

# Assessing global potential output growth and the US neutral rate: April 2021

by Thomas Carter, Xin Scott Chen, Ali Jaffery, Christopher Hajzler, Jonathan Lachaine, Peter Shannon, Subrata Sarker, Graeme Westwood and Beiling Yan

International Economic Analysis Department  
Bank of Canada, Ottawa, Ontario, Canada K1A 0G9

[tcarter@bankofcanada.ca](mailto:tcarter@bankofcanada.ca), [scottchen@bankofcanada.ca](mailto:scottchen@bankofcanada.ca),  
[ajaffery@bankofcanada.ca](mailto:ajaffery@bankofcanada.ca), [chajzler@bankofcanada.ca](mailto:chajzler@bankofcanada.ca),  
[jlachaine@bankofcanada.ca](mailto:jlachaine@bankofcanada.ca), [pshannon@bankofcanada.ca](mailto:pshannon@bankofcanada.ca),  
[ssarker@bankofcanada.ca](mailto:ssarker@bankofcanada.ca), [gwestwood@bankofcanada.ca](mailto:gwestwood@bankofcanada.ca)



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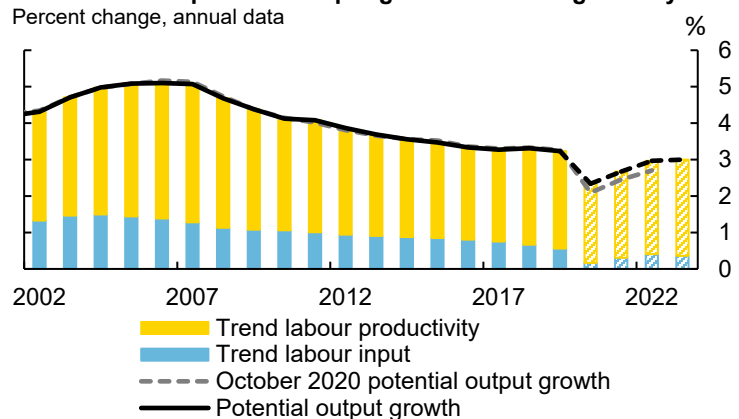
# Summary

We present the annual update of Bank of Canada staff estimates for global potential output growth and the US neutral rate of interest. These estimates both represent key inputs to the analysis supporting the April 2021 *Monetary Policy Report* (MPR).<sup>1</sup>

## Global potential output growth

The impact of the COVID-19 pandemic continues to be the main factor influencing the general dynamics of the outlook for global potential output growth. These dynamics remain broadly in line with those presented in the October 2020 assessment (Chen et al. 2020). Global potential output growth declined sharply in 2020 (**Chart 1**). The COVID-19 shock affected all regions (**Table 1**), but the largest contributing factor to the slowdown was a significant reduction in the growth of trend labour productivity (TLP) in oil-importing emerging-market economies (EMEs). Other contributing factors include ongoing headwinds from population aging and low trend total factor productivity (TFP) growth across most regions.

**Chart 1: Global potential output growth recovers gradually**



Source: Bank of Canada calculations

Last data plotted: 2023

Table 1: Projection for potential output growth						
	Share of real global GDP (percent)	Projected growth* (percent)				
		2019	2020	2021	2022	2023
United States	16	1.8	1.2 (1.1)	1.3 (1.1)	1.8 (1.5)	1.8
Euro area	12	1.4	0.9 (0.8)	1.1 (1.0)	1.2 (1.1)	1.1
Japan	4	1.0	0.5 (0.4)	0.6 (0.6)	0.7 (0.6)	0.7
China	17	6.2	5.5 (5.1)	5.5 (5.3)	5.4 (5.3)	5.4
Oil-importing EMEs†	34	4.0	2.5 (2.3)	3.2 (2.9)	3.8 (3.4)	3.8
Rest of the world‡	17	1.9	1.3 (0.9)	1.5 (1.3)	1.8 (1.5)	1.9
<b>World</b>	<b>100</b>	<b>3.2</b>	<b>2.3 (2.1)</b>	<b>2.7 (2.4)</b>	<b>3.0 (2.7)</b>	<b>3.0</b>

\* Numbers in parentheses are projections used in the October 2020 *Monetary Policy Report*.

† The oil-importing emerging-market economies (EMEs) group excludes China. It is composed of large EMEs from Asia, Latin America, emerging Europe, the Middle East and Africa (such as India, Brazil and South Africa) as well as newly industrialized economies (such as South Korea).

‡ “Rest of the world” is a grouping of all other economies not included in the first five regions. It is composed of oil-exporting EMEs (such as Russia, Nigeria and Saudi Arabia) and other advanced economies (such as Canada, the United Kingdom and Australia).

<sup>1</sup> For overviews of methodologies used to estimate global potential output and the US neutral rate, see Bounajm et al. (2019) and Bootsma et al. (2020), respectively.

We expect potential output growth to increase from 2.3 percent in 2020 to 3 percent by 2022, driven mainly by improvements in trend TLP growth. Compared with the October assessment, we have increased our estimate for potential output growth across all regions. This upward revision is due to the availability and faster rollout of the vaccines, especially in advanced economies, and weaker-than-expected effects from the pandemic in several regions (**Table 1**).

## US neutral rate

For the US neutral rate, we assess that the range of 1.75 to 2.75 percent estimated in autumn 2020 remains appropriate.<sup>2</sup> This assessment accounts for the improved outlook for US potential output growth, which, in isolation, would lead to a higher US neutral rate. However, this assessment also reflects revisions and shifts in other key inputs. Most notably, we expect that the impact of the COVID-19 recession on US income inequality will place somewhat stronger downward pressure on the US neutral rate than anticipated in the previous update.

The remainder of this note is organized as follows. First, we provide a more detailed regional breakdown of the potential output estimates presented in **Table 1**. Then we shed some light on the risks surrounding the estimates of potential output. Finally, we elaborate on staff’s assessment of the US neutral rate.

## Regional estimates for potential output growth

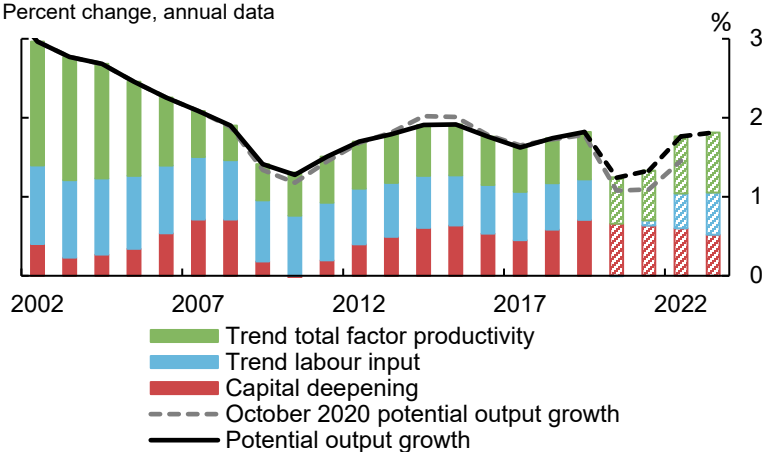
### United States

We expect the COVID-19 crisis to reduce US potential output growth mainly through a decline in trend labour input (TLI) growth as a result of labour market scarring and lower immigration (see Chen et al. 2020). By 2022, the level of US potential output will be about 0.8 percent lower due to the negative effects of the crisis.

Over the projection horizon, we expect US potential output growth to improve as immigration and labour market participation recover gradually (**Chart 2**).

We also anticipate that trend TFP growth will improve and return to its pre-pandemic path when the pandemic’s disruptive effects on businesses fade and resources are reallocated to firms with higher productivity.

**Chart 2: US potential output growth is expected to rise**  
Percent change, annual data



Source: Bank of Canada calculations

Last data plotted: 2023

<sup>2</sup> See Bootsma et al. (2020) for details on the autumn 2020 assessment of the US neutral rate.

Compared with the October 2020 assessment:

- potential output growth is an average of 0.2 percentage points higher each year from 2020 to 2022
- the level of potential output has been revised up by about 0.5 percent by 2022

The upward revision to potential output growth mainly reflects the effects of:

- faster-than-expected vaccine deployment
- lower-than-expected impact of physical distancing on economic activities
- stronger-than-expected business investment resulting from additional fiscal support

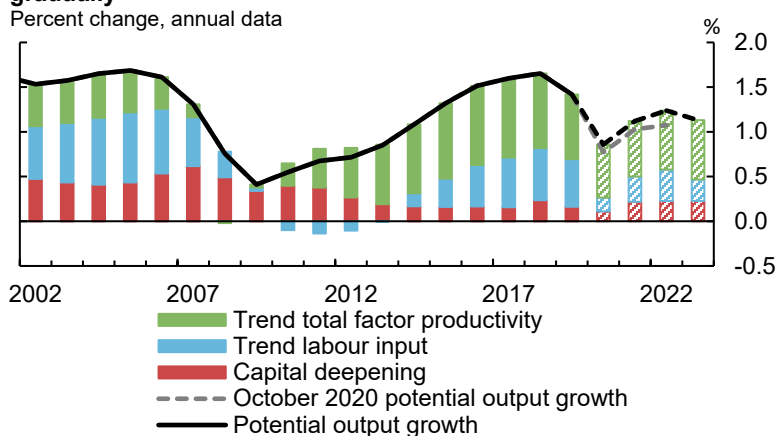
The largest revision has been to TLI, mainly reflecting a stronger trend participation rate. We expect the labour dislocation shock from COVID-19 to be less severe because the vaccine rollout will shorten the duration of the pandemic. This will result in less long-term unemployment and fewer permanent withdrawals from the labour force.

After TLI, trend TFP saw the second largest upward revision because productivity growth accelerated in the second half of 2020. Given that firms made rapid adjustments to minimize disruptions to work settings, the pandemic had a less pronounced impact on trend productivity growth in 2020. A faster rate of trend TFP growth from 2021 is expected to be maintained as the pandemic fades more quickly, reducing the intermediate costs of physical distancing imposed on firms (Bloom et al. 2020). The rate of capital deepening is slightly higher on average over the projection horizon, reflecting the stronger outlook for business investment.

## Euro area

The pandemic led to a drop in potential output growth in the euro area in 2020. This was mainly due to lower TLI growth resulting from reduced trend hours worked and, to a lesser extent, a lower trend participation rate. We expect potential output growth to recover gradually as the pandemic's effects on the labour market dissipate (**Chart 3**). Population aging, however, continues to weigh on TLI growth.

**Chart 3: Potential output growth in the euro area recovers gradually**



Compared with the October assessment:

- potential output growth has been revised up by 0.1 percentage point in each year from 2020 to 2022
- the level of potential output has been revised up by about 0.4 percent by 2022

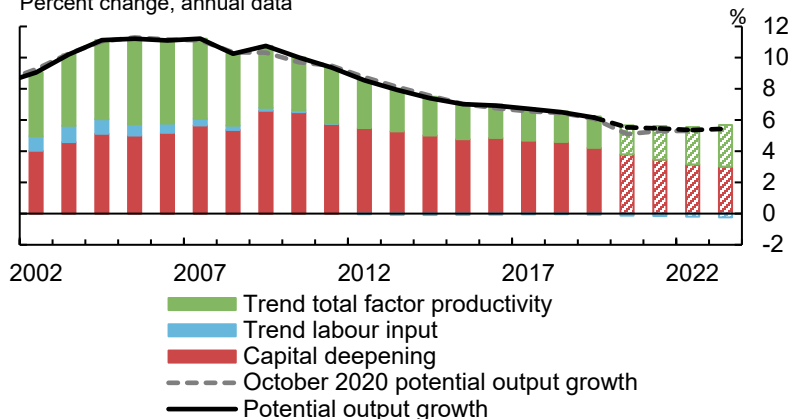
As the pandemic fades, faster recovery in trend TFP growth is the main factor pushing up the revision to potential output growth. Capital growth is also revised up slightly, reflecting a stronger-than-expected rebound in the third quarter of 2020 and more resilient investment despite the resurgence of the virus. The conclusion of the Brexit negotiations removes a source of nagging uncertainty, although it will likely have a negligible impact on potential output growth (International Relations Committee and Brexit Task Force 2020).

## China

China's potential output growth has been falling in recent years, reflecting population aging and slower capital accumulation. In 2020, potential output growth fell further, reflecting headwinds from the pandemic. By 2023, potential output growth returns to the path it was on before COVID-19 as the shock from the pandemic dissipates. Trend TFP growth picks up as a result of ongoing spending on research and development and a rebound in foreign direct investment (**Chart 4**).

**Chart 4: China's potential output growth returns to its pre-pandemic path**

Percent change, annual data



Source: Bank of Canada calculations

Last data plotted: 2023

Compared with the October assessment:

- potential output growth has been revised up by an average of 0.2 percentage points annually between 2020 and 2022
- the level of potential output is 1.2 percent higher than in the October projection by 2022<sup>3</sup>

The upward revision in potential output growth reflects China's stronger growth in capital and trend TFP. Investment is stronger than anticipated, boosted by increased infrastructure spending and reduced trade uncertainty. Trend TFP growth is also revised up because the pandemic's scarring effects have been lessened by a faster-than-expected reopening of the domestic and global economies, which supports increased trade and foreign direct investment.

## Oil-importing emerging-market economies

Potential output growth in oil-importing EMEs dropped significantly in 2020 due to lower capital accumulation and trend TFP growth caused by the pandemic. However, investment and trend TFP growth are expected to rebound as physical distancing measures are lifted and labour is reallocated. We therefore expect potential output growth to approach its pre-pandemic trend by 2022 (**Chart 5**).

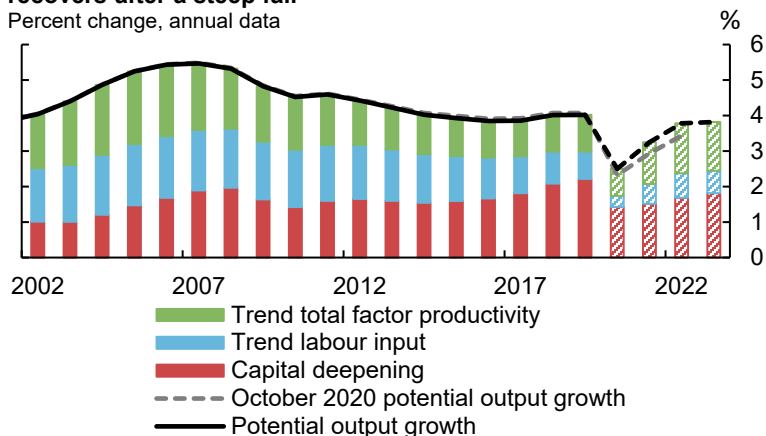
<sup>3</sup> Around half of the level change is due to methodological revisions. The other half is due to stronger-than-anticipated recovery. The methodological revisions have led to updates in historical potential output levels as well as minor upward revisions in the potential growth rate in coming years.

Compared with the October assessment:

- potential output growth has been revised up by an average of 0.3 percentage points annually between 2020 and 2022
- the level of potential output is revised up by 1.7 percent by 2022<sup>4</sup>

Trend TFP growth is higher than was assessed in October 2020. Most EMEs avoided severe resurgences in the virus and benefited from relaxed containment measures through the second half of 2020. This should allow for increased urbanization and reallocation of labour to the formal sector through 2022. Capital deepening has been revised up in all three years due to reduced caution and containment measures in the second half of 2020, a rebound in capital inflows and an improved demand outlook.

**Chart 5: Potential output growth in emerging-market economies recovers after a steep fall**  
Percent change, annual data



## Rest of the world

Potential output growth in Japan is expected to recover gradually from the sharp slowdown in 2020. The secular impact of an aging population, however, continues to weigh on the growth dynamics. Relative to the October assessment, the announcement of earlier-than-anticipated vaccines pushes both TLI and TFP growth up slightly. This revision results in an average annual upward revision of 0.1 percentage point to potential output growth over the projection horizon. The level of potential output is 1.0 percent above that in the October projection by 2022.<sup>5</sup>

Most advanced economies in the rest-of-the-world block have experienced multiple rounds of lockdown measures, which reduced their TLP. Oil-exporting economies in the-rest-of-the-world block have fared better with the virus, but low oil prices and production cuts have contributed to reducing their TLP growth. We expect TLP growth to recover gradually because the rapid approval and rollout of vaccines are expected to lead to reduced caution and containment measures. Recent rises in oil prices should also support the recovery in TLP growth in all the oil-exporting economies.

Compared with October 2020 estimates:

- potential output growth has been revised up by 0.3 percentage points on average annually over 2020–22
- the level of potential output is 0.5 percent higher by 2022<sup>6</sup>

<sup>4</sup> Historical revisions to GDP account for 0.8 percentage points of the increase. The remaining 0.9 percentage points represent changes to the growth outlook since the October MPR.

<sup>5</sup> Historical revisions to GDP account for 0.9 percentage points of the increase. The remaining 0.1 percentage point represents changes to the growth outlook since the October assessment.

<sup>6</sup> The increase to potential GDP growth is partially offset by historic revisions of -0.4 percent to the level of GDP. Changes to the growth outlook since the October projection account for a 1.0 percent upward revision to the level of potential output by 2022.

Trend TLP growth has been revised up, especially in the advanced economies of the rest-of-the-world block. This is due to positive vaccine developments and reduced disruptive effects of the pandemic. Oil-exporting economies also benefit from higher oil prices, which are expected to increase investment and raise trend productivity because the oil sector has relatively higher productivity in these economies.

## Risks around the outlook for global potential gross domestic product

We find that this assessment of potential output growth for all regions faces a high level of uncertainty. On the positive side, faster vaccine rollout and reduced sensitivity of economic activities to the virus could imply less labour market scarring. In addition, faster adoption of digital technologies and automation could provide a further boost to potential gross domestic product (GDP), especially in relatively advanced economies. In contrast, new variants of the virus necessitating longer lockdowns and continued physical distancing remain an important downside risk. In addition, higher market concentration may weigh on investment and trend TFP growth.<sup>7</sup>

Our estimates are subject to risks faced by individual EMEs. In particular, some EMEs face downside financial risks from weakened banking systems or elevated public and corporate debt that could negatively affect investment growth. In contrast, agricultural and labour market reforms in India and Indonesia represent an upside risk to long-term TFP growth in EMEs.

## US neutral rate

Our assessment of the US neutral rate represents a key input in the assessment of the Canadian neutral rate presented in Brouillette et al. (2021). As in previous updates, we focus on a medium- to long-run neutral concept that identifies the neutral rate with the policy rate consistent with stable inflation and output at its potential level after the effects of all cyclical shocks have dissipated (Mendes 2014).

Our overall assessment is that the range of 1.75 to 2.75 percent estimated in autumn 2020 remains appropriate for the US neutral rate. We reached this assessment using the same three structural models that were used for staff's previous neutral rate update (Bootsma et al. 2020). Our assessment accounts both for staff's new US potential output profile and for changes in other factors that play roles in determining the level of the US neutral rate. These other factors notably include:

- the level of US income inequality, for which higher values are associated with a lower neutral rate because they imply a concentration of resources among wealthier households with higher propensities to save; and
- the level of US government debt as a share of GDP, for which higher values are associated with a higher neutral rate based on simulations reported in Bootsma et al. (2020). This positive relationship reflects the fact that higher levels of government debt are associated with an increase in the supply of safe assets available to savers.

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<sup>7</sup> See Chen et al. (2020) for further details on some of these risks.



Inputs relating to both these factors have been updated as part of our 2021 assessment of the US neutral rate. For income inequality, this involved using a series of panel regressions similar to those in Roine, Vlachos and Waldenström (2009) to update our estimate of the likely medium-run impact of the COVID-19 recession on US income inequality. This analysis points to an impact on inequality somewhat larger than the preliminary estimate reported in Bootsma et al. (2020), implying more inequality-related drag on the US neutral rate than was assessed at that time.

For the US government’s debt-to-GDP ratio, we updated our estimate on the amount by which it will likely increase over the Bank’s projection horizon using recent forecasts from the bipartisan Committee for a Responsible Federal Budget (2021). These forecasts include estimates of the higher debt issuance associated with the recently passed *American Rescue Plan Act*. They also account for the fact that the outlook for US GDP has improved significantly since autumn 2020.

Overall differences between our current assessment of the US neutral rate and the autumn 2020 assessment thus largely reflect the balance of two things: upward pressure from US fiscal policy and an improved outlook for US potential output versus downward pressure from revisions to the outlook for US income inequality.

Comparing the middle and right-hand columns of **Table 2**, we see that the net effect of these upward and downward pressures is relatively modest in terms of the overall impact on the neutral rate estimates supported by the three structural models in question. For example, all models continue to support ranges centred at or near 2.25 percent, with 1.75 percent as the lower bound. While the appropriate upper bound is less clear, we maintain our usual practice of focusing on a symmetric range of plus or minus 50 basis points and therefore maintain our overall assessed range at 1.75 to 2.75 percent.

<b>Table 2: Summary of three structural models’ current and previous assessed ranges for the US neutral rate*</b>		
	Autumn 2020 (percent)	Current ranges (percent)
<b>HALO model†</b>	1.75 to 3	1.75 to 3
<b>Risk-augmented neoclassical growth model</b>	1.75 to 2.75	1.75 to 3
<b>Overlapping generations model</b>	2 to 2.5	2 to 2.5
<b>Full range of estimates</b>	1.75 to 3	1.75 to 3
<b>Staff’s overall view</b>	1.75 to 2.75	1.75 to 2.75

\* All estimates have been rounded to the nearest 25 basis points.

† As explained in Bootsma et al. (2020), the full name of this model is the “heterogeneity- and liquidity-adjusted semi-open economy model.”

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