NATIONAL BANK OF CANADA
FINANCIAL MARKETS

Special Report

Economics and Strategy

September 15, 2017

The Phillips curve still holds!

Summary

- In the wake of a notable improvement in the vigour of the U.S. labour market, inflation continues to surprise by its failure to accelerate much. The growth of the average wage remains below the rate formerly associated with the current slack in the labor market.
- Does that mean workers have lost bargaining power and the Phillips curve has become inoperative? No. People entering the labour market for the first time or after a period of non-employment tend to earn less than the average worker, limiting the growth of the average wage, and in today's world this effect is intensified by the demographic bulge of retiring baby boomers who earned much more than those entering the labour market.
- To control for these movements that can mask the ability of workers to negotiate pay increases, we should look at the median rate of wage growth. The median rate of wage growth in 2017 Q2 is entirely consistent with the historical relationship with the underemployment rate (U-6), contradicting the view that workers are struggling more than in the past in today's environment.
- However, we do see differences by age group. The wages of workers aged 55 and older have been growing less than in the past for a given underemployment rate, while the youngest workers seem to be doing better.
- Over the last year the underemployment rate continued to fall, suggesting an acceleration of the median wage-growth rate. Thus core inflation may accelerate despite demography continuing to be a headwind, especially as import-price deflation impact fades.

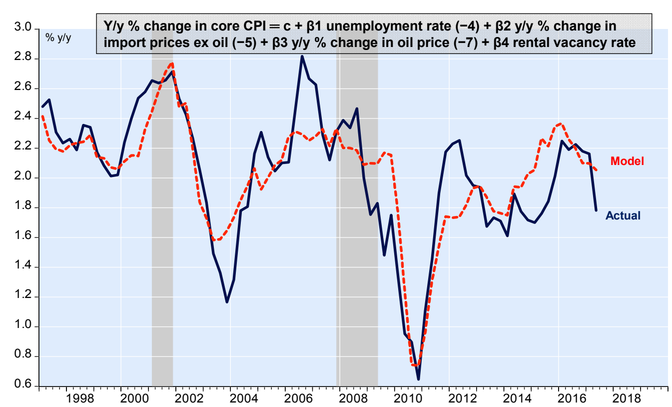
The enigma of low inflation

Despite notable improvement in the labour market, U.S. inflation remains low. This has led many observers to conclude that the Phillips curve, plotting an inverse relationship between inflation and unemployment, is no longer valid. Phillips showed (in 1958) a negative relation between unemployment and wage inflation in England from 1867 to 1957, leading him to conclude that when labour is short, employers must raise wages to meet their labour needs. In this Special Report we investigate the current low-inflation puzzle and report on the extent to which the Phillips curve is still relevant to analysis.

Over the last 20 years the U.S. unemployment rate has been a key factor in fluctuations of core CPI inflation, explaining 43% of the annual variation. However, a forecast for Q2 of this year based on this model would have projected an inflation rate of 2.3%, 53% above the reported 1.8%.

Wage pressures are not the only factor in fluctuations of core inflation. The explanatory power of the model rises to 69% when the regression is broadened to include import price inflation ex oil, oil price inflation and the vacancy rate of rental housing. This expanded model projected a U.S. disinflation trend beginning in early 2016 as a delayed result of soft prices for imports (vigour of the U.S. dollar) and for energy. Yet even with these variables taken into the model, observed inflation in Q2 was two tenths of a point less than the model suggested (chart).

U.S.: Core inflation since 1998
12-month change in core CPI, actual and model forecast, quarterly data (1997-2017Q2)

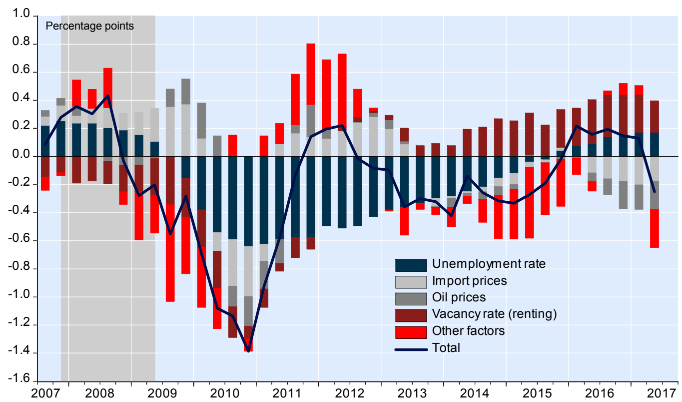


NBF Economics and Strategy (data via Datastream)

A price war in the wireless telecommunications market and low pharmaceutical prices have been fingered as temporary factors explaining part of this divergence. Yet overestimation of inflation by the model has been a tendency since 2013. Other factors (red bars, chart next page) seem to be at work in holding down inflation.

U.S.: Core inflation is low given the fundamentals

Contribution to the spread between core CPI and its historical average (percentage points)

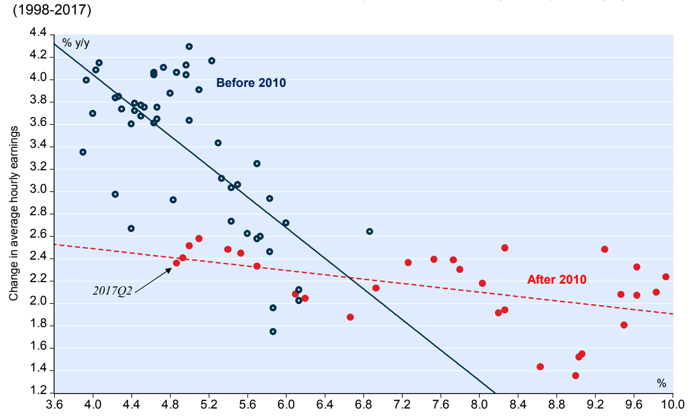


NBF Economics and Strategy (data via Datastream)

Can the forecasting errors be laid to a decline of the wage pressures associated with a given unemployment rate? In the period from 1998 through 2009, unemployment rates of slightly less than 5% generated growth in the average wage averaging 1 percentage point more than that observed in Q2 2017 (chart). This has led some observers to say the Phillips curve is no longer operative.

U.S.: Average wage growth has been unusually slow since 2010

Phillips curve defined as relationship between unemployment rate and average hourly earnings growth (1998-2017)



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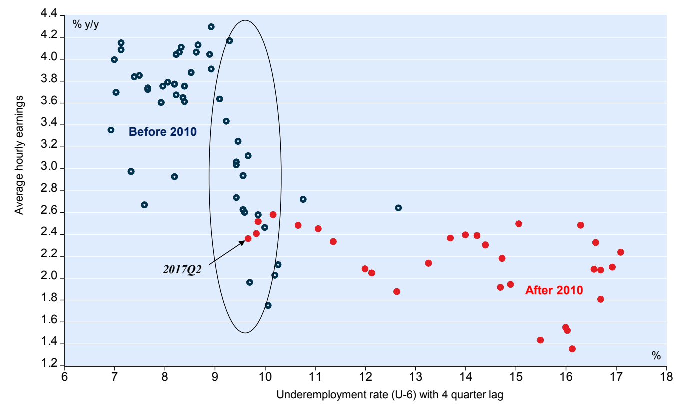
The unemployment rate is increasingly seen as giving less than a full picture of imbalance in the labour market. An alternative indicator, the underemployment rate ("U 6"), adds to the count of the unemployed "all persons marginally attached to the labour force [including discouraged workers], plus total employed part time for economic reasons" and adds to the count of the labour force all persons marginally attached to the labour force. If U 6 is substituted for the conventional unemployment rate in the Phillips curve, the current rate of increase of the average hourly wage growth is less abnormal but still lags the historical norm (chart).

Does that mean workers have less bargaining power than they used to?

U.S.: Average wage growth a bit slow given U-6

Phillips curve defined as relationship between underemployment rate and average hourly earnings growth (1998-2017)



NBF Economics and Strategy (data via BLS and Atlanta Fed)

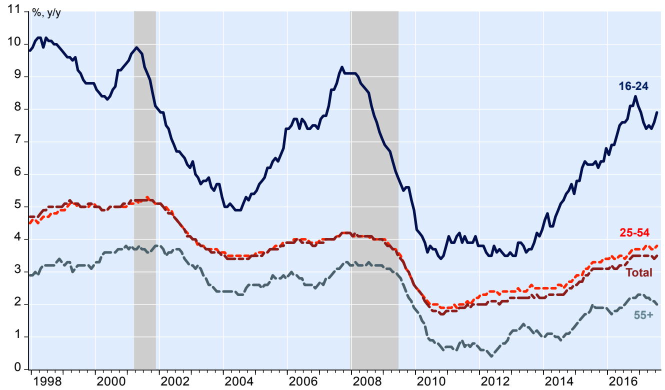
Demographics again

A rising average hourly wage is an indicator of rising employer wage bills and is thus a gauge of inflationary pressures in the economy. However, it is an imperfect gauge of worker bargaining power. On this point, an August 14 post on the San Francisco Fed's blog[1] argues that the labour market is currently in much better shape than some indicators suggest. The authors point out that workers entering full-time employment or returning to it after a period of non-employment tend to earn below-average wages. In other words, strong job growth can hold down the pace of wage growth. And currently this effect is more pronounced than usual because of an ongoing "Silver Tsunami" – the large-scale exit from the labour force of baby boomers, who are or were paid more than the average.

Another phenomenon related to population aging is also a factor in limiting the growth of average wages. The wages of workers 55 and older have historically grown more slowly than those of other workers. The phenomenon can be attributed in part to the much lower turnover of this cohort (charts).

[1] http://www.frbsf.org/our-district/about/sf-fed-blog/wage-growth-good-news/?utm_source=frbsf-sffedblog-landing-title&utm_medium=frbsf&utm_campaign=sffedblog

U.S.: Perspective on wage growth by age group
Median wage growth



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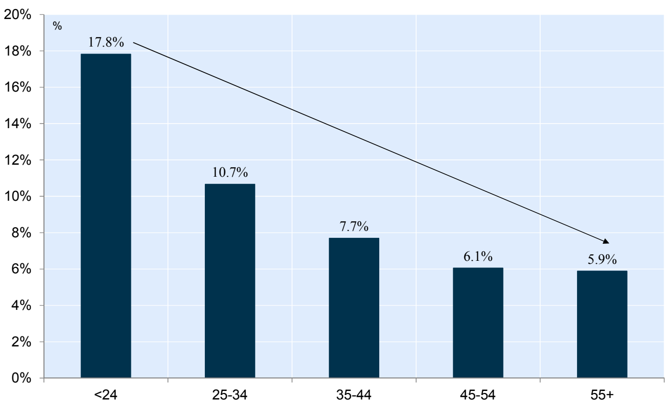
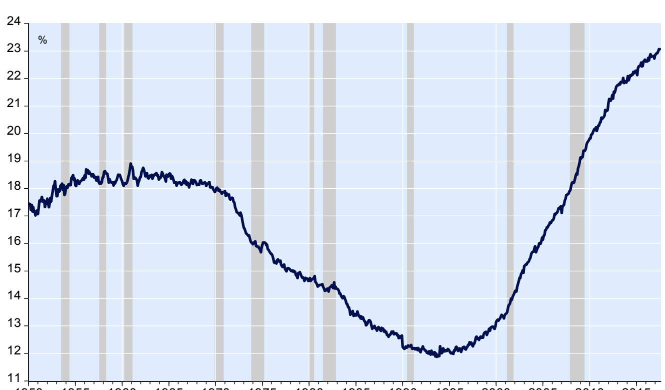
U.S.: Turnover is lower for older workers
Turnover rate by age group (12 months ending 2016Q1)



NBF Economics and Strategy (data via BLS)

Their unemployment rate is also much lower than that of other workers. Since the proportion of workers 55 and older has almost doubled since the 1990s, this drastic change could have impacted the relationship between unemployment rate and growth of average wages.

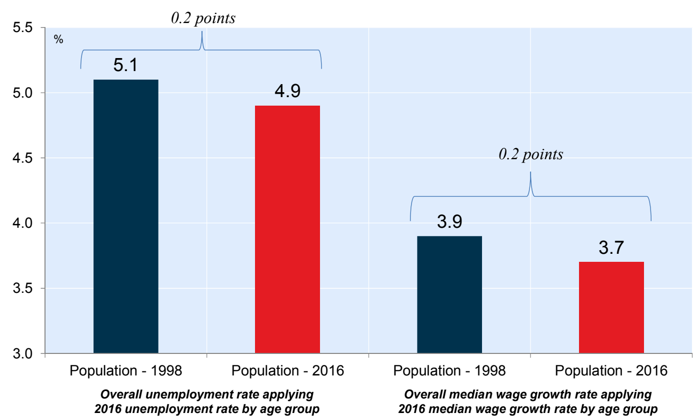
U.S.: Perspective 55+ workers
Share of 55+ in the labor market



NBF Economics and Strategy (BLS)

To illustrate the point we present two simulations. First, if the 2016 unemployment rates by age group are applied to the age distribution of the 1998 population, the result is an overall unemployment rate one-fifth of a percentage point higher than that observed in 2016 (chart). In other words, for the same set of unemployment rates by age group, population aging has structurally lowered the overall unemployment rate. The story for wage growth is similar. If the median 2016 growth rates of hourly wages by age group are applied to the age distribution of the 1998 population, the result is a wage growth rate also about one-fifth of point higher than the rate calculated for 2016 (chart). In other words, the U.S. population, like that of many other developed economies, is currently structured to produce unemployment rates lower than would have been the case in the past, coupled with overall wage growth slower than in the past.

U.S.: Effects of demographic change

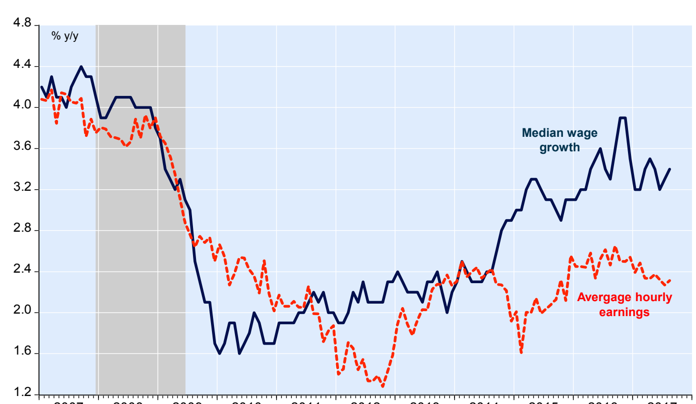


NBF Economics and Strategy (data via BLS and Federal Reserve of Atlanta)

What about bargaining power?

For these various reasons, a better gauge of whether workers have less bargaining power than before is the path of the median rate of wage growth, which unlike the growth rate of the average wage is not affected by changes in labour market inflows and outflows.

U.S.: Wage inflation indicators send different messages
Median wage growth and average hourly earnings

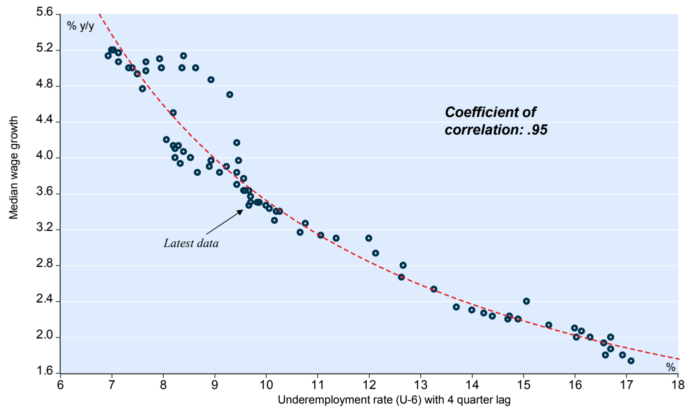


NBF Economics and Strategy (data via BLS and Atlanta Fed)

And here we find a strikingly strong correlation – coefficient .95 – of the underemployment rate with median wage growth over the last 20 years. Moreover, the wage growth of the past year is entirely consistent with its historical relationship to the labour market (chart). Contrary to what some observers say, workers are doing as well as in the past and their bargaining power is increasing in step with the fall of the underemployment rate. In other words, the Phillips curve still holds.

U.S.: With the right variables, the Philips curve works

Phillips curve defined as relationship between underemployment rate and median wage growth (1998-2017,quarterly data)

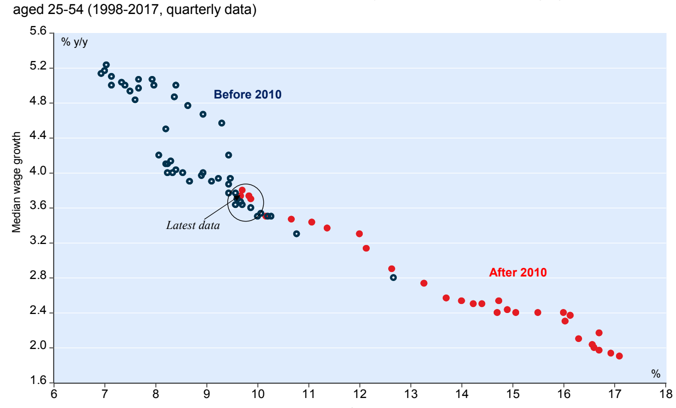


NBF Economics and Strategy (data via BLS and Atlanta Fed)

What about age groups? The central cohort, workers aged 25 to 54, is doing well by historical standards, showing wage growth consistent with the state of the labour market.

U.S.: Prime-age workers are doing just fine

Phillips curve defined as relationship between underemployment rate and median wage growth of workers aged 25-54 (1998-2017, quarterly data)

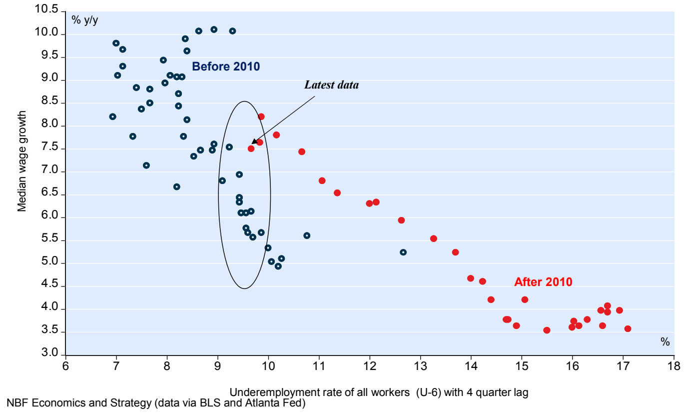


NBF Economics and Strategy (data via BLS and Atlanta Fed)

The story is different for younger workers. Wages of the group aged 16 to 24 are growing faster than the Phillips curve based on pre-crisis experience would suggest (chart).

U.S.: The youngest workers are faring much better than before

Phillips curve defined as relationship between underemployment rate and median wage growth of workers aged 16-24 (1998-2017, quarterly data)

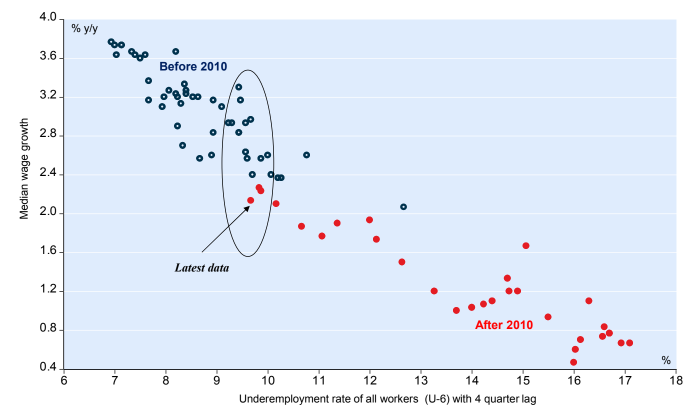


NBF Economics and Strategy (data via BLS and Atlanta Fed)

Workers 55 and older, on the other hand, are not managing the wage growth of the period before the Great Recession. There is reason to think this may reflect a strategy of maximizing the chances of keeping a job, rather than maximizing short-term income, in a world of rapid technological change.

U.S.: The oldest workers are struggling the most

Phillips curve defined as relationship between underemployment rate and median wage growth of workers aged 55+ (1998-2017, quarterly data)



NBF Economics and Strategy (data via BLS and Atlanta Fed)

Conclusion

In the wake of a notable improvement in the vigour of the U.S. labour market, inflation continues to surprise by its failure to accelerate much. The growth of the average wage remains well below the rate formerly associated with current labor market slack. Does that mean workers have lost bargaining power and the Phillips curve has become inoperative? No. People entering the labour market for the first time or after a period of non-employment tend to earn less than the average worker, limiting the growth of the average wage, and in today's world this effect is intensified by the demographic bulge of retiring baby boomers who earned much more than those entering the labour market. To control for these movements that can mask the ability of workers to negotiate pay increases, we should look at the median rate of wage growth. Over the last 20 years this indicator has correlated very strongly – coefficient .95 – with the underemployment rate. The median rate of wage growth in 2017 Q2 is entirely consistent with this historical relationship, contradicting the view that workers are struggling more than in the past in today's environment. We do see differences by age group. The wages of workers aged 55 and older have been growing less than in the past for a given underemployment rate, while the youngest workers seem to be doing better.

What does this mean for the conduct of monetary policy? As we have shown, the median rate of wage growth over the past year is consistent with the 9.7% underemployment rate of a year ago, and by all indications an improving labour market continues to accelerate wages. Over the last year the underemployment rate has fallen 1.2 percentage points, suggesting an acceleration of the median wage-growth rate to 4.3% from 3.5% over the coming year. Thus core inflation may accelerate, especially as import-price deflation impact fades.

That said, we should not fret unduly about the danger of runaway inflation, since inflation ultimately depends on the growth of the average wage. Given the demographic transition currently under way, unemployment rates by age group would have to be much lower than in the past to generate the same rate of inflation. The Federal Reserve can keep its normalization gradual.

Matthieu Arseneau

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Montreal Office
514-879-2529

Stéfane Marion
Chief Economist and Strategist
stefane.marion@nbc.ca

Marc Pinsonneault
Senior Economist
marc.pinsonneault@nbc.ca

Kyle Dahms
Economist
kyle.dahms@nbc.ca

Paul-André Pinsonnault
Senior Fixed Income Economist
paulandre.pinsonnault@nbc.ca

Matthieu Arseneau
Senior Economist
matthieu.arseneau@nbc.ca

Jocelyn Paquet
Economist
jocelyn.paquet@nbc.ca

Krishen Rangasamy
Senior Economist
krishen.rangasamy@nbc.ca

Angelo Katsoras
Geopolitical Analyst
angelo.katsoras@nbc.ca

Toronto Office
416-869-8598

Warren Lovely
MD, Public Sector Research and Strategy
warren.lovely@nbc.ca