Can an ageing workforce explain low inflation?

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1. Introduction

We investigate the effects of aging on inflation through the labour market. More specifically, we question whether the weakness of wage inflation over the last decade reflects, at least partially, the increase of labour supply by baby boomers.

The post 2013 recovery of advanced economies has not yet translated into "normal" levels of inflation. Core inflation remains near 1% in the euro area, it has increased from zero to 1% in Japan, while in the United States it is approaching 2% after a sustained recovery. Most other advanced economies also see little inflation. Core CPI inflation, the GDP deflator inflation and wage inflation adjusted for productivity have all remained closer to 1% than to 2%, their pre-crisis nominal anchor. In the case of the euro area, we observe "lowflation" in spite of the creation of over 11 million jobs and over 20 quarters in a row of growth at or above the euro area 1.2 to 1.3 % yoy growth potential.

Unemployment has declined steadily from its peak by several percentage points in the United States, Japan, Germany, Canada, the United Kingdom and Spain. Yet inflation is hardly picking up in these countries. It is very tempting to conclude that the traditional Phillips curve may be broken for good. The weakening of the effects of domestic activity on domestic inflation could result from globalisation or automation. Both weaken the bargaining power of workers. These forces have received a lot of attention.

We instead analyse whether the aging of baby boomers, another well known major transformation of advanced economies, has an impact on inflation. In particular, what has received surprisingly little attention is the tremendous increase in the participation of these baby boomers to the workforce. For instance, 6 of the 7 million jobs created in the euro area between 2013 and 2017 were filled by those aged above 50. In the United States, the share of workers in the workforce aged above 55 has almost doubled from 12% in 1995 to 23% in 2016. In Japan, even the participation of workers aged 65 has increased by nearly 4 million since 2007.

The participation rates of workers aged 55 to 64 has increased from 33% to 55%, on average across OECD countries in the last decade (Graph 1). In Germany, it increased from around 40% until 2003 to above 70% in 2016. This major transformation of the workforce coincides with the setting up of pension reforms as baby boomer cohorts approached the age of retirement. Such demographic conditions may influence the determination of wages drastically.

In principle, this increase in participation may, however, also reflect an increase in labour demand, in which case we expect it would have pushed wages up. The fact of the matter is that, as we show in a technical version of this paper, wages have responded negatively to increased participation of older workers. Therefore, the change in the composition of the workforce is akin to a major labour supply shock by

ageing workers. Arguably, these aim to preserve their lifetime purchasing power through postponing their retirement. Ceteris paribus, this positive labour supply shock is likely to push down the levels of wages and unit labour costs. If this transition implies a level shift over several years, it may also impact wage inflation during the years when the transition is taking place.

Our empirical analysis shows that this conjecture in not rejected in the data. Our estimates indicate the participation of the elderly has a specific effect on the labour market. It differs from the one of other age groups. A plausible explanation is that the shorter time horizon of job tenures as retirement approaches reduces the outside value of elderly workers. Hence, they have less incentive to search for other jobs. As a result, the increase of the participation of elderly workers may decrease wage pressure. This conjecture is consistent with a recent analysis of the Bank of Japan (2018), which shows that the wage elasticity of labour supply for the elderly is twice as high as the one of men aged 15 to 64. This in turn contributes to explain why Japanese wages have stagnated in spite of the steady decline of the unemployment rate. This overall negative effect of higher participation by older workers on wage inflation in the period is consistent with the estimates we report in this paper.

2. Data

We assembled annual data on wage inflation, CPI inflation, labour productivity, the rate of unemployment and the participation to labour markets for 19 OECD countries: the United States, Japan, Germany, France, the United Kingdom, Italy, Canada, Australia, Spain, the Netherlands, Belgium, Austria, Finland, Denmark, Norway, Sweden, Switzerland and Portugal and Ireland. Our panel is balanced from 1996 to 2016.

3. Estimation results

The estimates reported in the table correspond to fixed effects panel regressions. Given the narrow cross section of the sample, we also estimated the same equations with the Mean Group Estimators. Results, which are not reported for the sake of space, are very similar to the ones shown here.

As shown in the first column of the table, wage inflation is highly responsive to its three traditional determinants: lagged CPI inflation, productivity and the unemployment rate. The T-stat of the unemployment rate is around 12. The notion that wage inflation is not responding to labour market slack appears extremely unlikely. Of course, the sample we consider here, which includes the Great Financial Crisis, is one with a high degree of co-movement between local labour market conditions and the global business cycle. Hence, some of the effects of the national unemployment rate may imbed the effects of a global slack à la Borio and Filardo (2007). However, while it may be difficult to disentangle the role of the global slack and the local one, Jasova et al (2018) actually show that both domestic and global slack impact domestic inflation. Our estimates show that labour market slack influences wages whichever global or local business cycle is the driver of this labour market slack.

Turning to the period after 2009, for which estimates are reported in the last column, the effects of the unemployment rate on wage inflation are still estimated to be negative. However, given the reduction of the degrees of freedom we have over these seven years, these effects are somewhat less precisely estimated.

The second column reports the panel estimates of a specification augmented with three additional variables:

a. the difference in the unemployment rates of two categories of workers, the ones aged 55 to 64 and the ones aged 25 to 54;

b. the rate of participation to the labour market; and

c. the difference in the participation rates of workers aged 55 to 64 and the ones aged 25 to 54.

Our aim is to assess whether the increased participation of older workers impacts wages. However, we also include in the specification the participation rate of all age groups in order to control for the effects from forces that would drive overall participation rates. Following the same logic, we also assess whether changes in the age composition of unemployed impact wages or the overall effects of the unemployment rate impact wages. Therefore, we include both the overall unemployment and participation rates as well as differences of these age rates above 55 and below 55 to test for a specific effect of the proportion of workers aged above 55 on wage developments.

Among these three additional variables, only the last one has an effect on wage inflation. An increased participation of older workers has a negative effect on wage inflation. We also note that the coefficient of unemployment is hardly affected by including these additional coefficients.

In column four, we include the yearly changes in the difference in participation rates instead of their level. This is to check that our result is not "spurious" given that participation of the elderly shows a trend in many countries while wage inflation rates decline for the sample period. With this specification, we still find a negative effect of participation on wage inflation.

4. Robustness

In Mojon and Ragot (2019), the technical version of this paper, we further investigate the role of labour market developments for the G7 and on wage inflation at the regional level. We put together data on wage inflation, participation of workers aged above 55, CPI inflation and the unemployment rate for 203 European regions. The data cover 17 years from 2000 to 2016.

The panel estimation on the G7 countries is fully consistent with the ones reported here. Henceforth, it is not the case that the negative effects of an ageing workforce on wage inflation is coming from small countries in our OECD panel. It is also observed in the largest among the advanced economies.

Turning to the panel of 203 European regions, we regress the inflation of wage compensation of employees on the participation rate of old workers, lagged inflation and the unemployment rate with regional fixed effects to control for regional heterogeneity. The regressions show that the increase in the participation rate of old

workers has a significant and homogeneous negative effect on wage inflation. We also perform regressions controlling for total population, which generates the same outcome. We find that the regional unemployment rate has a negative effect on regional wage inflation, which is a further indication that regional labour markets exibit "Phillips curve-like" patterns.

5. Conclusions

Altogether, the results reported in this paper are reassuring about our understanding of recent labour market dynamics. First, we observe major adjustments of labour supply in response to the ageing of the population. In this respect, the persistent call of central banks for reforms has been either anticipated or answered to by politicians, labour market institutions, employers and workers. This increase in participation implies that potential output should have increased. If the participation of 20% of the working population (population aged 55 to 64 over population aged 20 to 64) has nearly doubled, it means that aggregate output potential should increase as well. It would increase by roughly 6% (as he participation rate of workers aged 55 to 64 increased from 30% to 60%) if the productivity of older workers grows in line with the one of other workers. It should increase by less than 6% if the productivity of older workers is slower. It will, in any case, grow as long as the productivity growth of these older workers is not too negative.

This result also indicates that the Phillips curve transmission of monetary policy to wage inflation is not broken. Increasing participation of older workers has shifted the Phillips curve, which has blurred the response of wage inflation to increasing employment. Central banks who spur activity and employment will eventually harvest domestic wage inflation, and, in all likelihood, inflation of goods and services.

Third, it is not clear yet how high participation rates of older workers will go. We are probably undergoing a very long transition and we don't know when it will end. But as long as this transition implies a larger slack than measured by the unemployment rate, the economy operates below its "NAIRU" potential. Taking a broader perspective, it seems that the unemployment rate has not been a comprehensive indicator of labour market slack.

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Estimates of wage Phillips curves in a panel of 19 OECD countries

	(1) 1996-2016	(2)	(3)	(4)	(5)	(6) 2010-2016
Lagged CPI inflation	0.417***	0.339***	0.412***	0.340***	0.412***	0,117
	(7.84)	(6.34)	(7.76)	(6.41)	(7.78)	(1.14)
Labour productivity growth	0.229***	0.194***	0.224***	0.194***	0.229***	0.0687
	(6.48)	(5.57)	(6.36)	(5.62)	(6.51)	(1.40)
Unemployment rate	-0.378***	-0.392***	-0.381***	-0.394***	-0.381***	-0.274**
	(-12.99)	(-13.08)	(-12.37)	(-13.96)	(-13.14)	(-3.13)
Unemployment rate difference between the "above 55" and the "below 55" workers		-0.000811	0.0746			
		(-0.01)	(1.22)			
Participation rate		0.00812	-0.0398			
		(0.26)	(-1.30)			
Participation rate difference between the "above 55" and the "below 55" workers		-0.0666***		-0.0654***		-0.0494
		(-5.18)		(-5.63)		(-1.29)
Change in the participation rate difference between the above 55 and the below 55 workers			-0.104		-0.126*	
			(-1.78)		(-2.26)	
Constant	4.289***	2.041	6.919***	2.595***	4.394***	2.392
	(16.46)	(0.94)	(3.51)	(6.62)	(16.68)	(1.95)
Number of countries	19	19	19	19	19	19
Number of observations	425	425	425	425	425	130

The dependent variable is wage inflation. Wages as measured as the compensation of employees.
t-stats are in parentheses.
All regressions include a country fixed effect.
Countries included in the sample: Australia, Austria, Belgium, Canada, Denmark, France, Finland, Germany, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Participation rates: share of "55–64" year old population that work

In per cent of the population

Graph 1

United States
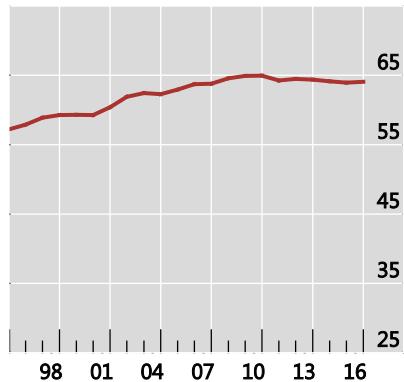
Japan
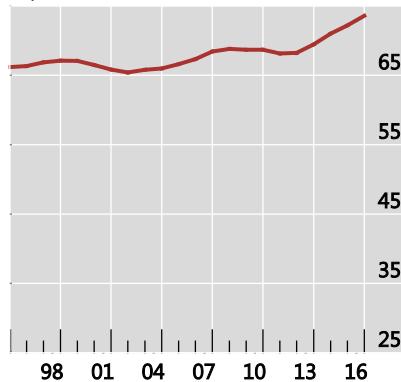
Germany
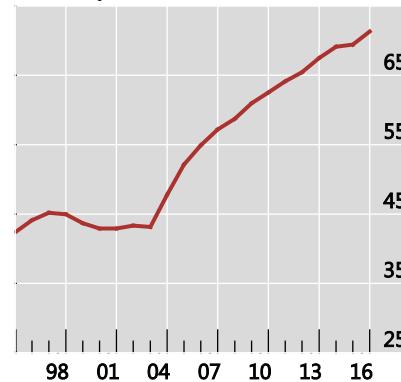
France
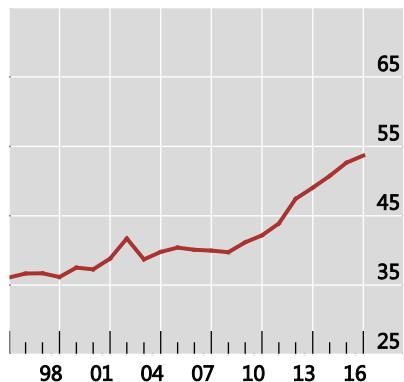
United Kingdom
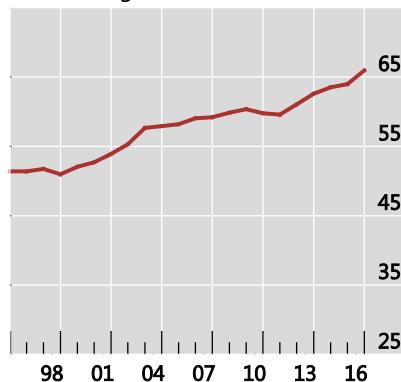
Italy
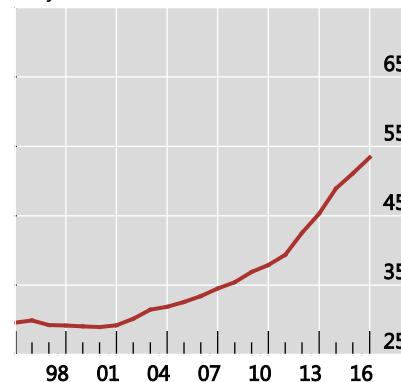
Canada

Spain

Netherlands