

Wage-price Dynamics in a High-inflation Environment: The International Evidence

Neyavan Suthaharan and Joanna Bleakley^[*]



Photo: Nick Hirst / EyeEm – Getty Images

Abstract

Headline inflation is at multi-decade highs in most advanced economies, reflecting a confluence of factors. Wages growth has also increased, but not to the same extent. This article examines the risk that a wage-price spiral could emerge in these economies by looking at historical experience and the various factors that could make a spiral more likely. It finds that the current episode has many differences to the 1970s, when a wage-price spiral did emerge. Central banks are now focused on ensuring inflation remains low, medium-term inflation expectations remain anchored and structural changes in the labour market reduce the likelihood that wages and inflation chase each other. Nonetheless, authorities need to be mindful of the risk of a wage-price spiral.

Introduction

Headline inflation has surged in most advanced economies, driven by various factors. Wages growth has also picked up considerably, but more slowly and by less than inflation. Although prices and wages typically move together, supply shocks, such as COVID-19 outbreaks and Russia's invasion of Ukraine, can disrupt this positive co-movement and result in prices rising faster than wages. This initial wedge between prices and wages can then translate into a wage-price spiral depending on various factors such as labour market tightness, institutional elements and inflation expectations.

Assessing the risk of a wage-price spiral and guarding against it is a necessary precondition if central banks are to return inflation to target without materially weakening employment and economic growth.

Why has inflation surged?

Headline inflation in most advanced economies has surged to its highest rate in several decades, with the peak yet to be reached in some countries (Graph 1). In addition to strong growth in food and energy prices, core inflation is at very elevated rates.

The initial increase in inflation in mid-2021 was mostly concentrated in durable goods prices, given that a huge increase in demand for goods occurred at the same time as supply was constrained, and in energy prices which recovered from relatively low levels in 2020. However, inflation has become increasingly broadly based over the past year in many economies, with the share of items with inflation greater than 4 per cent rising from around 30 per cent in late 2021 to around 75 per cent in July 2022 in many cases (Graph 2).

The global surge in inflation has largely been driven by three key factors:

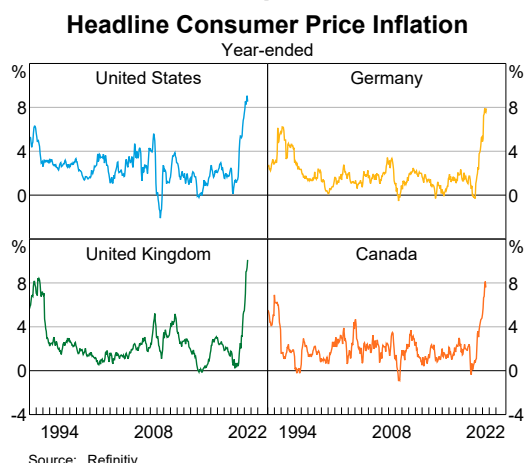
1. **Supply in global goods markets was unable to keep up with surging demand during the pandemic**, leading to shortages across a wide range of consumer goods. One reason for these

imbalances was that consumer demand for goods increased sharply as consumers were inhibited from spending on high-contact services, and it has taken time for supply to catch up. Another reason was that supply capacity was reduced in some cases, as manufacturers anticipated a sharp drop in demand in early 2020 and restrictions to contain the spread of COVID-19 disrupted ‘just-in-time’ supply chains (most notably for semiconductors and shipping) (Carstens 2022).

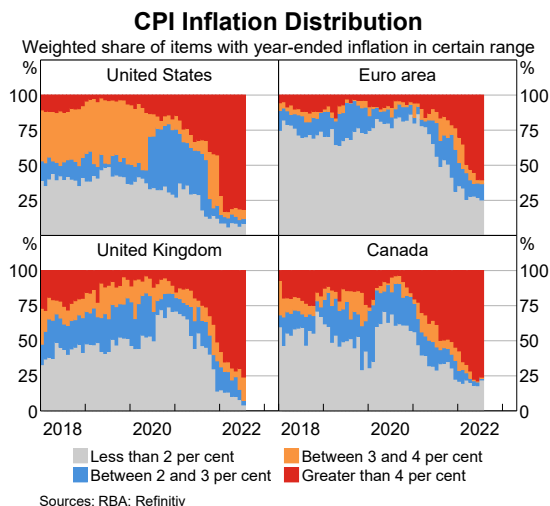
2. **Many advanced economies made a stronger-than-expected recovery from the COVID-19 pandemic**, as vaccines allowed economies to reopen and stimulatory fiscal and monetary policy helped boost incomes and demand.
3. **Commodity prices rose sharply**, initially because of the strong and energy-intensive nature of the global recovery and low levels of investment in fossil fuels and electricity storage capacity (BIS 2022). More recently, Russia’s invasion of Ukraine has added significantly to energy and food commodity prices.

These sequential supply shocks and other factors, taken separately, might have had only a temporary effect on inflation. Together, they have compounded each other and kept inflation persistently high. Notably, services inflation – which tends to be much more persistent than goods inflation – is now running at their highest rates in a number of decades in most advanced economies (Graph 3).

Graph 1



Graph 2



Wages growth has increased as the labour market has tightened

Nominal wages growth has increased as labour demand recovered rapidly since mid-2020. Unemployment rates and vacancy-to-unemployment ratios are at their strongest levels in a few decades, with a high share of firms in many advanced economies citing difficulty in finding workers (Federal Reserve 2022). The increase in wages growth in advanced economies has in most cases been broadly in line with what would have been predicted by the relationship between

unemployment rates and wage growth over the 2010s (see the red and yellow dots in Graph 4). However, the recovery in labour supply in the United States and the United Kingdom from the pandemic was incomplete, adding to pressures on labour markets there. Consistent with this, wages have grown notably faster in the United States than would have been expected from the relationship during the 2010s, and are more in line with the relationship seen in the decade before the pandemic.

While nominal wages growth has picked up, it has not been able to keep pace with the rapid rise in inflation. This has resulted in significant declines in real wages in many economies over the past year.

The relationship between prices and wages

Wages growth is an important driver of inflation because wages are a large share of firms' costs. If wages growth exceeds productivity growth and then firms raise prices to preserve margins and profitability, this can drive inflation higher. Alternatively, if inflation is already high for other reasons, then the relationship between wages and prices can be the mechanism by which high inflation persists, since workers often seek larger wage rises when inflation is increasing and is expected to remain high for a protracted period (to compensate for declining purchasing power), which in turn increases firms' costs.

However, during the inflation-targeting period (since the early 1990s), inflation has been low and expectations have been well anchored. In this environment, inflation and wages have largely moved together, driven by common demand factors such as the amount of spare capacity (the output gap or unemployment gap) in the economy. When aggregate demand in the economy moves ahead of what the domestic economy is able to supply, this allows firms to more easily raise prices and generates 'demand-pull inflation' (Figure 1). Likewise, when labour demand increases relative to supply, workers are able to bargain for higher wages. The resulting demand-driven co-movement between prices and wages is the foundation of standard inflation models such as the mark-up model (where prices are set at a 'mark-up' to wages and other input costs) and the Phillips curve (where price and wage inflation are both a function of the unemployment rate or output gap). Consistent with this, causality tests between inflation and wages growth find Granger causality running in both directions.^[1]

Price inflation can also be affected by a range of supply-side factors that can disrupt the typically positive correlation with wages. In 'cost-push' inflation, firms face higher non-labour input costs that reduce their profits and erode their ability to pay higher wages. As a result, firms may raise their selling prices to maintain margins while at the same time aiming to limit wages growth (Figure 1). This dynamic relies on firms having enough pricing

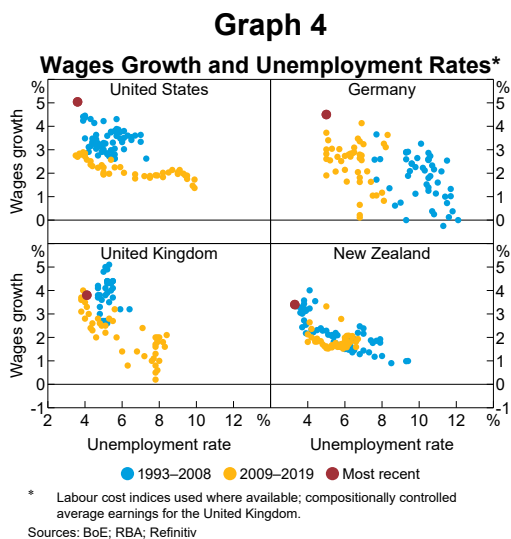
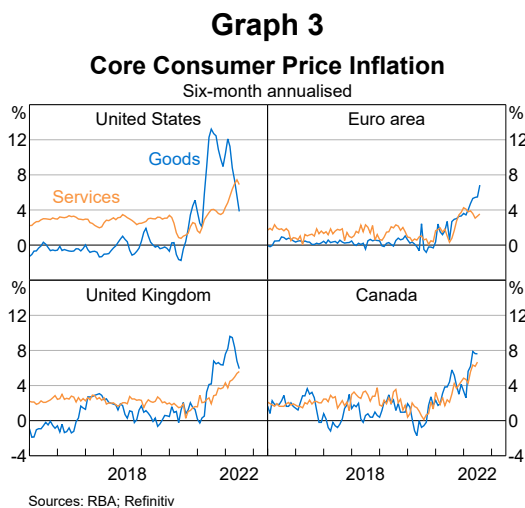
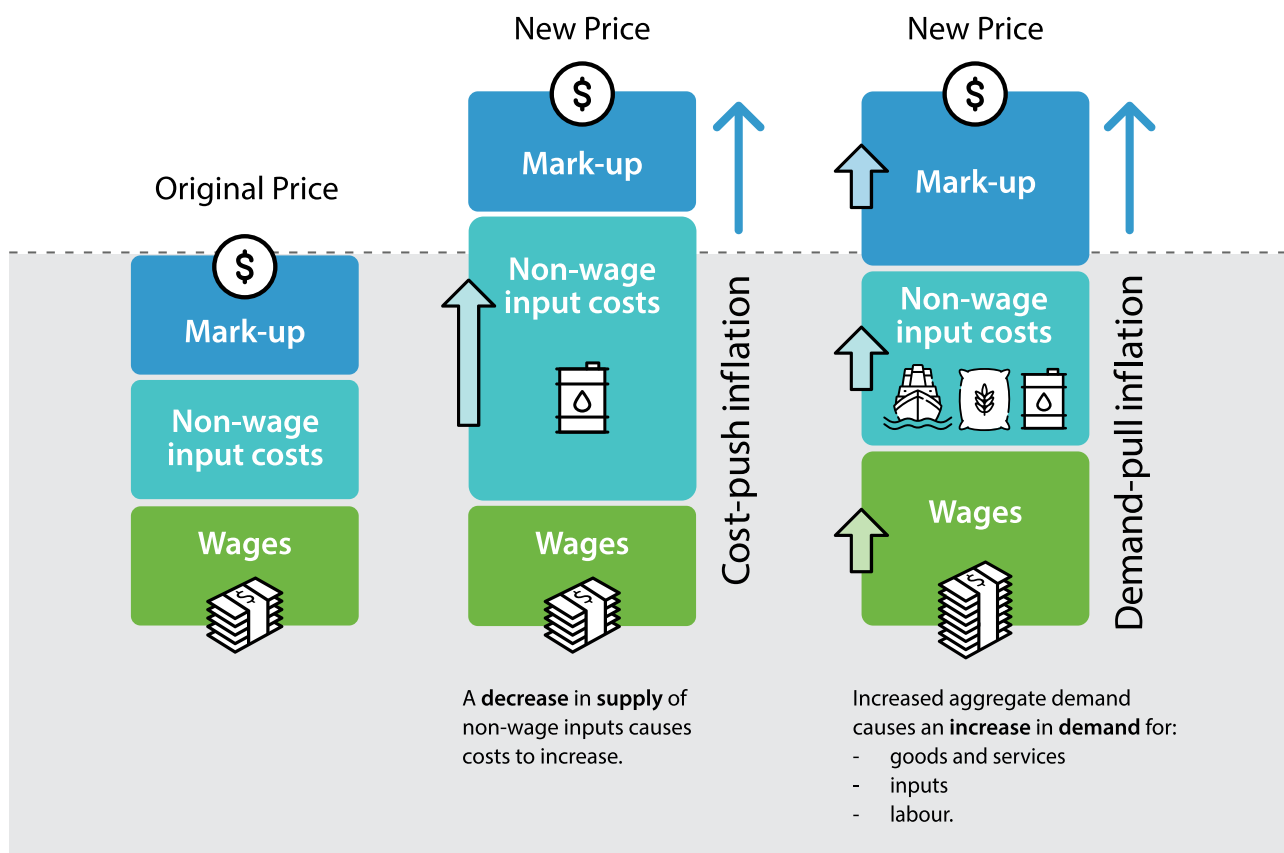


Figure 1: Cost-push and Demand-pull Inflation

power to be able to preserve margins in this way, which depends on the level of competition in the industry. Such outcomes are less common than the demand-driven movement that creates a positive overall correlation between prices and wages growth, but they still arise at times.

During the inflation-targeting era, there have been various examples of adverse supply shocks that have produced higher inflation in advanced economies without a commensurate pick-up in wages growth; these shocks have included sharp increases in commodity prices, large exchange rate depreciations and sustained declines in productivity growth. Notably, these shocks have generally coincided with spare capacity in labour markets, meaning the shock was more likely to be absorbed without generating significant upward pressure on wages. In this context, inflation expectations remained anchored and the rise in inflation proved to be temporary. Examples of such supply shocks include the following:

- After the global financial crisis, oil prices rose to persistently high levels largely due to geopolitical tensions; while inflation rose in many economies as a result, including the United States, wages growth was little changed (Graph 5). Higher oil prices are inflationary because petrol accounts for a sizeable share of the household consumption basket in advanced economies and because of the pervasive effect of oil on the costs of producing, transporting and selling a wide range of goods and services.
- A substantial depreciation in the British pound after the 2016 Brexit referendum pushed headline inflation sharply higher while both wages growth and domestically generated inflation (proxied here by services inflation) was little changed (Graph 5) (Bank of England 2017). A depreciation in the exchange rate raises the domestic price of imported goods without

increasing the ability of firms to pay higher wages.^[2]

- Across various economies over the 2010s, a decline in productivity growth raised the cost of production for firms (Arsov and Evans 2018). Standard theory states that real wages should track workers' productivity in the long run (Productivity Commission 2020). This implies that while inflation and (nominal) wages growth move together, each moves around a different average rate, with the wedge between those averages capturing the trend in productivity growth. When the trend rate of productivity growth changes, realised inflation and wages growth can move apart for a period while the new differential in their trends is established.

One example where a shock occurred during a period of tight labour markets was when Australia's terms of trade surged during the late 2000s, largely owing to demand for Australian resources from emerging economies, particularly China (Battelino 2010). Price inflation initially increased, soon followed by a pick-up in wages growth, which kept inflation elevated above target for some time. By the early 2010s, however, the effects of the global financial crisis, a stronger Australian dollar and rising interest rates all dampened growth, which lowered both wages growth and inflation. The additional buffer provided through exchange rate adjustment in a flexible exchange rate regime was a marked difference compared with earlier episodes of terms

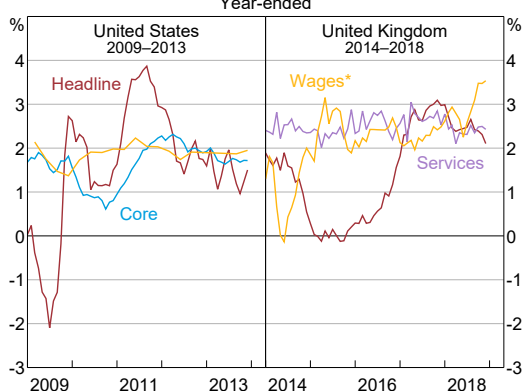
of trade shocks that occurred when fixed or managed exchange rates were commonplace.

The self-defeating nature of wages chasing inflation in the face of supply shocks

Once a wedge between prices and wages has emerged (e.g. because of a supply shock), attempts by workers to push for higher wages to 'catch-up' to inflation may not necessarily be successful in maintaining real wages over the medium term. In one sense this is because the rise in nominal wages to restore purchasing power can spur firms to increase prices further, which would negate the catch-up effect of the initial increase in wages. But ultimately, this inability to restore real wages reflects that if fundamental factors have increased the equilibrium price of intermediate inputs relative to wages, attempting to reverse that shift in relative prices will create a disequilibrium (unless firms don't have the pricing power to pass on increases in their costs). In those circumstances, wages constantly 'chase' inflation, resulting in a wage-price spiral (Figure 2).

A canonical example of such a spiral occurred in the 1970s in most advanced economies – known as 'The Great Inflation'. Political instability in the Middle East at that time resulted in two severe oil price shocks that pushed inflation to very elevated rates. Workers resisted cuts to real wages, and were supported by high rates of unionisation and automatic inflation indexation clauses (discussed further below). Monetary policy also did not tighten by as much as the increase in inflation, so that real interest rates fell; in part, this reflected that a number of economies still had managed exchange rate regimes in this period, and so monetary policy was directed at keeping the exchange rate at the desired level rather than controlling domestic inflation. (Higher interest rates would have attracted foreign capital and put upward pressure on the exchange rate, which in turn would have required the central bank to expand domestic money supply, thereby easing policy again.) It is also relevant that US fiscal policy was very expansionary, partly because of spending related to the Vietnam War (Federal Reserve 2013).

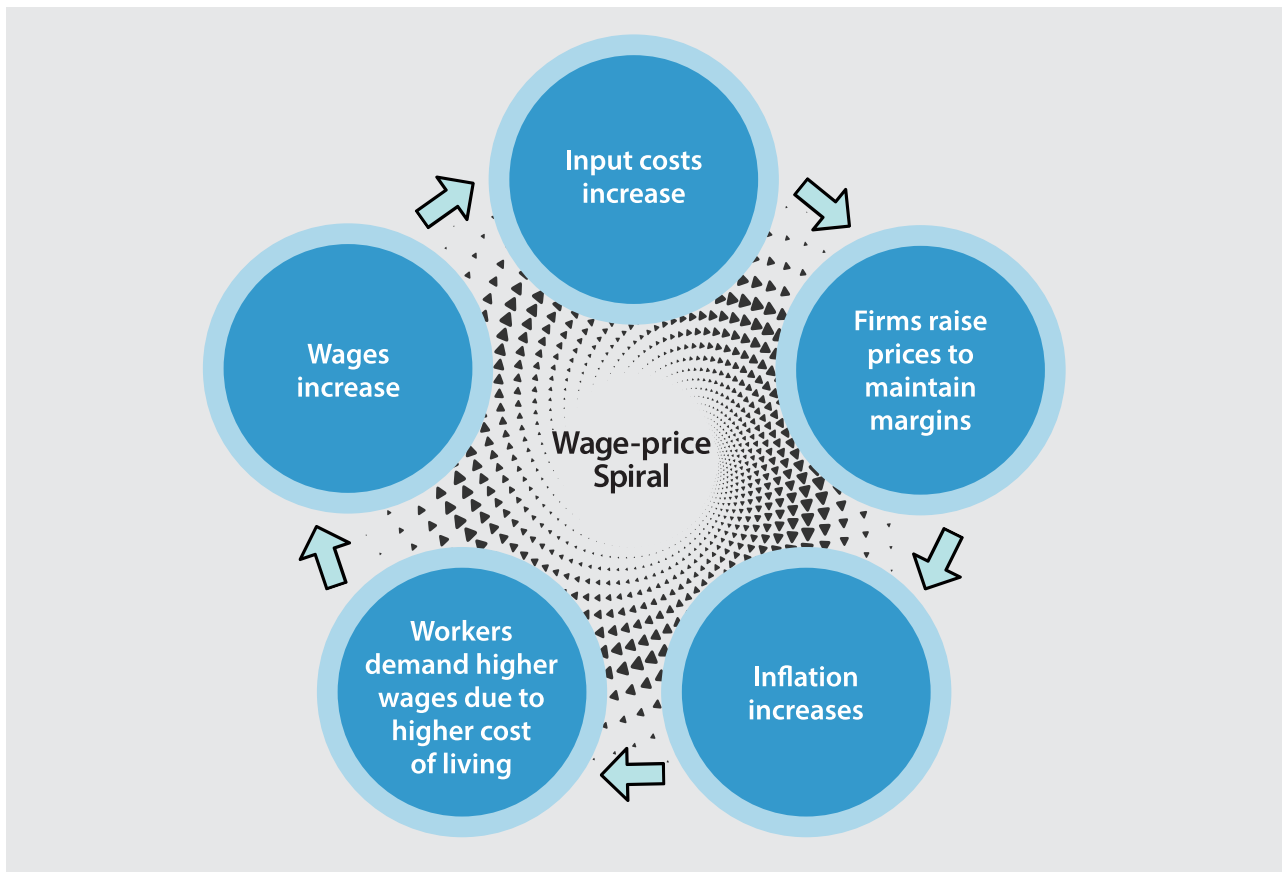
Graph 5
Consumer Price Inflation and Wages Growth
Year-ended



* Employment Cost Index used for United States and three-month moving average of average earnings for United Kingdom.

Sources: RBA; Refinitiv

Figure 2: Wage-price Spiral



In spite of all this, the sharp lift in nominal wages growth still fell short of inflation in most economies. This partly reflected the fact that wages tend to respond to prices with a lag because of the nature of wage-setting mechanisms, while prices are able to be reset more frequently in response to changing cost pressures and demand conditions. Historically, it has generally been the case that wages growth has tended to fall below the rate of inflation as the latter moves to high rates (Graph 6).

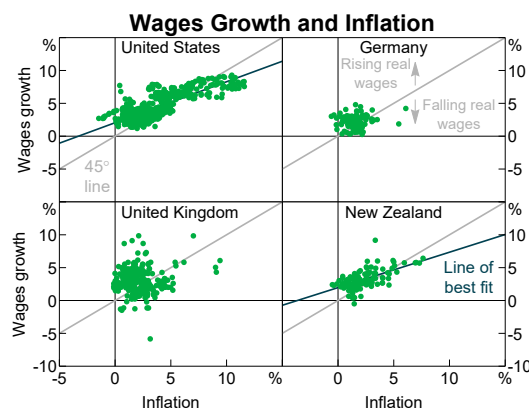
- the prevalence of wage indexation arrangements
- the pricing power of firms allowing them to preserve margins
- inflation expectations.

What causes a wage-price spiral?

While supply shocks can push up inflation, these have not translated into wage-price spirals in the inflation-targeting era. This is because several other factors influence whether an initial shock to inflation will turn into a wage-price spiral, including:

- how tight the labour market is
- the balance of bargaining power between workers and firms
- the inherent stickiness of wages

Graph 6



Sources: RBA; Refinitiv

A tight labour market

A tight domestic labour market can support attempts by workers to ensure wages keep pace with inflation. This is because workers have more bargaining power in such an environment, even when there are supply shocks, because it is harder for firms to find suitable labour. A reverse example of this can be observed in the *lack* of wages growth in many economies after the global financial crisis, when demand was weak, and as inflation pushed higher on the back of rising oil prices.

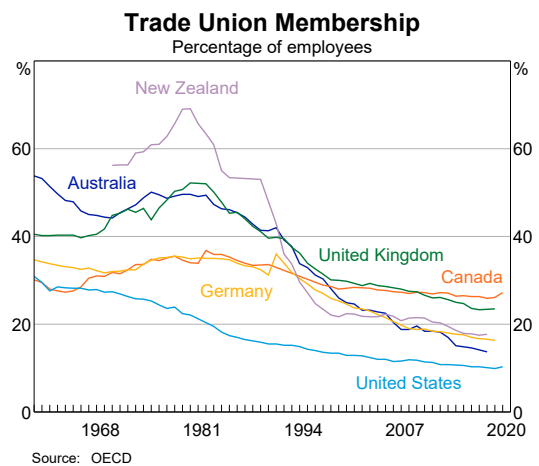
The balance of bargaining power

Institutional factors can affect workers' bargaining power and the likelihood of 'real wage resistance'. For example, high rates of trade union membership or collective bargaining coverage will tend to strengthen workers' power. Both of these factors were high in the 1970s but have declined in most advanced economies since then – especially outside of continental Europe (Graph 7; Graph 8). Similarly, workers in economies with more centralised wage setting – such as in the euro area – have greater bargaining power, and so the responsiveness of wages to prices is likely to be higher (BIS 2022). Moreover, stricter job protection regulations that limit the ability of firms to dismiss workers can give workers greater protection to push for higher wages, which may increase the responsiveness of wages growth (such rules are stricter in the euro area than in the United States and Canada). Higher minimum wages and unemployment benefits (relative to wages) also increase bargaining power and shift up the level of wages, although it is less clear that they amplify the *responsiveness* of wages to inflation. Overall, when workers have stronger bargaining power, their ability to push for larger wage increases (as prices rise) is enhanced (BIS 2022).

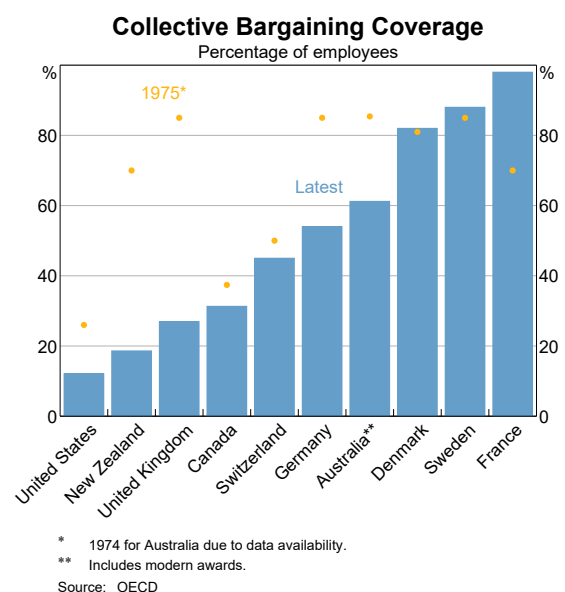
Global factors also matter for the balance of bargaining power, since the prospect of replacing domestically produced goods with imports can hold down wages in a tight domestic labour market; in addition, increased availability of imported inputs reduces the impact of non-labour input costs on domestic inflation pressures. This was one factor contributing to low wages growth in the

early 2000s: the US economy was strengthening, with inflation rising steadily and the unemployment rate below estimates of its natural rate, but wages growth did not pick up. Over this period, there had been a boost to global labour supply (relative to demand) as China entered the World Trade Organization in 2001, increasing global competition – particularly for manufacturers in the United States (Goodhart and Pradhan 2020). While increased competition in the goods market reduced manufacturers' pricing power and the relative price of manufactured goods, the implied threat of import competition was broadly based and so weighed more heavily and more broadly on wages growth.

Graph 7



Graph 8



The 'stickiness' of wages

The frequency at which wages are renegotiated can create 'stickiness' that reduces the responsiveness of wages to economic conditions. For example, collective bargaining agreements (CBAs) are usually renegotiated every few years, so can delay the responsiveness of wages to inflation in countries where CBA coverage is high, such as in the euro area where the average duration of CBAs is between about one and three years, depending on the country (Graph 8). Infrequent wage adjustments can sometimes mean that the supply shock to inflation has unwound by the time a large share of wages has been renegotiated; this implies that, although the level of real wages is restored, the period of lower real wages is not caught up afterwards. Economies where wages are less 'sticky' may therefore be more susceptible to meeting the conditions for a wage-price spiral and may find it harder to break out of a spiral once it has begun.

Wage indexation arrangements

Automatic indexation of wages to inflation can increase the likelihood of a wage-price spiral. If wages are automatically indexed to inflation, increases in prices automatically trigger wage increases (although since indexation is almost always backward-looking there may be a lag between the higher inflation and the wage increase). Indexation is more common in countries with a higher inflation history, and the use of indexation has decreased significantly since the 1970s as inflation has declined (BIS 2022). Nevertheless, there are still a number of advanced economies where at least minimum wages are indexed to inflation, particularly in the euro area (Koester and Grapow 2021). For example, in Belgium, virtually all wages are indexed to inflation; in Spain, the share of newly agreed collective bargaining agreements with indexation clauses has approximately doubled this year, to around 30 per cent (Hernández de Cos 2022). Relatedly, economies in which wages in one sector are heavily influenced by wages in another are also more prone to see excess demand in one part of the economy result in rapid wages growth more broadly. This can contribute to a wage-price spiral following a sector-

specific shock. Historically, such arrangements were quite common because of centralised wage-setting mechanisms, but the prevalence of formal mechanisms to maintain relative wages across industries has decreased significantly.

Pricing power of firms

If firms have more pricing power, it is more likely that a wage-price spiral could occur because firms can pass-through higher input costs to prices without losing as much market share, perpetuating any spiral that might be emerging. By contrast, firms with less pricing power are more likely to absorb higher input costs into their margins, instead of raising prices.

Inflation expectations

Inflation expectations play a significant role in whether a wage-price spiral might occur. If firms and workers expect a rise in inflation to be persistent, they are more likely to react strongly, either by raising prices or seeking higher wages. These expectations are largely shaped by the nature of the inflationary shock and agents' anticipation of the policy response to correct any overshoot above target. In the inflation-targeting era, although near-term expectations tend to fluctuate, medium-term expectations have been broadly stable (Graph 9).



Conclusion: Assessing the risk of an imminent wage-price spiral

In many countries, inflation is at historically high rates, the labour market is exceptionally tight and wages growth is picking up, so there are risks that a wage-price spiral could emerge in some economies. Large increases in the price of essential household items, like petrol and food, also mean that inflation is more salient than normal, pushing households away from a world of ‘rational inattention’ to price growth (BIS 2022).

Consequently, near-term inflation expectations have increased to their highest rate in several decades. In current wage negotiations, workers are already trying to recoup previous erosion in purchasing power and secure themselves against future price increases (Blanchard 2022); the current tightness of labour markets globally means workers are in many cases well placed to successfully negotiate for higher wages. These factors increase the risk of a wage-price spiral.

There are a number of factors that work against a wage-price spiral emerging, however, implying that the overall risk in most advanced economies is probably quite low, and certainly lower than in the 1970s. One group of these factors relates to the pricing power of workers and firms, which has fallen over the past decades as a result of institutional change and increased globalisation raising competition. Wage indexation is also less prevalent than it once was, though this could reverse if high inflation persists and bargaining arrangements were to respond to this.

The very different arrangements surrounding current monetary policy, as opposed to in the 1970s, also mitigates the risk of a spiral. Most advanced economy central banks now have mandates to achieve a target rate of, or range for, inflation. They have therefore started raising policy interest rates significantly, and their public statements reference strong commitments to ensure that inflation returns to target. This contrasts with the 1970s when real rates fell over a three-year period after the shock to inflation and therefore stimulated the economy.

Largely because central banks have successfully maintained inflation consistent with their targets over many years and have responded to high inflation decisively in recent months, to date inflation expectations beyond the current year have remained in check (Graph 9). Households’ expectations for inflation beyond this year remain consistent with central banks’ targets, and businesses and financial markets expect inflation to broadly return back towards target. These expectations are likely to feature in price- and wage-setting behaviour. This is starkly different to the 1970s when most agents believed inflation would persistently remain high, which fuelled further price increases. Nevertheless, if inflation remains elevated and if monetary policy doesn’t respond sufficiently, there is a risk that medium-term expectations could de-anchor and then feed into firms’ pricing decisions and wage outcomes in these economies.



Endnotes

[*] The authors are from Economic Analysis Department.

[1] Granger causality running in both directions means that past values of inflation can help to predict wages growth and past values of wages growth can help to predict inflation.

[2] The reason for the fall in the exchange rate matters – and depreciations driven by rising risk premia perhaps matter most (Forbes 2015).

References

Arsov I and R Evans (2018), ‘Wage Growth in Advanced Economies’, RBA *Bulletin*, March.

Bank of England (2017), *Monetary Policy Report*, November.

BIS (Bank of International Settlements) (2022), *Annual Economic Report*, June.

Battelino R (2010), 'Mining Booms and the Australian Economy', Address to The Sydney Institute, Sydney, 23 February .

Blanchard O (2022), 'Why I Worry About Inflation, Interest Rates, and Unemployment', PIIE Series, Peterson Institute for International Economics, 14 March.

Carstens A (2022), 'The Return of Inflation', Speech at the International Center for Monetary and Banking Studies, Geneva, 5 April.

Federal Reserve (2013), 'The Great Inflation', Federal Reserve History, 22 November.

Federal Reserve (2022), 'Beige Book', 20 April.

Forbes K (2015), 'Much Ado About Something Important: How Do Exchange Rate Movements Affect Inflation?', Speech at the Macro and Finance Research Group Annual Conference, Cardiff, 11 September.

Goodhart C and M Pradhan (2020), *The Great Demographic Reversal*, 1st ed, Palgrave Macmillan, London.

Hernández de Cos P (2022), 'The Case for an Incomes Agreement in Spain?', Speech at the 50th Anniversary of the Faculty of Economics and Business Studies, Universidad de Sevilla, 26 April.

Koester and Grapow (2021), 'The Prevalence of Private Sector Wage Indexation in the Euro Area and its Potential Role for the Impact of Inflation on Wages', ECB *Economic Bulletin*, Issue 7/2021.

Productivity Commission (2020), 'Recent Productivity Trends', February.