

Global Economic Outlook

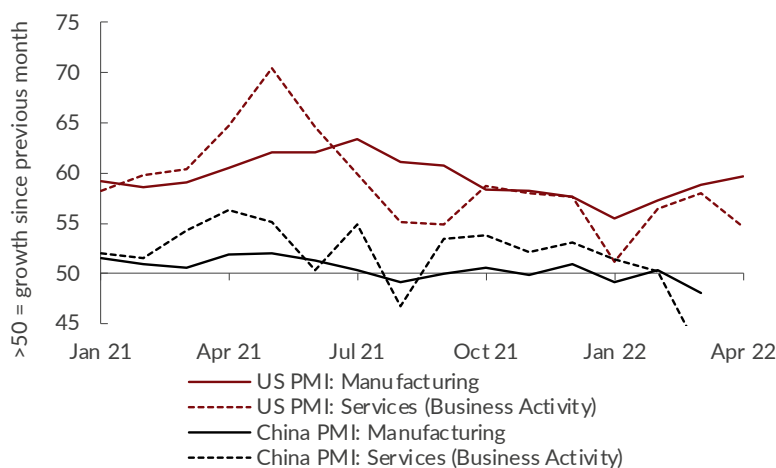
By Corrado Macchiarelli and Barry Naisbitt with Janine Boshoff, Ian Hurst, Iana Liadze, Xuxin Mao, and Patricia Sanchez Juanino¹

Context

Before the start of the war in Ukraine, monthly global economic activity indicators for the manufacturing and service sectors had continued to show expansion, although there were signs of slowing manufacturing growth and negative effects on activity due to Covid-19 outbreaks, especially in China. The global composite PMI index edged down to 52.7 in March, but still signalled growth, as the index has now done for almost two years. The decline in the index for manufacturing in the month was more pronounced than that for services and export business noted the fastest decline in the index since July 2020. In China, the increase in Covid-19 cases and renewed lockdowns contributed to a sharp drop in the services PMI in March, which fell from 50.2 to 40, the steepest fall since the start of the pandemic. The manufacturing PMI also fell, but not as sharply, from 50.4 to 48.1. The pandemic has created difficulties in shipping items but falling export orders and market uncertainties over the war in Ukraine were also cited as factors worsening business conditions. The wider ASEAN manufacturing PMI reached a 6-month low in March, although the reading is still consistent with robust growth in the first quarter.

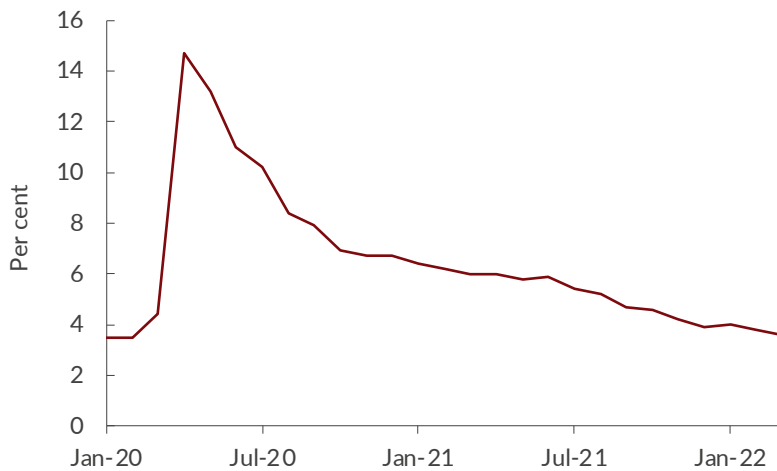
Several economic activity indicators have continued to strengthen in the US in recent months. In March the manufacturing PMI accelerated to 58.8, its strongest reading in seven months, with supply disruptions reported to be easing. The services PMI also increased, to 58.0, marking a recovery from the Omicron-induced slowing earlier this year (figure 3). With the unemployment rate having fallen to 3.6 per cent in March, the lowest since February 2020, and non-farm payroll employment increasing by a monthly average of 550,000 in the first quarter, the US labour market has tightened further (figure 4).

Figure 3 Recent trends in global PMIs (index)



Source: Refinitiv Datastream, J.P.Morgan, IHS Markit

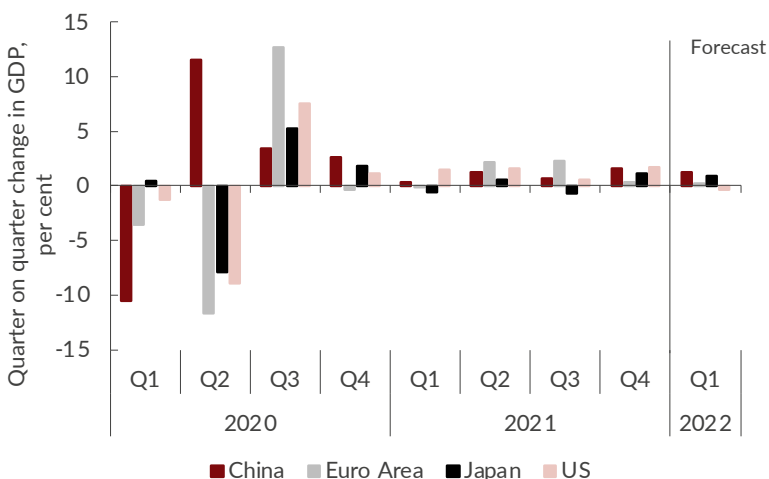
¹ We would like to thank Jagjit Chadha and Stephen Millard for helpful comments and Patricia Sanchez Juanino and Joanna Nowinska for preparing the charts and the database underlying the forecast. The forecast was completed on 20 April 2022. Exchange rate, interest rate and equity price assumptions are based on information available to 14 April 2022. Unless otherwise specified, the source of all data reported in tables and figures is the NiGEM database and NIESR forecast baseline. All questions and comments related to the forecast and its underlying assumptions should be addressed to Iana Liadze (enquiries@niesr.ac.uk).

Figure 4 US unemployment rate (per cent)

Source: St Louis Federal Reserve database (FRED)

Despite the strong US economic and labour market indicators, consumer confidence has fallen since mid-2021. While confidence about households' present situation edged up in March (from 105.7 to 107.2), expectations about their future situation fell to their lowest since 2014. The combination of high and rising inflation and the prospect of further increases in policy interest rates will have dampened future confidence.²

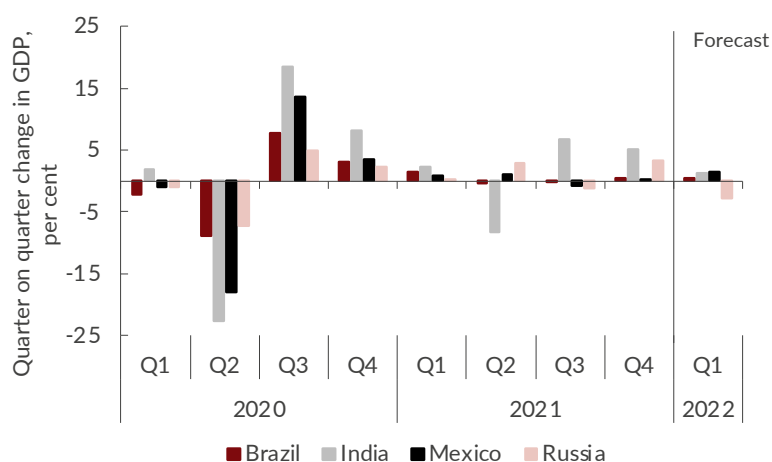
The Euro Area composite PMI declined slightly in March but remained positive, at 54.9. However, within the composite total index, the manufacturing PMI index fell to a 14-month low. Germany, Italy and Spain all reported falls in the index of activity, with the German index at an 18-month low. Part of the decline was reported to be due to an intensification of supply-chain pressures following rising Covid-19 infections in China and longer lead times due to the war in Ukraine. The IHS Markit Eurozone Services PMI was broadly unchanged at 55.6 in March, marking strong growth in the first quarter of the year.

Figure 5 Quarterly changes in GDP since 2019Q4 – major economies (per cent)

Source: NiGEM database and NIESR forecast

There remains considerable heterogeneity across countries, particularly between advanced and emerging economies (figures 5 and 6). The Russia-Ukraine conflict is providing a further strain on economic activity in advanced economies in particular. While there are common features such as supply-chain difficulties that have held back performance, the continued presence of Covid-19, new outbreaks of Covid-19 and measures to restrict its spread have also affected economic activity, particularly in those countries whose vaccine coverage is still lagging.

2 See The Conference Board Consumer Confidence Survey® <https://www.conference-board.org/data/consumerconfidence.cfm>.

Figure 6 Quarterly changes in GDP since 2019Q4 – emerging market economies (per cent)

Source: NiGEM database and NIESR forecast

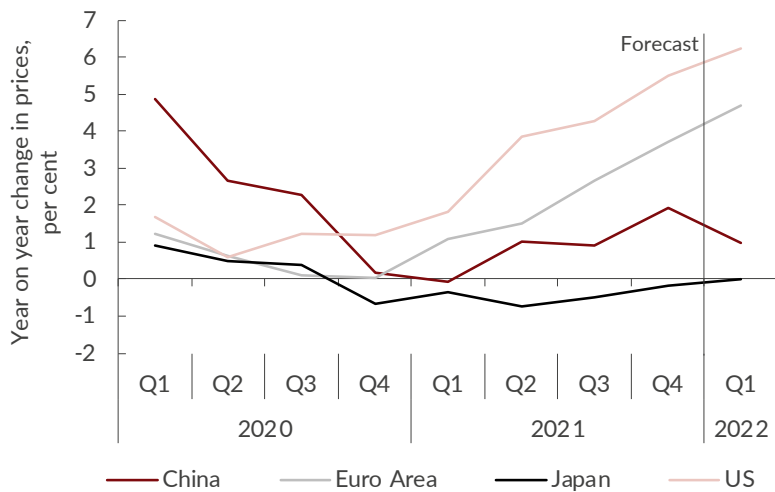
The speed of recovery in demand in advanced economies has contributed to rising inflation, particularly in the US.

The pace of increase in inflation in some advanced economies has been very strong and has led to wider monetary policy challenges. In the US, UK and Euro Area consumer price inflation in early 2022 has continued to increase ahead of forecasts and has reached multi-decade highs, with annual CPI inflation reaching 8.5 per cent in the US, 7.0 per cent in the UK and 7.4 per cent (HICP) in the Euro Area in March (figure 7). Higher prices are squeezing consumers' spending power, leading to slower demand growth.

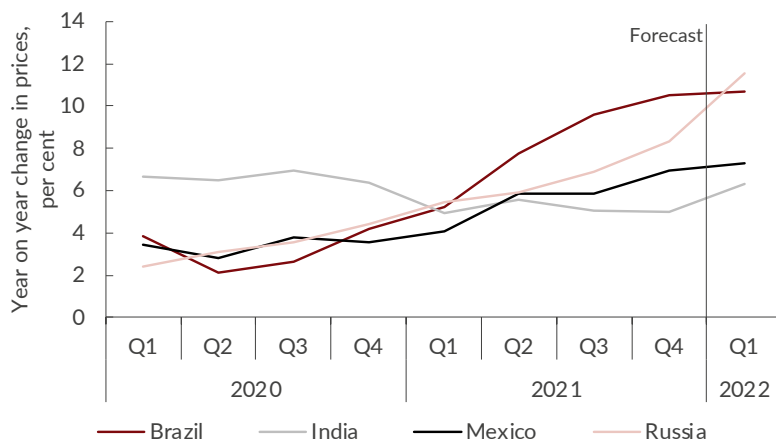
The general expectation before the war in Ukraine was that the peak in annual inflation in advanced economies would likely be in the first half of this year and that inflation would ease into 2023. The sharp increases in oil, gas, wheat and other commodity prices following the start of the war now threaten to keep inflation rising longer and exert a greater strain on consumers. In addition, the recent Covid-19 experience in China threatens to prolong the period of supply-chain disruption (see also "Box A: China's slowdown is structural"). If the spikes in commodity prices stabilise and supply disruptions ease, annual inflation should ease in 2023. The extent to which inflation will come down will partly depend on the CPI basket composition and how much of the observed inflationary pressure will affect its 'stickier' components such as housing (especially in the US, see Mortimer-Lee, 2022).

Higher inflation also threatens the prospect of increased inflation expectations becoming embedded and foretells of more substantial wage increases. Against this background, central banks are shifting towards a "normalization" of monetary policies. For example, in September 2021 the US Federal Reserve (the Fed) median projection for policy rates in 2023 was 1.0 per cent. Following the March 2022 meeting, that projection had been raised to 2.8 per cent and the Fed raised policy rates in March and signalled the reduction of its asset holdings. The Bank of Canada has also raised policy rates, by 50 basis points in April.

Higher inflation and tighter monetary policy are not just advanced economy themes (figures 7 and 8). Central banks in Brazil, South Korea, Mexico and South Africa have already increased policy interest rates this year and the commodity price pressures from the start of the war in Ukraine are likely to intensify inflationary pressure in these and other emerging economies.

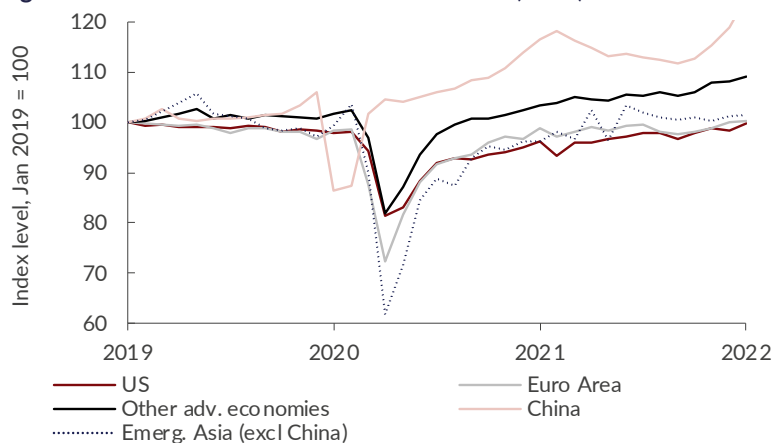
Figure 7 Annual inflation since 2019Q4 – major economies (per cent)

Source: NiGEM database and NIESR forecast

Figure 8 Annual inflation since 2019Q4 – emerging market economies (per cent)

Source: NiGEM database and NIESR forecast

Supply-chain disruptions contributed to world trade growth slowing through the first half of last year. We estimate that world trade grew by 8.7 per cent in 2021 following the 8.4 per cent fall in 2020. The most recent data shows the expansion in goods trade steadying except in China (figure 9) and continued restrictions on international travel and low vaccination rates in some countries have contributed to the incomplete recovery in services trade. China's expansion in trade since the beginning of the year is expected to continue as a result of the EU-US trade restrictions against Russia (see NiGEM Topical Feature).

Figure 9 Recent trends in international trade (index)

Source: Netherlands Bureau for Economic Policy Analysis (CPB), World Trade Monitor.

Benchmark forecast and risks

Assumptions

Our forecast assumes that the economic disruption from the war in Ukraine in terms of high and more volatile commodity prices continues at least through this year. Even if an early resolution to the war were possible, the reduction of oil and gas purchases from Russia and other adverse economic effects would continue to affect global economic activity into early 2023 (see NiGEM Topical Feature).

As the recent spike in Covid-19 infections and subsequent lockdown in China show, the progress of the Covid-19 pandemic remains a crucial issue for the global economic outlook. Our central assumption is that more widespread vaccinations mean that Covid-19 comes under control gradually. Not all countries have high vaccine protection, even though more than 11.5 billion doses of vaccine have been administered worldwide, according to data collected by Bloomberg.³ The Omicron variant continues to represent a significant economic and public health risk particularly in low and lower-middle income countries. Our forecast assumes, in effect, that Covid-19 variants reduce in severity and in the extent of the economic disruption that they cause. Nevertheless, the relative lack of vaccine doses in lower income economies is still a problem that needs addressing to enable reduced transmission of Covid-19 globally.

Our monetary policy assumptions are largely based on market-implied interest rates and show a steeper upward path for policy interest rates in the US than in our Winter 2022 forecast three months ago. Recently reported rates of price inflation in major advanced economies have been higher than anticipated and have resulted in financial markets factoring in higher policy interest rates in major advanced economies over the next two years. While markets still view the increase in inflation as likely to be temporary, we now expect inflation to rise higher than previously expected and take longer to fall back to 'normal' rates.

On fiscal policy, our forecast is based on current published fiscal plans. President Biden's 'Build Back Better' proposal – which is subject to ongoing discussion – is not included in the fiscal measures. The European Union's Next Generation EU programme is not included in the baseline scenario; countries that have already received funds are expected to benefit from grants (and loans) mainly through additional longer-term productive potential (Giacca and Macchiarelli, 2021; Liadze and Macchiarelli, 2021).

Exchange rates have been volatile in the period since the war started, with the US dollar appreciating against most other major currencies. We assume that exchange rates follow the uncovered-interest parity condition, based on interest rate differentials, over the medium term. We also assume that corporate bond spreads gradually converge towards their long-term averages.

3 See the Bloomberg Covid vaccine tracker www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/ accessed 21 April 2022.

The increase in oil prices this year (with Brent crude at \$102 pb on 20 April compared with \$87 pb three months earlier) gives a higher price level over our forecast period, with oil prices in 2023 some 21 per cent higher than in our Winter forecast. We follow the US Energy Information Administration (EIA) assumptions, which imply that the pressure coming from oil prices will only fade gradually and prices are projected to be around \$89 pb in the medium term, around 28 per cent higher than in our Winter forecast. Higher commodity prices in general are an assumption in this forecast. Full details of the assumptions are in Appendix A.

Economic activity

At the same time as demand rebounded following the Covid-19 recession, higher oil and commodity prices combined with supply-chain bottlenecks led to rising inflation. Higher inflation is now squeezing consumers' real spending power and adding downward pressure on demand growth.

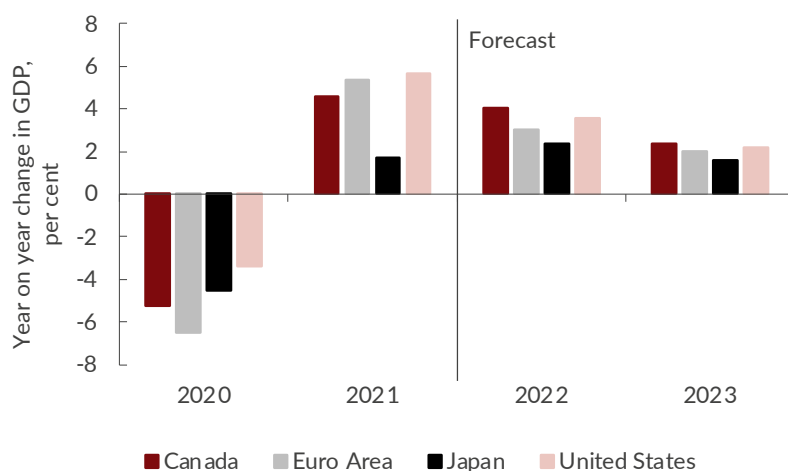
The initial economic impacts of the war in Ukraine have added substantially to these upward inflation pressures and the reduction in real incomes (see Liadze et al, 2022a and the NiGEM Topical Feature). With the recent lockdowns in China adding to shipping delays, this combination of factors has worsened the short-term outlook for economic activity. While the war and sanctions will directly reduce GDP growth in Russia and Ukraine, the adverse economic effects from the war will be widespread, particularly in Europe for countries that are heavily dependent on oil and gas imports from Russia, such as Germany and Italy.

In the past three months the monetary authorities in the US, Canada and the UK have responded to higher inflation by raising policy interest rates. While we still expect some of the inflation due to supply bottlenecks to be temporary, inflation has continued to exceed forecasts and the latest supply shock from the Russia-Ukraine war threatens to solidify the higher inflation. The tighter monetary policy adds a further downward ratchet to GDP growth prospects at a time when, with the pace of the rebound in activity after the Covid-19 recession in 2020 having eased, we were forecasting slower global GDP growth in 2022 than in 2021, with the pace of consumer spending growth slowing and some rebalancing away from goods purchases in favour of services.

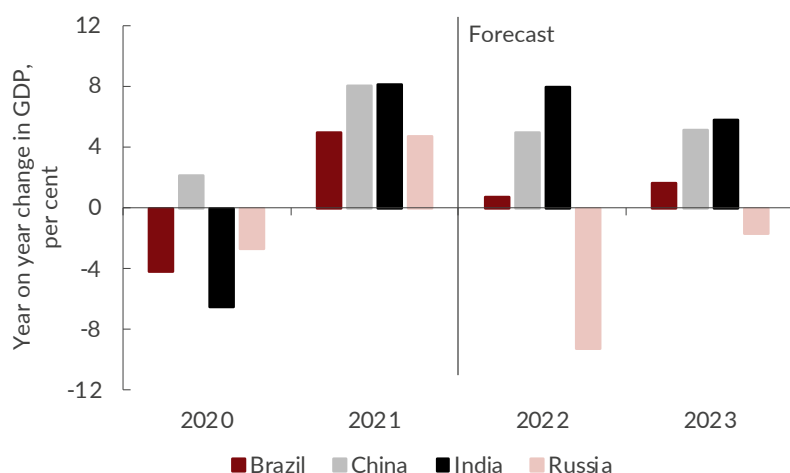
We have revised down our 2022 and 2023 growth forecasts for advanced economies, with the US now projected to grow by 3.5 per cent in 2022, down from 3.6 per cent in our Winter forecast, and 2.2 per cent in 2023 (figure 10). Since the pandemic, the United States has had the strongest overall GDP performance among the G7 countries.

We expect the adverse effects of war in Ukraine to be more significant in the Euro Area and have revised down our forecast for growth in 2022 to 3.0 per cent (from 3.8 per cent) and 2.0 per cent in 2023 (from 2.5 per cent). If Germany and Italy take stronger steps to cut gas imports from Russia, the result would likely be even slower growth (see "Box B: War in Ukraine and the options for Europe's energy supply"). The ECB stands out from the Fed in terms of being expected to take less policy action.

Figure 10 GDP growth in advanced economies (per cent)



Source: NiGEM database and NIESR forecast

Figure 11 GDP growth in emerging economies (per cent)

Source: NiGEM database and NIESR forecast

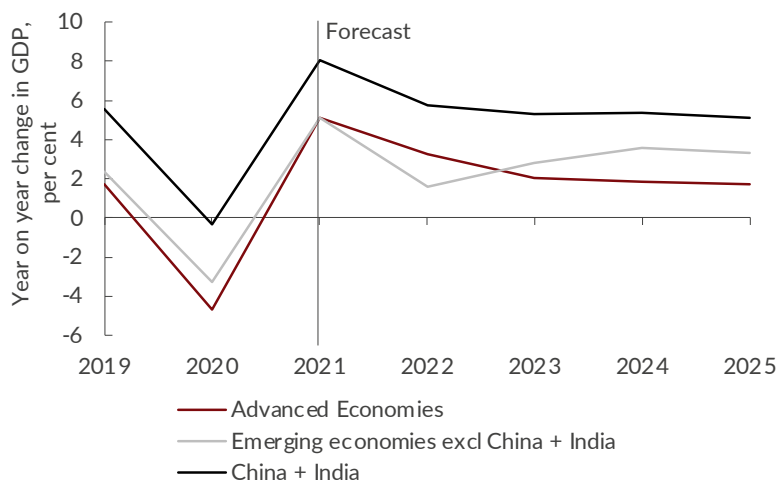
We forecast GDP growth of 2.4 per cent this year in Japan after 1.7 per cent last year, as shown in figure 10. Inflationary pressure has not picked up since last summer as much as in other G7 economies but high input costs, shortages of raw materials, and shipping delays have restrained goods production.

Emerging market economies resumed growth last year, with stronger manufacturing trade and increasing commodity demand. Although many emerging market economies are not likely to reach pre-pandemic GDP levels until late 2022, the two largest economies, China and India, have already regained their pre-pandemic GDP levels.

There are significant differences in GDP growth projections across the major emerging economies. India, Indonesia and Vietnam are forecast to have the strongest GDP growth this year; China continues to be affected by Covid-19 and could see growth just below 5 per cent this year, although strong performance in exports has sustained the recovery so far. Chinese economic growth continues to be restrained by persistent production and consumption disruptions caused by Covid-19 outbreaks, as well as the property market downturn. Consistent with slowing growth, monetary policy has eased a little and government spending on social security and infrastructure development is poised to expand in 2022.

India is still on track to achieve the fastest growth in 2022 (8 per cent), with a strong manufacturing and service performance. There remain concerns of another Covid-19 surge, as has occurred in other countries. We project growth of 5.8 per cent in 2023, similar to our Winter forecast (5.7 per cent) as the post-pandemic pace subsides (figure 11).

Higher inflation has already affected Brazil and growth is forecast to slow to 0.7 per cent this year. The largest forecast revision is to GDP growth in Russia where, despite the high prices received for oil and gas exports, the war is forecast to lead to recession. There is great uncertainty about how deep this could be, but we have forecast a 9.3 per cent fall in GDP this year and a further, smaller fall in 2023 (figure 11). Full details of the forecast are shown in table 2 and Appendix B.

Figure 12 GDP growth in emerging and advanced economies (per cent)

Source: NiGEM database and NIESR forecast.

We expect the split in economic growth performance, seen over the past two decades, between China and India and the other emerging economies to continue in the short and medium term (figure 12). Over the medium term (2024-28), we forecast Chinese GDP to grow at an annual average pace of 4.7 per cent and Indian GDP 5.2 per cent. We expect greater volatility within other emerging economies and a lower average growth medium-term rate at 3.2 per cent. Other emerging economies are likely to see similar GDP growth to advanced economies in the short term, with recessions in Russia and Ukraine affecting the aggregate figures.

The weaker global GDP growth in this forecast is reflected in slower world trade growth. We have revised down our forecast for world trade growth in 2022 from 6.2 per cent to 3.7 per cent and for 2023 from 6 per cent to 3.6 per cent. These revisions reflect the wider economic impacts of the war in Ukraine, continued supply chain disruptions, and reactions to heightened inflationary pressures. On the positive side, international travel restrictions are starting to be relaxed, especially in Europe, and this will help to boost service sector activity and trade. Many face-to-face service activities have resumed, supporting sectors that have been badly affected (Naisbitt and Whyte, 2020; 2021; Macchiarelli, 2021).

Our assumption is that the disruptive effects of Covid-19 on the global economy and the adverse economic effects of the war in Ukraine diminish as time passes. As a result, the global economy is forecast to return to a steady growth path in the medium term, with average annual growth of just over 3 per cent and inflation stabilising at rates similar to those experienced before the pandemic. We forecast that the average annual GDP growth rate of China and India combined (which accounts for around 25 per cent of global GDP on a PPP basis) will be around 2 – 3 percentage points lower in the medium term than in the previous decade.

Advanced economies, which comprise around 42 per cent of global GDP on a PPP basis, are forecast to show only a slight slowing in their aggregate growth rates of the past two decades. Annual GDP growth is forecast to average around 1.7 per cent a year over 2024-28. Output growth for other emerging economies (which account for around one third of global GDP) is expected to continue to be faster than for advanced economies. However, the gap in the growth rates has become smaller over the past two decades and we expect it to continue to be narrow.

	percentage change												
	Real GDP ^a												
	World	OECD	China	India	BRICS+	Euro Area	USA	Japan	Germany	France	Italy	UK	World Trade ^b
2020	-3.1	-4.7	2.2	-6.5	-1.3	-6.5	-3.4	-4.5	-4.9	-8.0	-9.1	-9.3	-8.4
2021	5.8	5.5	8.1	8.1	7.3	5.4	5.7	1.7	2.9	7.0	6.6	7.4	8.7
2022	3.3	3.3	4.9	8.0	3.9	3.0	3.5	2.4	2.3	3.4	3.0	3.5	3.7
2023	3.2	2.2	5.1	5.8	4.3	2.0	2.2	1.6	2.0	1.8	1.8	0.8	3.6
2024-2028	3.1	1.7	4.7	5.2	4.4	1.6	1.6	0.8	1.5	1.7	1.3	1.4	4.4

	Private consumption deflator									Interest rates ^c			Oil (\$per barrel) ^d
	OECD	Euro Area	USA	Japan	Germany	France	Italy	UK	India	USA	Japan	Euro Area	
2020	1.7	0.5	1.2	0.3	0.7	0.6	-0.2	1.1	6.6	0.5	-0.1	0.0	43.0
2021	3.8	2.2	3.9	-0.4	3.0	1.7	1.6	2.4	5.1	0.3	-0.1	0.0	69.9
2022	8.2	5.3	5.3	1.2	5.7	3.6	4.3	7.3	5.9	1.1	-0.1	0.0	80.8
2023	4.4	2.6	3.3	1.2	2.6	2.3	2.5	4.7	5.1	2.5	-0.1	0.6	84.0
2024-2028	2.4	1.9	2.2	1.0	1.8	1.9	1.8	1.9	4.2	2.8	0.3	1.6	88.9

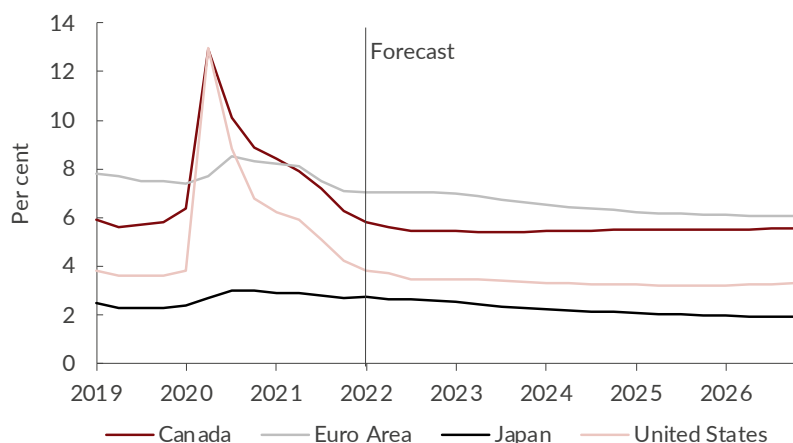
Notes: BRICS+ includes Brazil, China, Russia, India, Indonesia, Mexico, South Africa, Turkey. ^a GDP growth at market prices. Regional aggregates are based on PPP shares. 2017 reference year. ^b Trade in goods and services. ^c Central bank intervention rate, period average per cent. ^d Average of Dubai and Brent spot prices.

Source: NiGEM database and NIESR forecast.

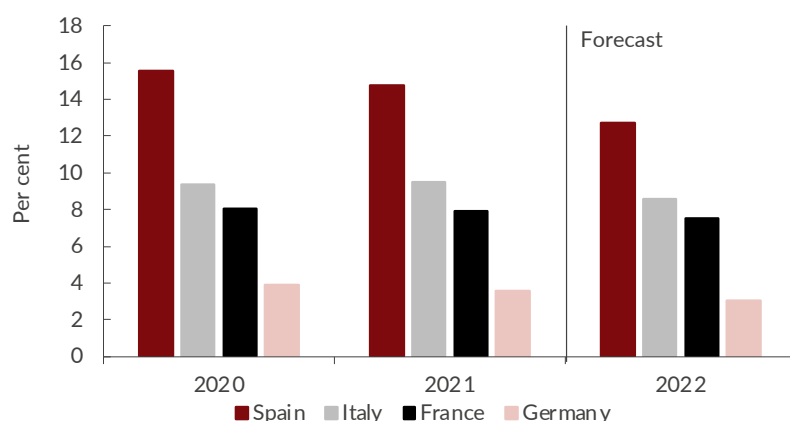
Unemployment

With the initial downward shock from Covid-19 having passed and economic activity rebounding, unemployment rates have fallen in advanced economies. In the US the unemployment rate in March at 3.6 per cent is the lowest since February 2020. Although the unemployment rate has fallen, the US labour market remains affected by the pandemic with a lower participation rate (at 62.4 per cent compared to 63.4 per cent in February 2020) and shifts in demand between sectors leading to labour shortages. The 6.4 million jobs generated in 2021 was the largest annual amount ever recorded but, despite this, the number of existing employees was still 1.6 million lower in March than it was in February 2020, before the pandemic struck.

Figure 13 Unemployment rates (per cent)



Source: NiGEM database and NIESR forecast

Figure 14 Unemployment rates (per cent)

Source: NIGEM database and NIESR forecast

Unemployment rates in the Euro Area, Japan and the UK have now fallen to similar levels to those before the pandemic hit. With slower economic growth now projected, we forecast that unemployment rates will flatten (figure 13). This slowing of growth comes at a time when there is already considerable heterogeneity in Euro Area labour markets (figure 14): Spain (12.6 percent) and Italy (8.5 percent) had the highest unemployment rates among the largest Euro Area economies in February, with those rates higher than before the pandemic. Germany (3.1 percent), followed by the Netherlands (3.4 percent), recorded the lowest levels. The reduction in Euro Area growth prospects due to the war and higher inflation suggests that Euro Area labour markets are likely to remain subdued in comparison to pre-pandemic levels.

For now, reduced labour market participation in advanced economies remains a concern, as that could further boost wages in, especially, service sectors. The scarring effect from the pandemic or new virus variants could delay the time at which some people feel comfortable returning to work and cause worker shortages to continue for longer.

Inflation

Annual OECD inflation is now forecast to rise from 1.7 per cent in 2020 to 8.2 per cent this year. Before the war in Ukraine, we had forecast 5.2 per cent inflation this year. We continue to forecast that inflation will be lower in 2023, but at 4.4 per cent will remain high by the standards of the past decade. The combination of the sharp slowdown in growth, the topping out of peaks in oil and gas prices, and relatively well-anchored medium-term inflation expectations will contribute to inflation eventually falling.

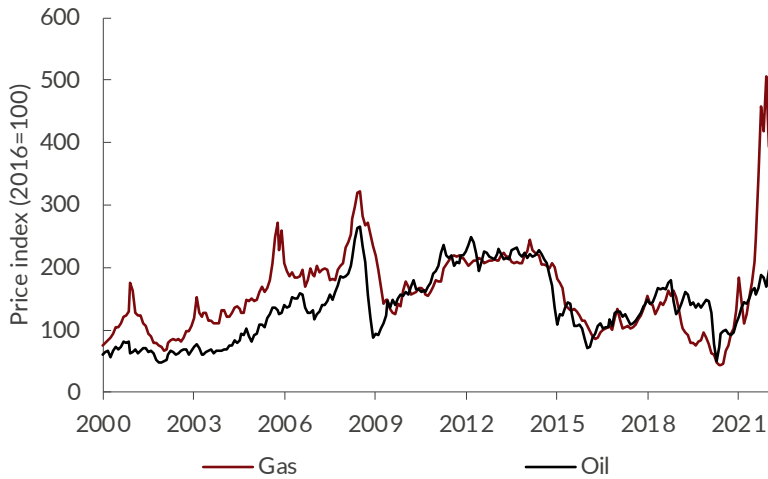
The combination of aggressive fiscal and monetary loosening in response to the challenges posed by the Covid-19 pandemic contributed to a rapid rebound in demand at a time when supply chain disruptions caused by Covid-19 restrictions have limited the supply response. Commodity price inflation has increased as demand has risen. Monetary authorities, in advanced economies especially, have tried to look through what was initially seen as a temporary increase in inflation. As vaccines became more widely available and supply-chain problems were resolved, it was expected that inflation would slow.

The increase in inflation has been stronger and more prolonged than anticipated a year ago. The higher commodity prices caused by the war have added to the urgency to tackle inflation (figure 15). Our central view remains that while prices will keep rising, the pace of such increases will ease. Tighter monetary policy will assist in this process with central banks having begun to increase policy interest rates and halt asset purchases.

A key determinant of inflation expectations and future inflation will be what happens in labour markets. Labour markets have tightened over the past year in advanced economies as economic activity has expanded but employment levels remain below pre-pandemic levels, indicating potential scope for further growth. But some sectors and occupations are seeing labour shortages. If labour supply does not recover fully, this could point to upside risks to inflation, especially if international restrictions on labour mobility develop further. Such effects could

be particularly acute for small firms and industries, especially in service sectors, that rely on seasonal and cross-border employees. Higher inflation raises the possibility of a wage-price spiral as in the 1970s, with companies trying to pass on labour cost increases to consumers to avoid an erosion of profit margins. While significantly higher wage inflation is possible, the slowing in economic growth is likely to play a role in moderating wage inflation.

Figure 15 Crude oil and natural gas prices (index)

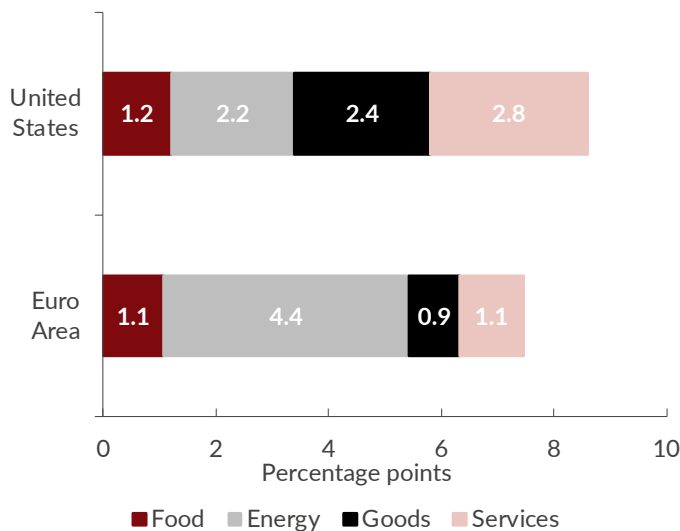


Source: IMF commodity price database

In February, the US annual PCE inflation rate rose further to 6.4 per cent, with energy prices up 25.7 per cent and food prices up 8 per cent, and core PCE inflation at 5.4 per cent was the highest since 1983. While these inflationary pressures will persist, slower growth and higher policy rates are expected to contribute to slower, but still perhaps uncomfortably above target, inflation in 2023 (Mortimer-Lee, 2022 and Sanchez-Juanino et al., 2021). We forecast consumer expenditure deflator inflation to average 5.3 per cent this year and 3.3 per cent in 2023 (figure 17).

In the Euro Area, annual HICP inflation was 7.4 per cent in March, up from 1.3 per cent a year earlier. The Euro Area is more exposed to higher oil and gas prices from Russia than the US and we forecast that inflation in the Euro Area will average 6.7 per cent this year but fall back to 2.6 per cent next year as activity slows.

Figure 16 Contribution to annual inflation rate, March 2022 (percentage points)

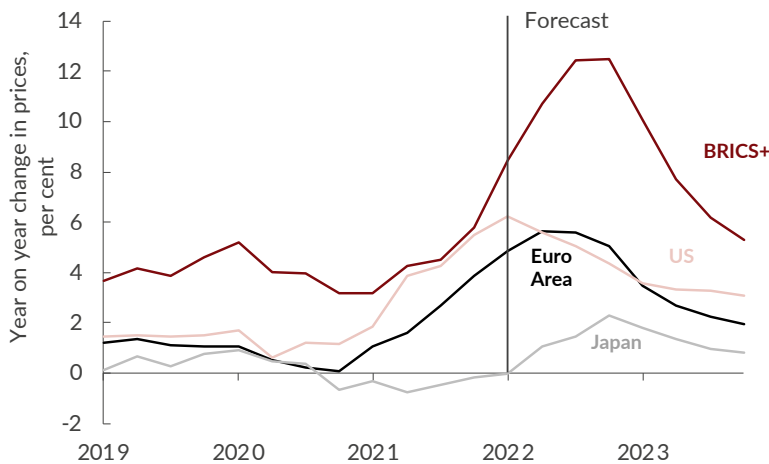


Source: Eurostat; BLS

The response of central banks will be determined by how much inflation is driven by demand versus supply factors. Figure 16 suggests that while in the US aggregate inflation is being driven by inflation across all sectors, inflation in the Euro Area is mainly the result of the escalation of energy prices, given Europe’s high energy dependency on Russia.

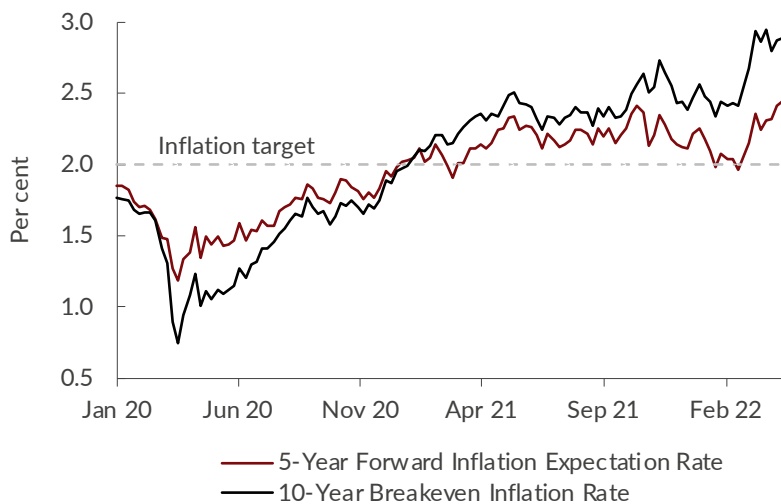
If inflation persists at higher levels, fighting inflation might come at the expense of hurting the growth of the global economy. This is the line that central banks will need to walk. The end of the Fed’s ultra-accommodative monetary policy will lead some currencies to experience a depreciation against a stronger US dollar, potentially causing other central banks to raise their interest rates to limit any adverse effects from foreign exchange market movements and inflation. We have explored this issue in a previous Topical Feature using our NiGEM model, with a particular focus on the Euro Area and Emerging Market Economies (see Liadze et al., 2022b).

Figure 17 Inflation in advanced and emerging economies (per cent)



Source: NiGEM database and NIESR forecast.

Figure 18 US inflation expectations (per cent)



Source: FRED, St. Louis Federal Reserve.

The inflation picture is complex in emerging market economies. Some countries, such as China, South Africa and Indonesia, are seeing inflation running below pre-pandemic rates. Others, such as Brazil and Russia, are seeing rapid increases in inflation but for country-specific reasons. The widespread depreciations of emerging market currencies against the US dollar have added to inflationary pressures.

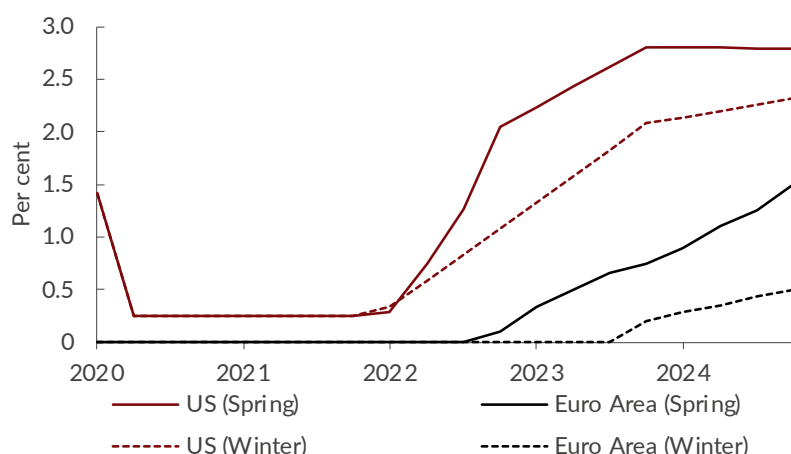
Global inflation risks remain on the upside in the near term, especially if commodity prices continue to rise and supply bottlenecks take a long time to resolve. Even if there are no further cost increases, the impact of past rises in shipping and transportation costs and commodity prices is already significant across the G20 countries. The more positive early indicators (such as the Baltic Dry Index) that fell in late 2021, have again come under pressure from the effects of Covid-19 and war. Our expectation remains that the higher rates of inflation will most likely be temporary rather than permanent, although the more inflation rises in the near-term the greater the risk that higher inflation rates start to form part of general expectations (figure 18).

We project that the current increase in inflation will subside in the medium term as supply chain issues from the pandemic are cleared, the short-term spikes in commodity prices ease, the effects of fiscal policy boosts wane and central banks raise policy interest rates. Average annual inflation in advanced economies is forecast to be around 2.5 per cent once the current inflation episode ends.

Economic policy

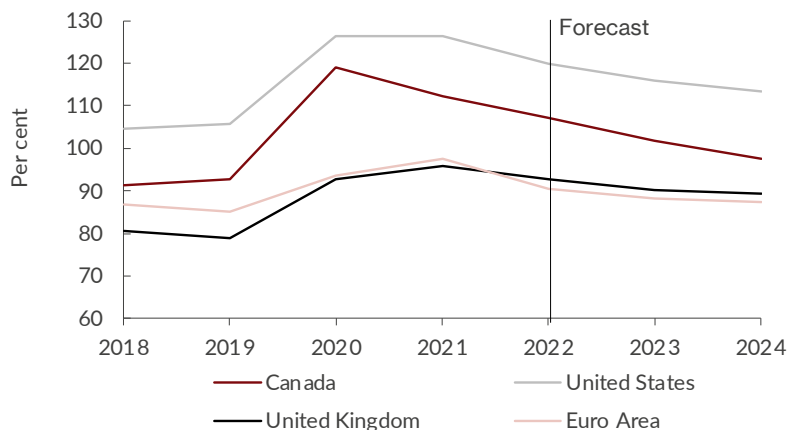
With the reduction in the severity of the most recent Covid-19 variant, governments have largely withdrawn the special fiscal policy support that helped in the acute phase of the virus. The legacy risks of that support in the form of elevated public debt to GDP ratios have led governments to begin taking actions to stabilise or reduce debt to GDP ratios.

Figure 19 Central bank policy rates in NIESR forecasts (per cent)



Source: NiGEM database and NIESR forecast

Figure 20 Public sector debt / GDP ratios (per cent)



Source: NiGEM database and NIESR forecast.

We forecast that government debt to GDP ratios in the G7 economies will decline gradually as emergency support measures implemented during Covid-19 are unwound and economies grow (figure 20). Even with gradual adjustment, the combination of rising policy interest rates (figure 19), higher longer-term market interest rates resulting from the tighter policies (table 3), increased geo-political uncertainty and scaled back central bank buying of bonds represents a challenge to government finances in the medium term.

Table 3 Recent directions in 10 year government bond yields (per cent)^a

	January 2020	December 2021	March 2022	Change since December 2021	2022 forecast (end-of-year)	2023 forecast (end-of-year)
USA	1.76	1.45	2.13	↑	2.7	2.8
Euro Area	0.16	0.11	0.79	↑	1.4	1.7
Japan	-0.02	0.05	0.20	↑	0.3	0.6
Canada	1.50	1.46	2.12	↑	2.7	2.8
UK	0.67	0.83	1.49	↑	2.0	2.7
China	3.05	2.78	2.82	↑	3.1	3.4
India	6.58	6.41	6.82	↑	6.5	5.7
Brazil	6.77	10.68	11.81	↑	16.8	15.0
Russia	6.22	8.48	12.71	↑	10.8	9.7
Australia	1.18	1.64	2.51	↑	2.5	2.2
Turkey	10.93	21.61	24.57	↑	21.9	18.6

Note: (a) Monthly average rates are shown. Forecast values refer to end of year rates.

Source: Central banks, DataStream and NiGEM, NIESR.

Emerging market economies with high external debt and expected low growth (e.g., Brazil and South Africa) will remain exposed to financial market stress, particularly should investor risk sentiment deteriorate because of increased inflationary pressure. High debt levels expose financial systems to a sharp rise in longer-term interest rates and country risk premia, which might be triggered by increased risk aversion, higher-than-expected inflation, and monetary tightening (Holland et al., 2021b).

Higher interest rates globally and the spillover effects on other economies from higher US interest rates (Haache and Laidze (2017), Liadze and Naisbitt (2018), Holland et al. (2021a, b)) will increase the costs of servicing public sector debt at a time when levels of public debt relative to GDP remain at historically high levels. Those advanced economies that are keen to reduce their public debt to GDP ratios may see this effect as restricting the scope for new fiscal spending, for example on increased defence measures in the light of the war in Ukraine.

However, some emerging market economies that have a greater dependence on shorter-term floating-rate debt, and where debt is foreign currency (most often US dollar) denominated, are likely to see larger adverse effects that might be supplemented by increased sovereign risk premia. Given the existing exposures, if inflation rises more strongly than forecast, leading to more rapid interest rate increases and higher interest rates, and currencies depreciate substantially against the US dollar accompanied by rising sovereign risk premiums, the tightening of financial conditions would mean that the possibility of sovereign debt crises cannot be ruled out, especially given the substantial increases in debt that have been accrued during the Covid-19 pandemic.

Persistent higher inflation will lead to rising market yields in the medium term, mainly driven by short-term interest rate expectations (see Macchiarelli, 2022). This might increase pressure on fiscal positions particularly for economies facing risks from a currency depreciation that leads to increased sovereign spreads and with limited ability to reduce expenditure or raise taxation. While the increase in inflation is projected by financial markets to be temporary (with inflation peaking in 2022), this view could change as higher inflation readings continue to occur this year and next year.

The sharp increase in inflation, which has risen further than expected six months ago, has led to a renewed focus on monetary policy tightening. The US Fed has halted asset purchases and begun what is expected to be a series of policy interest rate increases that will take short-term rates above 2 per cent next year. The combination of the effects of earlier fiscal boosts, the rapid turnaround in labour markets and the increases in energy and other commodity prices in the past year all create risks that inflation will increase further, and that wages and inflation

expectations could also rise substantially. The US economy is not alone amongst advanced economies in this predicament, and table 4 shows that policy interest rate increases have been widespread this year.

The March projections from the Fed raised market interest rate expectations and our forecast reflects this higher path for interest rates. We anticipate that higher rates will, together with external forces, return the rate of inflation in the US to target gradually. But inflation may endure longer than we expect (see Sanchez-Juanino et al., 2021). The Fed needs to walk the line between a more aggressive policy stance that could bring inflation down more quickly and a less aggressive stance, which would lower the risk of provoking a recession and sharp movements in longer-term asset markets such as those as seen at the time of the ‘taper tantrum’ in 2013.

Table 4 Recent directions in monetary policy interest rates (per cent)^{a,b}

	January 2020	December 2021	March ^b 2022	Change since December 2021	2022 forecast (end-of-year)	Change since Winter Outlook	2023 forecast (end-of-year)	Change since Winter Outlook
USA	1.75	0.25	0.50	↑	2.1	↑	2.8	↑
Euro Area	-0.50	-0.50	-0.50	-	0.1	↑	0.8	↑
Japan	-0.10	-0.10	-0.10	-	-0.1	-	-0.1	-
Canada	1.75	0.25	1.00	↑	1.9	↑	2.6	↑
UK	0.75	0.25	0.75	↑	2.0	↑	2.5	↑
China	4.15	3.85	3.70	↓	3.8	-	3.9	↑
India	5.15	4.00	4.00	-	4.0	-	4.0	↑
Brazil	4.50	9.25	11.75	↑	11.8	↑	10.5	↑
Russia	6.25	8.50	17.00	↑	17.0	↑	15.3	↑
Australia	0.75	0.10	0.10	-	0.5	↑	1.3	↑
Turkey	11.25	14.00	14.00	-	13.6	↑	11.4	↑

Note: (a) Monthly average rates are shown. Forecast values refer to end of year rates. (b) Canada and Russia data corresponds to April.

Source: Central banks, DataStream and NIGEM, NIESR.

Within the G7, the ECB remains the outlier for now. The ECB is still, in effect, looking through the price rises created by supply shocks and geo-political pressures, in part because the recovery in the Euro Area economy has lagged that in the US. With interest rates and the pace of asset purchases remaining accommodative, the main challenge for the ECB will be to ensure that inflation expectations and domestic wage pressures do not increase substantially and threaten higher medium-term inflation.

Rising inflation in several major emerging market economies (e.g. Brazil and Mexico) has led to their central banks tightening monetary policy (see table 4). Some countries have also faced capital outflows and currency depreciations, which have also prompted policy tightening. Many will have to walk the line between domestic demand weakness and near-term inflationary pressure especially with spillover effects on financial markets from Fed tightening (Danninger et al., 2022). The risk of de-anchoring inflation expectations is also an important factor in the policy mix.

Emerging economies face considerable challenges from central bank interest rate tightening and from a retreat from exceptionally large asset purchases in the major advanced economies. Many emerging economy governments will need to be cautious about withdrawing fiscal support too soon while still keeping a close watch on medium-term debt sustainability. The heavy reliance of many emerging economies on foreign capital makes their public finances more vulnerable to rising foreign interest rates and exchange rate depreciation. At the same time, weaker exchange rates may help support export activity but at the cost of boosting already high inflation.

Higher interest rates at a time of substantial increases in government indebtedness will add to concerns over the sustainability of such debt, especially creating vulnerabilities for countries that are already subject to high-risk premia on interest rates, such as Argentina, Brazil, Turkey, Indonesia and Russia or countries with a large share of debt at short maturity (see OECD, 2021). We have previously shown that financial spillovers could impact these countries through lower output and trade growth and a slower pace of global GDP growth. We estimate that the

effect of these negative spillovers on emerging economies' GDP varies between 0.2 percentage points in India, to 1 percentage point in Brazil and 2.4 percentage points in Argentina (Holland et al., 2021b).

Risk analysis

The slowdown of world and Euro Area GDP growth in the light of the Russia-Ukraine conflict raises the risk that we may see a much more protracted weakening of global activity, particularly as some Euro Area economies such as Germany and Italy remain heavily exposed to Russian energy exports, while others still present structural deficiencies. Our view, underpinning the central forecast, is that the Russia-Ukraine conflict will represent a drag on growth at least until 2023. A further escalation of international tensions and the possibility that the effect of higher fuel and food price rises might have a larger impact on emerging markets are among the key downside risks to our main case forecast.

Alongside the official measures showing slower activity growth, some measures of business sentiment have dipped in April, possibly reflecting an increased sense of nervousness about some of the tail risks materialising. While it is impossible to attach individual probabilities to these events, we have looked at the distribution of historical residuals to construct confidence bands around our main case scenario for GDP growth and inflation in Figure 1 and Figure 2. In both cases, the fan chart is intended to represent the uncertainty around the central forecast shown by the central line. There is a 10 per cent chance that GDP growth (or inflation) in any particular year will lie in any given shaded segment in the chart. There is a 20 per cent chance that GDP growth (or inflation) will lie outside the shaded area of the fan.

In the Euro Area, recent survey data for Germany confirm a sharp fall in expected business conditions. While part of this is likely to be related to specific materials shortages created by the war in Ukraine, it possibly also represents businesses' views of the possibility of an embargo on Russian energy and the effects that such an embargo would have on economic activity in the Euro Area's largest economy. This is part of the tail risks to our central forecasts.

Research by Bachmann et al. (2022) and the Bundesbank (2022) has pointed to the contractionary effects on the German economy that such an embargo would have: between 3 per cent and 5 per cent of GDP (see also NiGEM Topical Feature). There is the obvious coordination problem among EU member states and the picture gets more complicated when one considers the complexities of various EU economies, as well as the technical and geopolitical questions surrounding the issue of replacing Russian energy exports.

While risks to the major economies – specifically, China, the Euro Area and the US – in light of the conflict tend to dominate the debate, risks could materialise for emerging economies as well. Findings from an extension of our NiGEM Topical Feature suggest that a worldwide increase in uncertainty as a result of the war could reduce full-year global growth by a further 0.2 percentage points. This might happen if rising fuel and food prices have a larger global impact, with emerging markets more affected, or in the case of further escalation of international tensions.

The potential downside risks to global economic prospects are thus linked to the Russia-Ukraine conflict while inflation was already rising after the pandemic. The squeeze in real incomes, feeding into lower aggregate demand, remains conditional on developments in inflation expectations, the extent to which higher inflation expectations become entrenched and how monetary policy reacts. At the same time, with real income being squeezed and consumer confidence dipping again, any downside shock that leads to higher unemployment may reveal further economic vulnerability, with central banks already walking a delicate line between fighting inflation and avoiding a further recession.

There remain long-term and structural issues as well, including China's slowdown (Box A) and the need for Europe's transition away from dependence on Russian energy supply (Box B). Globally, the unevenness of vaccine distribution and the possibility of further virus flare ups continue to cloud the horizon, particularly for low and lower middle income countries. The build-up of debt – in both public and private sectors – against the backdrop of rising interest rates, as discussed in the previous sections, could create a potential vulnerability and, after such a long period of ultra-low interest rates, borrowers and lenders may have grown so accustomed to low debt service costs that even gradual and limited increases in interest rates could have more substantial negative effects on confidence and spending than usually anticipated.

At a time when growth has slowed, there are still possible upside risks to global economic activity, particularly through accelerating digital transformation (i.e., with companies increasing their use of digital technology and work from home policies implemented during the pandemic) and short-term productivity improvements. This interaction could boost consumers' and firms' confidence and labour force participation, causing potential output to increase. Relatively strong activity could also return if the further uncertainty that has resulted from the Russia-Ukraine conflict ends, although this appears a rather remote possibility at the moment.

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Box A: China's slowdown is structural

By Saul Eslake¹

Background

China has directly contributed one quarter of the growth in global GDP (as measured by the IMF at purchasing power parities) thus far during the 21st century. But its trend growth rate has unambiguously slowed over this period, from an average of over 10 per cent per annum during the first decade to an average of just under 6½ per cent per annum over the past decade. And it seems set to slow further over the coming decade. This is likely to have important consequences for the growth trajectory of the world economy mainly as a matter of arithmetic, rather than economic theory.

The growth rate of a country's real GDP can be entirely explained by the growth rate of its population, the change in the proportion of the population who are employed, the change in the average number of hours worked by those who are employed, and the output of goods and services per hour worked by those who are employed. China's rapid growth between 1979 and 2010 (some 10 per cent per year, on average) was – as depicted in Figures A1 and A2 – the result of:

- Fairly rapid growth in its population, averaging 1.4 per cent per year up until 1995, after which it slowed to 0.5 per cent per year between 2000 and 2010;
- An increase in the employment-population ratio of almost 11 percentage points (from 47.4 per cent in 1979 to 58 per cent in the middle years of the first decade of this century);
- An increase in average hours worked from 37.9 per week in 1979 to 41.8 per week by 2010; and
- Growth in labour productivity averaging 7.9 per cent per year over the entire period.²

Over the past decade, however, China's economic growth rate has slowed – to an average of 7¼ per cent per year between 2010 and 2019 (i.e., before the onset of Covid-19):

- The growth of the population has continued to slow, to 0.3 per cent per year towards the end of the decade;
- The employment-to-population ratio has declined, by 1.8 percentage points from its peak in 2004-07 to 56.6 per cent by 2019 (largely reflecting the increasing proportion of the population who are now retired).
- Average hours worked have remained stable, at around 41.8 per week; and
- Growth in labour productivity has slowed, from over 8 per cent per year at the beginning of the decade to an average of 6½ per cent per year between 2017 and 2019 inclusive.

The short-but-sharp recession induced by the onset of Covid-19 in the first quarter of 2020, the subsequent rebound in economic activity in the middle of 2020, and the ensuing ebbs and flows associated with natural disasters, power shortages and recurring virus outbreaks (including the most recent one) complicate the interpretation of these metrics over the past three years.

However, it seems highly probable that at least three of them will continue to damp China's potential long-term growth rate over the next decade (and beyond). The most recent United Nations demographic projections suggest that the growth rate of China's population will continue to decline until the population peaks in 2029, and that thereafter the population itself will start to decline (something which recent changes to China's 'one-child' policy may eventually slow, but will not reverse).³ The employment-to-population ratio seems highly likely to continue to decline, given that the 'working-age' population (i.e., those aged 15-64) as a proportion of the total, which peaked at 73.8 per cent in 2010 and declined by 3.4 percentage points over the ensuing decade, is expected to decline by a further 2.8 percentage points over the coming decade. For the

1 Box written by Saul Eslake, Principal of Corinna Economic Advisory, an economics advisory business based in Hobart, Australia, and co-partner in Independent Economics.

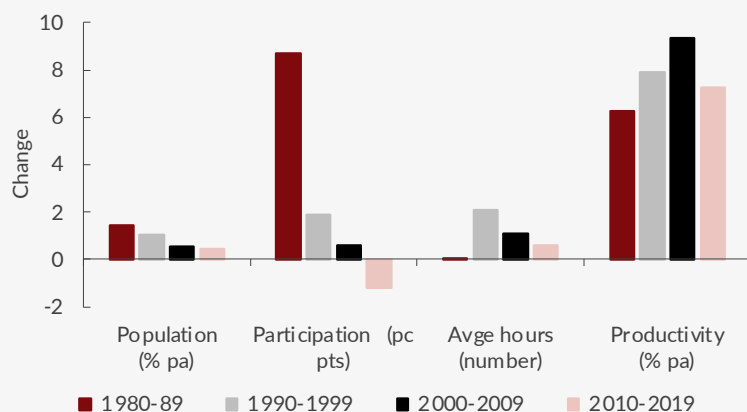
2 These figures, and those in the following paragraph, are derived from the Conference Board's Total Economy Database (August 2021 edition), using the 'official' series for real GDP.

3 See United Nations Department of Economic and Social Affairs, 2019 Revision of World Population Prospects.

same reason, average hours worked are unlikely to increase (not having done so over the past 15 years) and may well decline – especially given increasing public antipathy and regulatory hostility towards the so-called ‘996 culture’ (working from 9am to 9pm, six days per week).

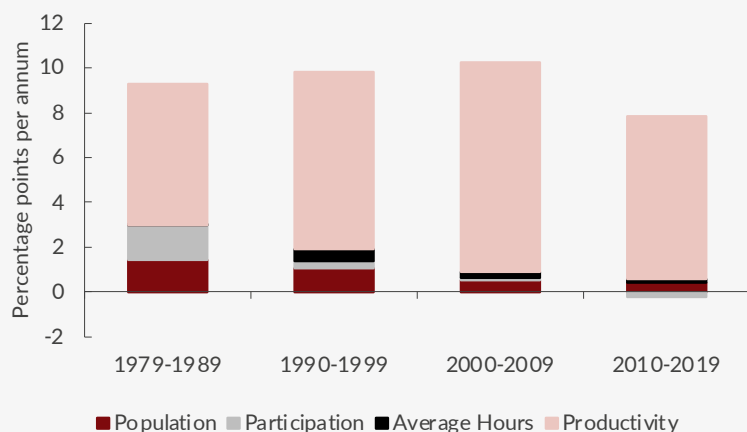
Whether China can sustain economic growth at the (lower) rate which it achieved during the 2010s therefore depends on whether it can reverse the slow-down in productivity growth which occurred over the decade between the global financial crisis and the onset of Covid-19. The argument here is that, although not impossible, this is an unlikely prospect. Rather, it seems more plausible that productivity growth in China will continue to slow, and possibly by a larger margin than it did during the 2010s.

Figure A1 Drivers of Chinese real GDP growth, 1979-2019



Source: The Conference Board, Corinna Economic Advisory, and Llewellyn Consulting

Figure A2 Contributions to Chinese GDP growth, 1979-2019



Source: The Conference Board, Corinna Economic Advisory, and Llewellyn Consulting

W(h)ither structural change?

A major contributor to the sustained rapid growth in labour productivity that China has attained over the past four decades has come from the movement of ‘factors of production’ (labour, capital and land) out of subsistence agriculture into manufacturing and services.

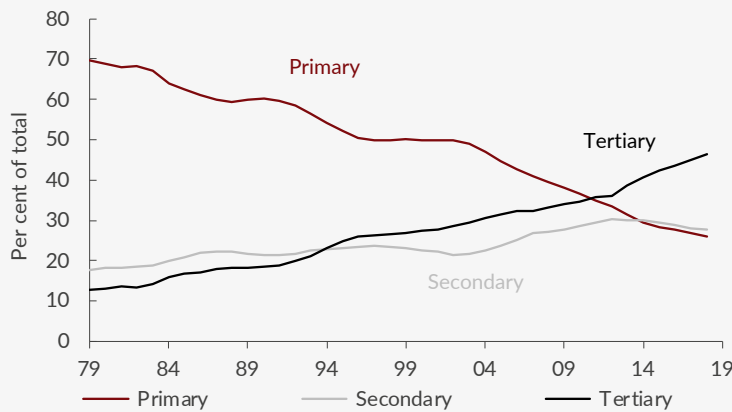
Although labour productivity (measured, unavoidably crudely, by GDP per person employed) in Chinese agriculture has improved dramatically over the past 40 years, it has always been less than one-quarter (and

usually less than one-fifth) of that in manufacturing. So the decline over this period in the proportion of China’s workforce employed in primary industry, from 70 per cent in 1979 to 26 per cent in 2018 (still the latest year for which data are available) – and the corresponding increase in the proportion employed in secondary and tertiary industries from 18 per cent to 28 per cent, and from 12 per cent to 46 per cent, respectively, has been a crucial factor in China’s ability to sustain its extraordinarily rapid rate of economic growth for so long (Figure A3).

However, the scope for further reductions in agriculture’s share of economic activity and employment is now much more limited. Moreover, manufacturing’s share of GDP peaked at around the time of the global financial crisis, and its share of total employment in the early 2010s. Almost 60 per cent of the growth in China’s GDP over the decade to 2019 came from the tertiary sector.

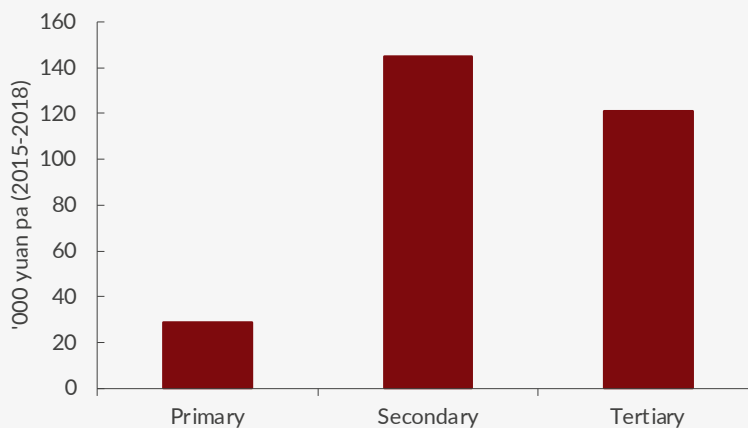
And because labour productivity in services is about 16 per cent lower than that in manufacturing (see Figure A4), the likely continued growth in services as a share of total economic activity will (all else being equal) detract from overall productivity growth.

Figure A3 Sectoral composition of employment in China



Source: China National Bureau of Statistics, Corinna Economic Advisory and Llewellyn Consulting

Figure A4 GDP per person employed, by sector, 2015-18



Sources: China National Bureau of Statistics, Corinna Economic Advisory, and Llewellyn Consulting

Two recent developments seem likely to drag on productivity growth over the coming decade.

The first is the new ‘Dual Circulation Strategy’ first laid out by China’s President Xi Jinping in May 2020 and formally adopted as part of the 14th Five Year Plan at the National People’s Congress in February 2021⁴. This strategy explicitly seeks to reduce China’s reliance on international trade and investment as drivers of economic growth (while still remaining open to both), instead fostering growth in domestic demand and supply.

The shift in emphasis is partly a response to the deteriorating bilateral political and economic relationships between China and the US – with a particular aim of reducing China’s dependence on US technologies. And China is hardly alone in reconsidering the ‘strategic’ risks posed by global supply chains in the wake of the pandemic. But in China, no less than in other countries, the pursuit of ‘security’ or ‘resilience’ in preference to ‘efficiency’ is almost certain to entail some cost in terms of productivity.

It is also partly a recognition of the fact that, with China now accounting (in 2021) for more than 15 per cent of total world merchandise exports, compared with less than 1 per cent in 1979 and less than 4 per cent even as recently as 2000, the rest of the world simply cannot absorb growth in Chinese exports at the rates it has over the past three or four decades.

The second risk arises from China’s regulatory ‘crackdown’ on important parts of the services sector, including e-commerce, financial services, gaming, and private education, as part of a greater emphasis on reducing inequality and promoting ‘common prosperity’.⁵

While efforts to reduce inequality need not detract (and indeed can enhance) overall economic growth,⁶ the particular nature of China’s regulatory crackdown has already resulted in significant dislocation of the targeted sectors,⁷ and may well reduce the pace of innovation and hence productivity growth.

A farewell to leverage

China’s ability to sustain economic growth after the global financial crisis at a pace which, though slower than over the previous three decades, was still much more rapid than almost every other economy in the world, was also facilitated to no small degree by a significant increase in financial leverage.

Total credit outstanding rose from 140 per cent of China’s GDP in the second half of 2008 to 285 per cent of GDP by the third quarter of 2021 – a higher figure than for any of the other emerging market economies for which the Bank for International Settlements maintains comparable data, and only about 10 pc points below the average for ‘advanced’ economies (Figure A6).

More than half of that debt (equivalent to about 155 per cent of GDP) is owed by non-financial corporations (and within that, a large proportion is owed by state-owned enterprises to state-owned banks).

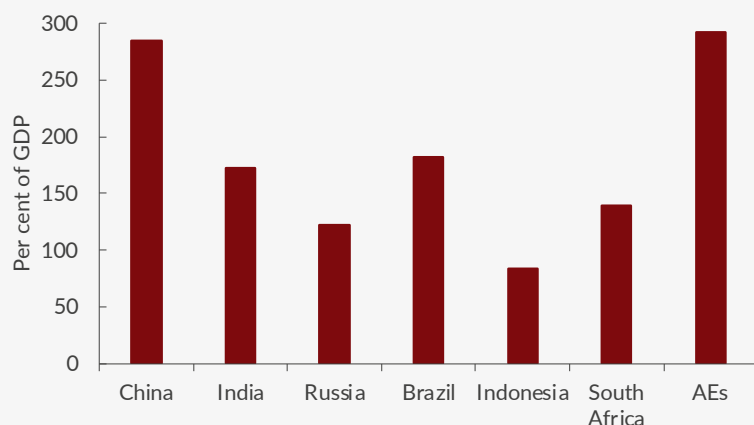
Corporate sector leverage actually peaked in 2016 (Figure A6), immediately after the financial crisis of 2015–16, which saw the People’s Bank of China (PBoC) use one-fifth of its reserves in a (successful) attempt to defend the renminbi.

4 See e.g. Alessandro Bazzoli, ‘China’s Plan for the Post-Pandemic World Order: The Dual Circulation Strategy’, *Global Risks Insights*, 30 April 2021; or Lin Justin Yufu and Xiaobing Wang, ‘Dual Circulation: a New Structural Economics view of development’, *Journal of Chinese Economic and Business Studies*, 4 June 2021.

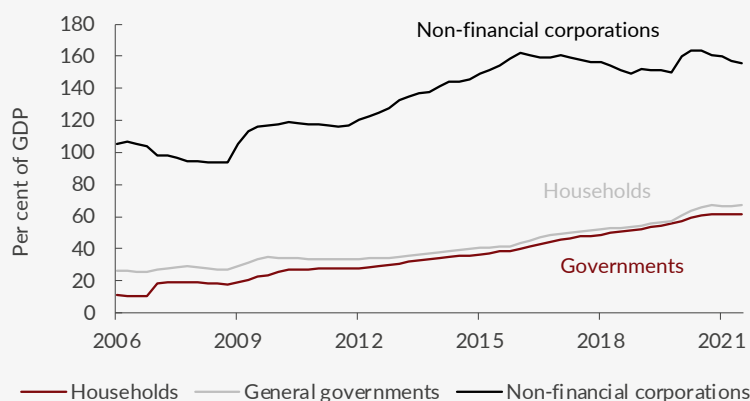
5 For an official explanation, replete with references to ‘strengthening the “four consciousnesses”, firming the “four self-confidences” and achieving “two maintenances”’, see ‘The Central Committee of the Communist Party of China (CPC) and the State Council issued the outline for the implementation of the construction of a government under the rule of law (2021-2025)’, *Xinhuanet*, 11 August 2021. This document commits to, among many other things, “strengthen[ing] law enforcement in key areas related to the vital interests of the masses, such as food and medicine, public health, natural resources, ecological environment, safe production, labour security, urban management, transportation, financial services, education and training”.

6 See e.g. Federico Cingano, *Trends in Income Inequality and its Impact on Economic Growth*, OECD Social, Employment and Migration Working Papers No. 163, Paris, 9 December 2014; and Era Dabla-Norris, Kalpana Kocchar, Nujin Suphaphiphat, Frantisek Ricka and Evridiki Tsounta *Causes and Consequences of Income Inequality: A Global Perspective*, IMF Staff Discussion Note 15/03, International Monetary Fund, Washington DC, June 2015.

7 Lily Kuo, ‘Xi Jinping’s crackdown on everything is remaking Chinese society’, *Washington Post*, 9 September 2021.

Figure A5 Credit to non-financial sectors, Q3 2021

Source: Bank for International Settlements, Corinna Economic Advisory, and Llewellyn Consulting

Figure A6 Credit as a proportion of GDP by sector, Q3 2021

Source: Bank for International Settlements, Corinna Economic Advisory, and Llewellyn Consulting

In the aftermath of that episode, China's monetary authorities sought to clamp down on 'shadow banking', in particular, and property-oriented leverage more generally.⁸

In August 2020 the PBoC and the Ministry of Housing imposed new regulations (known as "the three red lines") limiting debt to assets, net debt to equity, and cash to short term borrowings of property development companies to 70 per cent, 100 per cent and 1, respectively (these are the regulations of which China Evergrande has fallen foul, raising profound concerns about its viability). These form part of a broader determination to rein in China's real estate 'bubbles', in line with Xi Jinping's insistence that "houses are for living in, not for speculation". As a result, property investment has been making a much smaller contribution to overall GDP growth in recent years than prior to 2015, and that is unlikely to change in the years ahead.

It is particularly notable that, unlike every 'advanced' economy and almost every other 'emerging or developing' economy, China has consciously eschewed any wide-ranging 'unorthodox' monetary policy measures in order to support economic growth. China's fiscal policy response to Covid-19 has also been smaller (as a proportion of GDP) than in nearly all 'advanced' economies and in other large 'emerging' economies.⁹

8 See e.g. Guo Shuqing (Chairman of the China Banking and Insurance Regulatory Commission), 'Unswervingly Fight the Critical Battle of Preventing and Defusing Financial Risks', Qiushi, People's Bank of China, Beijing, 26 August 2020.

9 IMF, Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic, Washington DC, July 2021.

Conclusion

China is no longer capable of sustaining the double-digit growth in real GDP that it did between 1979 and the global financial crisis. And, unlike in the years immediately after the global financial crisis, China's authorities are fully aware of that.

Under Xi Jinping they are pursuing a range of economic (and political) objectives – but maximizing GDP growth is not one of them. The most recent meeting of China's National People's Congress (China's rubber-stamp Parliament) set a real GDP growth target of 5½ per cent for 2022 – which, if achieved (something that now looks more doubtful given the likely impact of China's continuing 'zero tolerance' approach to Covid-19 in response to the most recent virus outbreaks) would be the lowest growth rate in 40 years, other than the 4.3 per cent and 4.1 per cent recorded in 1989 and 1990, respectively.

China's growth is likely to continue on a slowing trend.

Box B: War in Ukraine and the options for Europe's energy supply

By Christopher Aitken and Erkal Ersoy¹²

Introduction

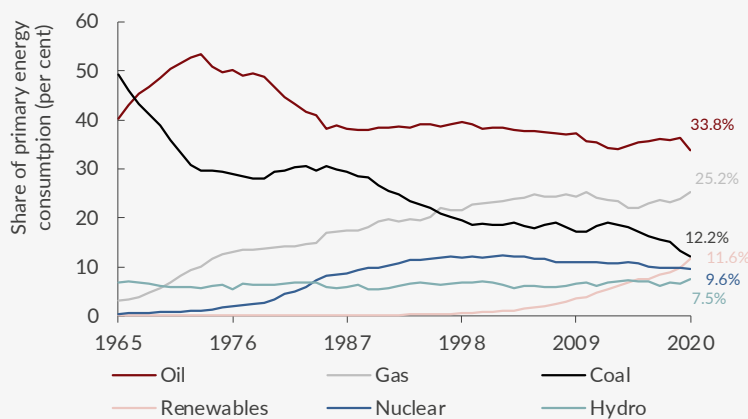
On 24 February 2022, Russia invaded Ukraine. Immediately, European countries made it clear that they stand with Ukraine in the conflict with Russia through swift action, sanctions, and the relaxation of immigration rules.

The imposed sanctions have had pronounced effects on the already struggling Russian economy. One of Russia's only remaining income streams is its fossil fuel exports, especially natural gas exports to Europe. The idea that European countries are effectively financing a war they condemn is anathema to the public and politicians alike. This analysis attempts to answer the question of whether Europe could realistically meet its energy requirements without Russia. To preview our conclusion, we argue that substituting away from gas imports from Russia is feasible in the medium to long term but very costly in the immediate future. That said, these costs would certainly be worth paying if doing so leads to an end to the war in Ukraine.³

The importance of Russian gas in the European energy system

Natural gas has become increasingly important in Europe's energy mix over the last few decades, accounting for approximately 25 per cent of European primary energy consumption in 2020 (Figure B1). This upward trend is partly due to Europeans' desire to substitute away from coal, which releases much more carbon dioxide per unit of energy than natural gas. Europe has managed slowly to reduce coal's share in its energy mix from around 19 per cent in 2000 to less than 12 per cent in 2020, while also reducing oil's share from 38 per cent to 34 per cent over the same period. With nuclear and hydropower's contributions remaining relatively constant, natural gas and renewables have gained importance (Figure B1). This has made natural gas a key fuel in meeting Europe's energy demand.

Figure B1 European Energy Mix



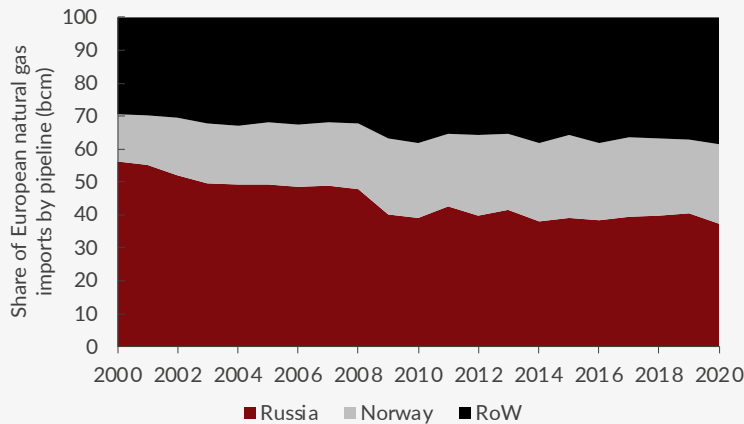
Source: Authors' calculations based on BP Statistical Review of World Energy (BP, 2021).

This natural gas comes from many countries. Approximately 40 per cent is produced in Europe. The rest is imported from other countries, particularly Russia. Europe's dependence on Russian gas has diminished over

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- 2 This work was presented as part of the Special Session organised by NIESR on 'The economic effects of the Russia-Ukraine conflict' that took place at the Royal Economic Society Annual Conference on 12 April, 2022.
- 3 The effectiveness of sanctions was discussed by the Treasury Select Committee and their findings published in House of Commons (2022).

the last 20 years: in 2000, over 56 per cent of natural gas imported to Europe by pipeline came from Russia. By 2020, this figure had fallen to 38 per cent (Figure B2). Note, however, that this is because Europe has been importing more pipeline gas from elsewhere, making imports from Russia a smaller share of the larger whole. The other key supplier of European natural gas is Norway. Norwegian pipeline exports to Europe more than doubled between 2000 and 2020, now accounting for around 24 per cent of total pipeline imports (Figure B2). Overall, however, there is no denying that pipeline imports from Russia are critical for Europe. Could Europe realistically move away from Russian gas? If so, how quickly?

Figure B2 European natural gas imports by pipeline (in billion cubic metres)



Source: Authors' calculations based on BP Statistical Review of World Energy (BP, 2021). RoW=Rest of the World.

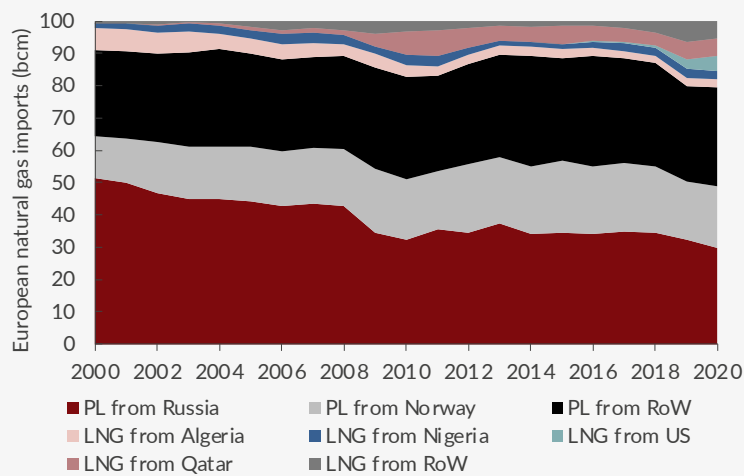
Is Russian natural gas unavoidable for Europe?

There are two overarching solutions. The first option is to reduce gas consumption, either by substituting towards a different source of energy or by reducing overall energy consumption. The second is to move away from Russian imports but retain gas in the energy mix at its current level. We could think of the former as diversification of the energy mix and the latter as diversification of natural gas supply. Because of the region's existing dependence on gas, there are no easy solutions in the short term. But over the longer term, diversification of supply and the energy mix are possible, and the latter is likely to have the largest effect in shoring up Europe's energy security.

The alternative to pipeline trade is transporting natural gas in liquefied form. We have the technology to do this using liquefied natural gas (LNG). European gas supply relies on both technologies, although pipeline imports significantly exceed LNG imports. Figure B3 plots the percentage shares of imports from Europe's top natural gas trading partners. Pipeline imports (PL) are much larger than LNG imports.

Reducing gas imports from Russia in the short term would be difficult. In 2020, Europe imported 185 billion cubic metres (Bcm) of gas from Russia (BP, 2021). According to the International Energy Agency (IEA), Europe could realistically import an additional 10 Bcm of natural gas via pipeline from Norway⁴ and Azerbaijan, plus 20 Bcm as LNG from other exporters around the world, such as Qatar (IEA, 2022). Constraining factors include tight limits on the export capacity of major producers (Reuters, 2022c), international competition for the existing supply of the fuel – particularly from Asia – and limits on the continent's regasification capacity which are both geographical and technical in nature (IEA, 2022; Rystad Energy, 2022).

⁴ Equinor and its partners are planning to increase gas exports from the Norwegian continental shelf (Equinor, 2022).

Figure B3 European natural gas imports by type and origin

Source: Authors' calculations based on BP Statistical Review of World Energy (BP, 2021). RoW=Rest of the World.

Options in the longer term

Over the medium to long term, there is more scope for reshaping Europe's energy policy. With respect to the development of new capacity, floating terminals could be a more cost- and time-effective solution than onshore facilities. Refitting an existing vessel as a floating storage and regasification unit (FSRU) can be achieved within 18 months, while onshore terminals take much longer.

Europe also needs new LNG contracts. As Figure B3 shows, pipeline imports from Russia dominate LNG imports. These contracted volumes will therefore need to be substantial if they are to make a serious dent in Europe's gas dependency problem. Consequently, they need to be sought from exporters with the requisite production capacity and industry maturity.

The United States is the world's largest gas producer and a natural partner to seek out. In 2020, it produced 915 Bcm of natural gas but also consumed 90 per cent of it domestically. By comparison, Russia produced around 640 Bcm, and exported nearly 240 Bcm. As such, the United States cannot currently meet Europe's demand, but has the capacity to do so in the future. It has reportedly granted construction and export permits for LNG terminals that would have a combined annual liquefaction capacity of around 220 Bcm (Wood Mackenzie, 2022). By 2025, half of these could be online and furnishing Europe with significant flows of gas. Qatar and Australia are also countries Europe could look towards. In 2020, they exported around 106 Bcm of LNG each (BP, 2021). In Qatar, work is already underway to increase the country's production and LNG export capacity within the next five years (Reuters, 2022a, 2022b).

Importing LNG is not the only option. At the end of 2020, the long-awaited Southern Gas Corridor became operational, linking Greece, Bulgaria and Italy with gas production facilities in Azerbaijan via Turkey (TAP, 2022). The pipeline is now expected to deliver 10 Bcm to the continent each year, helping to diversify supply away from Russia. Crucially, this was designed with expansion in mind: with further investment, it could support a further 10 Bcm of imports per year. An additional proposal to link Eastern Mediterranean producers with Italy and Greece could bring in a further 10 Bcm each year from 2025 (European Commission, 2021).

In the longer run, ensuring energy security will require investing heavily in new renewables capacity. This expansion of capacity will need to accelerate rapidly. In the meantime, exploiting existing nuclear and hydroelectricity generation capacity should be a priority.

Options in the short term

Short term emergency solutions available to Europe are costly. Due to logistical and technical difficulties, we believe it would be challenging to achieve the proposals put forward thus far. Given the current tightness of the market, procuring 50 Bcm of additional LNG imports next year as suggested by the European Commission's (2022a) REPowerEU report is optimistic. This volume is 2.5 times more than the IEA (2022) estimated would be available. Furthermore, many of the planned measures have a long time horizon and would not address immediate concerns.

One possibility would be to substitute away from gas towards coal or fuel oil. There are fewer issues with coal supply, and Europe still has a substantial fleet of coal-fired power plants. The IEA estimates that, if used, this alternative generation capacity could offset the requirement for around 22 Bcm of Russian gas imports (IEA, 2022). But the environmental impact would be substantial. Given the already enormous projected costs from climate change, as set out by the Intergovernmental Panel on Climate Change (IPCC, 2022), policymakers may be reticent to pursue this option. That said, increasing emissions temporarily to help save innocent lives in the ongoing conflict seems like a price worth paying – especially if we are determined to make up for these emissions in the near future.

Beyond that, governments could consider demand-oriented policies. These could include campaigns to turn down boilers in the winter and air conditioning units in the summer – perhaps with financial incentives provided for doing so – and usage monitored via smart meters (European Commission, 2022b). Even with these measures, we are likely to see severe shortages next winter.

Conclusion

The options available to Europe in the short run are limited, imperfect, and costly. They also require immediate upfront investment and commitment despite considerable uncertainty surrounding natural gas demand in the next decade. In the immediate future, alternative fossil fuels, such as coal, might have to be considered despite the costly implications for the climate. Even then, shortages and associated price rises appear inevitable. These costs would certainly be worth paying if doing so leads to an end to the war in Ukraine.

On the demand side, although the sharp rise in prices is likely to dampen natural gas consumption, further progress is required. To this end, it is important to be uncompromising in the pursuit of energy efficiency improvements. Public campaigns with information on energy efficiency can help, especially if they are coupled with policies and financial incentives.

In the longer term, European energy policy can aim to diversify energy and natural gas supply. A two-pronged approach that involves developing renewable energy capacity while ensuring natural gas supply would be wise and would ensure we emerge from this conflict greener, less reliant on Russian gas and therefore more able to continue isolating Russia in retaliation for its actions. In addition to building renewables capacity within the continent, European investment in renewables capacity in Eastern Mediterranean and Northern African countries could provide an attractive solution. This type of investment would enable countries in these regions to export more gas to Europe by reducing their domestic consumption of the fuel, while also contributing to Europe's climate commitments.

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