking populations are finding deflation pressure that is greater than expected.

In the very long run

A rarely appreciated strength of the U.S. regional inflation data is that for some metro areas the annual data go back to the early 1900s. This allows the construction of a panel dataset for 17 metro areas that spans 90 years. Combined with decennial census data, this allows for a model estimating the effects of decadal changes in population on decadal changes in inflation, with decade- and metro area-fixed effects. Focusing on long-run changes helps reduce the risk that business cycle fluctuations are driving the relationship between population and inflation, and would suggest that population growth has a permanent effect on inflation levels, not a temporary effect.

Table 3 shows that a 1-percentage point change in population growth increases inflation over the same decade by 0.1 percentage point (see Model 1) or 0.14 percentage point (see Model 2) when an AR1 term is included, which is one-third to one-half of the effect in the short-run model. The relationship is statistically significant in both models despite the use of decade- and metro area-fixed effects.

Is it aging?

While there is a strong association between population growth and inflation at the metro level, this leaves open the question of why. One possible explanation is that population growth is slowing because of aging, and it is aging that is reducing inflation. For example, Bullard, Garriga and Waller (2012) hypothesize that older people have a preference for lower wages and a higher return to capital, which affects preferences for inflation. The effect of aging on inflation can also

4 The models without the AR1 also show close coefficients, with -0.38 for the cross-country model and -0.31 for the metro area model.

5 The natural population growth rate is measured by annual births minus deaths divided by the average population from 1970 to 2016 to prevent year-to-year changes in the denominator from affecting the instrument. The instrument is year-to-year change in this natural growth rate.

occur through expectations of lower future growth, and changes in investment and consumption (Liu and Westelius). However, both the international and metro area models present inconsistent evidence on the effects of aging on inflation.

The international models suggest that prime-age population is what matters most, contrary to the theory that an older population is key (see Appendix Table 2). Estimating effects for three different age groups separately shows that the only age group that affects inflation is the 25-to-44 group. Faster growth in the number of seniors does not affect inflation, controlling for growth in other age groups. While a growing senior share does appear deflationary, this is insignificant when country-specific trends are controlled for.

At the metro area level, the results are also inconsistent. A growing share of those age 65 and up is inflationary but not robust to the inclusion of metro area-specific trend, while growth in the population age 65 and up is deflationary (see Appendix Table 3).[6]

In both metro area and international models, it is difficult to find a robust relationship between aging and inflation. In contrast, population growth remains significant even when controlling for aging. This suggests at the very least that it is not the primary mechanism driving the association between population growth and inflation.

The housing market channel

That prime-age population growth has the strongest relationship in both models is suggestive that household formation and housing demand may be crucial. In addition, economic theory provides support for the housing channel. Population growth creates greater supply and demand for labor, meaning the effect on wages is indeterminate and may vary. Population growth will make capital more scarce relative to labor; however, if population is predictable, forward-looking investors may anticipate population flows in determining capital stock, minimizing the effect on returns to capital. Land, in contrast to both labor and capital, is much more likely to be in relatively fixed supply. Forward-looking investors can help mitigate this somewhat by increasing the supply of housing in expectation of population flows. However, underlying land scarcity means that supply should slope upward at least somewhat. Beyond geography, regulatory and legal constraints can make the housing supply highly inelastic. In addition, when population declines, existing housing stock is unlikely to be torn down. As a result, even if investors can fully anticipate population declines, the declines can have a negative effect on house prices and rents, as depreciation only slowly removes the housing stock.

Table 4: Population Growth Affects Housing

Regression models

Variable (b/p)	Model 1	Model 2	Model 3
Population growth	0.59	0.30	0.10
	0.00	0.00	0.00
Shelter CPI, % change yr ago			
t			0.31
			0.00
t-1	0.38		
	0.00		
Headline CPI, % change yr ago		0.32	0.09
		0.00	0.00
Constant	0.02	0.04	0.04
	0.00	0.00	0.00
Adjusted R-Squared	0.75	0.92	0.97
Sample	968	968	968
Metro areas	22	22	22
Time period	1973-2016	1973-2016	1973-2016
Dependent variable	Shelter CPI	Headline CPI	Headline CPI

Note: All models include country- and yr-fixed effects, outliers excluded.

Sources: Census Bureau, BLS, Moody's Analytics

As a result, the housing market is a plausible mechanism through which population growth affects inflation. The metro area inflation data can shed light on this using inflation in shelter, which is available for 22 metro areas back to at least 1973. First, using year-to-year growth in shelter and headline inflation as dependent variables for these metro areas over the same period, we can see that population has a stronger effect on shelter than headline inflation. Model 1 in Table 4 shows that a 1-percentage point decrease in population reduces shelter inflation by 0.59 percentage point. In comparison, Model 2 shows that the same population decline would reduce headline CPI by only 0.3 percentage point. Both models include AR1 terms, year-fixed effects, and metro area-fixed effects.

Next, Model 3 shows that when current year shelter inflation is controlled for, the effect of population growth on headline inflation is reduced to 0.1, which is a fraction of the full 0.59 effect without those controls (as seen in Model 1). In other words, when controlling for the effect on shelter prices, population growth's effect on overall CPI is greatly diminished. Additional models reported in Appendix Table 4 show that these results are even more stark when controlling for the unemployment rate: After controlling for the effect of shelter inflation, population has no effect on headline CPI.

These results suggest that a significant amount of the effect of population growth on headline inflation runs through the housing market. These results are consistent with Liu and Westelius, who find that Japanese prefecture population growth has the strongest effect on housing inflation in that prefecture. They report a coefficient of 0.897, which is close in magnitude to the 0.59 coefficient found in this analysis.

6 The availability of more detailed population data by age for the metro areas allows the use of nonadjacent age groups, in comparison to the international model. For the metro area data, age groups are: 0 to 4, 25 to 44, and 65 and up. This reduces the multicollinearity caused when a cohort ages from one group to the next in a single year.

Conclusion

Cross-country and U.S. metro panel regressions provide a highly consistent view of the association between inflation and population growth. For countries, a 1-percentage point decrease in population growth is associated with a decline of one-third to two-thirds percentage point in annual inflation. For metro areas, the effect is more consistently around a decrease of one-third percentage point in inflation.

The metro area models abstract from differences in monetary policy, and are far more robust to controlling for the strength of the local economy. Additional robustness tests include an instrumental variable that focuses on natural population growth of births minus deaths, and a very long-run model focusing on 90 years of data. That inflation and population growth remain strongly related even at decadal changes suggests that population growth has a permanent effect on the price level. The results are not only consistent with the cross-country data but also have coefficients that are remarkably similar to those found in Liu and Westelius' study of Japanese prefectures.

U.S. population growth in the 1990s averaged 1.2% per year, and it has slowed in the most recent data to 0.7%. Using a range of coefficients from one-third to two-thirds, as suggested by the model results above, slowing population growth is creating an inflation headwind of 0.18% to 0.36% per year in the U.S. compared with the 1990s. This effect should grow, as population growth continues to slow in the U.S. because of demographic headwinds. In Japan, population growth has been slowing for longer and population is now contracting. Here one must go back to the 1980s to find growth rates of 0.5 percentage point or more. The nonlinearity of the relationship is not precisely estimated, but given the slow depreciation of housing it is likely that the effects of population on inflation increase as growth approaches zero and population contracts. As a result, it is plausible that declining population is creating serious deflation pressures in Japan.

That population may be an important driver of inflation growth may be relatively underappreciated by economists and policymakers, but it is not unintuitive. Land remains a relatively fixed factor in many places, which will generate a less than perfectly elastic housing supply even in the long run, let alone in the short run. This is compounded by a variety of legal and regulatory restrictions that keep housing supply from responding above and beyond the physical space limitations. The importance of housing as a mechanism is supported by the metro area models, which show population has a stronger effect on shelter inflation than the headline CPI, and that after controlling for shelter inflation, population growth has zero effect on headline. There is far less support for the effect of aging on inflation.

These results suggest that part of the stubbornly low inflation that some countries are facing is a result of slowing population growth. This implies that more monetary easing or fiscal policy may be required to lift inflation to target levels than might otherwise be expected. Finally, the results suggest that immigration may help hit inflation targets that remain stubbornly out of reach.

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Appendix

Appendix Table 1: Population Growth and Inflation in OECD Countries Only

Regression models

Variable (b/p)	Model 1	Model 2	Model 3	Model 4	Model 5
Population growth	1.23	0.47	-0.19	-0.12	
	0.00	0.00	0.41	0.49	
Lagged CPI growth		0.72		0.67	0.71
		0.00		0.00	0.00
Unemployment rate			-0.19	-0.11	
			0.00	0.00	
Population growth positive					0.32
					0.04
Population growth negative					3.27
					0.00
Constant	0.02	0.01	0.14	0.07	0.02
	0.00	0.00	0.00	0.00	0.00
Adjusted R-Squared	0.67	0.84	0.74	0.87	0.84
Sample	1,026	1,026	504	504	1,026
Countries	19	19	14	14	19
Time period	1962-2015	1962-2015	1980-2015	1962-2015	1962-2015

Note: All models include country- and time-fixed effects and exclude outliers.
Sources: Government statistics offices, Moody's Analytics

Appendix Table 2: Mixed Results for the Effect of Aging Internationally

Regression models

Variable (b/p)	Model 1	Model 2	Model 3	Model 4
Population growth			0.30	0.49
			0.02	0.00
Population growth 0 to 14	0.03	0.09		
	0.64	0.16		
Population growth 15 to 64	0.33	0.44		
	0.01	0.00		
Population growth 65 and up	0.07	0.04		
	0.31	0.55		
Share of population 65 and up			-0.11	-0.13
			0.03	0.28
Lagged CPI	0.59	0.55	0.58	0.55
	0.00	0.00	0.00	0.00
Constant	0.01	0.01	0.02	0.02
	0.03	0.05	0.00	0.05
Adjusted R-Squared	0.72	0.72	0.72	0.72
Sample	1,456	1,456	1,456	1,456
Metro areas	27	27	27	27
Time period	1962-2015	1962-2015	1962-2015	1962-2015
Metro area trend		X		X

Note: All models include country- and yr-fixed effects, outliers excluded.
Sources: Government statistics offices, Moody's Analytics

Appendix Table 3: Mixed Results for the Effect of Aging in Metro Areas

Regression models

Variable (b/p)	Model 1	Model 2	Model 3	Model 4
Population growth			0.29	0.35
			0.00	0.00
Population growth 0 to 4	0.02	0.03		
	0.40	0.31		
Population growth 25 to 44	0.24	0.26		
	0.00	0.00		
Population growth 65 and up	-0.13	-0.13		
	0.00	0.03		
Share of population 65 and up			0.11	0.10
			0.00	0.15
Lagged CPI	0.30	0.28	0.32	0.30
	0.00	0.00	0.00	0.00
Constant	0.02	0.02	0.01	0.01
	0.00	0.00	0.07	0.27
Adjusted R-Squared	0.93	0.92	0.92	0.93
Sample	1012	1012	1012	1012
Metro areas	23	23	23	23
Time period	1972-2015	1972-2016	1972-2017	1972-2018
Metro area trend		X		X

Note: All models include metro area- and yr-fixed effects, outliers excluded.

Sources: Census Bureau, BLS, Moody's Analytics

Appendix Table 4: Population Growth Affects Housing, Even Controlling for Unemployment

Regression models

Variable (b/p)	Model 1	Model 2	Model 3
Population growth	0.734	0.287	0.013
	0.000	0.000	0.792
Shelter CPI, % change yr ago			
t			0.312
			0.000
t-1	0.441		
	0.000		
Headline CPI, % change yr ago		0.352	0.131
		0.000	0.000
Unemployment rate	-0.408	-0.206	-0.060
	0.000	0.000	0.034
Constant	0.047	0.043	0.033
	0.000	0.000	0.000
Adjusted R-Squared	0.598	0.788	0.873
Sample	594	594	594
Metro areas	22	22	22
Time period	1990-2016	1990-2016	1990-2016
Dependent variable	Shelter CPI	Headline CPI	Headline CPI

Note: All models include country- and yr-fixed effects, outliers excluded.

Sources: Census Bureau, BLS, Moody's Analytics

About the author

Adam Ozimek is an associate director and senior economist in the West Chester office of Moody's Analytics. Adam covers state and regional economies, as well as U.S. labor markets and demographics. Prior to joining Moody's Analytics, Adam was Senior Economist and Director of Research for Econsult Solutions, an economics consulting company. He received his PhD in economics from Temple University and his bachelor's degree in economics from West Chester University.

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Concise and timely economic research by Moody's Analytics supports firms and policymakers in strategic planning, product and sales forecasting, credit risk and sensitivity management, and investment research. Our economic research publications provide in-depth analysis of the global economy, including the U.S. and all of its state and metropolitan areas, all European countries and their subnational areas, Asia, and the Americas. We track and forecast economic growth and cover specialized topics such as labor markets, housing, consumer spending and credit, output and income, mortgage activity, demographics, central bank behavior, and prices. We also provide real-time monitoring of macroeconomic indicators and analysis on timely topics such as monetary policy and sovereign risk. Our clients include multinational corporations, governments at all levels, central banks, financial regulators, retailers, mutual funds, financial institutions, utilities, residential and commercial real estate firms, insurance companies, and professional investors.

Moody's Analytics added the economic forecasting firm Economy.com to its portfolio in 2005. This unit is based in West Chester PA, a suburb of Philadelphia, with offices in London, Prague and Sydney. More information is available at www.economy.com.

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