Appendix: Labour markets and inflation in the wake of the pandemic

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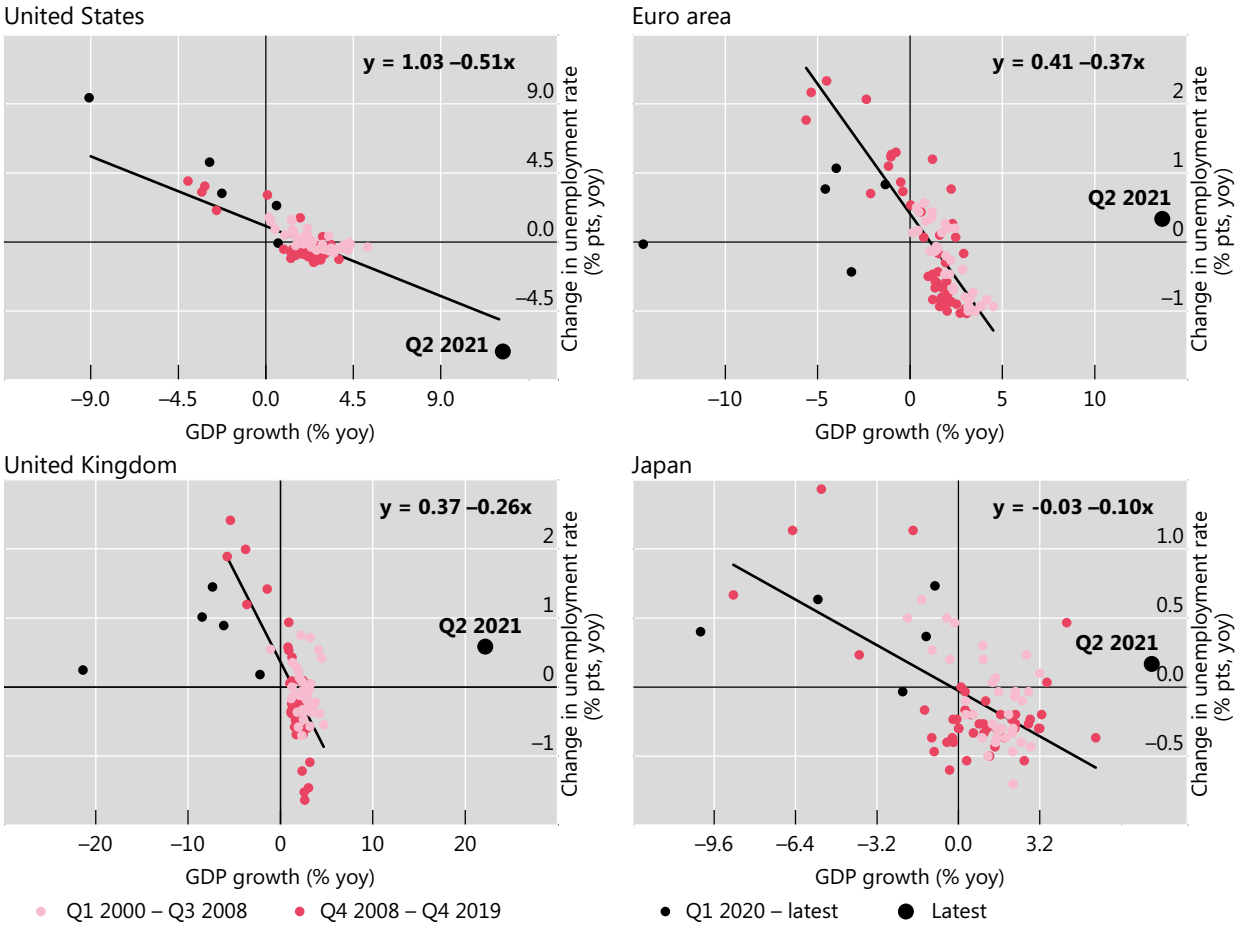
Okun's law

Okun's law depicts the relationship between GDP growth and the change in the unemployment rate. In general, one would expect faster GDP growth to be associated with a lower unemployment rate because firms will seek to hire more workers to meet the increasing demand from consumers. The strength of the relationship can vary between countries, reflecting, among other factors, differences in labour market institutions. The graphs below illustrate that in some countries, including Canada and the United States, changes in unemployment rates during the pandemic have been broadly in line with what would have been expected given the pre-pandemic Okun's law relationships in these countries. In others, such as the United Kingdom and the euro area, movements in the unemployment rate were much smaller than would have been expected given the large changes in GDP growth.

Okun's law[1] Graph A1

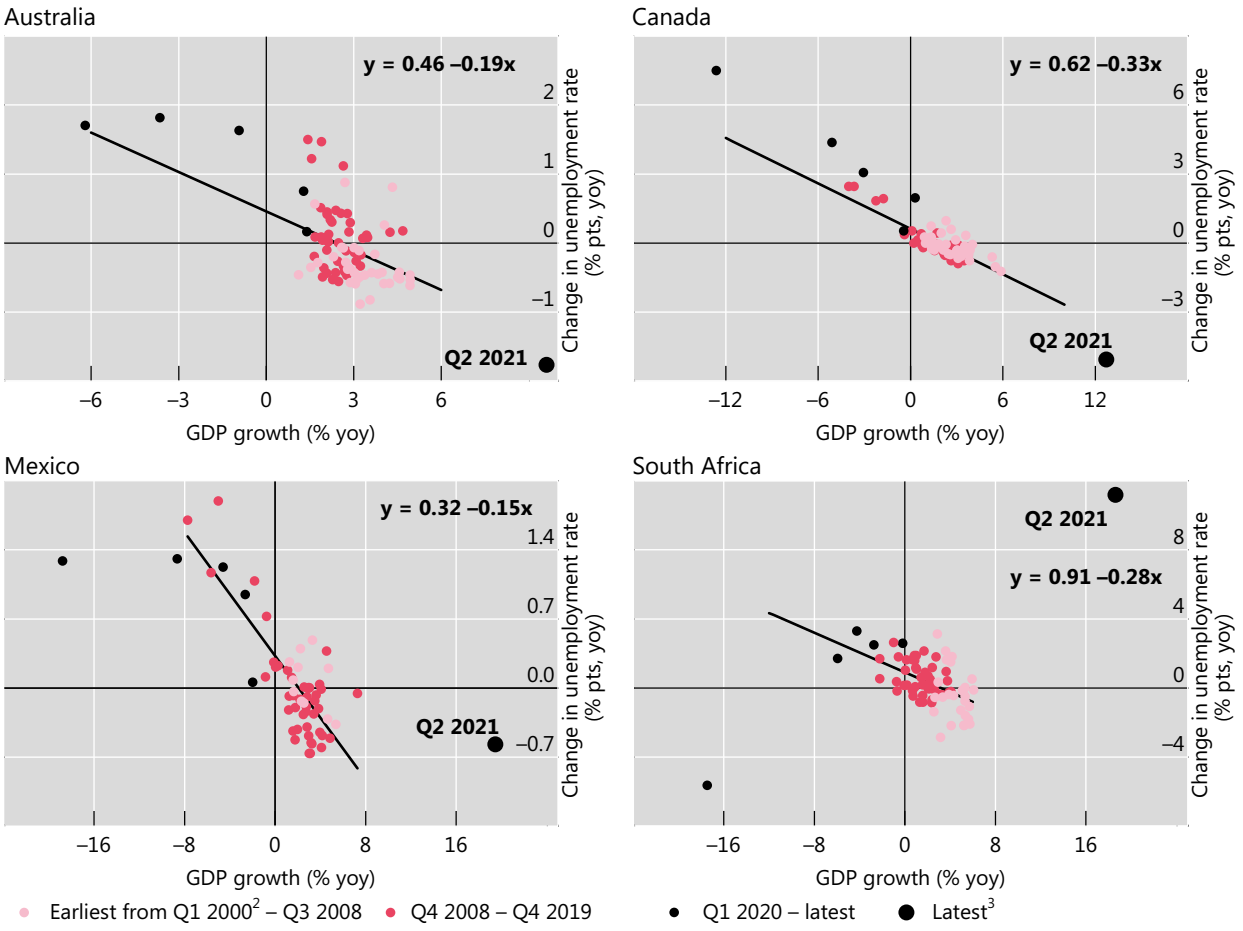


[1] The fitted lines refer only to data before 2020.

Sources: Datastream; BIS calculations.

Okun's law[1]

Graph A1 (continued)



[1] The fitted lines refer only to data before 2020. [2] Q1 2002 for ZA, Q1 2006 for MX and Q1 2000 otherwise. [3] For Q2 2021 GDP growth (% yoy), JP Morgan forecast was used for ZA.

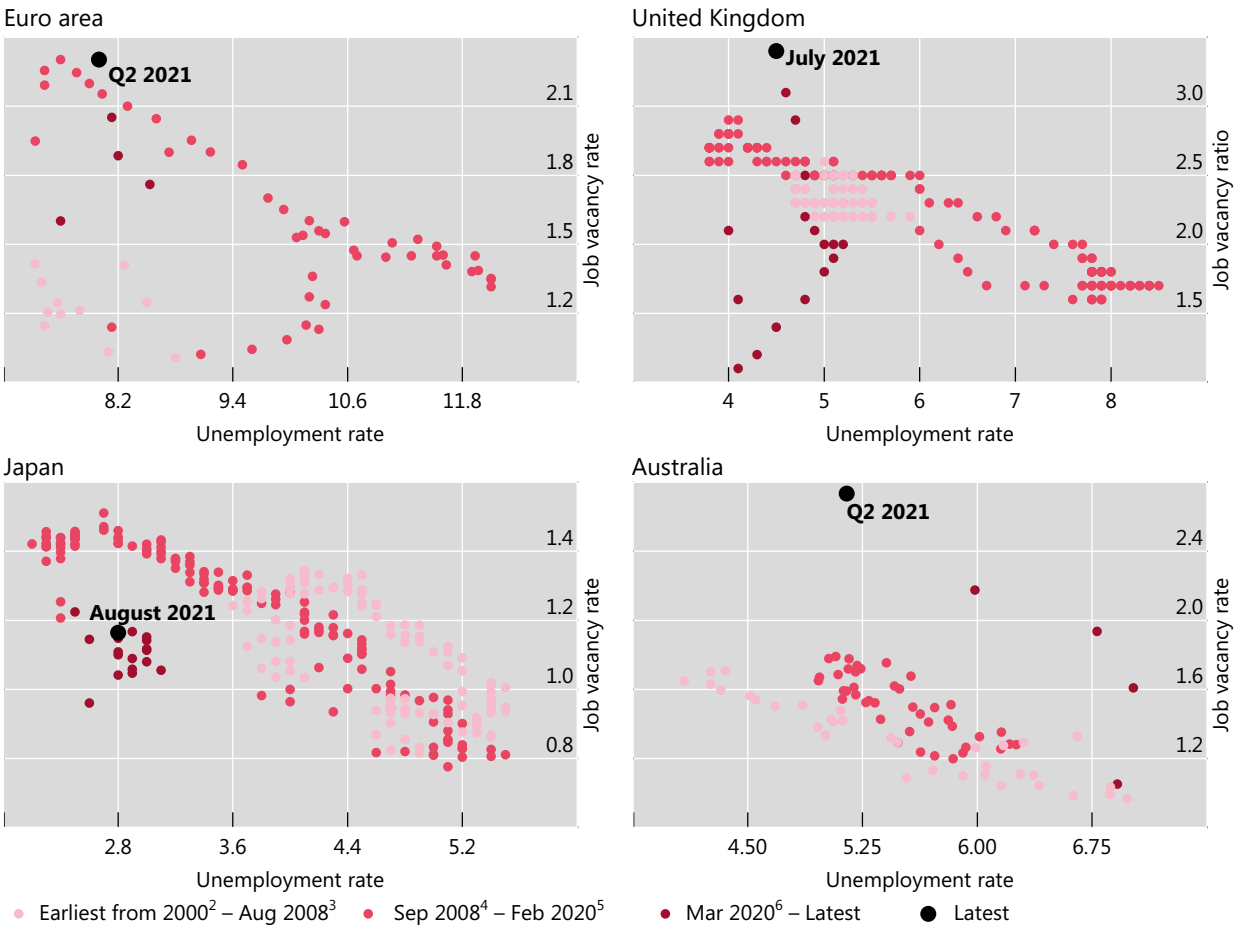
Sources: Datastream; JPMorgan Chase; national data; BIS calculations.

The Beveridge curve

The Beveridge curve depicts a negative relationship between unemployment and job vacancies. The underlying intuition behind this relationship is that as vacancies (vacant job positions) increase, the number of people unemployed decreases –all else equal. The position of the economy on the curve reflects the state of the labour market within the business cycle. For example, a high level of job vacancies concomitant with a low level of unemployment (eg during an economic boom) points to a "tight" labour market, where firms face hiring difficulties and aggressively compete for workers. Even though the downwards-sloping Beveridge curve is a robust finding across countries, the curve can shift over time. An upward shift, for example, may reflect structural changes in the sectoral composition of labour demand (eg if firms need new skills that are not immediately available on the market) or supply (eg if workers' preferences for some types of job have changed).

Beveridge curves shifted during the pandemic[1]

In per cent — Graph A2



[1] Job vacancy rate computed as (number of job vacancies) / (number of occupied posts + number of job vacancies)*100. Job vacancy ratio computed as three month rolling average ratio of vacancies per 100 employee jobs. [2] For EA, Q1 2006; for GB, May 2001; for JP, January 2000; for AU, Q1 2000. [3] For AU and EA, Q3 2008. [4] For AU and EA, Q4 2008. [5] For AU and EA, Q1 2020. [6] For AU and EA, Q2 2020.

Sources: Datastream; national data; BIS calculations.

Contributions to markets' medium-term inflation expectations – methodology

The cumulated contributions to the change in markets' inflation expectations reported in the right-hand panel of Graph 4 are based on the estimates of the following regression, for rolling-windows of 60 days (t= T − 60 days, … , T) since June 2018 (T = 15jun2018, … ,15jun2021) and a sample of seven countries (US, EA, JP, DE, GB, AU, ES):

$$F2y3y_{it-1} = \alpha_{iT} + \beta_{1T}\,\mathrm{InflationSwap1y}_{it} + \beta_{2T}\mathrm{Mobility}_{it} + \beta_{3T}\mathrm{CostFreight}_{t} + \beta_{4T}\mathrm{CommodityPriceInflation}_{t} + \beta_{5T}\mathrm{Vacancies/Unemployment}_{it} + \varepsilon_{it}$$

The left-hand side variable, $F2y3y_{it-1}$, is the 2 year-3 year forward inflation rate, as implied by the 5 year and 2 year inflation swaps: F2y3y=100*((((1+inflationSwap5y/100)^5)/((1+inflationSwap2y/100)^2)) ^(1/3))-100. The right-hand side variables are the one-year inflation swap ($\mathrm{InflationSwap1y}$), the Google Global Mobility Index ($\mathrm{Mobility}$), the growth rate of the Global Freight Index ($\mathrm{CostFreight}$), the market-based six-month-ahead commodity price inflation expectations ($\mathrm{CommodityPriceInflation}$), and the vacancies to unemployment ratio ($\mathrm{Vacancies/Unemployment}$). These variables are meant to capture the effects of news and potential cost-push factors susceptible of affecting inflation expectations in the medium run. The regression also includes rolling-window country fixed effects (α_{iT}), which control for quarterly country-specific macroeconomic changes, including monetary and fiscal policy announcements and changes in aggregate demand.

The cumulative contributions reported in Graph 4 (right-hand panel) are backed out using both the evolution of the cost-push factors in the US and the estimates of how market-based inflation expectations on average reacted to such changes (the β_{kT}). The contribution of each factor is cumulated over time starting in Q2 2018 and is, by construction, equal to zero in Q2 2018.