

**CAC (MPI) 2-1**

<b>Part and Chapter:</b>	<b>Part I Overview CAC (MPI) 1-1 (C) Figure 1</b>	<b>Page No.:</b>	<b>Page 6 of 7</b>
<b>PUB Approved Issue No:</b>	<b>8. Cost of operations</b>		
<b>Topic:</b>	<b>Cost Impairments re People Risks</b>		
<b>Sub Topic:</b>			

**Preamble to IR:**

The Expense Alloc Basic % plus the Basic % Claims Expense seems to exceed 100%.

For example, the ISM – Cryptographic Service Enhancements 2021/22 Deferred Costs Transferred to Expense is stated as \$119,333.15 and is being allocated 79.38% to Basic Expense (\$94,726.65) and 55.83% to Basic claims expense (\$66,623.70) resulting in a total amount of \$161,350.35 being allocated and not \$119,333.15.

**Question:**

For greater clarity please explain the figures provided in the Expense Alloc Basic &, Basic Expense, Basic % Claims Exp and Basic Claims Expense columns and reconcile the apparent inconsistencies as identified in the Preamble.

**Rationale for Question:**

To clarify the allocation methodology applied to Figure 1 in CAC (MPI) 1-1 (C).

**RESPONSE:**

The Basic % Claims Exp and Basic Claims Expense columns were incorrectly included in *Figure 1* of *CAC (MPI) 1-1*. They were carried forward from a previous year's filing and are no longer applicable. The columns were hidden, rather than deleted, and were mistakenly unhidden when the response was submitted.

The Expense Alloc Basic % and Basic Expense columns fully represent the allocation of the impairments.

**CAC (MPI) 2-2**

<b>Part and Chapter:</b>	<b>Part IV – Nova Project CAC (MPI) 1-38 (b) PUB (MPI) 1-1(c) Appendix 3</b>	<b>Page No.:</b>	<b>Page 2 Page 10</b>
<b>PUB Approved Issue No:</b>	<b>19. Project Nova</b>		
<b>Topic:</b>	<b>Prior experience with McKinsey &amp; Company</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

Page 2 of the response to CAC (MPI) 1-38 states at (b)::

“The proposal from McKinsey addressed the critical factors to minimize risk, assure value delivery and provide a comprehensive approach that displayed experience and expertise to address the complexity of the issues identified. Based on the informal engagements and interviews with the top tier firms, the President & CEO, CITO and CTO unanimously agreed that the corporation should retain McKinsey & Company (Canada).”

Page 10 of Appendix 3 to the response to PUB (MPI) 1-1(c) explains that the Board authorized the waiving of the tendering process for the McKinsey contract. Page 27 of the same Appendix includes an explanation that further program delays of approximately an additional 3 months would be incurred if the normal procurement process was followed.

**Question:**

- a) Please confirm that the President & CEO of MPI has had prior consulting relationship experiences with McKinsey & Company. If yes, please provide a narrative description of the extent of these previous consulting relationships or experiences in terms of the size and nature of the projects, the complexity of the projects, the duration (time) of the projects, issues encountered and resolved and the achievement of business objectives.

- b) In the event the President and CEO of MPI has not had prior working consulting relationships or experiences with McKinsey & Company (to understand and know the capability of McKinsey), please articulate the basis for and motivation to engage McKinsey on Project Nova "based on the informal engagements and interviews with the top tier firms".
- c) Please explain how MPI confirmed that the value to be received from McKinsey was reasonable and within industry norms. Please provide any analysis which was undertaken, including a detailed risk/benefit analysis or otherwise. If no analysis was undertaken please explain why not.
- d) Please explain why MPI determined that it would not use the successful bidder as part of the initial RFP process.
- e) Please explain the how or whether the possibility of stopping work on Project Nova while during a traditional tendering process was considered. If it was, please provide details. If not, please explain why not.

**Rationale for Question:**

To better understand the process by which McKinsey was engaged by MPI and the probability of McKinsey to successfully operationalize Project Nova.

**RESPONSE:**

a) to e)

MPI confirms that its President and CEO did not have any prior consulting relationship experience with McKinsey & Company. He and the Chief Information Technology Officer (CITO), who both have prior international experience working with Fortune 500 Corporations, are aware that there are a limited number of qualified vendors who have experience in successfully assisting clients in the insurance industry to address issues arising in large scale complex digital transformation projects. Conflicts of interest related to prior involvement in Project NOVA further limited the number of potential vendors.

While a request for proposals (RFP) is the general (preferred) process by which MPI retains service providers, there are a number of exceptions to that process. One exception is urgency to address a matter that could not be addressed in time using open tendering. Halting work on Project NOVA does not stop the requirement of MPI to pay expenses. MPI estimates that the "burn rate" for delays in proceeding with Project NOVA to be \$4 million per month.

For the purposes of assessing urgency to address this matter, MPI estimated (optimistically) that it would take 3 months to develop, issue and award the RFP prior to the commencement of the work. Therefore, the total cost of the 3-month delay would have been approximately \$12 million. Other RFPs associated with Project NOVA took an average of 9 months from the time of issuance to when the successful vendor commenced work. The RFP for the NOVA Program Governance was 5.5 months from release to contract signing while the recent GLM software RFP took 6 months.

MPI interviewed potential top-tiered qualified vendors. As stated above, the President & CEO, CITO and Chief Transformation Officer (CTO) were unanimous in their assessment that McKinsey was the successful candidate. It is highly unlikely that another unidentified vendor would have successfully responded to an RFP. It was determined that it was not prudent to needlessly expend \$12 million to either delay the start date of McKinsey's work (after they won the tender) or determine if another potential vendor could provide the same quality of service as McKinsey for a lesser amount (at least \$12 million less).

**CAC (MPI) 2-3**

<b>Part and Chapter:</b>	<b>Part IV – Project Nova</b>	<b>Page No.:</b>	<b>CAC (MPI) 1-27, page 1</b>
<b>PUB Approved Issue No:</b>	<b>19. Project Nova</b>		
<b>Topic:</b>	<b>2022 Re-Baseline business case adjusted NPV equals \$(188.9M).</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

On page 1 of CAC (MPI) 1-27 in the response it states:

“...the program objectives of Project NOVA are critical and must be completed, irrespective of its net present value.”

**Question:**

To contain the increasing costs, risks, scope and uncertainty of Project Nova, has MPI considered simplifying the project by modernizing only one line of business at a time and assessing successes, failures and risks before proceeding to other lines of business? Please provide a narrative discussion on how MPI might proceed with Project Nova, one line of business at a time and starting with SRE, to mitigate costs and risks. If proceeding with the modernizing of one line of business at a time is not feasible or possible, please provide an explanation of why.

**Rationale for Question:**

To clarify and understand MPI’s rationale of proceeding with an IT project that carries significant risk and a material negative NPV.

**RESPONSE:**

The scope for Project Nova's first 2 releases are focused on single lines of business. Release 1 is focused on the SRE line of business, Release 2 is focused on MPI's participation in the International Registration Plan (IRP) for commercial trucking. These lines of businesses were considered first because of their size and technology dependencies.

Release 3 was originally planned as a replacement for Autopac Online (AOL) and the Driver Licensing System (DLS). This covers Autopac Insurance, Driver Licencing and the Vehicle Registration lines of business. MPI originally planned to migrate customers onto the new technologies on their anniversary date. Once a customer arrives at their anniversary date, all business, whether insurance or driver licence related, would be conducted on the new technologies. This big bang approach was initially considered over splitting each line of business into their own release, primarily because of how the underlying technology is built. However, MPI is not able to decommission AOL in a simple and straight forward manner. There would also be a large impact to internal staff and brokers if business processes were split along lines of business.

To help manage the delivery risk, and avoid the big bang approach, MPI is changing direction and breaking Release 3 (R3) into much smaller release objectives. Instead of 1 large release, R3 will be broken into ~40 core release objectives with about ~20 customer self-service release objectives. Each of the release objectives will be planned, designed, developed, tested and then released into production. The focus on release objective will give MPI the ability to assess its successes and failures in an agile manner.

The following is a partial list of release objectives for Release 3. Many of the Release objectives are for a single line of business, while some of the release objectives cover many lines of businesses:

- Obtain driving credential
- Renew Driver Licence
- Cancel Driver Licence

- Obtain Record of Driving Credential
- Obtain Identity Card
- Renew Identity Card
- Obtain Registration & Insurance Product
- Change Registration & Insurance Mid-term
- Renew Registration & Insurance
- Cancel Registration & Insurance
- Obtain Temporary Registration Permit
- Obtain Rental Vehicle Insurance coverage
- Obtain Winter Tire Loan



**CAC (MPI) 2-4**

<b>Part and Chapter:</b>	<b>Part III BMK Appendix 3 CAC (MPI) 1-83</b>	<b>Page No.:</b>	<b>Page 3</b>
<b>PUB Approved Issue No:</b>	<b>12. Operational benchmarking</b>		
<b>Topic:</b>	<b>Investments in IT</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):****Question:**

Please confirm that Gartner prepared the responses to CAC (MPI) 1-83 (a) and (b). If not, please ask Gartner to review the responses provided in CAC (MPI) 1-83 and provide their responses.

**Rationale for Question:**

To assess Gartner's findings and advice in terms of proceeding with a project that projects a material negative NPV which MPI rate payers will ultimately pay.

**RESPONSE:**

Gartner did prepare the responses to CAC (MPI) 1-83(a) and (b).

**CAC (MPI) 2-5**

<b>Part and Chapter:</b>	<b>Part IV - Nova, Information Technology, and Value Management - Nova Project VM.1.5</b>	<b>Page No.:</b>	<b>PUB (MPI) 1-103 (b) page 2 Figure 1</b>
<b>PUB Approved Issue No:</b>	<b>19. Current IT Strategic Plan and IT Expenses and Projects</b>		
<b>Topic:</b>	<b>Allocation of Network Operations Centre as a Service (NOCaaS)</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

The last column in Figure 1 of PUB (MPI) 1-103 (b) indicates Allocation percentages.

**Question:**

Please confirm that the percentages indicated relate to amounts being allocated to Basic Insurance.

**Rationale for Question:**

To clarify the response to PUB (MPI) 1-103 (b).

**RESPONSE:**

The percentages listed in Figure 1 of *PUB (MPI) 1-103(b)* represent the allocations of the resources that are allocated to the Network Operations Centre as a Service (NOCaaS) Project. The percentage represented in the list is not related to a line of business allocation, but rather the amount of time the resource is able to provide to the project.

**CAC (MPI) 2-6**

<b>Part and Chapter:</b>	<b>Part V Expenses EXP.3.2.3, Fig. EXP-8 Appendix 7 Fig. EXP-7-1 &amp; Fig. EXP7-2</b>	<b>Page No.:</b>	
	<b>PUB (MPI) 1-47 (c) PUB (MPI) 1-109 (a)</b>		
<b>PUB Approved Issue No:</b>	<b>8. Cost of operations and cost containment measures</b>		
<b>Topic:</b>	<b>Expensing external labour for Nova Implementation</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

The response to PUB (MPI) 1-47 (c) states: "...MPI expenses the external labour costs incurred to support NOVA overall as they are not directly attributable to the development activities."

The response PUB (MPI) 1-109 (a) states: "For the duration of NOVA, MPI requires a higher number of consultants to support the existing environment and application activities in operations. MPI will use staff to deliver NOVA and to backfill operational positions with consultants over the next couple years, as it begins to deliver on the largest part of the program with R3 (personal lines) and R4 (claims)."

**Question:**

Please provide a detailed narrative discussion and breakdown of external labour costs being expensed as a result of supporting the existing environment and applications as shown on Figure 1 line 7 as opposed to supporting Project Nova.

**Rationale for Question:**

To better understand the accounting treatment of external labour costs as expensed vs capitalized.

**RESPONSE:****Figure 1 External Labour Expense- Corporate**

Line No.	External Labour Expenses	2021/22A	2022/23FB	2023/24F	2024/25F
1	<i>(\$C 000s, except where noted)</i>				
2	Normal Ops - supporting existing environment & applications	3,833	4,769	4,858	4,725
3	Normal Ops - supporting Project Nova	-	5,273	8,028	10,915
4	Nova Program Initiatives	6,158	13,002	3,006	2,572
5	Other Initiatives	3,271	14,848	13,849	14,349
6	<b>Total External Labour Expenses</b>	<b>13,262</b>	<b>37,892</b>	<b>29,741</b>	<b>32,561</b>

The External Labour NOVA funds within COE Architecture and Digital Workplace and Service Management are funds needed for additional operational consultants and/or term staff during the 2022/23 - 2025/26 timeframe. This period is referred to internally as the "bubble" period. During this timeframe, many of the existing IT staff will be working on NOVA and helping to implement the newer technologies.

Since the Legacy systems will still be operational it is important that MPI maintains and supports these systems. The External Labour NOVA funds are meant to be used to hire additional consultants and/or term staff to help support the Legacy systems. The FTE and associated funding were determined as part of a detailed FTE analysis (submitted with MPI 2023 GRA application as NOVA Appendix 07 PUB NOVA FTE Analysis Output 2022 Re-baseline Confidential).

**CAC (MPI) 2-7**

<b>Part and Chapter:</b>	<b>PART IV – NOV</b>	<b>Page No.:</b>	<b>26 of 32</b>
<b>PUB Approved Issue No:</b>	<b>19. IT Projects</b>		
<b>Topic:</b>	<b>Key drivers of Project Nova cost increase</b>		
<b>Sub Topic:</b>	<b>De-risking costs</b>		

**Preamble to IR (If Any):**

In “Nov.6 Business Case”, MPI addresses “de-risking”:

- Line 10 on Page 26 indicates \$23.1M in added costs for new resources and services to help de-risk the program
- Line 12-13 on Page 26 indicates that another \$34.6M was identified by McKinsey’s assessment for de-risking

As a result of these two items, the total cost of “de-risking” appears to be \$57.7M against a overall project budget of \$224.1M (excluding contingency of \$65.8M) or 26% of the Project Budget.

**Question:**

- a) Recognizing the portion of the project budget which has now been allocated to reducing the risk of Project Nova, please provide a narrative discussion comparing Project Nova’s “de-risking” costs with comparable costs in projects of similar size and scale undertaken other Canadian public sector organizations?
- b) Please explain whether the size of the cost variance in the new rebaseline and the costs associated with de-risking prompted a review of the scope of Project Nova that specifically contemplated reducing the scope or otherwise simplifying the project. If yes, please explain what was considered and why the project simplifications considered were not implemented. If not, please explain why not.

**Rationale for Question:**

To inform an assessment of the impacts of the multiple changes to Project Nova, including the external reviews, budget resets, expansions in external resources and oversight, and extension of the payback period.

**RESPONSE:**

- a) The cost to de-risk the program that was identified by MPI are primarily driven by the additional 20 months to flatten the delivery schedule. \$37.9M attributable to the 20-month addition and an additional \$23.1M to retain resources and vendor services to de-risk the gaps that were identified during the first 6 months of delivery.

\$31.5M was recommended by McKinsey as opportunities to de-risk budget delivery. In MPI's review of these de-risk opportunities, it was identified that an additional \$3.1M would be required to fund resource gaps to execute on the recommendations (totaling \$34.6M). McKinsey leveraged their proprietary research as well as the experience of leaders in its Value Assurance practice to test NOVA against industry standard reasons for cost or schedule overruns.

- b) In MPI's re-baseline process and with support and validation from McKinsey's assessment, it was determined that the original project benefits and objectives supported the additional spend. Reducing scope would put at risk MPI's ability to achieve critical objectives of reducing technology risk, enabling customer self-service, improving information security, enabling future business agility and achieving cost savings and operational efficiencies.

**CAC (MPI) 2-8**

<b>Part and Chapter:</b>	<b>PART IV – NOV</b>	<b>Page No.:</b>	<b>26 of 32</b>
<b>PUB Approved Issue No:</b>	<b>19. IT Projects</b>		
<b>Topic:</b>	<b>Key drivers of Project Nova cost increase</b>		
<b>Sub Topic:</b>	<b>De-risking costs</b>		

**Preamble to IR:**

In the “Nov.6 Business Case”, on page 26 lines 3 to 11, MPI indicates that flattened delivery adjustments increased the delivery timeline and added \$61M in new costs.

**Question:**

- a) Please confirm that a Flattened Delivery indicates the same is work being performed only over a lengthened time period.
- b) Given that compressed timelines usually involve overtime charges and use of more expensive contract resources, they are typically associated with additional costs. Please explain why changing to a longer timeline is incurring \$11.3M in addition resource costs.
- c) Similar to b), please explain why the integrator costs did not remain the same in the flattened delivery, but instead increased by \$17.8M.
- d) Regarding the \$7M in additional licensing and subscription costs at line 7, please confirm whether these costs were included in the original project budget. Please explain whether these costs are simply shifting from being in the operating budget to the development budget due to the longer period of time project Nova is in development.

**Rationale for Question:**

To better understand the relationship between the flattened delivery and project costs.

**RESPONSE:**

- a) Yes, a Flattened Delivery indicates the same scope of work over a longer period of time, allowing for the reduction of parallel work and moving to a more sequential delivery model for the four major releases (R1A,R2A,R3A,R4A) and three minor releases (R2B,R3B,R4B). Project Nova leadership identified the parallel work as a main risk/issue that needed to be de-risked to alleviate organizational capacity and capability constraints.
- b) The original three-year timeline was not staffed with expensive consultants and did not budget for significant overtime. The constraint in resources that required MPI to extend the delivery timeline to 5 years concerned critical MPI resources such as Product Managers, Product Owners, UX Designers, Technical Leads and Business Subject Matter Experts.
- c) MPI extended the program by 20 months, which was roughly 50% of the original timeline. However, none of the costs, including the SI costs, increased by 50%. All of the costs took into account the fact that the scope was remaining the same but being delivered over a longer period of time. The longer period of time is the main driver for the increase in costs.
- d) Yes, these costs are 100% shifting from operational budget to project budget as the flattened delivery schedule runs for a longer period of time. This is not an increase to program spend, simply to what budget covers the cost.



**CAC (MPI) 2-9**

<b>Part and Chapter:</b>	<b>PART IV – IT, NOV IT Appendix 6</b>	<b>Page No.:</b>	<b>“IT Benchmarking” (no page numbers)</b>
<b>PUB Approved Issue No:</b>	<b>19.</b>		
<b>Topic:</b>	<b>IT Benchmarking</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

The IT Benchmarking timeline indicates that MPI received a Letter of Withdrawal from one prospective vendor on December 11, 2019.

**Question:**

If MPI is aware of the reason for the withdrawal, please provide an explanation. Please also explain whether or not MPI considered whether the withdrawal was relevant to the benchmarking process, and if so, whether changes to the process were contemplated. If yes, please describe the changes contemplated and related decisions.

**Rationale for Question:**

To understand the vendor selection process for the IT Benchmarking exercise for the purpose of assessing the benchmarking results.

**RESPONSE:**

The prospective vendor that submitted a Letter of Withdrawal on December 11, 2019 did not formally or informally provide a reason for the withdrawal. There is nothing that would lead MPI to speculate that the withdrawal was relevant to the benchmarking process or to consider changes to the process.

**CAC (MPI) 2-10**

<b>Part and Chapter:</b>	<b>PART IV – IT, NOV IT Appendix 6</b>	<b>Page No.:</b>	<b>“IT Benchmarking” (no page numbers)</b>
<b>PUB Approved Issue No:</b>	<b>19. IT Projects</b>		
<b>Topic:</b>	<b>IT Benchmarking</b>		
<b>Sub Topic:</b>	<b>Gartner</b>		

**Preamble to IR:****Question:**

Please provide documentation of the scope of work assigned to Gartner by MPI. If it is not possible to provide documentation, please provide a description of the scope of work assigned to Gartner.

**Rationale for Question:**

To inform an assessment of the IT Benchmarking process underway.

**RESPONSE:**

Please see *Attachment A - The Gartner Scope of Work*, which MPI files confidentially.

**Attachment A:  
Information Technology Benchmarking Services**

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This material is the subject of a confidential motion.

**CAC (MPI) 2-11**

<b>Part and Chapter:</b>	<b>PART IV – Information Technology, Project Nova</b>	<b>Page No.:</b>	
	<b>IT Appendix 5</b>		
<b>PUB Approved Issue No:</b>	<b>19. IT Projects</b>		
<b>Topic:</b>	<b>Risk Registry</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):****Question:**

- a) Please identify whether, and if so, where in the Risk Registry MPI has considered its dependency on Vendors.
- b) Please provide a narrative describing the dependencies, potential impacts and mitigation strategies in place relevant to risks associated with MPI's dependency on Vendors.

**Rationale for Question:**

To understand MPI's vendor dependency risk.

**RESPONSE:**

- a) MPI's dependence on vendors is a Moderate risk.
- b) The MPI 2.0 vision relies on vendors to supply software and platforms. There are numerous benefits to this strategy (reduced time to operationalize, reduced maintenance and infrastructure costs, use of mature products, following industry best practices, etc.); however, the increase in the number of vendors does

increase the level of vendor risk when compared against solutions developed in-house.

The largest vendor-specific risk is unplanned system outages. When a vendor's platform or application becomes unavailable, MPI is reliant on the vendor to troubleshoot and resolve the cause of the outage, then restore the system to an operational level. During this time, users of the system are typically unable to complete their activities.

Another vendor-specific risk is application and platform performance. The speed at which an application responds to user requests or computes the outcomes of certain actions can be negatively impacted during peak usage periods as the application or platform becomes strained by the increased number of requests.

System outage risk is mitigated operationally by engaging with vendors whose solutions implement the concept of High Availability, and contractually by Service Level Agreements (SLAs). High Availability solutions are developed to ensure minimal to no downtime by automatically redirecting to secondary components if any components unexpectedly fail. The level of High Availability is defined in the SLA within the contract of every technology vendor, and is based on the criticality of the system to MPI. Typical requirements range from 99.8% to 99.99+% monthly uptime. A vendor's failure to achieve this level of support results in financial penalties to the vendor (also defined in the SLA).

Vendor risk is also mitigated by MPI's Data Management & Analytics (DMA) strategy. When data is stored within vendor solutions, MPI ensures that the data relevant to MPI is regularly brought into the MPI data environment using automated processes. This allows the DMA team to perform data analysis activities, and ensures MPI has a version of the data that can be used to migrate to a new application or platform if the vendor cannot meet their contractual obligations (where MPI finds it necessary to engage with a new vendor).

Application performance risks are mitigated by the "Cloud-First" strategy under MPI 2.0. Applications and platforms built on cloud infrastructure are generally

more capable of offloading their work to higher-performing IT infrastructure in periods of increased activity than applications running in a data centre.

**CAC (MPI) 2-12**

<b>Part and Chapter:</b>	<b>PART IV – IT</b>	<b>Page No.:</b>	
<b>PUB Approved Issue No:</b>	<b>19.</b>		
<b>Topic:</b>	<b>Lean Portfolio Management</b>		
<b>Sub Topic:</b>			

**Preamble to IR:**

The Lean Business Case template provided in, for example, VM Appendix 1 appears to

1. exclude a cost/benefit analysis;
2. exclude an analysis of the proposed action versus the status quo; and
3. exclude important objective measures such as financial return/benefit, cost savings, internal rate of return and/or payback;

**Question:**

- a) With the considerations noted above missing from the Lean Business Case process, please explain how competing projects are weighed against one another without significant consideration of financial impact or benefit?
- b) Please explain how the LPM Committee avoids bias toward change considering that the LPM process appears to exclude consideration of maintenance of the status quo?

**Rationale for Question:**

To understand how Lean Portfolio Management informs prudent business decision making.

**RESPONSE:**

- a) Financial impact or benefit is given due consideration when weighing projects against one another. In addition to the Lean Business Case as described in PUB (MPI) 1-105, the Weighted Shortest Job First (WSJF) prioritization model is also used to sequence jobs to produce maximum economic benefits. Please see response to PUB (MPI) 1-105 for additional information.

In addition to WSJF, MPI has again started to incorporate Project Financials into the Lean Business Case. The project financials include but are not limited to Net Present Value (NPV), Minimum Viable Product (MVP) Costs and Full Project Costs.

As the LPM process continues to mature, Value Assurance and Value Management are foremost considerations to ensure the proper requirements and governance continue to be in place.

- b) The LPM process also gives consideration to the status quo. This is evident in the Epic Hypothesis Statement (EHS) wherein the proposed solution is described in comparison/contrast to the current solution, as applicable. In addition, the Lean Business Case also identifies Alternative Solutions, including maintaining the status quo as an option. The "Alternative Solutions" section includes evaluation areas such as the benefits, costs and risks of not selecting the identified alternative solutions.

The Lean Business Case includes a section describing Risks/Obstacles of NOT proceeding with the Project.

The above information contributes largely in leading to unbiased LPM decisions towards change.



**CAC (MPI) 2-13**

<b>Part and Chapter:</b>	<b>PART IV – NOVA Project</b>	<b>Page No.:</b>	<b>29 of 32</b>
<b>PUB Approved Issue No:</b>	<b>19.</b>		
<b>Topic:</b>	<b>Security Software Savings</b>		
<b>Sub Topic:</b>			

**Preamble to IR:**

On Page 29 of the Nova chapter at lines 1 to 5, the GRA refers to “removing \$19.8M in ongoing benefits tied to security software savings”.

**Question:**

Please provide a narrative reconciling this change in projected savings with the fact that Project Nova represents moving to commercial software products offered by Tier 1 organizations whose value proposition includes the security of their software, as well as hosted solutions which shift the burden of security from MPI to the hosting provider.

**Rationale for Question:**

To understand the change in security software savings.

**RESPONSE:**

The security software savings that were removed were associated with the additional costs that MPI originally estimated (\$1.5M per annum) as being required for a new security solution for MPI’s legacy systems. It was a cost avoidance benefit identified in the original business case. As part of the 2022 Re-Baseline, IT leadership and external consultant McKinsey reviewed this benefit and decided that it could no longer be justified as a cost avoidance item. Further discussions revealed that special

software or services were not required to protect the legacy systems, so the ongoing benefit was removed.

The statement regarding the move to Tier 1 providers with enhanced security within their hosted solutions, and a shift of some security aspects from MPI to the hosting provider is a valid one. MPI's Information Security Office will work with all new providers to monitor and evaluate security features, processes and maturity so that MPI information is protected and with proper controls in place.

**CAC (MPI) 2-14**

<b>Part and Chapter:</b>	<b>PART V – CI</b>	<b>Page No.:</b>	<b>Page 45 of 95</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Collision</b>		
<b>Sub Topic:</b>	<b>Total Loss Frequency</b>		

**Preamble to IR:**

Section CI.9.1.2 indicates at line 2 of page 45 that in order to develop total loss frequency, “MPI trended the 2010-2019 frequency into the forecast years.” Figure CI-33 does not include the relevant frequency metrics for 2010/11 and 2011/12.

**Question:**

Please provide total loss frequency for 2010/11 and 2011/12.

**Rationale for Question:**

To replicate MPI’s calculation for the 2022/23 total loss frequency for collision.

**RESPONSE:**

The collision total loss frequency for 2010/11 is 0.028, while the 2011/12 frequency is 0.026.

**CAC (MPI) 2-15**

<b>Part and Chapter:</b>	<b>PART VI – RM, Appendix 9</b>	<b>Page No.:</b>	<b>Page 9 of 165</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Collision</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

In response to CAC (MPI) 1-48, MPI acknowledged a labeling error in Figure CI-39. It appears that labeling error flows through to the development of Rating Year Claim Costs in Table 2 for Collision.

**Question:**

Please confirm the consistency with the undiscounted claim amounts from Part VI – RM, Appendix 9, Table 2 (Collision) and CAC (MPI) 1-48, Figure 1.

**Rationale for Question:**

To clarify data presented due to labeling error.

**RESPONSE:**

Confirmed, the corrected table is included in the Error and Omissions filing, *MPI Exhibit #38*.

**CAC (MPI) 2-16**

<b>Part and Chapter:</b>	<b>PART VI – RM Appendix 9</b>	<b>Page No.:</b>	<b>Pages 2-11 of 165</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Rating Year Claim Costs</b>		
<b>Sub Topic:</b>			

**Preamble to IR:**

The column sums for the “rating year 2023/24 undiscounted reported” and rating year 2022/23 undiscounted paid in the various “Table 2”s in the page range identified above do not agree.

**Question:**

Please indicate the reasons for these differences and any implications on the determination of the rate indication.

**Rationale for Question:**

To understand the consistency in paid and reported projections.

**RESPONSE:**

The differences between the reported and paid claim costs (based on the rating year) arise from the manner in which rating year claim costs are calculated. An explanation of how the rating year claim costs are calculated using accident year claim costs can be found under *Rate-making Chapter RM.4.2.1 Rating Year Claim Costs*. This calculation is outlined in the notes for each table in *Appendix 9 Table 2 - Rating Year 2023/24 Claims Costs*. The calculation results in small differences between total paid and total reported claim costs (based on the rating year) because the conversion of

accident year based claim costs to rating year based claim costs is different for paid claim costs than it is for reported claim costs.

**CAC (MPI) 2-17**

<b>Part and Chapter:</b>	<b>PART V – CI</b>	<b>Page No.:</b>	<b>Page 24 of 95</b>
	<b>CAC (MPI) 1-45</b>		
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Weekly Indemnity</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

Figure 2 of the response to CAC (MPI) 1-45 includes an average severity for three claim groupings and the overall average.

**Question:**

Please provide the claim counts underlying each of the averages presented in Figure 2 of the response to CAC (MPI) 1-45.

Please provide a narrative discussion as to the process used to develop the average severity values in Figure 2 of the response to CAC (MPI) 1-45. Please include MPI's approach to considering development in the response.

**Rationale for Question:**

Clarity in approach and methodology used by MPI.

**RESPONSE:**

The underlying claim counts are provided below:

**Figure 1 Weekly Indemnity Claim Counts by Size**

Line No.	Accident Year	Claim Counts			
		HTA Earned Units	Third Party Deductible	Third Party Loss of Use	Other Property Damage
1	2004/05	1,974	38	48	2,060
2	2005/06	1,848	44	57	1,949
3	2006/07	1,967	38	81	2,086
4	2007/08	1,935	49	79	2,063
5	2008/09	1,766	42	77	1,885
6	2009/10	1,748	43	70	1,861
7	2010/11	1,810	39	99	1,948
8	2011/12	1,714	42	87	1,843
9	2012/13	1,870	52	85	2,007
10	2013/14	1,751	47	77	1,875
11	2014/15	1,585	28	71	1,684
12	2015/16	1,653	45	87	1,785
13	2016/17	1,668	33	107	1,808
14	2017/18	1,792	35	104	1,931
15	2018/19	1,783	16	99	1,898
16	2019/20	1,620	20	110	1,750
17	2020/21	1,111	99	61	1,271
18	2021/22	1,384	137	34	1,555

To derive the average severity values, each claims incurred amount is developed to ultimate, and claims are categorized based on these amounts. Then, average severities are calculated as total ultimate incurred (for the given group and year) divided by the number of claims.



**CAC (MPI) 2-18**

<b>Part and Chapter:</b>	<b>Part V - CI</b>	<b>Page No.:</b>	<b>Page 78-79 of 95</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Property Damage</b>		
<b>Sub Topic:</b>			

**Preamble to IR:****Question:**

Please provide the claim counts and HTA by accident year and sub-coverage (third party deductible transfer, third party loss of use, other property damage). Please confirm if MPI is fitting linear or exponential regression models to the 2015-2019 frequency experience for these coverages.

**Rationale for Question:**

To reconcile to MPI's property damage frequency forecast, including clarification of the rounding of the frequency data presented in Figure CI-69.

**RESPONSE:**

MPI has fit a linear regression model to the 2015-2019 frequency experience for each of the listed coverages. HTA earned units and claim counts by sub-coverage are provided below:

**Figure 1 HTA Earned Units and Property Damage Claim Counts**

Line No.	Accident Year	HTA Earned Units	Claim Counts		
			Third Party Deductible	Third Party Loss of Use	Other Property Damage
1	2007/08	736,791	34,805	17,817	2,702
2	2008/09	752,983	35,572	18,140	2,837
3	2009/10	764,243	32,784	16,936	2,705
4	2010/11	775,557	38,421	19,235	2,796
5	2011/12	793,813	34,225	17,491	2,868
6	2012/13	812,141	39,356	20,495	3,009
7	2013/14	823,518	40,319	20,814	3,090
8	2014/15	835,178	34,781	18,100	2,948
9	2015/16	848,635	35,670	18,390	2,888
10	2016/17	861,942	36,279	18,693	3,058
11	2017/18	874,357	37,511	20,214	3,306
12	2018/19	882,537	36,172	18,867	2,898
13	2019/20	887,453	33,168	16,998	2,824
14	2020/21	891,738	21,919	10,425	2,108
15	2021/22	918,683	30,169	12,738	2,331

**CAC (MPI) 2-19**

<b>Part and Chapter:</b>	<b>Part V - CI</b>	<b>Page No.:</b>	<b>Page 80-81 of 95</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Property Damage - Severity</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

We note MPI relies heavily on latest severity observation (2021/22) for the property damage severity forecast. As an example, MPI's 2022/23 third party deductible transfer severity is equal to the 2021/22 observation, adjusted by \$125 to account for the impact of CERP times 1.0025 for the expected severity growth.

**Question:**

Please explain why MPI chose to rely on an adjustment to a single data observation rather than the fitted value from a regression model which considers multiple data observations and historical trend simultaneously.

Please also provide an explanation of the large increase in third party deductible transfer severity and third party loss of use severity between 2020/21 and 2021/22.

**Rationale for Question:**

To better understand development of property damage severity.

**RESPONSE:**

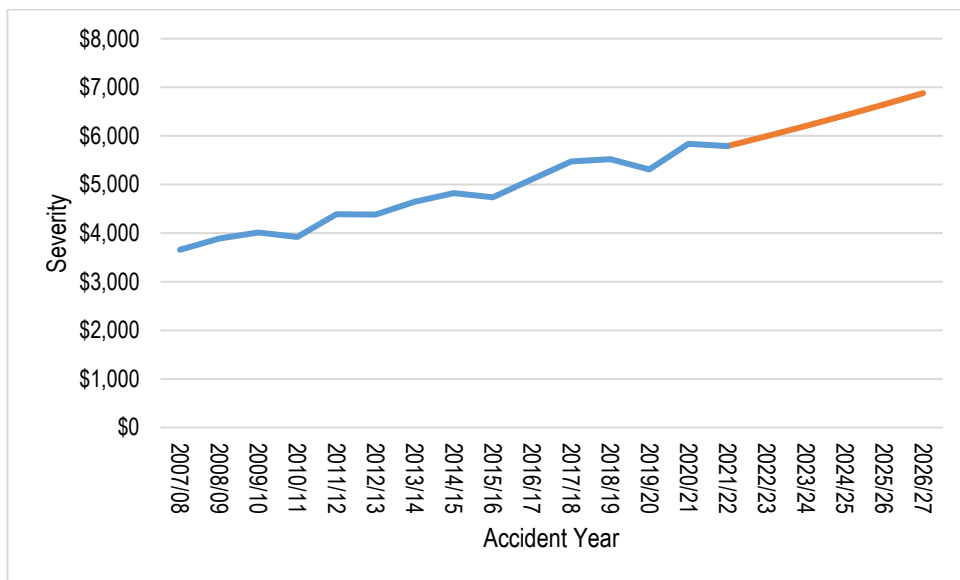
For Property Damage All Other, MPI selected the latest severity and grew it by the long term average, resulting in a forecast very close to the linear trend.

Regarding Property Damage Third Party Loss of Use: between 2020/21 and 2021/22, supply chain issues increased repairs times. As a result loss of use severity saw a large increase. Without a clear indication of when this will return to pre-COVID-19 levels, MPI selected a 2-year weighted average (33%/67% weighting for 2020/21 and 2021/22 respectively) of \$437 with 1.75% growth which follows the 10-year trend. The resulting forecast falls within the historical range of severity amounts.

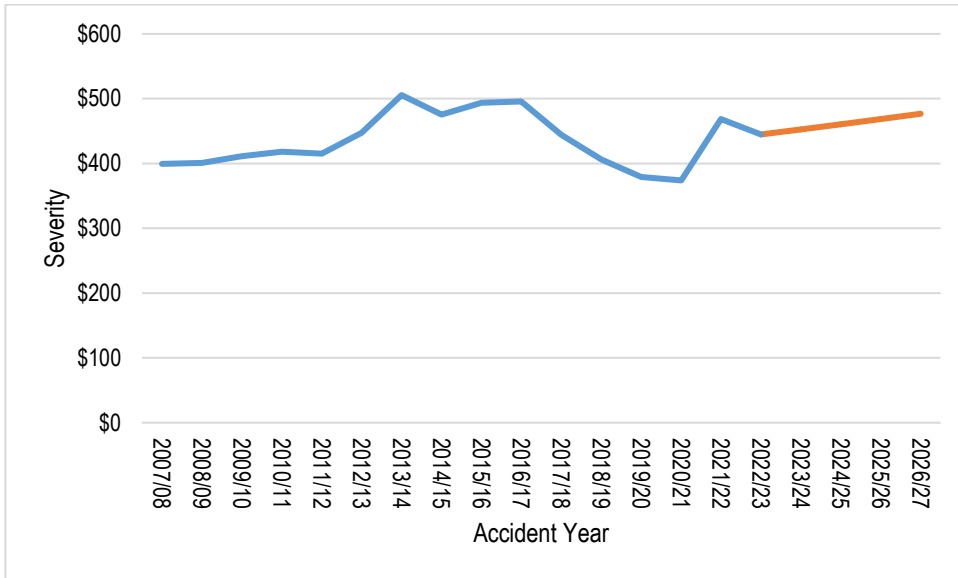
Between 2020/21 and 2021/22 the Basic deductible increased from \$500 to \$750. On average, half of Basic policies include the new deductible throughout 2021/22. As a result, Property Damage Third Party Deductible Transfer saw an increase in severity roughly equal to half this deductible change. MPI adjusted the latest severity to account for the remaining policies that were not yet on the new Basic deductible. This adjusted severity, which is estimated to fully account for the one time deductible shift, was then increased by 0.25% which is based on the long term growth rate excluding 2021. The Property Damage Third Party Deductible Transfer severity is historically very stable as the deductible is a fixed amount.

Graphs displacing historical and selected severities are provided below:

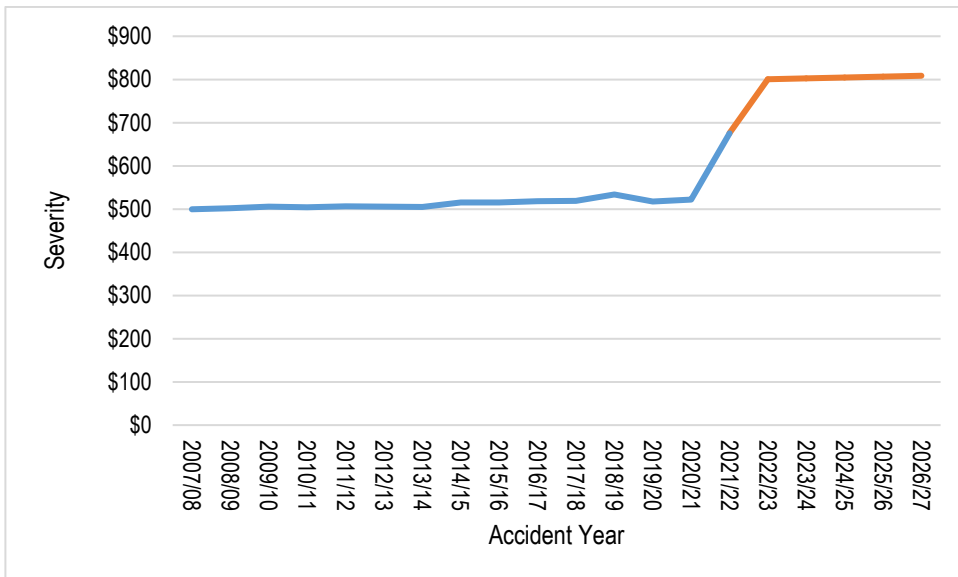
**Figure 1 Property Damage All Other Severity Graph**



**Figure 2 Third Party Loss of Use Severity Graph**



**Figure 3 Third Party Deductible Transfer Severity Graph**



**CAC (MPI) 2-20**

<b>Part and Chapter:</b>	<b>PART VI – RM Appendix 9</b>	<b>Page No.:</b>	<b>Page 5 of 165</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Accident Benefits – Other (Indexed)</b>		
<b>Sub Topic:</b>			

**Preamble to IR:**

Table 2 for Accident Benefits - Other (Indexed) presents 2022/23 rating year claim costs. The accident year headers are 2022/23 and 2023/24.

**QUESTION:**

Please confirm the years in Table 2 for Accident Benefits - Other (Indexed).

**RATIONALE FOR QUESTION:**

Clarity on data presented.

**RESPONSE:**

MPI confirms that the accident year headers should be 2023/24 and 2024/25. The revised Table 2 for Accident Benefits – Other (Indexed) can be found in the Errors and Omissions filing (*MPI Exhibit #33*).

**CAC (MPI) 2-21**

<b>Part and Chapter:</b>	<b>Part V – Claims Incurred Fig CI-66</b>	<b>Page No.:</b>	<b>Page 51-76 of 95</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>			
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

Estimates for comprehensive consider the frequency and severity for several perils.

**Question:**

Please provide a table of frequency and severity selections by peril underlying the estimates in Figure CI- 66. Please also include the HTA units in the table.

**Rationale for Question:**

To summarize the actuarial assumptions underlying the comprehensive claims incurred.

**RESPONSE:**

Frequency and severity selections by peril, as well as HTA units selections are provided below:

**Figure 1 HTA Earned Units, Frequency and Severity Selections by Peril**

Line No.	Peril	Selected Frequency					Selected Severity				
		2022/23	2023/24	2024/25	2025/26	2026/27	2022/23	2023/24	2024/25	2025/26	2026/27
1	<b>Glass</b>	0.034	0.035	0.036	0.037	0.038	370	392	416	440	467
2	<b>Hail</b>	0.006	0.006	0.006	0.006	0.006	3,490	3,615	3,743	3,875	4,013
3	<b>Vandalism</b>	0.008	0.008	0.008	0.008	0.008	1,866	1,930	1,997	2,066	2,137
4	<b>Rodents</b>	0.002	0.002	0.002	0.002	0.002	1,770	1,814	1,860	1,907	1,956
5	<b>Theft</b>	0.005	0.005	0.005	0.005	0.005	4,779	4,893	5,011	5,131	5,254
6	<b>Other</b>	0.007	0.007	0.007	0.007	0.007	3,755	3,901	4,053	4,212	4,376
7											
8		<b>2022/23</b>	<b>2023/24</b>	<b>2024/25</b>	<b>2025/26</b>	<b>2026/27</b>					
9	<b>HTA Units</b>	932,897	942,908	953,029	963,262	973,606					



**CAC (MPI) 2-22**

<b>Part and Chapter:</b>	<b>Part VI - RM Appendix 9</b>	<b>Page No.:</b>	<b>Pages 2-11 of 165</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Seasonality</b>		
<b>Sub Topic:</b>			

**Preamble to IR:**

There is often seasonality in claims experience.

**Question:**

Please provide the number of policies (HTA units) written by month between 2015/16 and 2019/20.

For each coverage, please provide the number of claims reported by month between 2015/16 and 2019/20.

**Rationale for Question:**

To test the reasonableness of the factors used to attribute accident year costs to rating year.

**RESPONSE:**

Please see *Figure 1* for the number of written policies by month between 2015/16 and 2019/20 below. MPI grouped the written policies by month based on the latest effective month in a given year; as a result, the data is skewed to the later months. MPI believes that a better representation of this figure is based on earned units. *Figure 2* shows the number of earned policies by month between 2015/16 and 2019/20. Claims by reporting month would misrepresent the effect of seasonality,

since there may be a reporting delay. Therefore, we have shown the claim count by loss month, which is a better indicator of the seasonality in claim counts. *Figure 3* shows the number of ultimate claim counts by loss month between 2015/16 and 2019/20.

**Figure 1 Number of Policies (HTA Units) Written by Month Between 2015/16 and 2019/20**

Line No.		HTA Units				
		2015/16	2016/17	2017/18	2018/19	2019/20
1	April	61,166	62,590	62,519	63,662	64,169
2	May	64,537	67,001	68,360	68,676	68,471
3	June	64,156	65,598	66,025	66,092	65,036
4	July	76,939	74,227	77,084	78,818	78,812
5	August	76,947	78,501	80,136	81,607	80,054
6	September	87,169	87,569	88,487	88,433	88,346
7	October	97,889	96,582	101,152	100,810	100,464
8	November	100,315	100,752	103,008	101,952	100,423
9	December	100,052	100,882	98,982	98,535	98,791
10	January	98,828	101,190	103,898	103,217	103,517
11	February	101,718	102,744	103,978	104,244	105,893
12	March	157,480	160,228	158,406	160,554	161,257
13	<b>Total HTA Units</b>	<b>1,087,196</b>	<b>1,097,864</b>	<b>1,112,035</b>	<b>1,116,600</b>	<b>1,115,233</b>

**Figure 2 Number of Policies (HTA Units) Earned by Month Between 2015/16 and 2019/20**

Line No.		HTA Units				
		2015/16	2016/17	2017/18	2018/19	2019/20
1	April	68,330	69,198	70,379	70,941	71,681
2	May	72,130	73,170	74,271	75,147	75,617
3	June	70,664	71,627	72,738	73,564	74,046
4	July	73,553	74,495	75,654	76,465	77,035
5	August	73,876	74,901	76,004	76,769	77,306
6	September	71,609	72,638	73,681	74,322	74,825
7	October	73,647	74,556	75,753	76,209	76,726
8	November	70,086	71,090	71,884	72,476	72,863
9	December	71,125	72,137	73,073	73,711	74,171
10	January	70,253	71,250	72,317	72,943	73,362
11	February	63,214	64,166	65,055	65,560	66,038
12	March	70,280	71,257	72,226	72,736	73,280
13	<b>Total HTA Units</b>	<b>848,766</b>	<b>860,486</b>	<b>873,035</b>	<b>880,842</b>	<b>886,950</b>

**Figure 3** Number of Ultimate Claims by Loss Month Between 2015/16 and 2019/20

Line No.		Collision Claim Counts				
		2015/16	2016/17	2017/18	2018/19	2019/20
1	<i>(\$000's, except where noted)</i>					
3	<b>April</b>	6,933	7,312	7,099	7,074	6,483
4	<b>May</b>	7,364	7,703	7,576	7,515	6,892
5	<b>June</b>	7,543	8,120	7,924	7,528	7,349
6	<b>July</b>	7,500	8,005	7,829	7,521	7,483
7	<b>August</b>	7,419	7,904	7,594	7,655	7,454
8	<b>September</b>	7,819	7,938	8,046	7,745	7,684
9	<b>October</b>	8,364	8,705	9,268	8,664	10,371
10	<b>November</b>	9,749	9,222	10,955	9,953	10,223
11	<b>December</b>	11,307	13,090	12,299	10,570	10,810
12	<b>January</b>	10,703	12,446	11,453	11,849	11,117
13	<b>February</b>	9,174	9,162	9,846	12,416	8,011
14	<b>March</b>	8,418	8,670	8,578	8,297	6,374
15	<b>Total Collision Claim Counts</b>	<b>102,293</b>	<b>108,278</b>	<b>108,467</b>	<b>106,787</b>	<b>100,252</b>
		Comprehensive Claim Counts				
		2015/16	2016/17	2017/18	2018/19	2019/20
16	<i>(\$000's, except where noted)</i>					
17	<b>April</b>	4,793	4,947	4,761	4,974	5,003
18	<b>May</b>	5,383	5,673	5,398	6,303	5,546
19	<b>June</b>	8,107	10,444	6,292	12,608	6,381
20	<b>July</b>	9,701	10,268	7,896	7,136	7,687
21	<b>August</b>	10,765	8,423	6,567	9,070	6,789
22	<b>September</b>	5,644	5,829	5,729	5,920	8,065
23	<b>October</b>	5,654	5,122	5,963	5,616	6,626
24	<b>November</b>	4,610	4,739	4,493	4,647	4,652
25	<b>December</b>	3,881	4,321	3,823	3,858	4,063
26	<b>January</b>	3,924	4,484	4,164	4,478	4,592
27	<b>February</b>	3,864	3,638	3,863	4,083	4,335
28	<b>March</b>	4,755	4,564	4,590	4,654	4,655
29	<b>Total Comprehensive Claim Counts</b>	<b>71,081</b>	<b>72,452</b>	<b>63,539</b>	<b>73,347</b>	<b>68,395</b>

**Number of Ultimate Claims by loss Month Between 2015/16 and 2019/20 (cont'd)**

Line No.		Property Damage Claim Counts				
		2015/16	2016/17	2017/18	2018/19	2019/20
30	<i>(\$000's, except where noted)</i>					
31	April	3,779	3,903	3,848	3,809	3,524
32	May	4,101	4,266	4,388	4,270	3,818
33	June	4,295	4,338	4,456	3,942	3,916
34	July	3,983	4,190	4,100	3,963	3,751
35	August	4,033	4,284	4,257	4,081	3,919
36	September	4,307	4,174	4,433	4,180	4,187
37	October	4,563	4,426	4,856	4,287	5,011
38	November	4,875	4,327	5,743	4,909	4,989
39	December	6,618	7,500	7,296	5,966	5,886
40	January	6,306	7,054	6,678	6,688	6,329
41	February	5,347	5,091	6,067	7,333	4,486
42	March	4,741	4,476	4,908	4,506	3,174
43	<b>Total Property Damage Claim Counts</b>	<b>56,948</b>	<b>58,030</b>	<b>61,031</b>	<b>57,937</b>	<b>52,990</b>

Line No.		Public Liability Claim Counts				
		2015/16	2016/17	2017/18	2018/19	2019/20
44	<i>(\$000's, except where noted)</i>					
45	April	1	7	6	4	6
46	May	9	6	3	1	3
47	June	4	3	10	2	9
48	July	10	11	4	7	9
49	August	10	6	12	9	6
50	September	12	11	5	10	10
51	October	9	5	3	5	5
52	November	8	8	9	7	7
53	December	8	7	7	7	6
54	January	5	11	8	13	4
55	February	4	2	8	6	8
56	March	6	6	8	7	2
57	<b>Total Public Liability Claim Counts</b>	<b>86</b>	<b>83</b>	<b>83</b>	<b>78</b>	<b>75</b>

**Number of Ultimate Claims by loss Month Between 2015/16 and 2019/20 (cont'd)**

		<b>ABO Indexed Claim Counts</b>				
		<b>2015/16</b>	<b>2016/17</b>	<b>2017/18</b>	<b>2018/19</b>	<b>2019/20</b>
58	<b>(\$000's, except where noted)</b>					
59	April	718	769	676	705	565
60	May	870	876	849	774	701
61	June	883	825	908	830	782
62	July	837	912	831	872	774
63	August	920	964	972	889	827
64	September	886	869	872	879	839
65	October	979	1,037	1,123	973	1,038
66	November	1,094	1,098	1,159	1,018	951
67	December	1,281	1,310	1,211	1,078	1,085
68	January	1,219	1,221	1,297	1,132	1,154
69	February	1,093	861	1,150	1,234	644
70	March	883	818	829	836	532
71	<b>Total ABO Indexed Claim Counts</b>	<b>11,663</b>	<b>11,560</b>	<b>11,876</b>	<b>11,220</b>	<b>9,892</b>

		<b>ABO NonIndexed Claim Counts</b>				
		<b>2015/16</b>	<b>2016/17</b>	<b>2017/18</b>	<b>2018/19</b>	<b>2019/20</b>
72	<b>(\$000's, except where noted)</b>					
73	April	74	110	59	76	74
74	May	112	125	120	108	115
75	June	93	105	142	123	134
76	July	134	159	144	128	127
77	August	149	138	135	148	146
78	September	116	122	116	137	152
79	October	146	116	147	150	138
80	November	111	122	74	124	110
81	December	79	101	74	100	108
82	January	95	79	71	108	110
83	February	55	60	99	89	77
84	March	70	71	82	98	72
85	<b>Total ABO NonIndexed Claim Counts</b>	<b>1,234</b>	<b>1,309</b>	<b>1,262</b>	<b>1,390</b>	<b>1,365</b>

**Number of Ultimate Claims by loss Month Between 2015/16 and 2019/20 (cont'd)**

Line No.		Weekly Indemnity Claim Counts				
		2015/16	2016/17	2017/18	2018/19	2019/20
86	<i>(\$000's, except where noted)</i>					
87	April	113	114	112	119	96
88	May	137	154	165	136	140
89	June	135	117	169	153	136
90	July	140	178	166	165	140
91	August	165	146	168	177	160
92	September	159	134	158	145	153
93	October	178	167	217	172	192
94	November	166	184	142	166	167
95	December	169	199	166	174	165
96	January	171	176	170	189	194
97	February	123	116	166	184	92
98	March	129	123	132	118	115
99	<b>Total Weekly Indemnity Claim Counts</b>	<b>1,785</b>	<b>1,808</b>	<b>1,931</b>	<b>1,898</b>	<b>1,750</b>

**CAC (MPI) 2-23**

<b>Part and Chapter:</b>	<b>Part V – CI</b>	<b>Page No.:</b>	<b>Page 24 of 95</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Accident Benefits Other – Indexed</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

Figure 2 of the response to CAC (MPI) 1-46 includes an average severity for three claim size groupings and the overall average.

**Question:**

Please provide the claim counts underlying each of the averages presented in Figure 2 of the response to CAC (MPI) 1-46.

Please provide a narrative discussion as to the process used to develop the average severity values in Figure 2 of the response to CAC (MPI) 1-46. Please include MPI's approach to consider development in the response.

**Rationale for Question:**

Clarity in approach and methodology by MPI.

**RESPONSE:**

Underlying claim counts are provided below:

**Figure 1 Accident Benefits Other Indexed Claim Counts By Size**

Line No.	Accident Year	Claim Counts			
		\$0-\$100,000	\$100,000-\$250,000	\$250,000+	\$0+
1	2004/05	11370	16	21	11407
2	2005/06	10834	21	29	10884
3	2006/07	11970	26	35	12031
4	2007/08	11829	32	28	11889
5	2008/09	11403	30	25	11458
6	2009/10	10972	33	28	11033
7	2010/11	12003	36	29	12068
8	2011/12	11133	32	33	11198
9	2012/13	12146	32	32	12210
10	2013/14	12157	31	21	12209
11	2014/15	10543	34	14	10591
12	2015/16	11593	44	26	11663
13	2016/17	11491	31	38	11560
14	2017/18	11803	43	31	11877
15	2018/19	11152	49	20	11221
16	2019/20	9830	38	26	9894
17	2020/21	6484	15	16	6515
18	2021/22	9655	5	15	9675

To derive the average severity values, each claims incurred amount is developed to ultimate, and claims are categorized based on these amounts. Then, average severities are calculated as total ultimate incurred (for the given group and year) divided by the number of claims.



**CAC (MPI) 2-24**

<b>Part and Chapter:</b>	<b>PART V – CI</b>	<b>Page No.:</b>	<b>Page 24 of 95</b>
<b>PUB Approved Issue No:</b>	<b>9. Claims Forecasting</b>		
<b>Topic:</b>	<b>Accident Benefits Other – Non-Indexed</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):**

Figure CI-23 includes an average severity for three claim size groupings.

**QUESTION:**

Please provide the claim counts underlying each of the averages presented in Figure CI-23.

Please provide a narrative discussion as to the process used to develop the average severity values in Figure CI-23. Please include MPI's approach to consider development in the response.

**Rationale for Question:**

Clarity in approach and methodology by MPI.

**RESPONSE:**

Claim counts by size grouping are provided below:

**Figure 1 Accident Benefits Other Non-Indexed Claim Counts By Size**

Line No.	Accident Year	Claim Counts			
		\$0-\$100,000	\$100,000-\$250,000	\$250,000+	\$0+
1	2004/05	1375	42	4	1421
2	2005/06	1426	36	9	1471
3	2006/07	1584	53	11	1648
4	2007/08	1451	44	7	1502
5	2008/09	1364	40	17	1421
6	2009/10	1401	34	10	1445
7	2010/11	1303	32	14	1349
8	2011/12	1557	43	8	1608
9	2012/13	1346	43	9	1398
10	2013/14	1225	30	11	1266
11	2014/15	1064	35	12	1111
12	2015/16	1195	31	8	1234
13	2016/17	1247	50	11	1308
14	2017/18	1224	27	14	1265
15	2018/19	1371	32	9	1412
16	2019/20	1372	29	8	1409
17	2020/21	1241	32	11	1284
18	2021/22	1532	15	8	1555

To derive the average severity values, each claims incurred amount is developed to ultimate, and claims are categorized based on these amounts. Then, average severities are calculated as total ultimate incurred (for the given group and year) divided by the number of claims.

**CAC (MPI) 2-25**

<b>Part and Chapter:</b>	<b>Part VII - INV Attachment C</b>	<b>Page No.:</b>	<b>Page 11 of 33</b>
<b>PUB Approved Issue No:</b>	<b>7. Investment Portfolio</b>		
<b>Topic:</b>	<b>Risk Tolerance</b>		
<b>Sub Topic:</b>			

**Preamble to IR:**

In Mercer's Phase II Report, Mercer makes several conclusions regarding the risk appetites related to MPI's goals<sup>1</sup>, some of which are reproduced in the table below:

<b>MPI Goal</b>	<b>Mercer Conclusion</b>
Medium appetite to keep foreign currency exposure unhedged due to the diversified nature of the exposure	Mercer's analysis supports unhedged positions for a Canadian investor. Historically, unhedged positions have resulted in lower volatility over time for a Canadian investor relative to a hedged approach.
No appetite for equity exposure in the Basic Claims portfolio	Current Basic portfolio has no equity exposure. Some consideration is being given to including equities for the long-tail portfolio of the Basic liabilities, however.
Medium risk appetite for unhedged equity exposure in RSR/EXT/SRE/EFB Portfolios	The current unhedged equity exposure in the RSR/EXT/SRE portfolios is 23% while for the EFB portfolio it is 25%. In Mercer's experience, this does not exceed a medium risk appetite, and may even perhaps be on the conservative side.

<sup>1</sup> Source: MPI Corporate Risk Appetite Statement as of November 12, 2020

**Question:**

- a) Would MPI agree that surplus volatility, as measured in the ALM Study, takes into account the various types or sources of investment risk in the assets and liabilities (e.g., equity risk, interest rate risk, currency risk, etc.)? Please confirm and provide an explanation.
- b) Please provide a narrative explaining why MPI sets different appetites for the different sources of risk (e.g., no appetite for equity exposure in the Basic Claims portfolio, medium appetite to keep foreign currency exposure unhedged), rather than focusing on the total portfolio's surplus volatility?

**Rationale for Question:**

To understand the rationale for having different appetites for different sources of risk.

**RESPONSE:**

- a) Yes, MPI agrees that surplus volatility, as measured in the ALM Study, takes into account the various types or sources of investment risk in the assets and liabilities.
- b) MPI's risk appetite statement provides an explanation of MPI's risk taking in alignment with statutory requirements, strategic objectives and capital planning. MPI must therefore set a unique risk appetite for each source of risk rather than having an overall risk appetite for the surplus volatility.

**CAC (MPI) 2-26**

<b>Part and Chapter:</b>	<b>PART VII – INV PART VII – RMF Appendix 3</b>	<b>Page No.:</b>	<b>17-18 of 85 1 of 1</b>
<b>PUB Approved Issue No:</b>	<b>7, 20</b>		
<b>Topic:</b>	<b>ALM Study</b>		
<b>Sub Topic:</b>	<b>MPI’s Inflation Risk Assessment and Assumptions in ALM Study</b>		

**Preamble to IR:**

In the response to CAC (MPI) 1-60, MPI/Mercer confirmed that the inflation assumptions used in the current ALM Study were unchanged from the previous Study (i.e., 2.0% average and 2.6% standard deviation).

In response to question e), Mercer said about 10% of their clients increased their inflation assumption.

**Question:**

Please confirm whether the “increase” in inflation assumptions described above relates to the a) average inflation rate; b) standard deviation of inflation rate; or both a) and b).

**Rationale for Question:**

Inflation is an important consideration in the ALM Study, given the inflation-sensitivity of certain liabilities, so the assumptions related to the inflation level (expected average rate) and volatility (standard deviation) are important inputs in the ALM Study.

**RESPONSE:**

The increase to the inflation assumption was to the average inflation rate only.

**CAC (MPI) 2-27**

<b>Part and Chapter:</b>	<b>PART I – OV PART VII – INV Attachment C</b>	<b>Page No.:</b>	<b>3 of 13 31 of 33</b>
<b>PUB Approved Issue No:</b>	<b>7, 20</b>		
<b>Topic:</b>	<b>ALM Study</b>		
<b>Sub Topic:</b>	<b>Capital Market Assumptions (Inflation and Liability Benchmark Portfolio)</b>		

**Preamble to IR (If Any):**

The response to CAC (MPI) 1-61 says: "Standard deviation assumptions are **reviewed\*** annually, but not necessarily **updated/changed\***. Given that Mercer assumptions are long-term in nature, it does not expect to change these assumptions regularly, unless there is a fundamental change in the risk profile of an asset class."

**\* Bolded (emphasized) by MPI or Mercer**

MPI's response to CAC (MPI) 1-63 b) says: "One of the objectives of the ALM Study is to develop an optimal asset mix policy in light of the liability characteristics, if applicable. The goal is not to create an asset mix with the lowest absolute volatility (in isolation, volatility is not a key consideration). LBP represents the investment portfolio that will match as close as possible the movement of the liabilities. **The volatility of the LBP itself is not relevant.\*\***"

**\*\* Bolded (emphasized) by CAC**

**Question:**

- a) Please indicate how strongly MPI/Mercer agrees or disagrees with these statements over the period between the current ALM Study and the prior ALM Study (when capital market assumptions were established)?

- i. There has not been a fundamental change in the risk profile of **RRBs**.
  - ii. There has not been a fundamental change in the risk profile of MPI's **Basic Liabilities**.
  - iii. There has not been a fundamental change in the risk profile of MPI's **Pension Plan Liabilities**.
- b) Please clarify the statement that "the volatility of the LBP itself is not relevant", noting that the volatility of the LBP is related to its duration and duration-matching of the portfolio is a key investment strategy at MPI.

**Rationale for Question:**

To clarify responses to information requests.

**RESPONSE:**

- a)
- i. MPI and Mercer strongly agree that there has not been a fundamental change in the risk profile of **RRBs**. Specifically, Mercer's standard deviation assumption for RRBs is the same for the current ALM Study as it was for the prior ALM Study. Inflation expectations were considered low at the time of the prior ALM Study and hence the focus of the interest rate matching was the nominal liabilities, so RRBs were ultimately not recommended. Given current high inflation expectations, there was a higher emphasis on real liabilities and the potential role of RRBs in the current ALM Study.
  - ii. MPI and Mercer strongly agree that there has not been a fundamental change in the risk profile of MPI's **Basic Liabilities**. The duration (real and nominal) profile of the Basic Liabilities is not considered to be materially different between the current ALM Study and the prior ALM Study.



- iii. MPI and Mercer strongly agree that there has not been a fundamental change in the risk profile of MPI's **Pension Plan Liabilities**. Note that Employee Future Benefits (EFB) were modelled in aggregate in the current ALM Study, whereas the prior ALM Study modelled Pension Plan Liabilities only. Regardless, the duration (real and nominal) profile of the Pension Plan Liabilities is not considered to be materially different between the current ALM Study and the prior ALM Study.
- b) This statement that "the volatility of the liability benchmark portfolio (LBP) itself is not relevant" was meant to highlight that the development of the various asset mixes was optimized based on the volatility of the net funded status (asset portfolio minus LBP, referred to as the surplus volatility). And similarly, any asset mix decision should be driven by the surplus volatility, rather than the volatility of the asset-only or liability-only (i.e., LBP) portfolios. MPI confirms that the volatility of the LBP is tied to the duration of the liabilities and is directly incorporated into the surplus volatility.

**CAC (MPI) 2-28**

<b>Part and Chapter:</b>	<b>PART V – Forecasting</b>	<b>Page No.:</b>	
<b>PUB Approved Issue No:</b>	<b>4. Financial Forecast</b>		
<b>Topic:</b>	<b>Interest Rates</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):****Question:**

- a) Please confirm that the target for the overnight interest rate dictated by the Bank of Canada is an important tool in financial forecasting for MPI.
- b) Please provide the Bank of Canada overnight rate targets issued in the past 12 months.

**Rationale for Question:**

To inform an assessment of MPI's financial forecasting exercises.

**RESPONSE:**

- a) The target for the overnight interest rate dictated by the Bank of Canada is not used in MPI's financial forecasting model. The proxy for short-term interest rates used in MPI's financial model is the yield on the 91-day Treasury bill.
- b) *Figure 1* below sets out the Bank of Canada overnight rate targets issued in the past 12 months. This information was also provided in response to *PUB (MPI) 1-16(b)*, with the exception of the most recent increase on September 7, 2022.

**Figure 1 Bank of Canada Overnight Rate Targets**

Line No.	<u>Date</u>	<u>Increase</u>	<u>Overnight Rate</u>
1	8-Sep-21	0.00%	0.25%
2	27-Oct-21	0.00%	0.25%
3	8-Dec-21	0.00%	0.25%
4	26-Jan-21	0.00%	0.25%
5	2-Mar-22	0.25%	0.50%
6	13-Apr-22	0.50%	1.00%
7	1-Jun-22	0.50%	1.50%
8	13-Jul-22	1.00%	2.50%
9	7-Sep-22	0.75%	3.25%

**CAC (MPI) 2-29**

<b>Part and Chapter:</b>	<b>PART V – Forecasting</b>	<b>Page No.:</b>	
<b>PUB Approved Issue No:</b>	<b>4. Financial Forecast</b>		
<b>Topic:</b>	<b>Inflation Forecasting</b>		
<b>Sub Topic:</b>			

**Preamble to IR:****Question:**

- a) Please confirm that inflation projections are an important tool in financial forecasting for MPI.
- b) Please confirm that MPI relies on inflation projections issued by the Bank of Canada in its quarterly Monetary Policy Reports.
- c) Please file a copy of each of the four most recent Bank of Canada Monetary Policy Reports.

**Rationale for Question:**

To inform an assessment of the role of inflation in MPI's financial forecasting.

**RESPONSE:**

- a) MPI confirms that inflation projections are an important tool in its financial forecasting.
- b) MPI relies on inflation projections issued by the Canadian chartered banks and IHS Markit Global Insight. MPI does not rely on inflation projections issued by the Bank of Canada in its quarterly Monetary Policy Reports.

- c) Please find attached a copy of each of the four most recent Bank of Canada Monetary Policy Reports as published on the Bank of Canada website.

*Attachment A: Monetary Policy Report – 2021 10*

*Attachment B: Monetary Policy Report – 2022 01*

*Attachment C: Monetary Policy Report – 2022 04*

*Attachment D: Monetary Policy Report – 2022 07*



# Monetary Policy Report

October 2021





# Canada's inflation-control strategy<sup>1</sup>

## Inflation targeting and the economy

- The Bank's mandate is to conduct monetary policy to promote the economic and financial well-being of Canadians.
- Canada's experience with inflation targeting since 1991 has shown that the best way to foster confidence in the value of money and to contribute to sustained economic growth, employment gains and improved living standards is by keeping inflation low, stable and predictable.
- In 2016, the Government and the Bank of Canada renewed Canada's inflation-control target for a further five-year period, ending December 31, 2021. The target, as measured by the rate of inflation of the consumer price index (CPI), remains at the 2 percent midpoint of the control range of 1 to 3 percent.

## Monetary policy tools

- Monetary policy actions take time—usually from six to eight quarters—to work their way through the economy and have their full effect on inflation. For this reason, monetary policy must be forward-looking.
- The Bank normally carries out monetary policy through changes in the target for the overnight rate of interest (the policy rate).<sup>2</sup> The Bank also has a range of other monetary policy tools it can use when the policy rate is at very low levels. These tools consist of guidance on the future evolution of the policy rate, large-scale asset purchases (quantitative easing and credit easing), funding for credit measures, and negative policy rates. The potential use and sequencing of these additional tools would depend on the economic and financial market context.
- All of the Bank's monetary policy tools affect total demand for Canadian goods and services through their influence on market interest rates, domestic asset prices and the exchange rate. The balance between this demand and the economy's production capacity is, over time, the main factor that determines inflation pressures in the economy.

- Consistent with its commitment to clear, transparent communications, the Bank regularly reports its perspectives on the economy and inflation. Policy decisions are typically announced on eight pre-set days during the year, and full updates of the Bank's outlook are published four times each year in the *Monetary Policy Report*.

## Inflation targeting is symmetric and flexible

- Canada's inflation-targeting approach is *symmetric*, which means that the Bank is equally concerned about inflation rising above or falling below the 2 percent target.
- Canada's inflation-targeting framework is *flexible*. Typically, the Bank seeks to return inflation to target over a horizon of six to eight quarters. However, the most appropriate horizon for returning inflation to target will vary depending on the nature and persistence of the shocks buffeting the economy.

## Monitoring inflation

- In the short run, the prices of certain CPI components can be particularly volatile. These components, as well as changes in indirect taxes such as the goods and services tax/harmonized sales tax, can cause sizable fluctuations in CPI inflation.
- In setting monetary policy, the Bank seeks to look through such transitory movements in CPI inflation and focuses on a set of "core" inflation measures that better reflect the underlying trend of inflation. In this sense, these measures act as an operational guide to help the Bank achieve the CPI inflation target. They are not a replacement for CPI inflation.
- The Bank's three preferred measures of core inflation are CPI-trim, which excludes CPI components whose rates of change in a given month are the most extreme; CPI-median, which corresponds to the price change located at the 50th percentile (in terms of basket weight) of the distribution of price changes; and CPI-common, which uses a statistical procedure to track common price changes across categories in the CPI basket.

<sup>1</sup> See *Joint Statement of the Government of Canada and the Bank of Canada on the Renewal of the Inflation-Control Target* (October 24, 2016) and *Renewal of the Inflation-Control Target: Background Information—October 2016*, which are both available on the Bank's website.

<sup>2</sup> The *Framework for Conducting Monetary Policy at Low Interest Rates*, available on the Bank's website, describes these measures and the principles guiding their use.

The *Monetary Policy Report* is available on the Bank of Canada's website at [bankofcanada.ca](http://bankofcanada.ca).

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# Monetary Policy Report

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October 2021

This is a report of the Governing Council of the Bank of Canada:

Tiff Macklem, Timothy Lane, Lawrence Schembri, Paul Beaudry, Toni Gravelle and Sharon Kozicki.

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# Overview

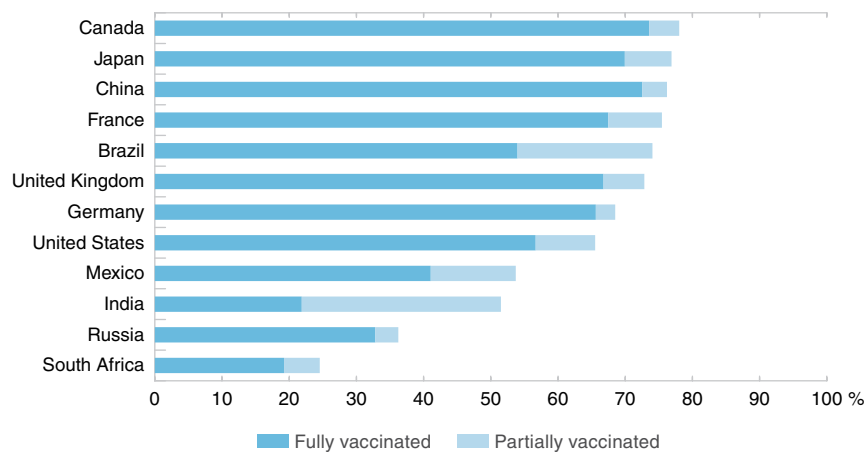
Rising vaccination rates and easing health restrictions are supporting the economic recovery in Canada and other major economies (**Chart 1** and **Box 1**). However, the Delta variant of COVID-19 has caused case numbers in some countries to rise. Emerging-market and developing economies with lower vaccination rates and less fiscal and monetary policy support are particularly affected.

Economic activity and inflation have picked up in the second half of 2021 in Canada and globally. As a result, central banks in several advanced economies have reduced the extent of their monetary stimulus or signalled their intention to do so.

Supply disruptions and energy constraints are weighing on growth and pushing up prices in many economies, including Canada's. Employment has increased, but labour market recoveries remain incomplete.

**Chart 1: COVID-19 vaccinations remain uneven across regions**

Percentage of population vaccinated against COVID-19



Sources: National sources via Our World in Data, and Bank of Canada calculations

Last observations: September 18–October 24, 2021

## Key messages

- The Canadian economy is once again growing robustly.
- Strong employment gains in hard-to-distance sectors have significantly reduced the uneven impact of the pandemic on workers. Despite continuing overall slack in the labour market, some businesses are having difficulty finding workers quickly enough to meet increasing demand.
- Disruptions to global supply chains have intensified, limiting the production of some goods and leading to both higher costs and higher prices.
- Although the impact and persistence of these supply factors are difficult to quantify, they suggest the output gap is likely narrower than projected in July. The Bank now expects economic slack will be absorbed sometime in the middle quarters of 2022, although the very unusual challenges of reopening an economy make this timing more uncertain than usual.
- Given persistent supply constraints and the increase in energy prices, the Bank expects inflation to stay above the control range for longer than previously anticipated, before easing back to close to the 2 percent target by late 2022.
- The Bank views the risks around this inflation outlook as roughly balanced. However, with inflation above the top of the Bank's inflation-control range and expected to stay there for some time, the upside risks are of greater concern.

## Box 1

## Key inputs to the projection

The Bank of Canada's projection is always conditional on several key assumptions, and changes to them will affect the outlook for the Canadian economy. The Bank regularly reviews these assumptions and assesses the sensitivity of the economic projection to them. The key inputs into the Bank's projection are as follows:

- Vaccination rollouts are progressing in many regions of the globe (**Chart 1**). The majority of public health restrictions and voluntary physical distancing measures are assumed to be lifted over the course of 2022. These restrictions and measures are expected to remain in place longer in emerging-market economies because of lower rates of vaccination.
  - Most public health restrictions in Canada should be eased by the end of 2021. Pandemic-related effects on demand—notably, consumer caution and reluctance to travel—are assumed to diminish gradually over the projection horizon. Households are assumed to spend 20 percent of the extra savings they have accumulated during the pandemic on consumption.
  - The projection incorporates \$108 billion in federal fiscal stimulus, in line with the 2021 federal budget.
  - Oil prices are assumed to remain near recent levels. The per-barrel prices in US dollars are assumed to be \$80 for Brent, \$75 for West Texas Intermediate and \$65 for Western Canadian Select—each \$5 higher than assumed in the July Report.
  - By convention, the Bank does not forecast the exchange rate in the *Monetary Policy Report*. The Canadian dollar is assumed to remain at 80 cents US over the projection horizon, close to its recent average and somewhat below the 81 cents US assumed in the July Report.
  - The pandemic and related containment measures and supply chain disruptions are having both temporary and lasting negative effects on the supply side of the Canadian economy.<sup>1</sup>
    - The Bank's assessment of the growth of potential output, a longer-term concept, looks through the short-lived effects of factors such as containment measures and supply chain
- disruptions. Potential output growth is assumed to average about 1.6 percent per year over 2021–23, approximately 0.2 percentage points lower than estimated in the July Report. This change mainly reflects the lower trajectory for business investment. As a result, the level of potential output in 2023 is projected to be about 1 percent below the pre-pandemic estimate.<sup>2</sup>
- The projection assumes that the supply of goods and services is no longer significantly affected by domestic containment measures but that it is adversely affected by other short-term factors. First, global supply chain disruptions are having a large temporary impact on supply. Second, the mismatch between employers' needs and unemployed workers' skills, exacerbated by the unevenness of the pandemic shock, is contributing to the temporary rise in long-term unemployment. Together, these effects are assumed to reduce supply, with a peak impact of about 1.8 percent in the fourth quarter of 2021. These effects are expected to dissipate gradually over 2022.
  - Estimates of overall supply growth can be obtained by combining the estimates of the temporary effects of the supply chain disruptions with the assessment of potential output.
- GDP growth resumed amid increased supply disruptions in the third quarter. The Bank estimates that the output gap—the difference between gross domestic product and supply—was about -2.25 to -1.25 percent in the third quarter, smaller than the revised estimate of -3.25 to -2.25 percent in the second quarter.
  - The neutral nominal policy interest rate is defined as the real rate consistent with output remaining sustainably at its potential and with inflation at target, on an ongoing basis, plus 2 percent for inflation. It is a medium- to long-term equilibrium concept. For Canada, the economic projection is based on an assumption that the neutral rate is at the midpoint of the estimated range of 1.75 to 2.75 percent. This range was last reassessed in the April 2021 Report.

<sup>1</sup> As in recent reports, the Bank makes the distinction between supply and potential output in the near term to account for the relatively short-lived nature of some of the decrease in supply caused by containment measures and, starting with this Report, supply chain disruptions.

<sup>2</sup> Estimates of the level of potential output in 2023 were not constructed as part of the January 2020 projection. The pre-pandemic estimate referred to in the text is calculated by extending the January 2020 projection for potential output by two years, i.e., through 2023, using the estimate for potential growth in 2021 that was provided in the January 2020 Report.

# Global economy

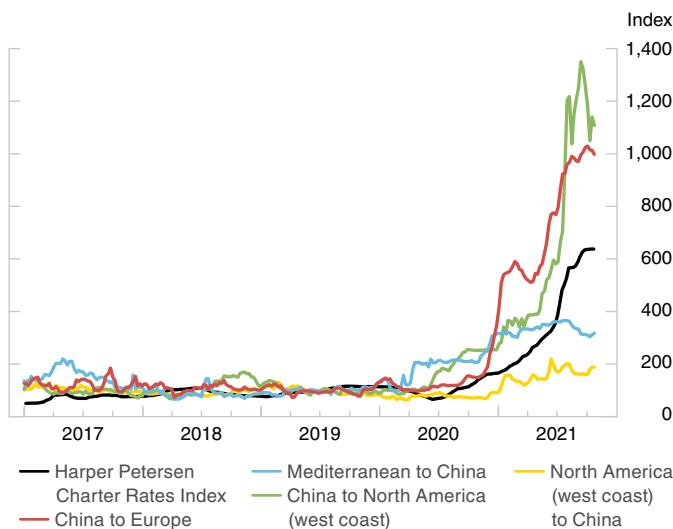
Global economic activity continues to improve, but progress remains choppy and uneven. The recovery has a firmer foundation in advanced economies than in emerging-market economies (EMEs) because of higher vaccination rates and more stimulative policy measures. Labour market improvements continue to be uneven and incomplete in many countries.

Activity in the United States has been recovering solidly, although the Delta variant has slowed progress in recent months. China’s economy is facing headwinds that are restraining growth. In other EMEs and the euro area, growth is resuming as restrictions related to COVID-19 are eased further.

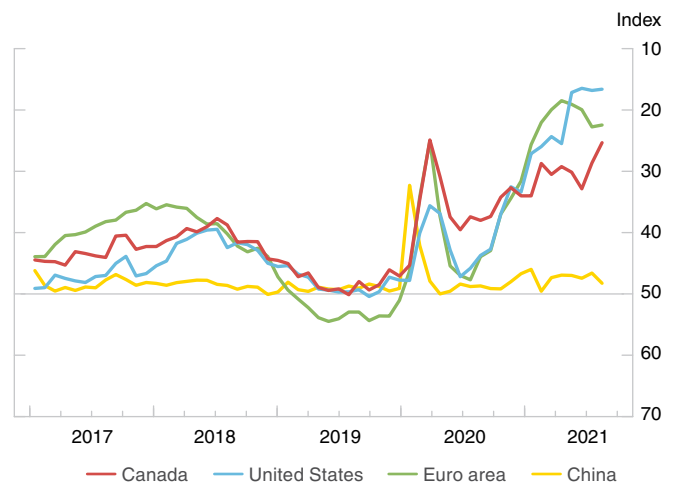
Major energy disruptions in various parts of the world are affecting economic activity and pushing up costs and inflation. Transportation bottlenecks and supply shortages of many goods are also limiting growth and putting upward pressure on the prices of some goods, especially in North America (Chart 2, Box 2). These pressures on inflation are expected to persist until the second half of 2022.

**Chart 2: Transport costs are elevated, and delivery times are rising to historically high levels**

a. Freightos Baltic Index and HARPEX, index 2019 = 100, weekly data



b. PMI: Manufacturing suppliers’ delivery times index, monthly data



Note: All series in panel a except the Harper Petersen Charter Rates Index (HARPEX) are from the Freightos Baltic Index. The Freightos Baltic Index provides market ocean freight rates for different trade lanes. The HARPEX reflects the worldwide price development on the charter market for container ships. The purchasing managers’ index (PMI) is a diffusion index of business conditions. For suppliers’ delivery times, an inverted index is used to show that a reading less than (greater than) 50 indicates an increase (decrease) in delivery times compared with the previous month.

Sources: IHS Markit and HARPEX via Haver Analytics and Freightos Baltic Index via Bloomberg Finance L.P.

Last observations: HARPEX, October 22, 2021; Freightos Baltic Index series, October 24, 2021; PMI, September 2021

Box 2

### Inflation rising globally as prices recover from 2020 lows

Inflation has risen above target in many advanced economies, including those of the United States, Canada, the United Kingdom and Germany, and has generally risen further in emerging-market economies (EMEs), including Brazil, Russia and Mexico. Higher prices for food and energy and pass-through from exchange rate depreciations are adding to inflationary pressures in many EMEs. If inflation expectations begin to de-anchor from the target, higher inflation could persist. In response to concerns about the inflation outlook, monetary policy has been tightened in certain EMEs, such as Brazil, Russia and Mexico.

However, inflation remains relatively low in Japan, China and a number of other economies. These global divergences in inflation result from differences in the extent of economic slack, historical experiences with inflation, and inflation expectations. Other idiosyncratic factors, including exchange rate effects, have also contributed.

The recent increases in inflation experienced in some countries are driven mostly by transitory factors that are boosting the level of prices:

- The rebound in prices for energy and other commodities from their pandemic-induced low levels

in 2020 is adding to headline inflation everywhere. Rising food prices are a main contributor, especially in EMEs where food is a larger share of the consumption basket. One notable exception is pork prices in China, which are putting downward pressure on inflation in that country as supply recovers from the impacts of African swine fever.

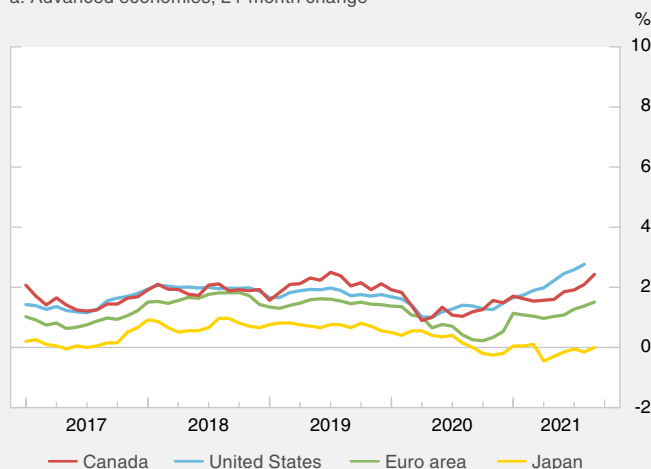
- For some services, such as transportation and hospitality, prices that fell at the beginning of the pandemic have started to rise in certain regions. This is particularly true in advanced economies, reflecting increased demand.
- Prices of some durable goods have increased sharply because of the surge in demand amid supply constraints, such as that experienced with the global shortage of semiconductors. Additionally, health and physical distancing restrictions at ports and factories are contributing to production disruptions and higher shipping costs.

These factors are causing a rapid increase in year-over-year inflation. However, changes in prices from two years ago are considerably less pronounced in advanced economies (**Chart 2-A**).

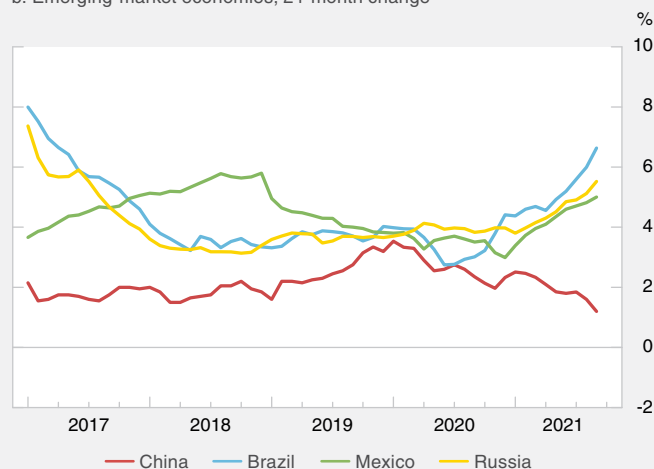
**Chart 2-A: Price changes over a two-year period are less pronounced**

Monthly data

a. Advanced economies, 24-month change



b. Emerging-market economies, 24-month change



Note: The 24-month change is the 2-year annualized growth rate of inflation calculated based on personal consumption expenditures inflation for the United States, Harmonised Index of Consumer Prices inflation for the euro area and CPI inflation for all other countries.

Sources: Statistics Canada, US Bureau of Economic Analysis, Statistical Office of the European Communities, Ministry of Internal Affairs and Communications (Japan), National Bureau of Statistics of China, Instituto Brasileiro de Geografia e Estatística, INEGI (Mexico) and Federal State Statistics Service (Russia) via Haver Analytics

Last observations: United States, August 2021; others, September 2021

Overall, the Bank projects growth of global gross domestic product (GDP) to rise to 6.5 percent in 2021—a very strong pace but slower than projected in the July Report (**Table 1, Box 3**). Global growth is expected to moderate in 2022 and 2023 as the recovery moves beyond the rebound phase and the effects of policy stimulus fade.

**Table 1: Projection for global economic growth**

	Share of real global GDP* (percent)	Projected growth† (percent)			
		2020	2021	2022	2023
United States	16	-3.4 (-3.5)	5.6 (6.6)	3.9 (5.1)	2.7 (1.8)
Euro area	12	-6.5 (-6.7)	5.3 (4.8)	4.5 (4.7)	1.9 (1.9)
Japan	4	-4.7 (-4.7)	2.5 (2.7)	3.0 (2.6)	0.1 (0.4)
China	18	2.3 (2.3)	7.9 (8.9)	5.3 (5.6)	5.9 (5.5)
Oil-importing EMEs‡	33	-2.5 (-2.5)	7.4 (8.0)	4.0 (3.9)	3.9 (3.8)
Rest of the world§	16	-3.5 (-3.6)	4.8 (4.7)	4.1 (3.8)	2.0 (2.3)
World	100	-2.2 (-2.4)	6.5 (6.9)	4.3 (4.4)	3.4 (3.2)

\* GDP shares are based on International Monetary Fund (IMF) estimates of the purchasing-power-parity valuation of country GDPs for 2020 from the IMF's October 2021 *World Economic Outlook*. The individual shares may not add up to 100 due to rounding.

† Numbers in parentheses are projections used in the previous Report.

‡ The oil-importing emerging-market economies (EMEs) grouping excludes China. It is composed of large EMEs from Asia, Latin America, the Middle East, emerging Europe 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 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).

Source: Bank of Canada

### Box 3

## Changes to the economic projection since the July Report

### Global GDP outlook

The growth outlook for global gross domestic product (GDP) has been revised down since the July Report, by about 0.3 percentage points on average for 2021 and 2022. For 2023, it has been revised up by 0.2 percentage points.<sup>1</sup>

The following factors explain the downward revisions to projected growth in 2021 and 2022:

- The outbreak of the Delta variant of COVID-19 appears to have had a larger negative impact than estimated in July on consumption in China, other emerging-market economies (EMEs) and the United States.

- US government expenditures for the second quarter of 2021 were significantly weaker than anticipated. The projection now assumes that US stimulus funds will be spent at a slower pace than what was assumed in the July Report.
- The effects of supply-chain disruptions on spending and prices are proving to be larger and more persistent than expected, particularly in the United States.
- Regulatory changes in China to property and other sectors are expected to weigh on housing and business investment.

(continued...)

<sup>1</sup> The level of global GDP at the end of 2023 is only 0.2 percent lower than projected in the July Report due to significant positive historical revisions to the GDP of oil-importing emerging-market economies and the euro area.



## Box 3 (continued)

**Canadian GDP outlook**

GDP growth in Canada in the third quarter of 2021 has been revised down by about  $1\frac{3}{4}$  percentage points, to around  $5\frac{1}{2}$  percent. The rebound in exports, consumption and business investment is expected to be weaker, stemming mostly from the impacts of supply chain disruptions. Housing market activity is also anticipated to decline at a somewhat faster pace.

GDP growth has been revised down by about 1 percentage point in 2021, to around 5 percent. As a result, the level of real GDP is about  $1\frac{1}{2}$  percent lower at the end of 2021 (**Chart 3-A**). GDP growth has been revised down by about  $\frac{1}{4}$  percentage point in 2022 and revised up by about  $\frac{1}{2}$  percentage point in 2023. Overall, these revisions leave the level of real GDP about  $\frac{3}{4}$  percent lower by the end of 2023, roughly in line with the downward revision to potential output (see **Box 1**).

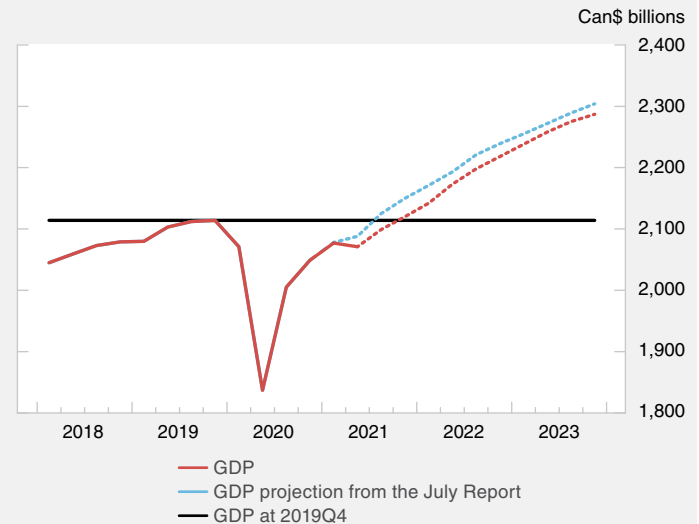
The lower projected outlook for GDP over 2022 and 2023 is largely due to greater and more persistent supply disruptions and weaker foreign demand.

**Canadian CPI inflation outlook**

Consumer price index (CPI) inflation is expected to be higher than projected in July. CPI inflation is revised up by about 0.4 percentage points in 2021, to around 3.4 percent. The outlook for CPI inflation is revised up by roughly 1 percentage point in 2022, to about 3.4 percent, and by about 0.1 percentage points in 2023, to around 2.3 percent. These upward revisions reflect the larger and more lasting impacts from supply constraints as well as higher energy prices.

**Chart 3-A: The rebound in Canadian GDP is slightly weaker than projected in the July Report**

Seasonally adjusted at annual rates, chained 2012 dollars, quarterly data



Sources: Statistics Canada and Bank of Canada calculations and projections

**Financial conditions remain accommodative**

Financial conditions continue to support economic activity. In advanced economies, corporate bond spreads are still narrow and equity price indexes are generally near their historical highs. Although they remain low, yields on 10-year government bonds are higher than noted in the July Report. This is partly due to elevated inflation expectations reported in market-based indicators and private sector forecasts. In response to improved economic conditions and rising inflation, several central banks in advanced economies are reducing or signalling their intentions to reduce the pace of their asset purchases. Some central banks, especially in EMEs, have also raised their policy rate.



## Strong but slower growth in the United States

US GDP grew at a strong pace in the first half of the year and has surpassed its pre-pandemic output level. The recovery of the labour market, however, is progressing more slowly. While the rate of job openings is near a record high, the employment rate remains below its pre-pandemic level for most categories of workers. Aggregate measures of wage growth have recently increased, with the pickup concentrated in certain industries—including leisure and hospitality—that have reopened rapidly.

GDP growth is expected to slow in the second half of 2021, reflecting a moderation in consumption growth. This is partly because the positive impacts of past government transfers are fading and the temporary resurgence of COVID-19 cases over the summer has dampened growth in hard-to-distance services. Transportation bottlenecks and shortages of semiconductors and construction materials continue to limit production in some sectors that are important for Canadian exports, such as motor vehicles and parts and construction. These supply chain disruptions are now projected to last until the second half of 2022, after which production in these sectors should improve.

In 2022 and 2023, solid consumption growth is expected to support GDP as households begin to spend some of the savings they accumulated during the pandemic. The projection also assumes an additional US\$1.5 trillion of government spending on infrastructure and research and development spread over eight years starting in 2022.

Overall, US GDP is expected to grow by 5.6 percent in 2021, a slower pace than projected in the July Report (**Box 3**). Growth is anticipated to moderate in 2022 and 2023 as the economic rebound from the pandemic ends and spending from fiscal stimulus packages wanes.

US personal consumption expenditures (PCE) inflation is expected to rise to close to 5 percent in the second half of 2021. It will likely peak in the fourth quarter and then gradually decrease as the temporary effects of supply shortages dissipate and energy prices stabilize. However, PCE inflation is expected to remain above 2 percent over the projection horizon.

## Euro area economy supported by easing of restrictions

Euro area GDP is expected to continue its strong rebound in the second half of 2021. High vaccination rates have allowed for an easing of health restrictions, which supports spending on hard-to-distance services. Policy measures also continue to bolster domestic demand. Growth is projected to moderate in 2022 and 2023 as the initial effects of the reopening and fiscal stimulus fade.

## China's economy facing several headwinds

China's GDP is expected to grow by about 8 percent in 2021 due to solid momentum from late 2020. However, growth has been slowing recently and is expected to average just above 2 percent in the second half of 2021. Efforts to contain the pandemic, as well as energy shortages and past fiscal and monetary policy tightening, have restrained this growth. In addition, property sector regulations implemented starting in 2020 are causing housing activity to decrease. As a result, some property developers are experiencing financial distress. Other regulatory changes in a wide range of sectors, including technology and education, are also expected to weigh on business investment. Growth is projected to slow to below 6 percent in 2022 and 2023. Uncertainty about the property sector and the impact of recent regulatory changes is high and could result in weaker-than-expected growth over the projection horizon.

## EME growth hindered by a shortage of vaccines

After contracting sharply in the second quarter, economic activity in other oil-importing EMEs is expected to bounce back in the second half of the year. This is supported by the decline in daily COVID-19 cases and the easing of some health restrictions. However, GDP growth in 2022 and 2023 is projected to slow relative to 2021 as the initial rebound phase passes. Slow vaccine rollouts and the lack of policy support are expected to continue to curtail growth in many EMEs.

In the rest-of-the-world group (see **Table 1**), economic activity continues to strengthen. Increases in oil production and prices have been boosting growth in this group's oil-exporting economies. Robust vaccination rollouts in advanced economies and the associated easing of restrictions are also supporting activity.

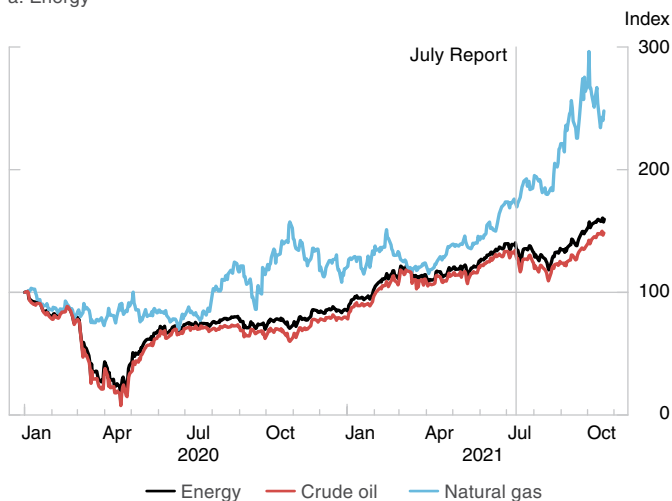
## Rising energy prices

Production of oil and natural gas has struggled to keep up with strengthening demand. At the same time, temporary supply outages and low inventory levels for oil and natural gas have driven energy prices up since the July Report (**Chart 3**, panel a). US oil and gas producers remain cautious about increasing production. As well, members of the Organization of the Petroleum Exporting Countries (OPEC) and some non-OPEC (OPEC+) oil producers continue to increase output only moderately despite high prices.

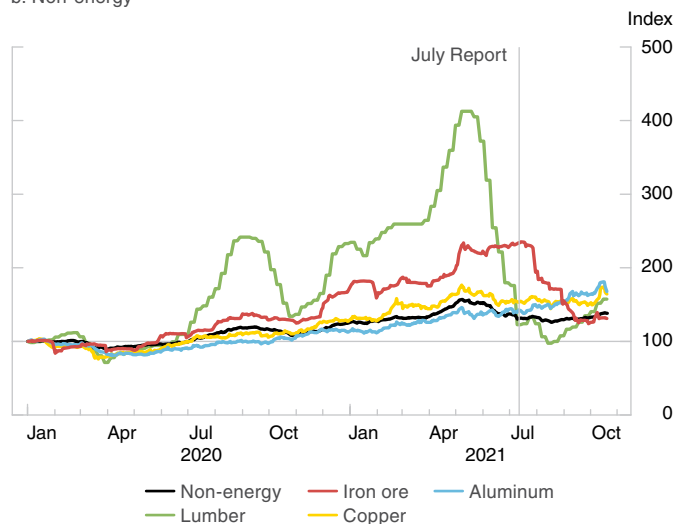
**Chart 3: Energy prices have risen, while other commodity prices have fluctuated in recent months**

Index: January 3, 2020 = 100, daily data

a. Energy



b. Non-energy



Note: The iron ore series reflects Chinese iron ore prices. All other series plotted are components of the Bank of Canada commodity price index. The crude oil index is a weighted average of the benchmarks for West Texas Intermediate, Western Canadian Select and Brent.

Sources: Chicago Mercantile Exchange, COMEX and London Metal Exchange via Haver Analytics, Random Lengths via Bloomberg Finance L.P., and Bank of Canada

Last observation: October 22, 2021

The prices of Brent, West Texas Intermediate and Western Canadian Select oil have risen and in the projection are assumed to be US\$80, US\$75 and US\$65, respectively, each US\$5 higher than in the July Report (**Box 1**). In the near term, temporary supply outages, rapid growth in demand and low global stocks could continue to support prices above these assumed levels. In the medium term, the likelihood of further increases of OPEC+ production in 2022 and an expansion of US output could pull oil prices down. Prices of natural gas are expected to remain high through the winter before easing in 2022 as peak seasonal demand passes and production picks up.

Prices have fluctuated significantly since the July Report for several components in the Bank's non-energy commodity price index (**Chart 3**, panel b). Sharp increases in global energy prices and regulatory actions in China to reduce carbon emissions have led to lower production and higher prices for aluminum and a number of other base metals. These changes have also resulted in decreased steel production and consequently a drop in prices of iron ore. Prices of forestry products have increased since the July Report. Markets expect non-energy commodity prices to remain elevated over the projection horizon due to a mix of strong global demand and limited supply.

## Canadian economy

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The Canadian economy is once again growing robustly, enabled by a high vaccination rate and the associated easing of containment measures. While the Delta variant is requiring continued public health precautions and weighing on consumer confidence, domestic demand has continued to recover. In particular, spending on hard-to-distance services has rebounded solidly. High vaccination rates have also reduced the risk to the economy of further widespread closures.

The labour market is recovering with a rebound in employment in hard-to-distance sectors. Despite an unemployment rate that remains above its pre-pandemic level, some firms are facing challenges finding workers.

Strong demand, globally and in Canada, has run up against persistent supply constraints that are limiting production and increasing costs. As a result, prices of some goods, particularly those impacted by global supply disruptions, are rising quickly. Bottlenecks and shortages are leading to production slowdowns, delayed or cancelled purchases, and lower investment. Energy supply disruptions in other countries are negatively affecting their manufacturing sectors, which in turn could exacerbate production slowdowns in Canada.

Annual growth in economic activity is forecast to be around 5 percent in 2021. Growth is projected to be about 4¼ percent in 2022 and 3¾ percent in 2023 (**Table 2**). Continued progress on managing COVID-19—both domestically and globally—should reduce uncertainty and cautiousness. In turn, this will boost consumption, exports and business investment. While the economy is likely to continue to require fiscal and monetary support, the recovery is becoming broader and more self-sustaining.

Overall, the outlook is for robust growth into 2022, but the pace has been revised down since the July Report because of more severe supply disruptions and weaker foreign demand (**Box 3**). Estimates of the adverse impacts of supply disruptions in 2021 and into 2022 have been revised up. Because supply is revised down by more than GDP, the output gap is narrower at the start of the projection than previously expected.

Significant uncertainty surrounds the outlook for GDP and potential output. In particular, the impacts of supply disruptions, labour market mismatches and accelerated digital investments remain difficult to quantify.

Consumer price index (CPI) inflation is expected to remain elevated for the rest of 2021 and into 2022 due to ongoing supply disruptions created by the pandemic and higher energy prices. Inflation is expected to ease to about 2 percent by the end of 2022 as these pressures dissipate. Inflation is then anticipated to rise modestly in 2023—as the economy moves into excess demand—before returning gradually toward target in 2024.

**Table 2: Contributions to average annual real GDP growth**

Percentage points\*†

	2020	2021	2022	2023
<b>Consumption</b>	-3.4 (-3.4)	2.7 (2.9)	3.4 (3.6)	2.5 (2.3)
<b>Housing</b>	0.3 (0.3)	1.3 (1.6)	-0.4 (-0.5)	0.1 (-0.1)
<b>Government</b>	0.1 (0.1)	1.7 (1.7)	0.7 (0.7)	0.3 (0.3)
<b>Business fixed investment</b>	-1.3 (-1.3)	0.2 (0.5)	0.8 (1.1)	0.9 (0.7)
<b>Subtotal: final domestic demand</b>	-4.3 (-4.3)	5.9 (6.7)	4.5 (4.9)	3.8 (3.2)
<b>Exports</b>	-3.2 (-3.2)	0.8 (1.2)	1.9 (1.8)	1.1 (1.6)
<b>Imports</b>	3.8 (3.8)	-2.3 (-2.7)	-2.4 (-2.5)	-1.7 (-1.7)
<b>Subtotal: net exports</b>	0.7 (0.7)	-1.5 (-1.5)	-0.5 (-0.7)	-0.6 (-0.1)
<b>Inventories</b>	-1.6 (-1.6)	0.7 (0.8)	0.3 (0.4)	0.5 (0.2)
<b>GDP</b>	-5.3 (-5.3)	5.1 (6.0)	4.3 (4.6)	3.7 (3.3)
<b>Memo items (percentage change):</b>				
Range for potential output	0.8–2.0 (0.8–2.0)	0.8–2.2 (0.8–2.2)	0.4–2.2 (0.4–2.2)	1.0–3.0 (1.0–3.0)
Real gross domestic income (GDI)	-6.3 (-6.3)	9.0 (9.4)	3.6 (3.8)	3.5 (3.1)
CPI inflation	0.7 (0.7)	3.4 (3.0)	3.4 (2.4)	2.3 (2.2)

\* Numbers in parentheses are from the projection in the previous Report.

† Numbers may not add to total due to rounding.

## Strong growth resumed

The economy is expected to grow by about 4¾ percent in the second half of 2021, much stronger than the average pace of around 2¼ percent in the first half of the year (**Table 3** and **Chart 4**). Consumption is leading the recovery, with a rebound in spending on in-person services combining with the already-elevated level of goods purchases. Spending on air transportation and food and accommodation has strengthened considerably in recent months. However, supply constraints and lingering cautiousness over the virus have been limiting spending and production (**Chart 5**).

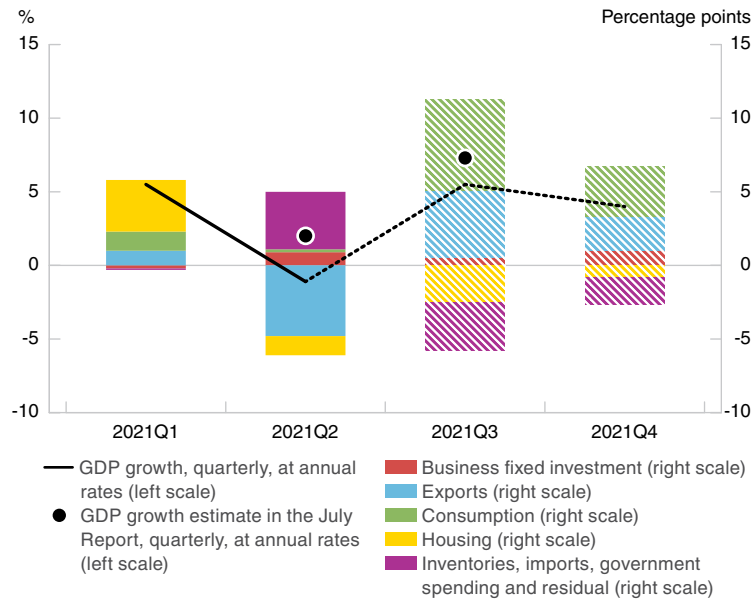
**Table 3: Summary of the quarterly projection for Canada\***

	2021					2020	2021	2022	2023
	Q1	Q2	Q3	Q4		Q4	Q4	Q4	Q4
<b>CPI inflation (year-over-year percentage change)</b>	1.5 (1.5)	3.4 (3.4)	4.1 (3.9)	4.8		0.7 (0.7)	4.8 (3.5)	2.1 (2.0)	2.5 (2.4)
<b>Real GDP (year-over-year percentage change)</b>	0.3 (0.3)	12.7 (13.6)	4.7 (6.0)	3.4		-3.1 (-3.1)	3.4 (4.9)	4.6 (4.2)	3.0 (2.9)
<b>Real GDP (quarter-over-quarter percentage change at annual rates)†</b>	5.5 (5.6)	-1.1 (2.0)	5.5 (7.3)	4.0					

\* Details on the key inputs to the base-case projection are provided in **Box 1**. Numbers in parentheses are from the projection in the previous Report.† Over the projection horizon, 2021Q3 and 2021Q4 are the only quarters for which some information about real GDP growth was available at the time the projection was conducted. For longer horizons, fourth-quarter-over-fourth-quarter percentage changes are presented. They show the Bank's projected growth rates of CPI and real GDP within a given year. As such, they can differ from the growth rates of annual averages shown in **Table 2**.

**Chart 4: Growth has resumed in the third quarter of 2021**

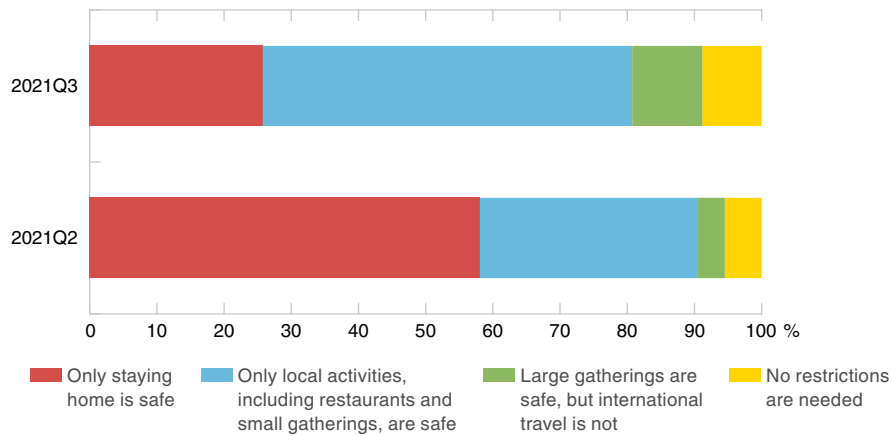
Contribution to real GDP growth, quarterly data



Sources: Statistics Canada and Bank of Canada estimates and calculations Last data plotted: 2021Q4

**Chart 5: People are more willing to engage in normal activities, but some cautiousness remains**

Share of respondents,\* percent



\* Respondents answering the Canadian Survey of Consumer Expectations question, "Which of the following best describes your willingness to engage in normal activities today?"

Source: Bank of Canada

Last observation: 2021Q3

**Chart 6: Housing market activity has declined but remains elevated**

Index: January 2020 = 100, monthly data



Note: Residential resales and housing starts are seasonally adjusted.

Sources: Canadian Real Estate Association, Canada Mortgage and Housing Corporation and Bank of Canada calculations

Last observation: September 2021

Housing resales and construction activity remain elevated but have declined from historically high levels (**Chart 6**). This is occurring amid signs that the pandemic-related boost in demand for more living space is easing. While multiple-unit housing starts have remained relatively robust, single-family starts have seen a more significant decline since the first quarter. Nonetheless, housing markets remain tight, and high disposable incomes and low borrowing rates should continue to support solid levels of housing activity.

Exports and business investment are expected to rebound through the second half of 2021, with foreign demand and business confidence strengthening. Shipping bottlenecks and shortages of key inputs are, however, pushing up costs and slowing production in the near term. In particular, the global shortage of semiconductors continues to weigh on motor vehicle production and exports.

**Robust job gains as the economy reopens**

Job gains have been robust in recent months as in-person services have resumed, benefiting many of the workers who suffered earlier in the pandemic (**Box 4**). However, unemployment remains elevated, and many of those who are employed are not working as many hours as they were before the pandemic.

The abrupt closure and subsequent rapid reopening of the economy in each wave of the pandemic have worsened the usual search frictions in the labour market. It takes time for workers to find the right job and for employers to find workers with the right skills and experience. As a result of these frictions in the matching process, the labour market is showing signs of both continued slack and acute shortages in some sectors.

Box 4

### Labour market recovery well underway but incomplete

The uneven nature of the COVID-19 shock has emphasized how diverse and segmented the labour market is—and the need to look at a broad range of measures to assess labour market health.

One way to do this is to examine indicators along three different dimensions: overall labour market conditions, inclusiveness and job characteristics.<sup>1</sup> Results from this approach indicate that significant progress has been made since the depths of the downturn in April 2020, though the recovery remains incomplete (**Chart 4-A**).<sup>2</sup>

- **Overall conditions.** In addition to the shortfall in the employment rate, the unemployment rate remains more than 1 percentage point above pre-pandemic levels.

- **Labour market inclusiveness.** Groups that suffered the greatest job losses—women and youth—have experienced an almost complete recovery in recent months. This is a welcome development because it suggests that much of the labour market unevenness introduced by the pandemic does not appear to be permanent. Nevertheless, significant differences that existed across groups before the pandemic remain, including the disparity of participation rates between men and women.

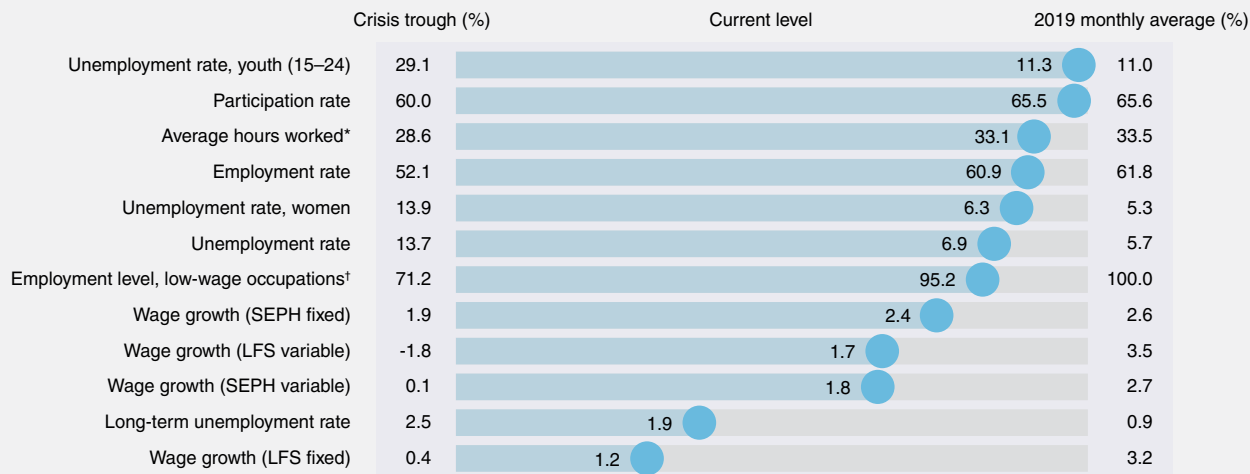
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1 This approach follows that in E. Ens, L. Savoie-Chabot, K. G. See and S. L. Wee, “Assessing Labour Market Slack for Monetary Policy,” Bank of Canada Staff Discussion Paper No. 2021-15 (October 2021).

2 See the full list of [indicators](#) on the Bank’s website.

**Chart 4-A: Despite significant progress, the labour market recovery remains incomplete**

Progress bars for selected labour market measures, seasonally adjusted, monthly data



\* Average hours worked are expressed in hours per week and not percent.

† For the employment level, the 2019 monthly average is expressed as 100%.

Note: This chart illustrates the extent to which labour market conditions have recovered. The recovery is shown through progress bars, where the current value of each measure, depicted by a blue circle, is compared with both its trough during the crisis and a pre-pandemic benchmark value (2019 monthly average). Long-term unemployed people are those who have been unemployed for 27 weeks or more. For more detail on wage growth measures, see **Chart 8**. Data for all series are from Statistics Canada’s Labour Force Survey (LFS) unless otherwise noted. SEPH stands for Survey of Employment, Payrolls and Hours.

Sources: Statistics Canada and Bank of Canada calculations

Last observations: LFS, September 2021; SEPH, July 2021



Box 4 (continued)

Moreover, the long-term unemployment rate for some groups remains extremely high. Employment of workers in low-wage occupations is also further behind in its recovery.

- **Job characteristics.** Despite employment gains, wage growth continues to lag, and many workers are still not getting the number of hours they would like.

Another way to examine the progress in the labour market is to look at the expanded labour market indicator (ELMI), a composite indicator that consolidates information from a broad range of labour market measures.<sup>3</sup> The ELMI can assess the level of

disagreement between indicators on the stage of the labour market recovery—with greater disagreement suggesting more unevenness. The level of disagreement among indicators about the state of the labour market has recently decreased, although it remains above the pre-pandemic average. This signals that further progress is needed to achieve a full recovery.

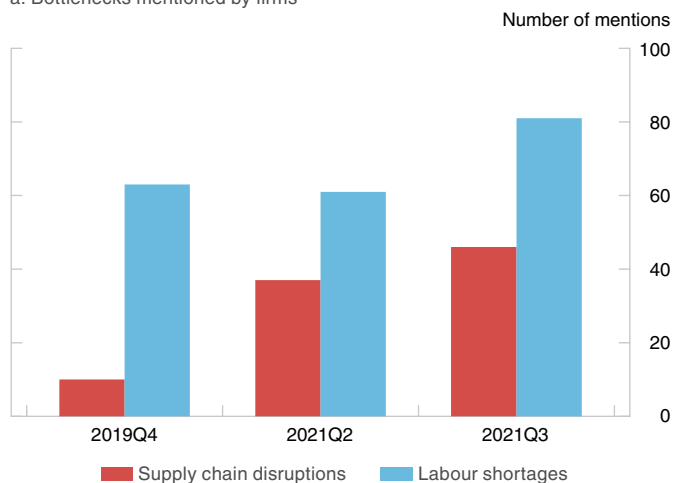
The labour market has seen a rapid improvement in recent months, reflecting the initial burst of job gains as the economy reopened. Additional improvement may take more time as the matching process between job vacancies and available workers unfolds.

<sup>3</sup> See [Ens et al. \(2021\)](#) for more details.

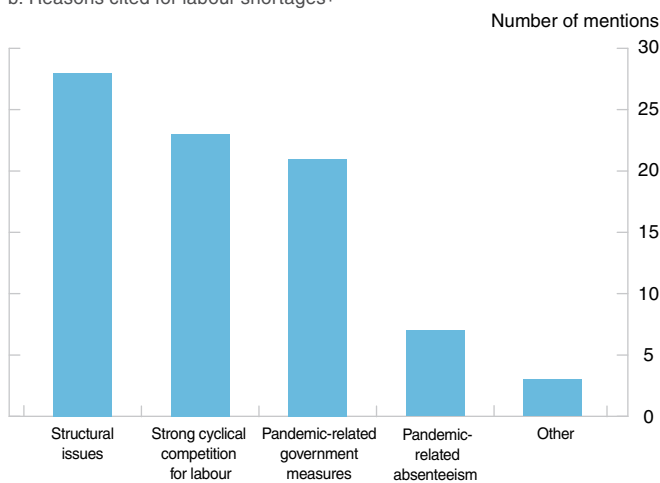
**Chart 7: Firms report increased capacity pressures due to labour shortages and supply disruptions**

Business Outlook Survey results, quarterly data

a. Bottlenecks mentioned by firms\*



b. Reasons cited for labour shortages†



\* Number of times firms mentioned supply chain disruptions or labour shortages when asked the question, “What would be the most important obstacles or bottlenecks to being able to meet an unexpected increase in demand?” Mentions of a fully utilized labour force and an inability to find suitable new labour at the current wages are counted as labour shortages. Mentions of raw material constraints, transportation difficulties and logistics bottlenecks are counted as supply chain disruptions. Firms could select more than one response.

† Number of times firms mentioned the factors listed in the chart when asked the question, “Does your firm face any shortages of labour that restrict your ability to meet demand?” Among respondents, 36 firms answered “Yes.” “Structural issues” includes factors such as an aging population, rural depopulation and general Employment Insurance disincentives. “Pandemic-related government measures” includes income support (Canada Recovery Benefit and Employment Insurance) as well as travel restrictions and their impacts on immigration. “Pandemic-related absenteeism” includes illness, providing child care and fear of contracting COVID-19. See the [Business Outlook Survey—Third Quarter of 2021](#) for more details.

Source: Bank of Canada

Last observation: 2021Q3

The results of the Bank’s Business Outlook Survey for the third quarter of 2021 suggest that labour shortages have intensified (**Chart 7**). These shortages fall into two areas.

The first is the re-emergence of shortages that existed before the pandemic, such as for skilled trades and digital-oriented jobs. These shortages are consistent with pre-pandemic challenges and could become more severe as the recovery unfolds.

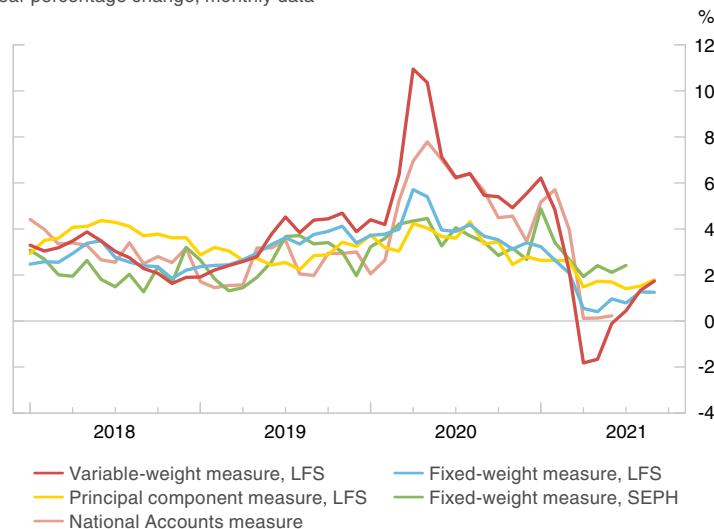
The second relates to businesses that are seeing a large increase in demand, including restaurants and retail establishments. Some of these shortages should be largely temporary, although it may take time to work through these shortages in certain sectors of the economy. Many Canadians are still unemployed, and employers can recruit and train workers only so quickly. In addition, some workers may be hesitant to return to customer-facing jobs due to lingering fears of the virus.

Moreover, some who had worked in industries that are rehiring in large numbers, such as restaurants, have moved on to other sectors or are pursuing further education or training. About one-half of unemployed workers who responded to the Canadian Survey of Consumer Expectations for the third quarter of 2021 reported that they were looking to move to a different industry. As a result, there is a risk that some of these labour shortages could persist.

Wage growth has risen with the rebound in employment but remains moderate (**Chart 8**). Wage gains by industry and occupation are generally at or below the average growth rates observed before the pandemic.<sup>1</sup> However, as labour markets continue to recover and competition for workers picks up, there could be increasing pressure to attract and retain staff through improved working arrangements, benefits and wages.

**Chart 8: Wage growth remains moderate**

Year-over-year percentage change, monthly data



Note: LFS stands for the Labour Force Survey; SEPH stands for the Survey of Employment, Payrolls and Hours. The LFS variable-weight measure is the average hourly wages of employees. The LFS fixed-weight measure is constructed using 2019 employment weights for wages based on employees' job status (full or part time), job permanency (permanent or temporary), industry of employment and occupation, while the LFS principal component measure is based on the estimated common trend of annual growth among these series. The National Accounts wage measure is constructed as total wages and salaries at a monthly frequency from the Canadian System of Macroeconomic Accounts divided by total hours worked from SEPH.

Sources: Statistics Canada and Bank of Canada calculations. Last observations: LFS, September 2021; SEPH, July 2021; National Accounts measure, June 2021

<sup>1</sup> Fluctuations in the number of workers in low-paying jobs during the pandemic have made aggregate wage measures more volatile because the composition of employment has shifted. Variable-weight measures have fluctuated the most, showing high rates of wage growth when employment in low-wage jobs dropped. Wage measures that are less influenced by composition effects, including fixed-weight measures, have been more stable.

## Supply disruptions weighing on productive capacity

For the economy as a whole, activity is below potential output. The Bank typically estimates excess supply for the entire economy. But the assessment continues to be more complicated than usual. As a result of pandemic-related disruptions, the degree of excess supply and demand varies materially across sectors, rendering an aggregate measure of slack less meaningful.

Instead, more sector-specific analysis is needed. For instance, activity in hard-to-distance service sectors such as travel and accommodation remains below its pre-pandemic levels largely because of weak demand. As such, these sectors face considerable slack.

In contrast, as consumers have shifted toward goods and housing, expenditures in these sectors have risen far above pre-pandemic levels. For example, spending on household appliances and furniture in the second quarter was about 20 percent higher than it was at the end of 2019.

This surge in demand for goods and housing is taking place amid global supply disruptions, creating excess demand for some goods. These supply disruptions include shortages of key intermediate inputs, such as semiconductors. The supply disruptions also include transportation challenges, such as container shortages and bottlenecks at key ports, which are raising shipping costs and delaying deliveries for many goods. In some cases, the supply constraints are so severe that production is actually falling despite higher prices. This is the case for new motor vehicles. These demand and supply factors indicate excess demand clearly remains in these sectors.

Supply has been revised down over the near term because of pandemic-related disruptions. These negative short-run supply-side effects are expected to peak in the fourth quarter and to gradually dissipate over 2022 (**Box 1**). Taking these respective demand and supply pressures into account, the Bank estimates that the output gap was between -2.25 and -1.25 percent in the third quarter. Uncertainty around this range remains particularly elevated given the exceptional mix of pandemic-related supply and demand factors.

## CPI inflation boosted by pandemic-related factors and energy prices

CPI inflation was about 4½ percent in September and is expected to rise and average around 4¾ percent over the remainder of 2021. Three key factors are generating the current strength in prices (**Chart 9** and **Box 5**). First, supply constraints are pushing up the prices of goods. Second, prices that had fallen last year are continuing to recover with the rebound in demand for hard-to-distance services. Third, in addition to these pandemic-related factors, higher energy prices are expected to contribute about 1¾ percentage points to total inflation in the fourth quarter of 2021.

## Box 5

## Reasons for higher inflation

Inflation is above 4 percent and will likely rise to about 4¾ percent in the fourth quarter of 2021.

About one-third of inflation in the fourth quarter is projected to come from higher energy prices. Gasoline and natural gas prices are contributing to higher inflation as rising demand and a growing number of severe weather events mix with constrained supply in the energy sector.<sup>1</sup>

In addition to elevated energy prices, several supply and demand factors related to COVID-19 are also driving this increase (see **Chart 9**).

### Supply disruptions pushing up prices for some goods

Pandemic-related restrictions and concerns about the virus, along with strong policy support, have boosted demand for goods and housing. At the same time, these sectors have also faced supply constraints.

These disruptions have pushed up the year-over-year increases of specific components of the consumer price index (CPI). For example:

- Prices for bacon, chicken and shrimp increased by 20, 10 and 9 percent, respectively.

- Homeowners' replacement costs rose 14 percent, in part due to elevated prices of building materials.
- Motor vehicle prices rose 7 percent because semiconductor shortages limited production.

### Rebound in demand lifting prices for in-person services

Sectors that had been hit hard by the pandemic have also begun contributing to increases in inflation:

- Airfare has recently increased, reflecting a partial recovery in demand and higher costs.<sup>2</sup> Air transportation prices are well above their September 2019 level.
- After sinking to a low not seen since the 1980s, prices of traveller accommodations such as hotels have somewhat recovered because many Canadians resumed summer travel.

In contrast, prices remain weak in sectors still affected by soft demand, such as travel tours, with an inflation rate of about -14 percent. Overall, the rebound in demand has contributed less than supply constraints to CPI inflation over the past few quarters.

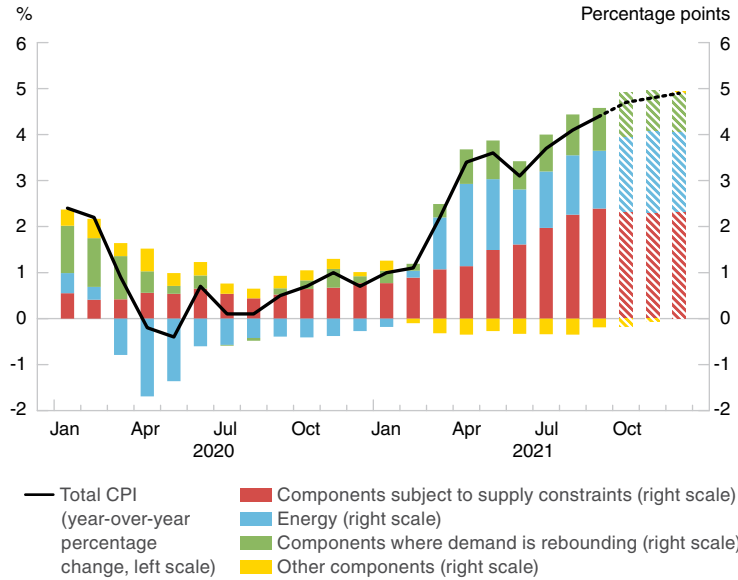
<sup>1</sup> In September 2021, gasoline and natural gas prices were up 33 percent and 16 percent, respectively.

<sup>2</sup> The increase in the air transportation prices component in August 2021 was also due to the reintroduction of certain long-distance flights in the calculation of this CPI component.

Core measures of inflation have also picked up but by less than the CPI. While CPI-common has remained below 2 percent, CPI-trim and CPI-median have continued to rise (**Chart 10**). The rebound in demand influences all three measures. However, CPI-trim and CPI-median are more affected by components experiencing supply constraints, such as motor vehicles. As a result, CPI-trim and CPI-median are expected to remain relatively elevated over the near term.

**Chart 9: Pandemic-related factors and energy prices are pushing up CPI inflation**

Contribution to CPI inflation, in percentage points, monthly data



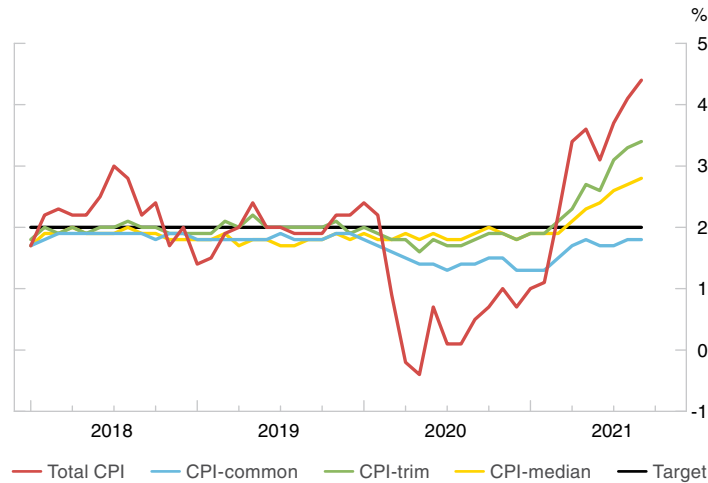
Note: "Components subject to supply constraints" includes motor vehicles, durable goods, and home repair and replacement costs. "Components where demand is rebounding" includes hard-to-distance services, transportation and travel-related services, food and alcohol in restaurants, rented accommodation and semi-durable goods.

Sources: Statistics Canada and Bank of Canada estimates and calculations

Last data plotted: December 2021

**Chart 10: Inflation has increased substantially in recent months**

Year-over-year percentage change, monthly data



Sources: Statistics Canada and Bank of Canada calculations

Last observation: September 2021

## Solid growth to continue over the projection horizon

Growth is expected to be supported by both domestic and foreign demand and to become broader and more sustainable over time. The contribution of exports and business investment is forecast to increase over the projection. Economic growth is projected to moderate from around 5 percent in 2021 to around 4¼ percent in 2022 and 3¾ percent in 2023, as the rebound from the reopening of the economy and fiscal stimulus fades.

Global disruptions are expected to reduce supply in Canada in 2021 and 2022 and to dampen economic activity and demand, with the peak impact occurring at the end of 2021 (Box 1). Based on these projections for aggregate demand and supply, the Bank forecasts the output gap to close sometime in the middle quarters of 2022. However, because the magnitude and persistence of the impacts of these supply constraints are uncertain, the timing of the absorption of slack is imprecise.

## Household spending leading the recovery

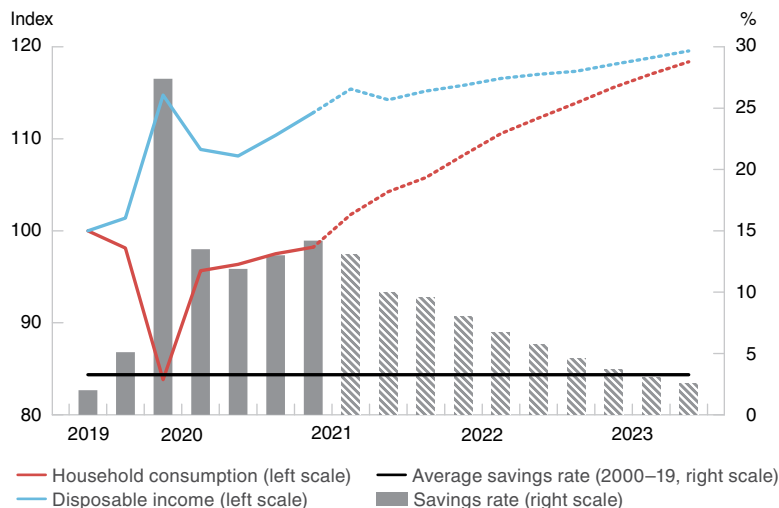
Consumption growth is expected to be strong, supported by solid confidence, high levels of disposable income and some spending of accumulated savings (Chart 11). With continued gains in employment and hours worked, growth in labour income should pick up even as government transfers gradually decline.

As the pandemic recedes and confidence rises, spending on hard-to-distance services is expected to continue to strengthen, while growth in demand for goods is projected to moderate. Nonetheless, a degree of cautiousness is anticipated to persist. Some consumers may be slower to resume normal activities even as the threat of infection gradually diminishes. Lingering economic concerns could also prompt some households, especially those with lower incomes, to hold onto more of their savings.

Housing market activity is anticipated to remain elevated over 2022 and 2023 after having moderated from recent record-high levels. Increased immigration, solid income levels and favourable financing conditions will support ongoing strength. New construction will add to the supply of houses and should help soften house price growth.

**Chart 11: Accumulated savings are expected to support consumption growth**

Nominal quarterly data; index: 2019Q4 = 100 for consumption and income



Sources: Statistics Canada and Bank of Canada calculations and projections

## Foreign demand to drive a solid recovery in exports

Robust foreign demand and elevated commodity prices are expected to support strong export growth (Chart 12). Supply chain issues will likely continue to weigh on activity but should be largely resolved by the end of 2022. The drought in Western Canada in summer 2021 is also expected to reduce agricultural exports over the next several quarters. The easing of these supply disruptions is anticipated to contribute to a continued strong recovery in exports later in 2022 and 2023.

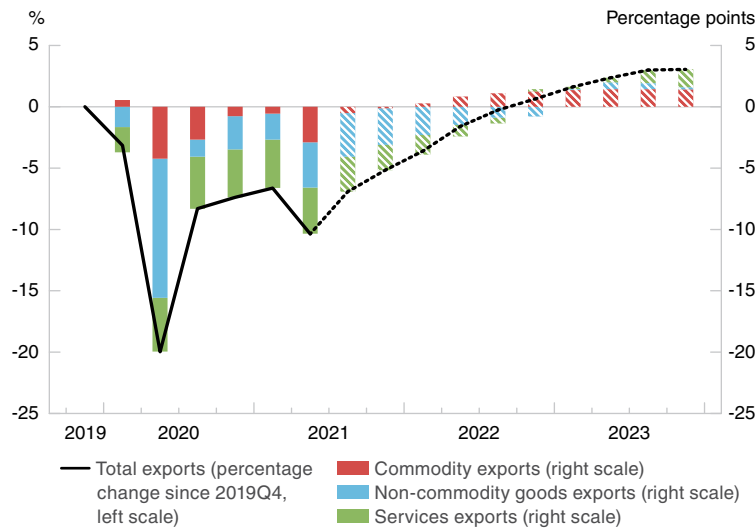
Services exports are projected to rebound as international travel approaches pre-pandemic levels. However, a full recovery will take time because new ways of working and climate initiatives could weigh on areas such as business travel.

The relatively high oil and natural gas prices will support energy exports over the projection horizon. Existing and planned oil transport capacity, including the recent expansion of Enbridge Line 3 as well as the forthcoming Trans Mountain Expansion Project, should meet anticipated export growth for several years.

Once the supply chain issues and shipping bottlenecks constraining trade have dissipated, imports are projected to grow in line with strong domestic demand and the expected rebuilding of inventories.

**Chart 12: Foreign demand and elevated commodity prices should support the recovery in exports**

Contribution to the deviation of real total exports from the 2019Q4 level, in percentage points, quarterly data



Sources: Statistics Canada and Bank of Canada calculations and projections

## Business investment to strengthen

Investment outside the oil and natural gas sector is anticipated to rise as supply disruptions ease, demand increases and business confidence improves (**Chart 13**). The Business Outlook Survey for the third quarter of 2021 revealed broad-based strength in investment intentions. The accelerating adoption of digitalization and information technologies should continue to boost hiring and investment. Although remote work and online shopping are reducing demand for office and retail space, the trend toward e-commerce should increase investment in logistics and warehouses.

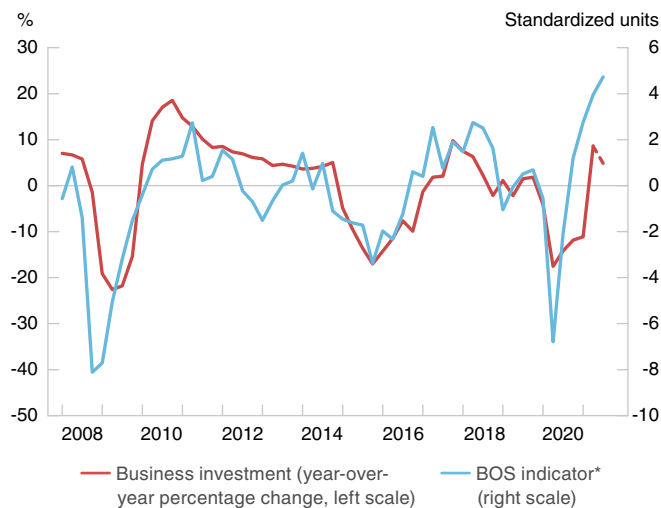
Investment in the oil and natural gas sector is forecast to increase but remain below pre-pandemic levels. Despite higher prices, investment is expected to remain subdued given elevated uncertainty about both future prices and long-term demand.

Inventory investment is expected to contribute to growth over the projection horizon as retailers rebuild inventories after unprecedented drawdowns in 2020 and ongoing delivery delays.

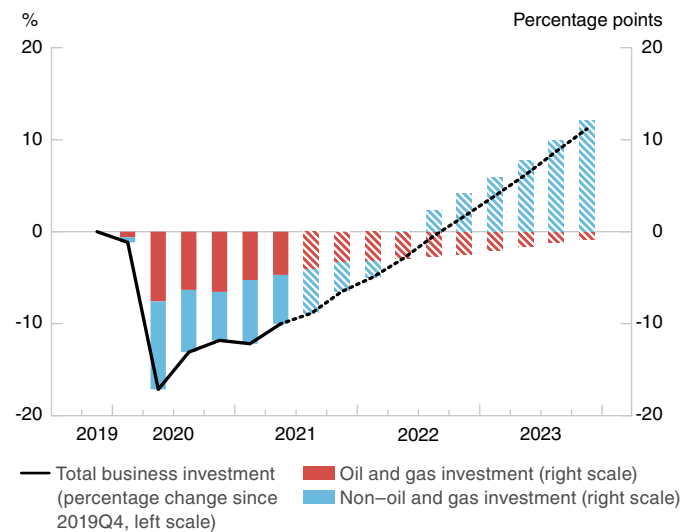
**Chart 13: Business confidence has continued to improve, and investment is anticipated to strengthen**

Quarterly data

a. Business investment and BOS indicator



b. Contribution to the deviation of real total business investment from the 2019Q4 level, in percentage points



\* This measure is a summary of the responses to the main questions in the [Business Outlook Survey \(BOS\)](#) that gauges overall business sentiment.

Sources: Statistics Canada, Bank of Canada and Bank of Canada calculations and projections

Last observation: BOS indicator, 2021Q3  
Last data plotted in panel a: business investment, 2021Q3



## CPI inflation to ease in 2022 to about 2 percent by year end

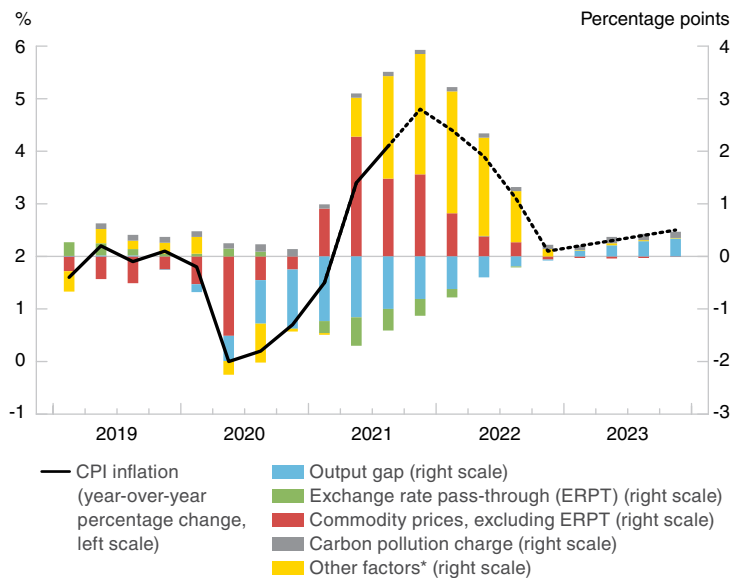
Pandemic-related forces are having a complicated impact on the inflation outlook. Supply constraints will push up the level of prices, but the effect on the rate of inflation is expected to diminish in 2022 (Chart 14).<sup>2</sup> This is because the upward pressure on prices will moderate, and inflation rates will come down as disruptions to supply gradually fade.

At the same time, the surge in demand for hard-to-distance services is also anticipated to moderate, putting less pressure on prices of services. Some CPI components, such as airfare, have already regained or surpassed their pre-pandemic levels, and further upward pressures are likely to be limited as additional capacity comes back online. In addition, the impact of higher energy prices is expected to dissipate over 2022. Consequently, CPI inflation is expected to ease from about 4¾ percent at the end of 2021 to around 2 percent at the end of 2022.

Afterward, the degree of excess demand becomes the primary factor influencing the projection for inflation. With the economy anticipated to move into modest excess demand, inflation is expected to be slightly above target in 2023. This is a consequence of Governing Council’s exceptional forward guidance to keep the policy interest rate at the effective lower bound until economic slack is absorbed so that the 2 percent inflation target is sustainably achieved. Inflation is expected to return again toward the target in 2024.

**Chart 14: CPI inflation is expected to ease as pandemic-related factors fade**

Contribution to the deviation of inflation from 2 percent, quarterly data



\* Includes, in particular, the effects of supply-related disruptions, such as shortages of semiconductors, on inflation

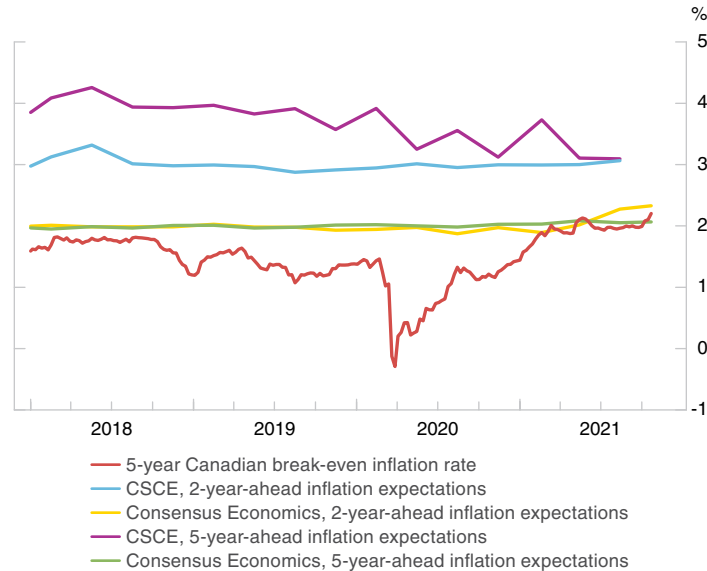
Note: Numbers may not add to total because of rounding.

Sources: Statistics Canada and Bank of Canada estimates, calculations and projections

<sup>2</sup> Recent evidence suggests that the price increases due to product shortages during the pandemic were significant and somewhat persistent, but the inflationary effects were ultimately temporary. See, for example, A. Cavallo and O. Kryvstov, “What Can Stockouts Tell Us About Inflation? Evidence from Online Micro Data,” Bank of Canada Staff Working Paper No. 2021-52 (October 2021).

**Chart 15: Inflation expectations remain stable**

Canadian break-even inflation rate (weekly average of daily data) and inflation expectations (quarterly data)



Note: CSCE stands for the Canadian Survey of Consumer Expectations. The 5-year Canadian break-even inflation rate is the difference between the yields of a nominal bond and a Real Return Bond of the same maturity, both issued by the Government of Canada. Break-even inflation rates provide a signal about the expected path of inflation as perceived by market participants, but they are also affected by fluctuations in inflation risk and liquidity premiums. Consensus Economics provides inflation forecasts for the next 10 years. These forecasts are transformed into fixed-horizon forecasts (2-year, 5-year) by weighted average.

Sources: Bloomberg Finance L.P.,  
Consensus Economics, Bank of Canada  
and Bank of Canada calculations

Last observations:  
Consensus Economics, October 2021; CSCE:  
2021Q3; break-even inflation rate, October 22, 2021

Medium- and long-term inflation expectations remain well anchored at the 2 percent target (**Chart 15**). Both businesses and consumers view price pressures as elevated in the near term. A large majority of respondents to the Business Outlook Survey for the third quarter of 2021 expect inflation to be above 2 percent on average over the next two years. However, a majority of firms view the factors pushing up inflation, including energy and supply issues, as temporary. The Canadian Survey of Consumer Expectations for the third quarter of 2021 reported that short-term inflation expectations have also risen, in line with actual inflation. Nonetheless, respondents' 2- and 5-year-ahead inflation expectations have remained stable.

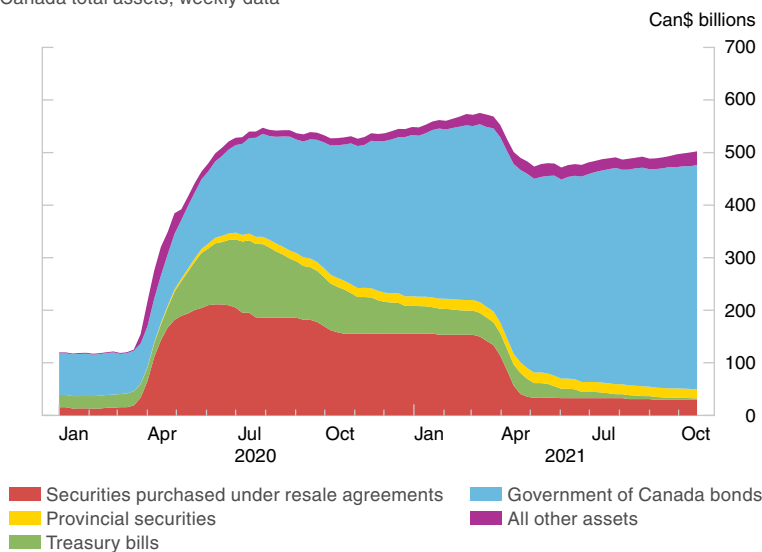
Private sector forecasters have increased their expectations for inflation two years from now. However, their longer-term expectations have remained stable. The July 2021 Consensus Economics forecast continues to show an average of 2 percent through 2031. In addition, while the 5- and 10-year Canadian break-even inflation rates are now somewhat above pre-pandemic levels, they are well aligned with the 2 percent inflation target.

# Evolution of the Bank of Canada's balance sheet

Based on the progress of the economic recovery, the Bank adjusted its target for purchases through its Government of Canada Bond Purchase Program (GBPP) in July 2021 from \$3 billion per week to \$2 billion per week. Since then, the Bank's ownership of total Government of Canada (GoC) bonds outstanding has increased modestly to 46 percent from 44 percent. The composition and size of the Bank's overall balance sheet, however, has been roughly stable (**Chart 16**).<sup>3</sup> Most of the shorter-term assets acquired at the start of the pandemic matured before the July Report. The remaining assets are mainly GoC bonds, which now make up about 85 percent of total holdings.

**Chart 16: The Bank of Canada's balance sheet remains stable**

Bank of Canada total assets, weekly data



Note: Government of Canada (GoC) bonds purchased in primary markets are measured at amortized cost. All other bonds, including GoC bonds purchased in secondary markets, are measured at fair value. "All other assets" includes Canada Mortgage Bonds, Real Return Bonds, corporate bonds and commercial paper. A full list of assets can be found on the [Bank of Canada's website](#).

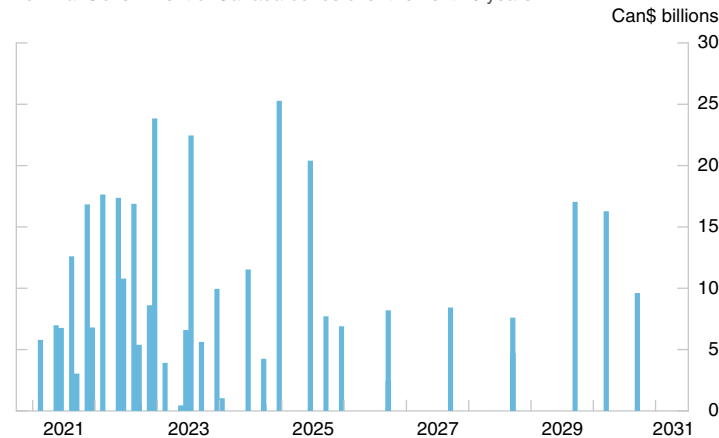
Source: Bank of Canada

Last observation: October 20, 2021

<sup>3</sup> See "About the Bank's Balance Sheet" on the Bank's website for more information.

**Chart 17: Close to 70 percent of the Government of Canada bonds held by the Bank of Canada will mature in the next 5 years**

Maturities of nominal Government of Canada bonds over the next 10 years



Note: Nominal Government of Canada bond holdings measured at par value.

Source: Bank of Canada

Last observation: October 22, 2021

In this context, the total stock of GoC bonds held on the Bank's balance sheet currently sits at around \$425 billion. This includes bonds acquired in both the primary market at GoC bond auctions and the secondary market through the GBPP.<sup>4</sup> While the proportion has varied over time, around 30 percent of the current stock of bonds on the Bank's balance sheet was purchased in the primary market and around 70 percent in the secondary market.<sup>5</sup>

Looking ahead, a significant amount of bond holdings will mature in the coming years, concentrated in the next one to five years, and these maturities will vary month to month (**Chart 17**).<sup>6</sup> Given this combination of large and uneven maturities, the Bank's total holdings of GoC bonds will fluctuate modestly over the next few years.

<sup>4</sup> The Bank regularly purchases Government of Canada securities at auctions in the primary market. Typically, this has been driven by the need to match its balance sheet liabilities, such as bank notes in circulation. See T. Macklem, "[Economic Progress Report: Monetary Policy for the Recovery](#)," (speech delivered virtually to the Fédération des chambres de commerce du Québec, Montréal, September 9, 2021).

<sup>5</sup> Data on the Bank's bond holdings can be found on the "[Bank of Canada Statement of Financial Position / Balance Sheet](#)" on the Bank's website.

<sup>6</sup> The Bank's holdings broadly reflect the market structure. The weighted average maturity of the Bank's holdings is similar to, but slightly shorter than, that of the market outstanding (6.2 years and 7 years, respectively).

## Risks to the inflation outlook

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Uncertainty around the projection remains unusually high. The outlook continues to depend on the evolution of the pandemic, including the spread of COVID-19 variants. However, in Canada, the likelihood of a severe downturn has diminished with high rates of vaccination. The reopening of the economy will nonetheless continue to be a complex process as pervasive supply constraints unwind. Households are also adjusting their consumption and employment in response to the shifting economic environment. Consequently, the evolution of supply and demand and its effects on inflation are particularly uncertain.

Some of the risks identified in previous reports have been partially incorporated into the projection. The base-case scenario now includes slower housing market activity over the near term and longer-lasting effects on inflation from supply-side disruptions.

The outlook for inflation remains subject to several upside and downside risks. The Bank views the risks to the outlook for inflation to be roughly balanced around its updated projection. However, with inflation above the top of the Bank's inflation-control range and expected to stay there for some time, the upside risks are of greater concern. While the Bank views elevated inflation as transitory, the realization of additional upside risks or unanticipated persistence of existing pressures could lead to a rise in inflation expectations along with more pervasive labour cost and inflationary pressures. The risk is that these effects begin to feed into embedded inflation.

Drawing from a larger set of risks that were considered, this section presents a selection of those identified as most important for the projected path of inflation.

(i) More persistent effects of the pandemic (↓)

The effects of the pandemic may be more severe and persistent than assumed in the projection. Some evidence shows that the immunity provided by vaccines may be waning more quickly than previously anticipated, increasing the potential for new waves of the pandemic. The spread of the Delta and other possible future variants may prolong the ongoing softness in demand for hard-to-distance services. This may dampen the rebound in confidence, resulting in lower spending and lower inflationary pressures.

- (ii) **Stronger household spending in Canada (↑)**

The projection continues to include some degree of caution around consumption. However, progress in vaccinations and reduced pandemic-related uncertainty could boost confidence by more than expected. As well, households could spend more of their accumulated savings or accelerate their spending. Consumption and residential investment would then be stronger than projected and would contribute to greater inflationary pressures.
- (iii) **More persistent supply bottlenecks and cost pressures (↑)**

Supply bottlenecks and cost pressures could lead to more persistent inflationary pressures and a slower economic recovery than what is embedded in the base case. At the same time, energy supply shortages in other countries could put further pressure on supply chains as manufacturing production is disrupted. These disruptions to business operations may also lead firms to adjust their supply chains in ways that could increase costs. More persistent labour shortages could also result in higher wage pressures.
- (iv) **Weaker Canadian exports (↓)**

The risks around exports remain tilted to the downside. Competitiveness challenges and Buy American provisions could mute the benefits of expected increases in foreign demand. More persistent or severe supply disruptions may further dampen exports. As well, China's economy could weaken further, notably in response to stress in the property sector and regulatory changes in other key sectors. This would pull down global commodity prices and Canadian exports.
- (v) **Sharp tightening of global financial conditions (↓)**

With high levels of global indebtedness, increased inflationary pressures, reduced policy support and elevated equity valuations, a pullback in risk appetite could trigger a sharp tightening of global financial conditions. This would constrain access to credit for vulnerable EMEs or other highly indebted borrowers and dampen global demand.





# Monetary Policy Report

January 2022





# Canada's inflation-control strategy

## Inflation targeting and the economy

- The objective of Canada's monetary policy is to promote the economic and financial well-being of Canadians. Canada's experience with inflation targeting since 1991 has shown that the best way that monetary policy can achieve this goal is by maintaining a low and stable inflation environment. Doing so fosters confidence in the value of money and contributes to sustained economic growth, a strong and inclusive labour market and improved living standards.
- In 2021, the Government of Canada and the Bank of Canada renewed the flexible inflation-targeting framework for a further five-year period, ending December 31, 2026.<sup>1</sup>
- The inflation target was renewed at the 2% midpoint of the 1%–3% control range, with inflation measured as the 12-month rate of change in the consumer price index (CPI).
- The Government and the Bank agreed that the best contribution monetary policy can make to the economic and financial well-being of Canadians is to continue to focus on price stability. The Government and the Bank also agreed that monetary policy should continue to support maximum sustainable employment, recognizing that maximum sustainable employment is not directly measurable and is determined largely by non-monetary factors that can change through time.
- Further, the Government and the Bank agreed that because well-anchored inflation expectations are critical to achieving both price stability and maximum sustainable employment, the primary objective of monetary policy is to maintain low, stable inflation over time.

## Inflation targeting is *symmetric* and *flexible*

- Canada's inflation-targeting approach is *symmetric*, which means the Bank is equally concerned about inflation rising above or falling below the 2% target.
- Canada's inflation-targeting framework is also *flexible*. Typically, the Bank seeks to return inflation to target over a horizon of six to eight quarters. However, the most appropriate horizon for returning inflation to target will vary depending on the nature and persistence of the shocks buffeting the economy.
- The 2021 agreement with the Government specifies that the 2% inflation target remains the cornerstone of the framework.
- The agreement further notes that the Bank will continue to use the flexibility of the 1%–3% control range to actively seek the maximum sustainable level of employment, when conditions warrant. The Bank will also continue to leverage the flexibility inherent in the framework to help address the challenges of structurally low interest rates by using a broad set of policy tools. The Bank will use this flexibility only to an extent that is consistent with keeping medium-term inflation expectations well anchored at 2%.

## Monetary policy tools

- Because monetary policy actions take time to work their way through the economy and have their full effect on inflation, monetary policy must be forward-looking.

- The Bank normally carries out monetary policy through changes in the target for the overnight rate of interest (the policy rate). The Bank also has a range of monetary policy tools it can use when the policy rate is at very low levels. These tools consist of guidance on the future evolution of the policy rate, large-scale asset purchases (quantitative easing and credit easing), funding for credit measures, and negative policy rates. The potential use and sequencing of these tools would depend on the economic and financial market context.
- All of the Bank's monetary policy tools affect total demand for Canadian goods and services through their influence on market interest rates, domestic asset prices and the exchange rate. The balance between this demand and the economy's production capacity is, over time, the main factor that determines inflation pressures in the economy.

## Communications

- Consistent with its commitment to clear, transparent communications, the Bank regularly reports its perspectives on the economy and inflation. Policy decisions are typically announced on eight pre-set days during the year, and full updates of the Bank's outlook are published four times each year in the *Monetary Policy Report*.
- The Bank is committed to explaining when it is using the flexibility of the inflation-targeting framework.
- Given the uncertainty about the maximum sustainable level of employment, the Bank will consider a broad range of labour market indicators.<sup>2</sup> The Bank will also systematically report to Canadians on how labour market outcomes have factored into its policy decisions.

## Monitoring inflation

- In the short run, the prices of certain CPI components can be particularly volatile and can cause sizable fluctuations in CPI inflation.
- In setting monetary policy, the Bank seeks to look through such transitory movements in CPI inflation and focuses on a set of "core" inflation measures that better reflect the underlying trend of inflation. In this sense, these measures act as an operational guide to help the Bank achieve the CPI inflation target. They are not a replacement for CPI inflation.
- The Bank's three preferred measures of core inflation are CPI-trim, which excludes CPI components whose rates of change in a given month are the most extreme; CPI-median, which corresponds to the price change located at the 50th percentile (in terms of basket weight) of the distribution of price changes; and CPI-common, which uses a statistical procedure to track common price changes across categories in the CPI basket.

<sup>1</sup> For more details, see *Joint Statement of the Government of Canada and the Bank of Canada on the Renewal of the Monetary Policy Framework* (December 13, 2021); *Monetary Policy Framework Renewal—December 2021*; and T. Macklem, "Our Monetary Policy Framework: Continuity, Clarity and Commitment" (speech to the Empire Club of Canada, Toronto, December 15, 2021).

<sup>2</sup> See, for example, the [range of indicators](#) that the Bank is using to track the recovery of the labour market from the effects of the COVID-19 pandemic.

The *Monetary Policy Report* is available on the Bank of Canada's website at [bankofcanada.ca](http://bankofcanada.ca).

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# Monetary Policy Report

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January 2022

This is a report of the Governing Council of the Bank of Canada:

Tiff Macklem, Carolyn Rogers, Timothy Lane, Lawrence Schembri,  
Paul Beaudry, Toni Gravelle and Sharon Kozicki

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## Overview

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A robust economic recovery continued throughout the second half of 2021 in Canada and abroad. Taking into account the faster-than-expected growth and strong job gains, the Bank judges that economic slack is now essentially absorbed.

The Omicron variant of COVID-19 emerged in late autumn, triggering household cautiousness and public health measures. These are temporarily slowing economic activity globally. The economic impacts of Omicron in Canada will likely be limited by high vaccination rates and the continuing adaptability of businesses and households (**Box 1**).

Disruptions to global supply chains have broadened and become more pronounced, pushing inflation higher in most advanced and emerging-market economies (EMEs). In response to inflationary pressures, some central banks have already raised their policy interest rates, and others have signalled they plan to do so.

### Key messages

- The Canadian economy had strong momentum heading into 2022.
- A wide range of measures and indicators suggest that economic slack is now absorbed. Estimates of the output gap are consistent with this evidence.
- Public health measures and widespread worker absences related to the Omicron variant are slowing economic activity in the first quarter of 2022, but the economic impact is expected to be less severe than previous waves.
- With the virus and related supply disruptions expected to fade, consumer spending is anticipated to rebound and exports and business investment are projected to grow solidly.
- The impacts from global and domestic supply disruptions are currently exerting upward pressure on prices. Inflationary pressures from strong demand, supply shortages and high energy prices should subside during the year. Inflation is expected to decline relatively quickly to about 3% by the end of 2022.
- Over the medium term, increased productivity is expected to boost supply growth, and demand growth is projected to moderate. Inflation is expected to decline gradually through 2023 and 2024 to close to 2%.
- The Bank views the risks around this inflation outlook as roughly balanced. However, with inflation above the top of the Bank's inflation-control range and expected to stay there for some time, the upside risks are of greater concern.

## Box 1

## Key inputs to the projection

The Bank of Canada's projection is always conditional on several key assumptions, and changes to them will affect the outlook for the Canadian economy. The Bank regularly reviews these assumptions and assesses the sensitivity of the economic projection to them. The key inputs into the Bank's projection are as follows:

- Vaccination rollouts are progressing in many regions around the world. It is assumed that most global public health restrictions and physical distancing measures will be lifted over the course of 2022. Some of these measures are expected to remain in place longer in emerging-market economies because of lower rates of vaccination.
- Most public health restrictions in Canada are expected to be eased in the first quarter of 2022. Pandemic-related effects on demand—notably, consumer caution and reluctance to travel—are assumed to diminish gradually over the projection horizon.
- As in the October projection, spending on household consumption is assumed to be boosted by an additional \$40 billion as individuals draw down a portion of their extra savings accumulated during the pandemic.
- The projection incorporates information from all available provincial and federal budgets.
- Oil prices are assumed to remain near recent levels. The per-barrel prices in US dollars are assumed to be \$80 for Brent, \$75 for West Texas Intermediate and \$65 for Western Canadian Select, as in the October Report.
- By convention, the Bank does not forecast the exchange rate in the *Monetary Policy Report*. The Canadian dollar is assumed to remain at 79 cents US over the projection horizon, close to its recent average and just below the 80 cents US assumed in the October Report.
- The pandemic is having both temporary and lasting effects on the supply side of the Canadian economy.<sup>1</sup>
  - The Bank's assessment of the growth of potential output, a longer-term concept, looks through the short-lived effects of factors such as containment measures, supply chain disruptions and labour market mismatches. As in the October Report, potential output growth is assumed to average about 1.6% per year over 2021–23. However, the level of potential output is raised by 0.3% due to positive historical revisions to investment, capital stock and gross domestic product (GDP). Despite these revisions, the level of potential output at the end of 2023 is projected to remain about 0.8% below the pre-pandemic estimate.<sup>2</sup>
- The projection assumes that several short-term factors are adversely affecting the supply of goods and services. First, supply chain disruptions are having a large, temporary impact on supply. Second, the mismatch between employers' needs and unemployed workers' skills—exacerbated by the unevenness of the pandemic shock—is contributing to the temporary rise in long-term unemployment. Together, these two effects are assumed to reduce supply, with a peak impact of 2.0% in the fourth quarter of 2021, slightly more severe than was estimated in October. These effects are anticipated to remain elevated in the first half of 2022 and to dissipate over the rest of the year. Third, measures taken to contain the Omicron variant coupled with elevated worker absences due to the rise in cases are expected to decrease supply temporarily in the first quarter of 2022 (see **Chart 8** on page 16).
- Estimates of overall supply growth can be obtained by combining the estimates of the temporary effects of these short-term factors with the assessment of potential output.
- GDP grew at a strong pace amid increased supply disruptions in the fourth quarter of 2021. The Bank estimates that the output gap—the difference between GDP and supply—was about -0.75% to 0.25% in the fourth quarter, smaller than the estimate of -2.25% to -1.25% for the previous quarter.
- The neutral nominal policy interest rate is defined as the real neutral rate plus 2% for inflation. The neutral real rate is defined as the rate consistent with both output remaining sustainably at its potential and inflation remaining at target, on an ongoing basis. It is a medium- to long-term equilibrium concept. For Canada, the economic projection is based on an assumption that the nominal neutral rate is at the midpoint of the estimated range of 1.75% to 2.75%. This range was last reassessed in the April 2021 Report.

<sup>1</sup> As in recent reports, the Bank distinguishes in the near term between supply and potential output to account for the relatively short-lived nature of some of the decrease in supply caused by public health measures, supply chain disruptions and labour market mismatches.

<sup>2</sup> Estimates of the level of potential output in 2023 were not constructed as part of the January 2020 projection. The pre-pandemic estimate referred to in the text is calculated by extending the January 2020 projection for potential output by two years, i.e., through 2023. It uses the estimate for potential growth in 2021 that was provided in the January 2020 Report.

## Global economy

Global economic activity recovered strongly in 2021. In the United States, the recovery has been robust, and the economy is now experiencing excess demand and particularly elevated inflation. Other regions have also made important progress, although most are still operating somewhat below capacity.

Inflation has risen around the world and is projected to peak by the first quarter of 2022 in most regions. High energy and food prices, as well as strong demand for goods amid widespread supply shortages and bottlenecks, have driven inflation up. Supply shortages are expected to dissipate gradually by the end of 2022. However, significant uncertainties remain about the resolution of these shortages, and the Omicron variant may lead to more disruptions in the near term.

The recovery is expected to continue over the projection horizon, despite some near-term weakness because of the emergence of the Omicron variant. Global growth is projected to moderate from 6¾% in 2021 to about 3½% in 2022 and 2023 (Table 1). The US economy is expected to continue growing at a robust pace, albeit with some moderation as policy support eases. Growth in China is expected to be restrained by weakness in the property sector and strict COVID-19 policies. Overall, the global growth outlook is weaker than it was in the October Report (Box 2).

**Table 1: Projection for global economic growth**

	Share of real global GDP* (%)	Projected growth† (%)			
		2020	2021	2022	2023
<b>United States</b>	16	-3.4 (-3.4)	5.6 (5.6)	3.7 (3.9)	2.5 (2.7)
<b>Euro area</b>	12	-6.5 (-6.5)	5.2 (5.3)	4.0 (4.5)	2.6 (1.9)
<b>Japan</b>	4	-4.5 (-4.7)	1.7 (2.5)	2.7 (3.0)	1.0 (0.1)
<b>China</b>	18	2.2 (2.3)	8.1 (7.9)	3.8 (5.3)	5.3 (5.9)
<b>Oil-importing EMEs‡</b>	33	-2.5 (-2.5)	8.1 (7.4)	3.5 (4.0)	3.7 (3.9)
<b>Rest of the world§</b>	16	-3.5 (-3.5)	4.9 (4.8)	3.3 (4.1)	2.5 (2.0)
<b>World</b>	100	-2.2 (-2.2)	6.8 (6.5)	3.6 (4.3)	3.4 (3.4)

\* GDP shares are based on International Monetary Fund (IMF) estimates of the purchasing-power-parity valuation of country GDPs for 2020 from the IMF's October 2021 *World Economic Outlook*. The individual shares may not add up to 100 due to rounding.

† Numbers in parentheses are projections used in the previous Report.

‡ The oil-importing emerging-market economies (EMEs) grouping excludes China. It is composed of large EMEs from Asia, Latin America, the Middle East, emerging Europe 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 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).

Source: Bank of Canada

## Box 2

## Changes to the economic projection since the October Report

### Global GDP outlook

Growth in China and emerging-market economies (EMEs) was a positive surprise for 2021. However, downward revisions to the outlook in most major regions over the projection horizon more than offset this growth. Overall, the level of global gross domestic product (GDP) has been revised down by 0.3% at the end of 2023 relative to the October Report. The following factors explain the revisions to the outlook:

- In response to the emergence of the Omicron variant of COVID-19, travel and public health restrictions are tighter than anticipated in all regions in early 2022. However, a large part of these effects should be temporary, and they are expected to dissipate in the second half of 2022 and in 2023.
- China's outlook has been revised down, reflecting a greater negative impact from the ongoing correction in the property sector.
- Monetary policy in the United States is expected to be less accommodative than previously anticipated because of the need to respond to higher-than-expected inflation.

### Canadian GDP outlook

The level of GDP in Canada at the end of 2021 has been revised up due to stronger estimated growth in the fourth quarter. This improved forecast offsets historical data revisions that revealed a sharper contraction in the second quarter. Taken together, these revisions resulted

in a lower estimate of GDP growth in 2021 by half a percentage point, to about 4½%.

GDP growth has been revised down by about a quarter of a percentage point in both 2022 and 2023, leaving the level of real GDP roughly ½% lower at the end of 2023. The following factors explain the revisions to the outlook:

- The Omicron variant and related containment measures temporarily reduce economic activity in the first quarter of 2022.
- Recent data and fiscal updates from provincial and federal governments suggest that growth in government spending is easing earlier than expected.
- Supply constraints will have larger and more broad-based negative implications on economic activity over 2022.
- The growth profiles for exports and business investment are revised down. This is due in part to the downward revision to the projection of US growth.

### Canadian CPI inflation outlook

Consumer price index (CPI) inflation is expected to be higher than projected in October. The outlook for CPI inflation in 2022 is revised up by about three-quarters of a percentage point to 4.2% and remains unchanged in 2023 at 2.3%. This upward revision mainly reflects larger impacts from various supply issues, notably those affecting shelter costs and food prices.

## Some tightening of global financial conditions

Government bond yields have risen in recent months in many countries, including Canada and the United States. This partly reflects market participants' anticipation that policy interest rates will be raised earlier than previously expected. Despite this recent tightening, financial conditions remain broadly accommodative. Corporate bond spreads and the Can\$/US\$ exchange rate are close to their levels at the time of the October Report. However, global equity prices have recently declined owing to the combination of higher expected interest rates and increased geopolitical tensions.

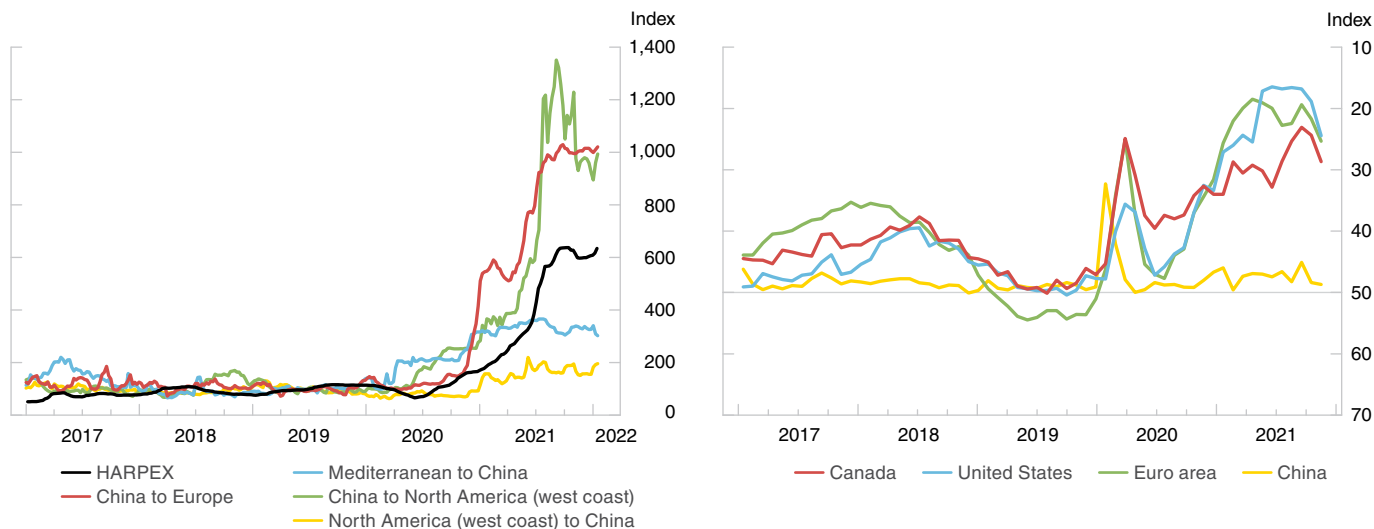
## Recent strong growth to moderate in the United States

Gross domestic product (GDP) growth rebounded at the end of 2021 after a period of soft activity associated with the spread of the Delta variant at the end of the summer. The labour market tightened considerably in the fourth quarter, as demonstrated by the decline in the unemployment rate and the

**Chart 1: Transportation costs and the share of firms that report worsening delivery times have likely peaked but remain high**

a. Transportation costs, index 2019 = 100, weekly data

b. PMI: Manufacturing suppliers' delivery times, monthly data



Note: All series in panel a are from the Freightos Baltic Index except the HARPEX (Harper Petersen Charter Rates Index). The Freightos Baltic Index provides market ocean freight rates for different trade lanes. The HARPEX reflects the worldwide price development on the charter market for container ships. The Purchasing Managers' Index (PMI) is a diffusion index of business conditions. For suppliers' delivery times, an inverted index is used to show that a reading less than (greater than) 50 indicates an increase (decrease) in delivery times compared with the previous month.

Sources: IHS Markit and HARPEX via Haver Analytics and Freightos Baltic Index via Bloomberg Finance L.P.

Last observations: HARPEX, January 21, 2022; Freightos Baltic Index, January 23, 2022; PMI, December 2021

elevated number of job vacancies. Aggregate measures of wage growth have increased, particularly in industries that reopened quickly, such as leisure and hospitality.

Bottlenecks at ports and global shortages of various goods will likely continue to curb production and push prices up. However, shipping costs seem to have plateaued, and some progress has been made on alleviating congestion at ports (**Chart 1**). Supply disruptions are anticipated to decline over 2022.

US GDP growth is projected to moderate from 5½% in 2021 to about 3¾% in 2022 and 2½% in 2023, as policy stimulus is withdrawn. Consumption is anticipated to remain solid in 2022 and 2023, supported by a strong labour market and households spending some of the savings they accumulated during the pandemic. The projection also incorporates the Bipartisan Infrastructure Law and other spending on research and development totalling US\$1.5 trillion over eight years starting in 2022.

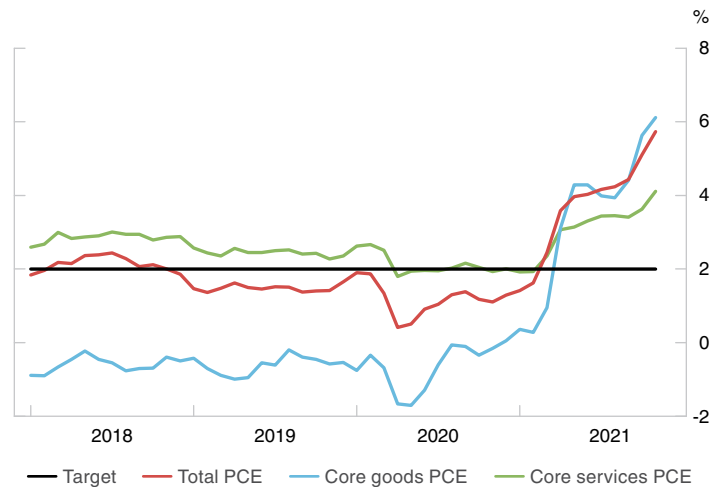
Total and core measures of US personal consumption expenditures (PCE) inflation remain high and are expected to peak at 5.7% and 5.0%, respectively, in the first quarter of 2022.<sup>1</sup> Past increases in energy prices and continued supply bottlenecks amid high demand for goods have been important contributors to inflationary pressures (**Chart 2**). The effects of energy and supply shortages are anticipated to decline, gradually leading to a moderation in inflation over the course of the year. However, with the economy expected to remain in excess demand, PCE inflation is anticipated to stay above 2% over the projection horizon, reaching 2.4% at the end of 2023.

<sup>1</sup> Total US consumer price index inflation is expected to peak at 7.1% in the first quarter.



**Chart 2: Supply shortages amid strong demand are boosting prices of US goods**

Year-over-year percentage change, monthly data



Note: PCE is personal consumption expenditures. “Total PCE” is the PCE price index, which reflects changes in the prices of goods and services purchased by consumers in the United States. “Core goods PCE” and “core services PCE” exclude food and energy.

Source: US Bureau of Economic Analysis via Haver Analytics

Last observation: November 2021

**Euro area recovery to continue amid new restrictions**

Growth in the euro area is estimated to have slowed in late 2021, following the reintroduction of targeted restrictions in many countries in response to rising COVID-19 cases. The new wave of health and travel restrictions will likely be short-lived and the recovery is expected to continue, with growth gradually moderating in 2022 and 2023.

Euro area inflation, as measured by the Harmonised Index of Consumer Prices (HICP), reached 5% in December. Most components of HICP have risen over the past year. However, a large part of the increase in inflation reflects high energy prices and past changes to the German value-added tax. Inflation is expected to ease over the projection horizon as the effects of these two factors dissipate.<sup>2</sup>

**Property sector weakness weighs on Chinese growth**

Growth in China is expected to slow to only 3¼% in 2022 as the property sector continues to adjust. Strict containment measures—particularly in light of the Omicron variant—continue to be a drag on the economy. Past tightening of regulations in the property sector has prompted a decline in housing activity that will likely be an important drag on growth in 2022. As a result, some property developers are experiencing financial distress. Other regulatory changes in a wide range of sectors, including technology and education, are also projected to weigh on domestic demand.

In response to the economic slowdown, Chinese authorities have modestly increased policy support. Growth is projected to recover to about 5¼% in 2023 as the drag on growth from the property sector diminishes. Uncertainty about both the impact of China’s “zero-COVID” policy and the fragility of the property sector remains high. Either of these factors could dampen growth by more than expected over the projection horizon.

<sup>2</sup> Energy prices in the euro area could continue to rise in the near term due to geopolitical tensions.



## Lower vaccination rates and policy tightening in emerging-market economies

After a strong recovery in 2021, growth is expected to slow in 2022 and 2023 in oil-importing EMEs and in the rest-of-the world group. Many countries have tightened monetary policy in response to increased inflationary pressures. Higher interest rates will weigh on economic activity, particularly in Latin America, Russia and emerging Europe. Growth in some EMEs may also be affected by low vaccination rates and renewed measures to contain COVID-19 outbreaks.

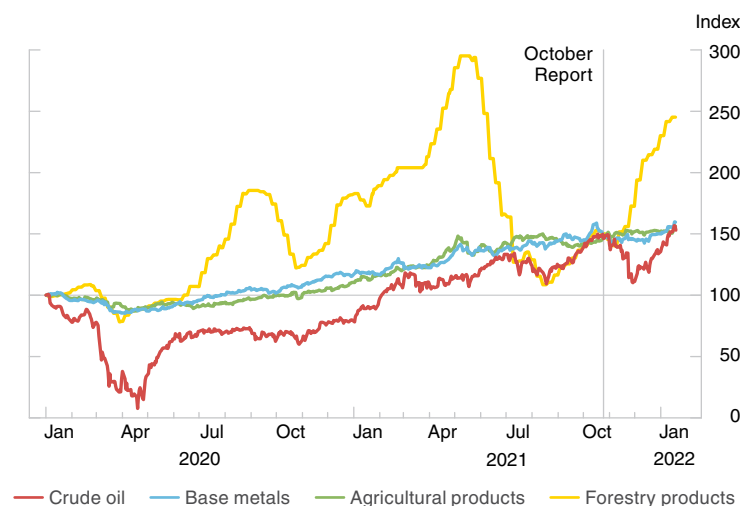
## High and volatile commodity prices

Oil prices have experienced significant volatility since the October Report (Chart 3). They initially fell sharply as the emergence of the Omicron variant increased uncertainty. With the economic impacts of Omicron now looking less severe than initially feared, prices have recovered. Concerns about global energy supply and heightened geopolitical tensions have also contributed to the rebound in oil prices. Over the projection horizon, the per-barrel prices of Brent, West Texas Intermediate and Western Canadian Select oil are assumed to be US\$80, US\$75 and US\$65, respectively, the same levels as in the October Report (Box 1).

Prices could stay above the flat oil price assumption if global energy shortages were to continue. Oil prices could also fall below this assumption if members of the Organization of the Petroleum Exporting Countries (OPEC) and some non-OPEC oil producers, including the United States, were to significantly increase production. The severity and persistence of the Omicron variant also remains a downside risk.

**Chart 3: Commodity prices remain high**

Index: January 3, 2020 = 100, daily data



Note: All series plotted are components of the Bank of Canada commodity price index. The crude oil index is a weighted average of the benchmarks for West Texas Intermediate, Western Canadian Select and Brent.

Source: Bank of Canada

Last observation: January 21, 2022

Lumber prices have surged since the October Report, largely reflecting the combination of strong demand from the North American housing sector and floods in British Columbia that have hindered rail and road transportation. Prices of base metals and agricultural products are marginally stronger than in October. Markets expect these non-energy commodity prices to stay elevated over the projection horizon. This is because of reduced supply—notably due to high energy input costs—and strong global demand.

## Canadian economy

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The Canadian economy experienced a strong rebound through the second half of 2021. Economic growth surged as the easing of public health measures boosted consumption of services, and exports bounced back due to growing foreign demand.

The unexpected arrival of the highly infectious Omicron variant is causing renewed hardship for many. It also serves as a reminder that the evolution of the pandemic remains uncertain. The sharp increase in the number of cases and the imposition of related public health measures are slowing activity at the start of 2022, but robust growth should resume in the second quarter. The combination of high vaccination rates and improved adaptability of businesses and consumers limits the downside economic risks from this wave of the pandemic.

Labour conditions are strong. The labour market had recovered to pre-pandemic levels by the end of 2021. The employment rate has fully recovered when accounting for demographic change, firms are having difficulty finding workers, and wage growth is rising. Omicron is leading to some temporary job losses in hard-to-distance sectors and to a spike in worker absences more broadly, but these effects are expected to be short-lived.

Faced with robust demand, many Canadian businesses are experiencing challenges due to supply constraints. Transportation bottlenecks, labour shortages and difficulty sourcing key inputs are resulting in reduced hours of operation, production slowdowns and delayed or cancelled sales. The overall effects of these supply disruptions are estimated to have been larger, broader and more persistent than initially anticipated. Exports and business investment have been particularly affected, as has consumer spending on some durable goods such as motor vehicles.

The outlook is for strong growth over the projection horizon as demand remains robust and supply recovers from the effects of the pandemic, with disruptions expected to ease gradually through 2022. Overall, growth is forecast to be around 4% in 2022 and 3.5% in 2023, supported by household spending on services, exports and investment (**Table 2**). This growth forecast is slightly weaker than in the October Report (**Box 2**).

Consumer price index (CPI) inflation is forecast to remain close to 5% over the first half of 2022. This is due to supply constraints coinciding with high energy prices and rising food costs. CPI inflation is anticipated to ease to about 3% by the end of 2022 as these pressures dissipate. Inflation is then expected to decline to around 2¼% by the second half of 2023 and remain close to the target in 2024.

**Table 2: Contributions to average annual real GDP growth**

Percentage points\*†

	2020	2021	2022	2023
<b>Consumption</b>	-3.5 (-3.4)	2.9 (2.7)	3.3 (3.4)	2.3 (2.5)
<b>Housing</b>	0.3 (0.3)	1.3 (1.3)	-0.7 (-0.4)	0.0 (0.1)
<b>Government</b>	0.3 (0.1)	1.3 (1.7)	0.4 (0.7)	0.5 (0.3)
<b>Business fixed investment</b>	-1.2 (-1.3)	0.0 (0.2)	0.7 (0.8)	0.7 (0.9)
<b>Subtotal: final domestic demand</b>	-4.1 (-4.3)	5.5 (5.9)	3.7 (4.5)	3.5 (3.8)
<b>Exports</b>	-3.1 (-3.2)	0.4 (0.8)	1.8 (1.9)	0.8 (1.1)
<b>Imports</b>	3.7 (3.8)	-2.1 (-2.3)	-2.0 (-2.4)	-1.3 (-1.7)
<b>Subtotal: net exports</b>	0.6 (0.7)	-1.7 (-1.5)	-0.2 (-0.5)	-0.5 (-0.6)
<b>Inventories</b>	-1.7 (-1.6)	0.8 (0.7)	0.5 (0.3)	0.5 (0.5)
<b>GDP</b>	-5.2 (-5.3)	4.6 (5.1)	4.0 (4.3)	3.5 (3.7)
<b>Memo items (percentage change):</b>				
Range for potential output	0.8–2.0 (0.8–2.0)	0.8–2.2 (0.8–2.2)	0.4–2.2 (0.4–2.2)	1.0–3.0 (1.0–3.0)
Real gross domestic income (GDI)	-6.2 (-6.3)	8.8 (9.0)	4.5 (3.6)	2.8 (3.5)
CPI inflation	0.7 (0.7)	3.4 (3.4)	4.2 (3.4)	2.3 (2.3)

\* Numbers in parentheses are from the projection in the previous Report.

† Numbers may not add to total due to rounding.

Sources: Statistics Canada and Bank of Canada calculations and projections

## Strong momentum heading into 2022

Growth was robust in the second half of 2021, at around 5½%. It is expected to moderate to about 2% in the first quarter (**Table 3** and **Chart 4**). The Omicron variant and its related supply disruptions are expected to temporarily weigh on hard-to-distance services such as travel and indoor dining, with the effects mitigated by governments extending their support programs. Elevated worker absences due to the rise in cases are anticipated to temporarily affect a broader range of industries. Strong growth is expected to resume later in the first quarter.

**Table 3: Summary of the quarterly projection for Canada\***

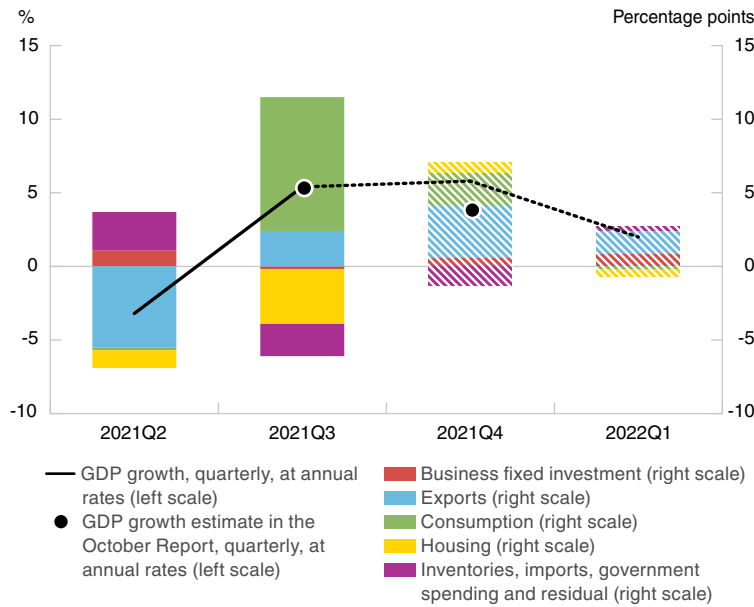
	2021			2022	2020	2021	2022	2023
	Q2	Q3	Q4	Q1	Q4	Q4	Q4	Q4
<b>CPI inflation (year-over-year percentage change)</b>	3.4 (3.4)	4.1 (4.1)	4.7 (4.8)	5.1	0.7 (0.7)	4.7 (4.8)	3.0 (2.1)	2.2 (2.5)
<b>Real GDP (year-over-year percentage change)</b>	11.8 (12.7)	4.0 (4.7)	3.2 (3.4)	2.4	-3.1 (-3.1)	3.2 (3.4)	4.2 (4.6)	2.7 (3.0)
<b>Real GDP (quarter-over-quarter percentage change at annual rates)†</b>	-3.2 (-1.1)	5.4 (5.5)	5.8 (4.0)	2.0				

\* Details on the key inputs to the base-case projection are provided in **Box 1**. Numbers in parentheses are from the projection in the previous Report.† Over the projection horizon, 2021Q4 and 2022Q1 are the only quarters for which some information about real GDP growth was available at the time the projection was conducted. For longer horizons, fourth-quarter-over-fourth-quarter percentage changes are presented. They show the Bank's projected growth rates of CPI and real GDP within a given year. As such, they can differ from the growth rates of annual averages shown in **Table 2**.

Sources: Statistics Canada and Bank of Canada calculations and projections

**Chart 4: The economy showed strong momentum heading into 2022**

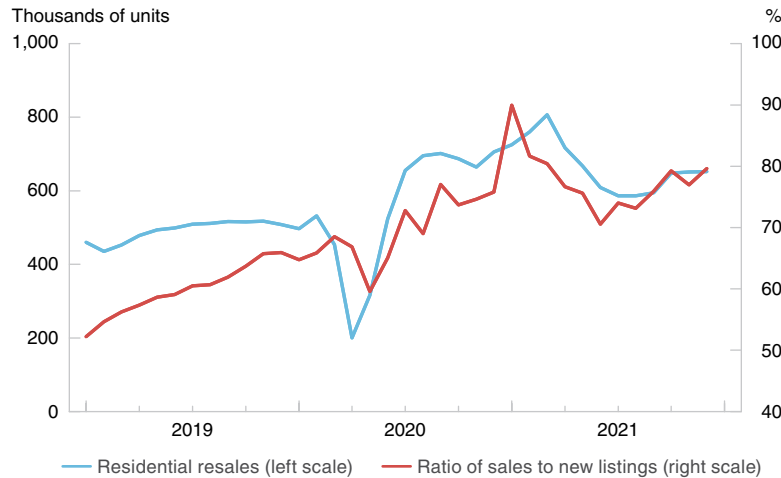
Contribution to real GDP growth, quarterly data



Sources: Statistics Canada and Bank of Canada calculations and estimates Last data plotted: 2022Q1

**Chart 5: Housing market activity has strengthened again in recent months**

Seasonally adjusted, monthly data



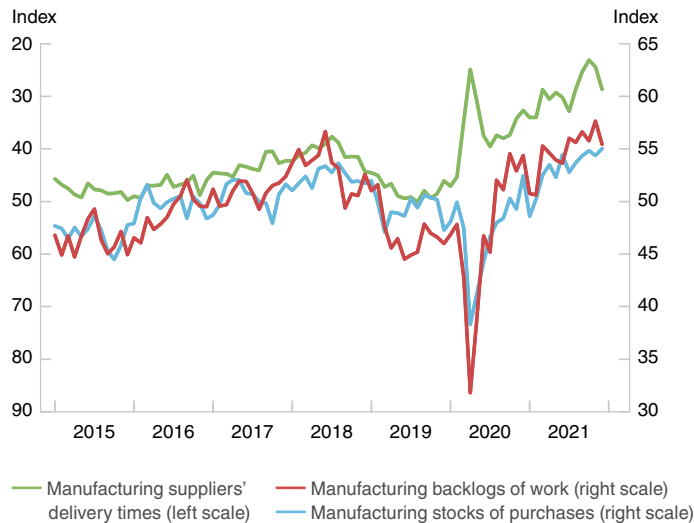
Note: Residential resales are seasonally adjusted at annual rates. Source: Canadian Real Estate Association Last observation: December 2021

Housing market activity has strengthened again in recent months, led by a rebound in resales (Chart 5).<sup>3</sup> Low borrowing rates and high disposable incomes are continuing to contribute to elevated levels of housing activity in the first quarter. At the same time, other factors that support demand, such as population growth, are also now picking up.

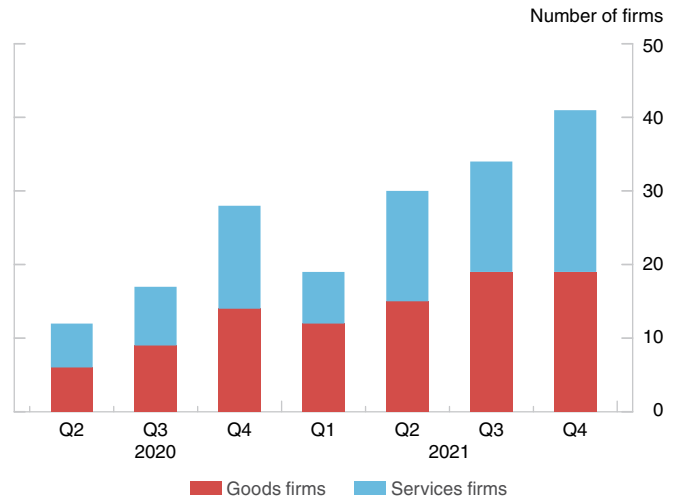
<sup>3</sup> For more information on housing market activity in recent years, see M. Khan and Y. Xu, "Housing Demand in Canada: A Novel Approach to Classifying Mortgaged Homebuyers," Bank of Canada Staff Analytical Note No. 2022-1 (January 2022).

**Chart 6: Supply disruptions are leading to delivery delays and weighing on production**

a. Canadian manufacturing PMI: selected indexes of production conditions, seasonally adjusted, monthly data



b. Number of firms reporting supply chain bottlenecks, Business Outlook Survey, quarterly data



Note: The Purchasing Managers' Index (PMI) is a diffusion index of business conditions. For suppliers' delivery times, an inverted index is used to show that a reading less than (greater than) 50 indicates an increase (decrease) in delivery times compared with the previous month. Services firms reporting supply chain bottlenecks include firms in the retail and wholesale trade sectors affected by delays sourcing products and, to a lesser extent, firms in the transportation, warehousing, construction and hospitality sectors. Mentions of raw material constraints, transportation difficulties and logistics issues are counted as supply chain bottlenecks. The [Business Outlook Survey](#) samples about 100 firms.

Sources: IHS Markit via Haver Analytics and Bank of Canada

Last observations: PMI, December 2021; BOS, 2021Q4

Supply constraints continue to weigh on spending and production. This can be seen, for example, in delays in the delivery of key inputs used by manufacturers (**Chart 6**). Despite these near-term challenges, solid foreign demand and improving business confidence should continue to support robust growth in business investment and exports.

## Labour markets tightened

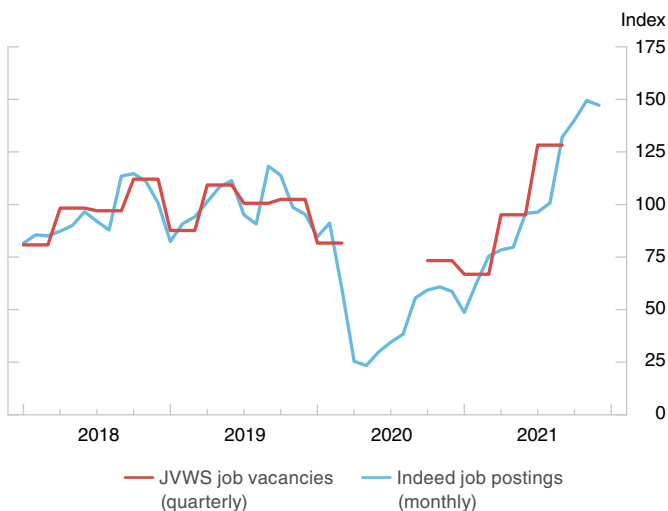
Employment growth has been robust in recent months. The unemployment rate is only 0.3 percentage points higher than it was in February 2020. Labour force participation rates are at or above pre-pandemic levels for most age groups, and job postings are at near-record levels. The Omicron wave is weighing temporarily on employment in hard-to-distance sectors. The expected short duration of restrictions should limit the impact on the labour market.

In the Bank's Business Outlook Survey (BOS) for the fourth quarter of 2021, about 40% of firms reported that labour shortages are restricting their ability to meet demand—a level not seen since 2007. Moreover, most of these firms expect the shortages to persist until at least 2023.

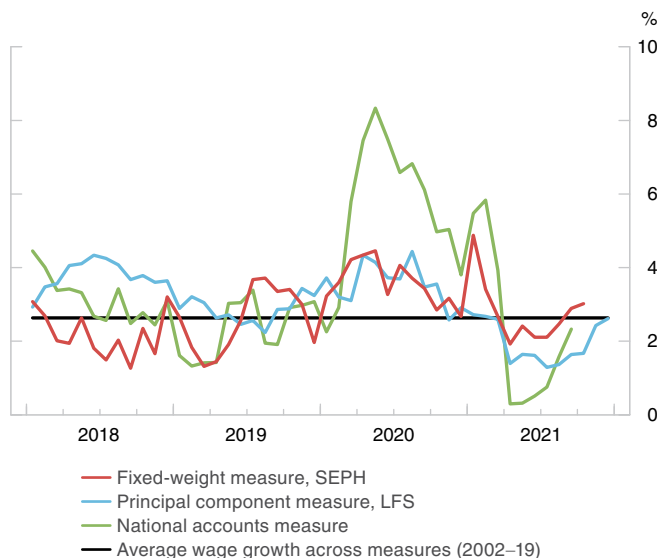
Wage growth is picking up, partly due to the need to attract employees (**Chart 7**). Given a greater number of job openings, many workers can more easily find higher-paying jobs that better fit their skills, and this should boost productivity.

**Chart 7: Wage growth is picking up amid high job vacancies**

a. Ratios of JWVS job vacancies and Indeed online job postings to unemployment, not seasonally adjusted, index: 2019 = 100



b. Wage growth measures, year-over-year percentage change, monthly data



Note: JWVS is the Job Vacancy and Wage Survey; LFS is the Labour Force Survey; SEPH is the Survey of Employment, Payrolls and Hours. Due to data limitations at the onset of the pandemic, JWVS job vacancies data are unavailable for the middle quarters of 2020. The LFS principal component measure is calculated using the estimated common trend of annual growth for wages based on employees' job status (full or part time), job permanency (permanent or temporary), industry of employment and occupation. The national accounts wage measure is constructed as total wages and salaries at a monthly frequency from the Canadian System of Macroeconomic Accounts divided by total hours worked from SEPH.

Sources: Statistics Canada, Indeed and Bank of Canada calculations

Last observations: LFS and Indeed, December 2021; SEPH, October 2021; national accounts wage measure, September 2021; JWVS, 2021Q3

Labour productivity growth has been weak amid broader labour market gains. Supply shortages, restrictions on the number of customers being served and slack in hard-to-distance services, such as travel, are likely contributing to this weakness. As pandemic-related supply disruptions abate and business investment strengthens, labour productivity growth should increase.

### Economic slack absorbed

The absorption of economic slack in the second half of 2021 was faster than expected in the October Report. At that time, output and employment growth were projected to be strong, but the recovery has been even more robust. This is due to a surge in services consumption, strong growth in exports and the addition of almost 800,000 jobs since May. At the same time, supply has been revised down since October because of further bottlenecks and shortages related to the pandemic (**Chart 8** and **Box 1**). Businesses have also reported that they increasingly face capacity constraints as they try to meet elevated demand.

Consequently, a broad set of measures—including labour market indicators, surveys on business sentiment and measures of core inflation—suggest that economic slack is now absorbed (**Box 3**). Taking the respective demand and supply pressures into account, the Bank estimates that the output gap narrowed to between -0.75% and 0.25% in the fourth quarter of 2021.

Box 3

### Economic slack in the fourth quarter of 2021

Estimates of the degree of slack in the overall economy are inherently uncertain. This is particularly true given the significant and unprecedented disruptions to supply and demand brought on by the pandemic. Consequently, a wide range of measures and indicators should be considered when estimating slack. These include the state of the labour market, responses to

surveys on business sentiment, measures of core inflation and estimates of the economy-wide output gap.

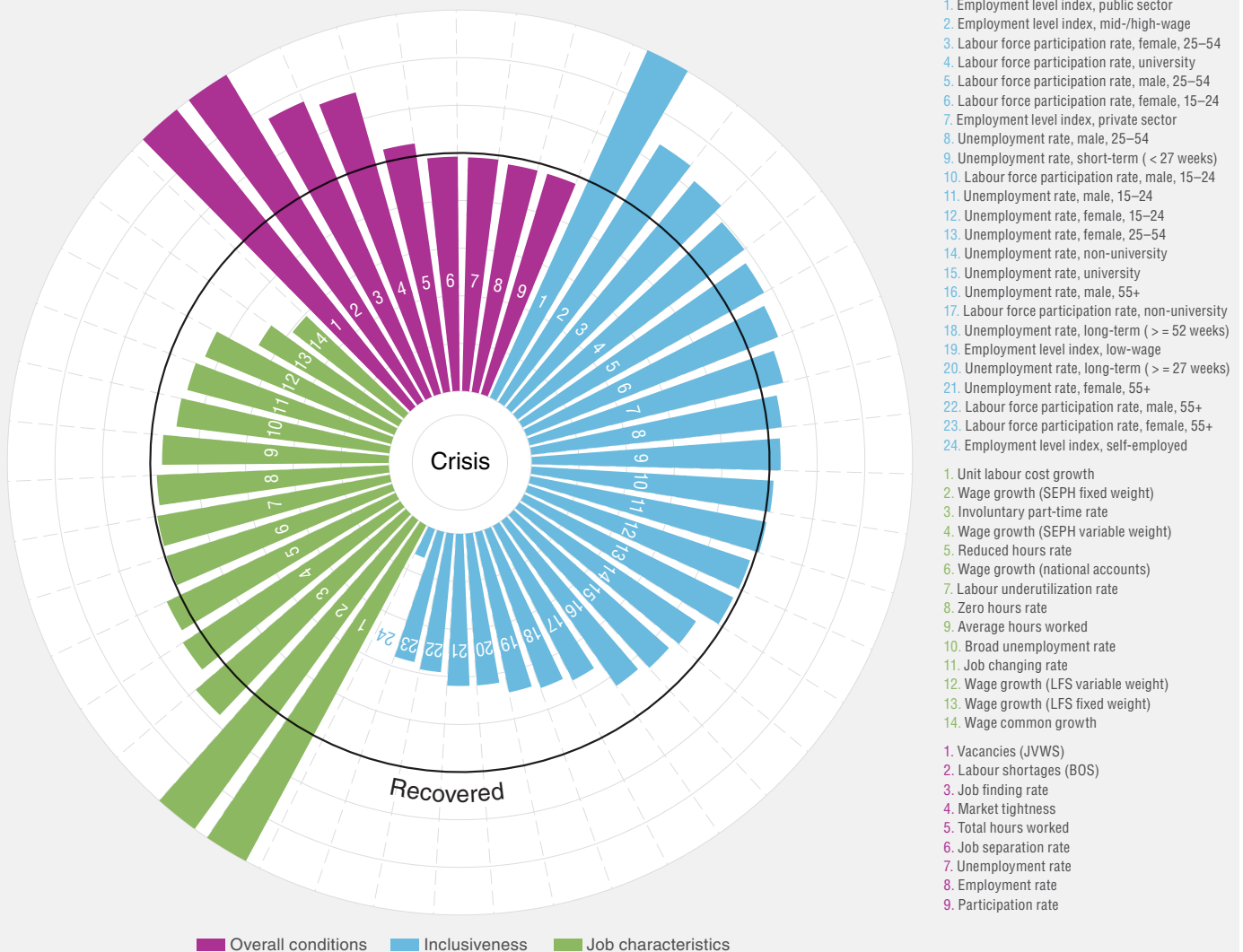
#### Labour market

Overall, labour market indicators suggest that slack in this market is absorbed (Chart 3-A). Aggregate measures

(continued...)

**Chart 3-A: Indicators suggest that labour market slack is absorbed**

Progress bars for selected labour market measures



Note: This chart illustrates the extent to which measures of labour market health have recovered. The recovery is depicted as progress bars, where the current value of a measure is compared with its pandemic trough and a benchmark value (2019 monthly average). When a bar reaches the ring labelled "Recovered," the measure has fully recovered. When a bar is near the circle labelled "Crisis," the measure is near its pandemic trough. LFS is the Labour Force Survey; SEPH is the Survey of Employment, Payrolls and Hours; BOS is the Business Outlook Survey; JVWS is the Job Vacancy and Wage Survey. For details, see the [Bank's web page on the labour market recovery from COVID-19](#).

Sources: Statistics Canada, Indeed, Bank of Canada and Bank of Canada calculations

Last observations: LFS and Indeed, December 2021; SEPH, October 2021; BOS, 2021Q4; JVWS and National Accounts, 2021Q3; national accounts wage measure, September 2021



## Box 3 (continued)

such as the employment, participation and unemployment rates are close to their pre-pandemic levels.<sup>1</sup> The job vacancy rate is near a series high, suggesting that labour market conditions are tight. Measures of inclusiveness have also improved with the return of employment rates to pre-pandemic levels for youth, as well as for women after accounting for changes in the population. In addition, respondents to the Business Outlook Survey report that labour shortages are at their highest level in more than a decade.

Some segments of the labour market have yet to fully recover:

- Employment of workers in low-wage occupations has continued to lag.
- The proportion of long-term unemployment remains high.
- Some measures of year-over-year wage growth have not quite fully rebounded.

### Business capacity pressures

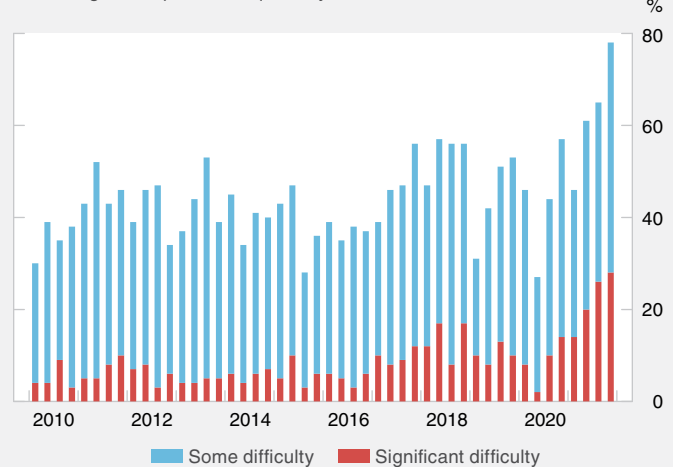
Canadian businesses across a wide range of sectors report that they are facing capacity constraints. The fourth-quarter 2021 Business Outlook Survey shows that more than three-quarters of respondents would have difficulty meeting an unexpected increase in demand—a survey high (**Chart 3-B**). In many cases, labour shortages are contributing to these capacity constraints. Private sector surveys show similar results. While survey respondents continue to point to supply disruptions as playing an important role, many businesses also cite strong demand. Capacity pressures are being reported not only by businesses that have seen their revenues grow over the course of the pandemic but also by those that have not.

### Measures of core inflation

Rates of core inflation also suggest that economic slack is absorbed. In normal circumstances, core inflation staying persistently at 2% would be consistent with no economic slack. The Bank's three preferred measures of core inflation—CPI-common, CPI-median and CPI-trim—currently sit at 2.1%, 3.0% and 3.7%, respectively. The price distortions caused by the pandemic make it more difficult to use measures of core inflation as a proxy for slack. For example, the impact of supply chain disruptions abroad may be pushing up CPI-trim and CPI-median; as a result, there may appear to be more excess demand in the domestic economy than there

### Chart 3-B: Reports of capacity pressures are increasingly widespread in the Business Outlook Survey

Percentage of respondents, quarterly data



Note: Percentage of respondents to the Business Outlook Survey reporting some or significant difficulty meeting an unexpected increase in demand or sales. See the *Business Outlook Survey—Fourth Quarter of 2021* for more details.

Source: Bank of Canada

Last observation: 2021Q4

actually is. CPI-common, which puts more weight on services and consequently on domestic conditions, has also been affected. Nevertheless, all three measures have moved up over the past year to above 2%, suggesting that the economy is at full capacity.

### Output gap

Estimates of the output gap bring together the Bank's assessment of both labour market slack and how labour productivity differs from its trend. While labour market slack is absorbed, supply disruptions and pandemic-related restrictions have weighed on labour productivity. Moreover, investment has been weak since the beginning of 2020.

The Bank takes these factors, as well as the latest upward revision to quarterly growth at the end of 2021, into account when estimating the output gap. The Bank estimates the output gap—the difference between gross domestic product and supply—to be between -0.75% and 0.25% in the fourth quarter of 2021. It is important to note that the complexity of recovery makes estimates of the output gap more uncertain than normal.

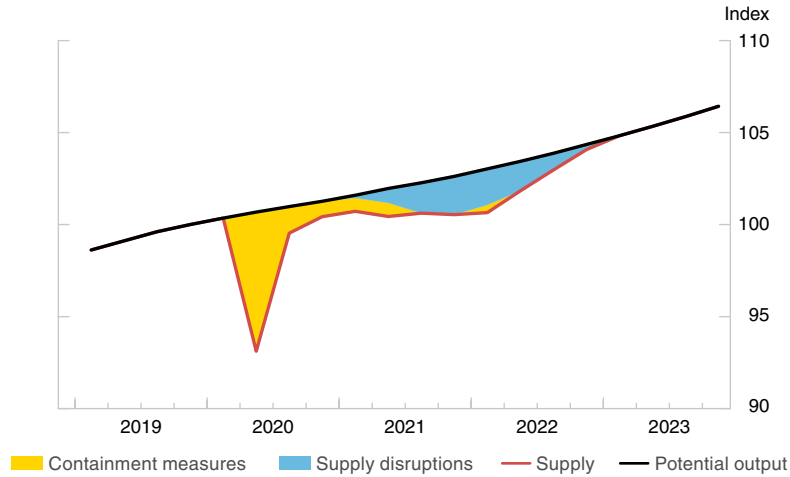
### Assessment of economic slack

The job market is tight, businesses face historically high capacity constraints, and measures of core inflation are above 2%. The Bank's estimate of the economy-wide output gap is consistent with these indicators. Taken together, these factors support the Bank's assessment that, overall, slack is absorbed in Canada.

<sup>1</sup> The labour market at the end of 2019 can be characterized as having had no slack.

**Chart 8: Supply disruptions are expected to dissipate gradually over 2022**

Index: 2019Q4 = 100, quarterly data



Note: “Supply disruptions” includes the short-term effects on supply of supply chain disruptions and labour market mismatch. The area labelled “Containment measures” in 2022Q1 also includes the effects on supply of worker absences due to the rise in COVID-19 cases. See **Box 1** for details.

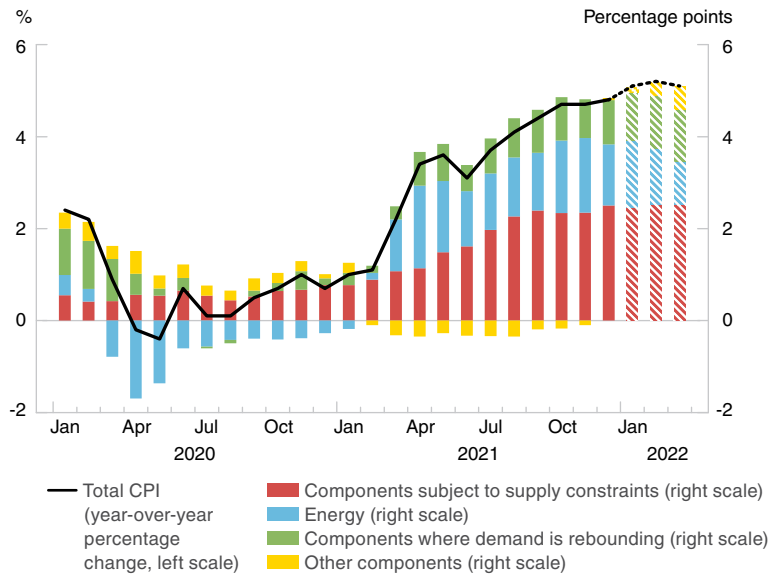
Sources: Bank of Canada calculations, estimates and projections

**CPI inflation elevated**

CPI inflation is forecast to average close to 5% in the first half of 2022. Inflation is elevated because of higher prices for durable goods, energy and food (**Chart 9**).

**Chart 9: Supply constraints and energy prices are pushing up inflation**

Contribution to CPI inflation, in percentage points, monthly data



Note: “Components subject to supply constraints” includes motor vehicles, durable goods, food purchased in stores (excluding fruits and vegetables), and home repair and replacement costs. “Components where demand is rebounding” includes hard-to-distance services, transportation and travel-related services, food and alcohol in restaurants, rented accommodation and semi-durable goods.

Sources: Statistics Canada and Bank of Canada calculations and estimates Last data plotted: March 2022

Durable goods prices are being pushed up by global supply chain disruptions, while Canadian energy prices are higher because of elevated global oil and natural gas prices. At the same time, last year's drought and ongoing supply challenges are contributing to higher food prices (**Box 4**). The result is that goods price inflation has reached nearly 7%, well above the previous 10-year average of roughly 1% (**Chart 10**). Taken together, energy prices and components subject to supply constraints are currently adding nearly 4 percentage points to inflation.

Box 4

### Upward pressure on food prices to persist

As consumers face rising prices at grocery stores, food price inflation is making headlines. Prices for food purchased in stores are up nearly 6% year over year (**Chart 4-A**).

Food categories with the strongest price inflation include:<sup>1</sup>

- beef, bacon and chicken—up 12%, 19% and 6%, respectively
- breakfast cereals, prepared fruits and prepared vegetables—up about 6%
- potato chips and other snacks and margarine—up about 7% and 18%, respectively

Several factors contribute to this recent increase in food prices.

First, domestic prices for agricultural commodities, which closely follow global prices, have recently increased significantly (**Chart 4-B**). This is due to unfavourable weather conditions in many growing areas of the world, including the drought in Western Canada. Because producing livestock and many processed foods requires these agricultural commodities, the higher input costs are passed along to consumers.

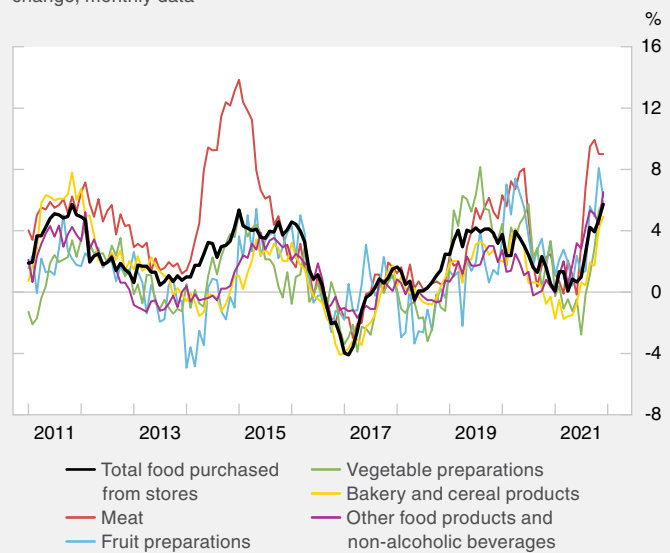
Second, supply chain disruptions have adversely affected food processors' productivity and unit costs. In addition, food processors have slowed production lines to implement health measures to protect their workers.

Third, higher energy costs are putting upward pressure on distribution costs. These and other such cost increases are contributing to, for example, the recent administrative increase in milk prices paid to farmers.

These increases in food prices will likely continue. As a result, the Bank of Canada expects that food price inflation will be above its historical average over 2022.

**Chart 4-A: Food price inflation is at a 10-year high**

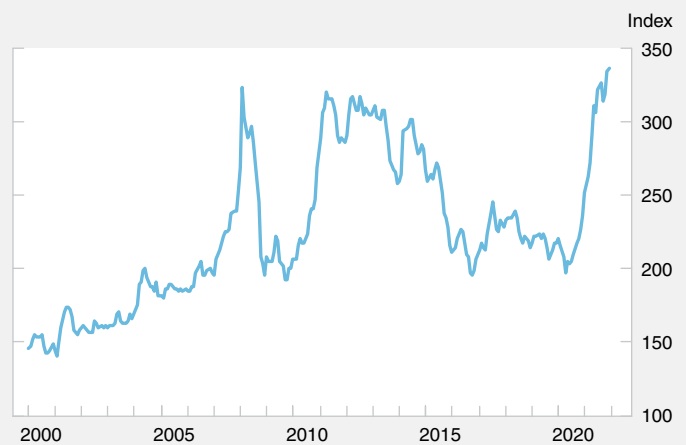
CPI inflation of food purchased from stores, year-over-year percentage change, monthly data



Sources: Statistics Canada and Bank of Canada calculations. Last observation: December 2021

**Chart 4-B: Agricultural prices have increased significantly**

Index: January 1972 = 100, monthly data



Note: The series plotted is the agricultural products component of the Bank of Canada commodity price index. Source: Bank of Canada. Last observation: December 2021

<sup>1</sup> These food categories are either shown or included in a grouping in Chart 4-A.

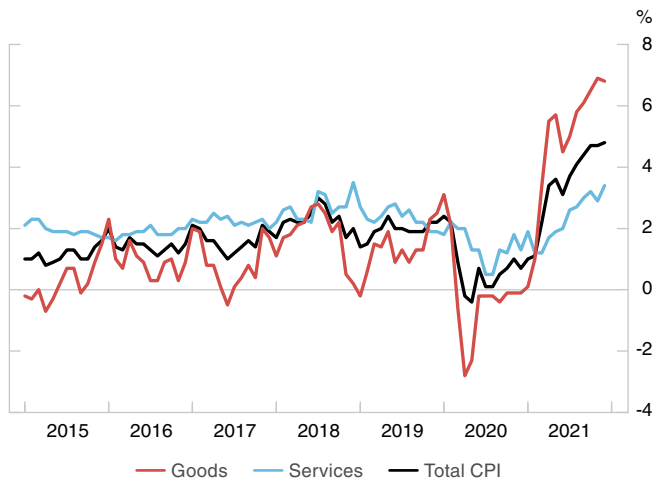
Services price inflation, which is affected by both domestic and external forces, has risen to nearly 3.5%. The increase is led by escalating construction costs due to higher prices for building materials and labour shortages. As a result of these factors, price pressures have broadened across CPI components (**Chart 10**). Close to 55% of CPI components are now growing at more than 3%, well above the historical average of 30%.

Core measures of inflation have edged higher since October, with CPI-trim and CPI-median at 3.7% and 3.0%, respectively (**Chart 11**). CPI-common has remained more muted at 2.1% because it attaches less importance to some components that have seen the largest price changes, such as motor vehicles. In contrast, some components with high weights—such as local transportation and health care goods—have experienced less intense price pressures.

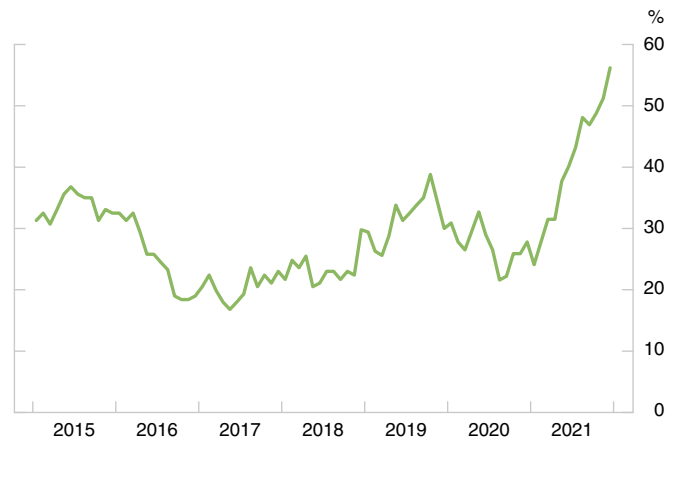
**Chart 10: Price pressures are affecting a large share of CPI components, particularly goods**

Monthly data

a. CPI inflation of goods and services, year-over-year percentage change



b. Share of CPI components growing above 3% on a year-over-year basis

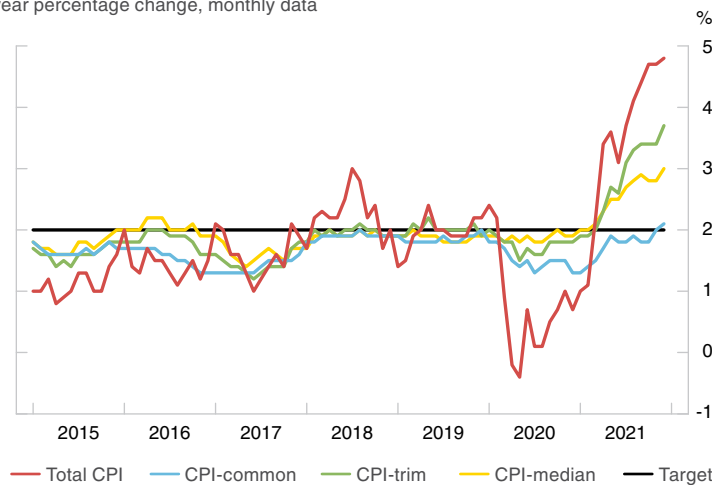


Sources: Statistics Canada and Bank of Canada calculations

Last observation: December 2021

**Chart 11: Inflation measures are elevated**

Year-over-year percentage change, monthly data



Sources: Statistics Canada and Bank of Canada calculations

Last observation: December 2021

## Strong growth over the projection horizon

Economic growth is projected to be robust and more balanced, averaging 3¾% over 2022 and 2023, supported by strong domestic and foreign demand (Table 2). As supply shortages ease and COVID-19 restrictions are removed, GDP will grow faster than employment, and output per worker will rise. Together with robust business investment and higher immigration, this increase in labour productivity will increase supply growth and should support economic growth without putting additional pressure on inflation.

## Consumption-led recovery

Consumption growth is forecast to be strong over the projection horizon, supported by job gains (Chart 12). Consumption should also be boosted by improving confidence and some spending of accumulated savings.

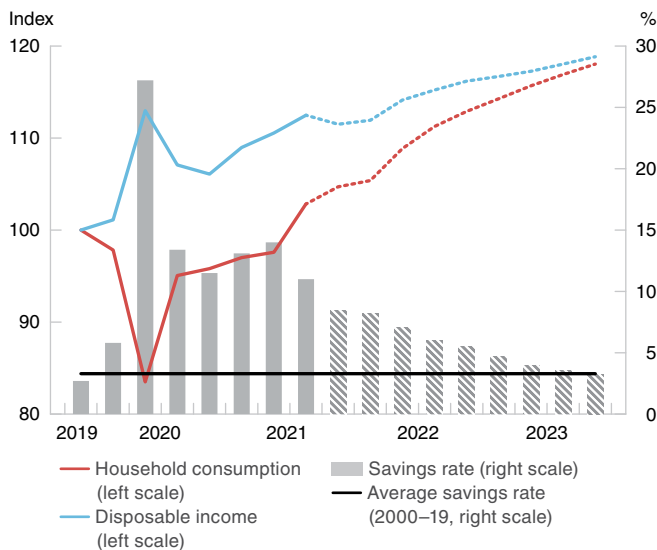
Beyond the first quarter of 2022, spending on hard-to-distance services is expected to increase further as cautiousness around the pandemic fades. Purchases that have been delayed—for goods such as motor vehicles and appliances—will also increase as supply disruptions ease.

Housing market activity is anticipated to remain elevated but ease from its current levels. Resales should be dampened by the fading of the pandemic-induced boost in demand, reduced support from accumulated savings, and borrowing rates that are now above their pandemic lows. Meanwhile, the easing of supply chain disruptions should support residential construction over 2022. The resulting growth in supply combined with easing demand should help rebalance housing markets and contribute to a moderation in house price growth.

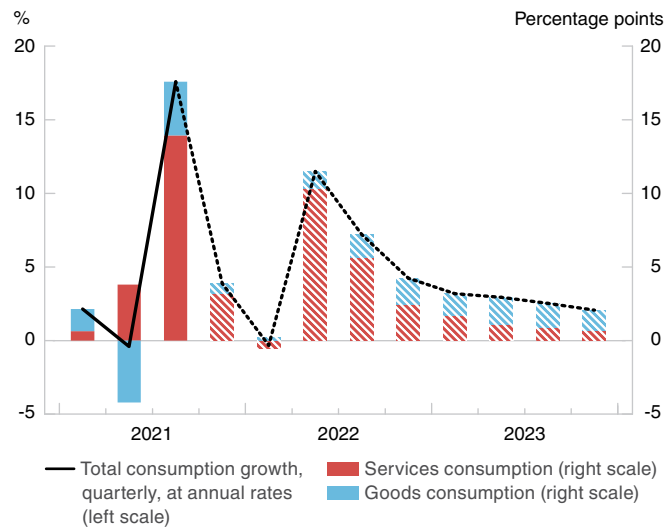
**Chart 12: Consumption growth is forecast to be strong, largely driven by services**

Quarterly data

a. Nominal data; index: 2019Q4 = 100 for consumption and income



b. Contribution to real consumption growth



Sources: Statistics Canada and Bank of Canada calculations and projections

## Foreign demand to support solid export growth

Export growth is projected to be robust in 2022, boosted by solid foreign demand and elevated commodity prices (**Chart 13**). It then moderates, along with US growth, in 2023. Goods exports, excluding energy, will also be supported by the dissipation of global supply disruptions.

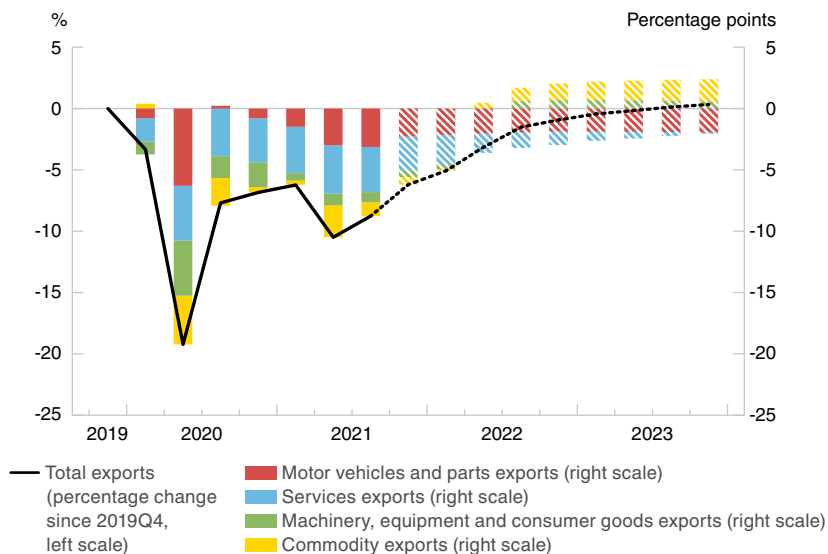
Services exports are anticipated to strengthen as international travel recovers. The recovery is expected to take time given the slow return of international tourism. Over the long term, the overall level of international travel may also be negatively affected by new ways of working and efforts to address climate change.

Relatively high prices for oil and natural gas are projected to support energy exports. Growth in energy exports is expected to be strong in 2022. It then eases in 2023 as expansions of oil sands production slow. With the addition of the Trans Mountain Expansion, transportation capacity should be sufficient to accommodate rising oil exports for several years.

As supply chain issues ease, strong domestic demand and firms' desire to invest and rebuild inventories should support the recovery in goods imports.

**Chart 13: Foreign demand and elevated commodity prices should support the recovery in exports**

Contribution to the deviation of real total exports from the 2019Q4 level, in percentage points, quarterly data



Sources: Statistics Canada and Bank of Canada calculations and projections

## Business investment to strengthen

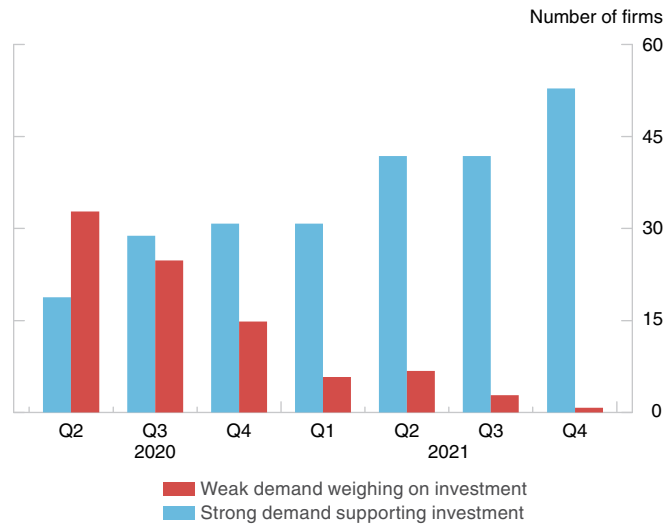
Robust business investment is expected after a period of pandemic-related weakness (**Chart 14**). Outside the oil and gas sector, firms are expected to increase their investment in the face of growing domestic and foreign demand, improved business confidence, limited production capacity and the gradual easing of supply constraints. The BOS for the fourth quarter of 2021 revealed broad-based strength in investment intentions.

Investment in the oil and gas sector is anticipated to increase but remain below pre-pandemic levels. Despite relatively elevated price levels, long-term investments, such as those in the oil sands, will likely remain subdued given high uncertainty about future demand. In contrast, shorter-term investments, such as conventional oil and gas wells, are expected to rise.

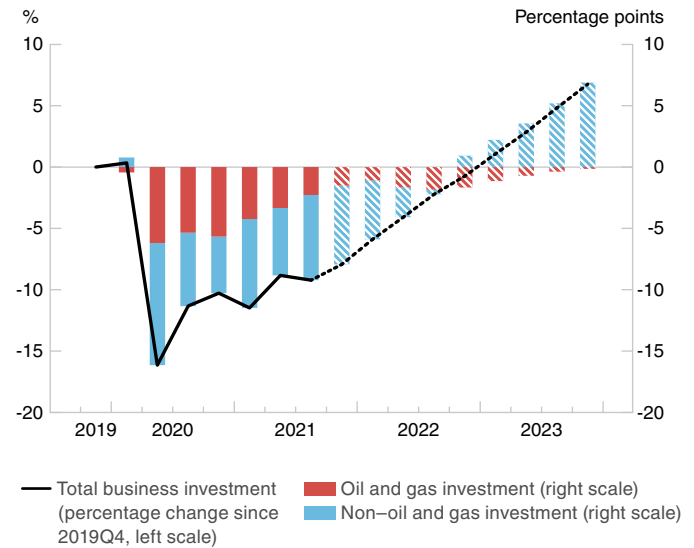
**Chart 14: Business investment is anticipated to strengthen**

Quarterly data

a. Investment intentions, as reported in the Business Outlook Survey (BOS)\*



b. Contribution to the deviation of real total business investment from the 2019Q4 level, in percentage points



\* Firms citing strong (weak) demand as drivers (impediments) to investment over the next 12 months. The Business Outlook Survey samples about 100 firms.

Sources: Statistics Canada, Bank of Canada and Bank of Canada calculations and projections

Last observation: BOS, 2021Q4

Inventory investment is projected to contribute to growth as businesses rebuild their inventories following unprecedented drawdowns in 2020 and ongoing delivery delays.

**CPI inflation to decline in the second half of this year**

As pandemic-related forces fade, inflation is forecast to ease over the second half of 2022 and into early 2023 (Chart 15). Upward pressure from supply shortages is expected to diminish over 2022. Under the assumption that oil prices remain flat, the boost from higher gasoline prices should also fade in the coming quarters. This expected easing can be seen in the evolution of annualized quarter-over-quarter inflation rates, which fall from around 4¾% in the first quarter of 2022 to about 2¼% by the fourth quarter of 2022. Year-over-year inflation is projected to decline from about 5% in early 2022 to about 3% by the end of 2022 as these pressures dissipate. Inflation is then expected to decline to around 2¼% by the second half of 2023 and remain close to the target in 2024.

Businesses and consumers view price pressures as elevated over the next two years. Most respondents to both the BOS and the Canadian Survey of Consumer Expectations for the fourth quarter of 2021 anticipate inflation to be above 3% on average over the next two years.

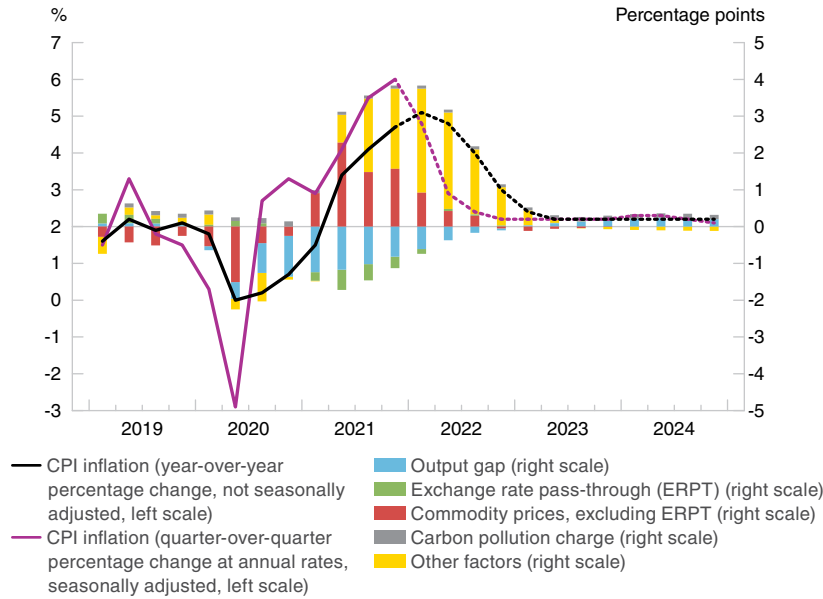
Despite this rise in expected inflation, longer-term inflation expectations remain well anchored (Chart 16). Most firms that responded to the recent BOS expect inflation to return close to the 2% target in one to three years.

Private sector forecasters have increased their expectations for inflation over the next year, but their longer-term expectations have remained stable. The October 2021 Consensus Economics forecast continues to show an average of 2% over the next 10 years. In addition, while the 5- and 10-year Canadian break-even inflation rates are now somewhat above pre-pandemic levels, they are well aligned with the 2% inflation target.



**Chart 15: CPI inflation is forecast to ease as pandemic-related forces fade**

Contribution to the deviation of year-over-year inflation from 2%, quarterly data

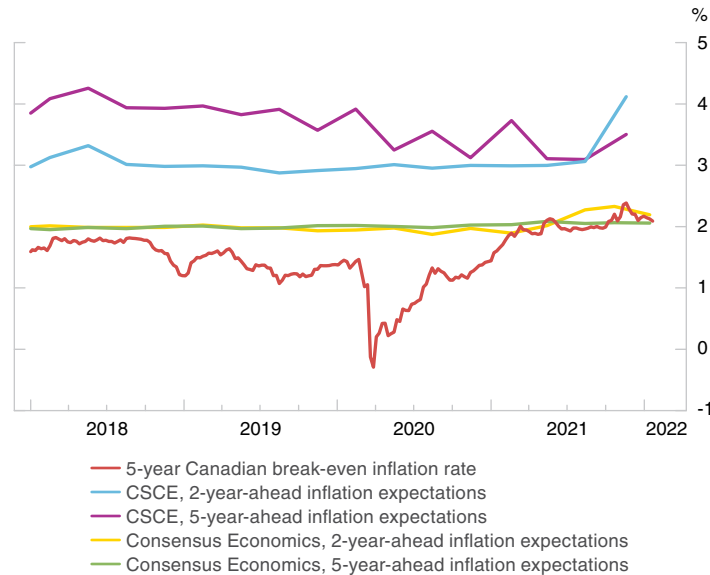


Note: “Other factors” includes, in particular, the impacts of various supply-related disruptions on inflation, such as the effects of semiconductor shortages on motor vehicle prices, of shipping bottlenecks on goods prices, and of unfavourable weather conditions on food prices. Numbers may not add to total due to rounding.

Sources: Statistics Canada and Bank of Canada calculations, estimates and projections

**Chart 16: Long-term inflation expectations remain well anchored**

Canadian break-even inflation rate (weekly average of daily data) and inflation expectations (quarterly data)



Note: CSCE is the Canadian Survey of Consumer Expectations. The 5-year Canadian break-even inflation rate is the difference between the yields of a nominal bond and a real return bond of the same maturity, both issued by the Government of Canada. Break-even inflation rates provide a signal about the expected path of inflation as perceived by market participants, but they are also affected by fluctuations in inflation risk and liquidity premiums. Consensus Economics provides inflation forecasts for the next 10 years. These forecasts are transformed into fixed-horizon forecasts (2-year, 5-year) by weighted average.

Sources: Bloomberg Finance L.P.,  
Consensus Economics, Bank of Canada  
and Bank of Canada calculations

Last observations:  
Consensus Economics, January 2022; CSCE, 2021Q4;  
break-even inflation rate, January 21, 2022

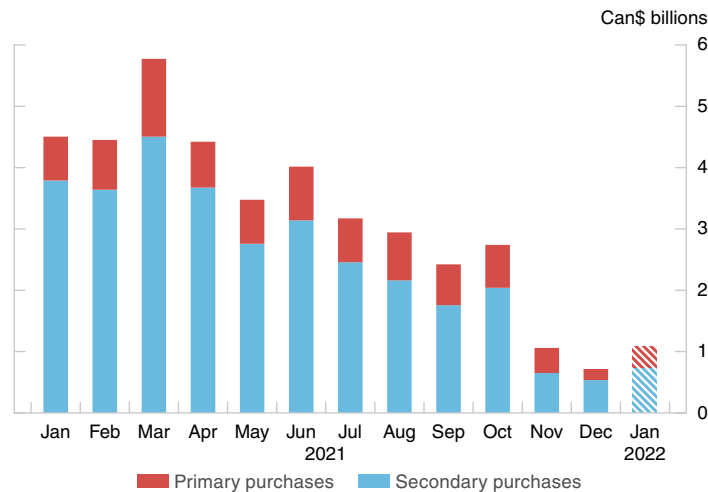


# Evolution of the Bank of Canada's balance sheet

In November 2021, in light of the progress made in the economic recovery, the Bank ended its program of quantitative easing (QE) and entered the reinvestment phase. In this phase, the Bank purchases Government of Canada bonds solely to replace maturing bonds and maintain the stimulus provided by previous QE purchases. At present, this requires approximately \$4 billion to \$5 billion in purchases per month (or about \$1 billion per week) across both the primary and secondary markets (**Chart 17**). These purchases keep the Bank's holdings of Government of Canada bonds roughly constant at around \$435 billion. This amount currently represents 87% of the Bank's total assets. The rest of the balance sheet largely reflects assets acquired early in the pandemic to keep markets functioning. Most of the assets acquired then have already matured and rolled off the Bank's balance sheet, and the remainder will do so over time.

**Chart 17: The pace of the Bank of Canada's government bond purchases declined through 2021**

Notional purchases of Government of Canada bonds in primary and secondary markets, weekly average



Note: The bars represent purchases of Government of Canada nominal bonds measured at par value. January 2022 purchases represent the weekly average in the month up to January 20.

Source: Bank of Canada

Last observation: January 20, 2022

## Risks to the inflation outlook

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Uncertainty around the projection remains unusually high. The outlook continues to depend on how the COVID-19 pandemic evolves, most notably the spread of variants. The pandemic will continue to weigh on confidence and disrupt supply for some time, posing both upward and downward risks to inflation. While high vaccination rates in Canada have diminished the likelihood of a severe downturn, the reopening of the economy remains complex. Pervasive supply constraints will need to unwind. Moreover, the work routines and spending habits of households are shifting. Consequently, the evolution of supply and demand and its effects on inflation are particularly uncertain.

Some of the risks identified in previous reports have been partially incorporated into the projection. For example, the base-case scenario includes a short-lived negative impact from the Omicron variant as well as more widespread inflationary pressures from supply-side disruptions.

While the upside and downside risks to the Bank's inflation projection are viewed as roughly balanced, the upside risks are of greater concern. Until inflation moves significantly lower, there is an elevated risk that Canadians will start to believe that inflation will stay high over the long term. Higher inflation expectations could in turn lead to more pervasive labour costs and inflationary pressures and could become embedded in ongoing inflation.

Drawing from a larger set of risks, this section presents a selection of those identified as most important for the projected path of inflation.

**(i) More persistent effects of the pandemic on confidence (↓)**

The emergence of the Omicron variant is a reminder that the evolution of the pandemic remains uncertain. The pandemic's effects on business sentiment, household confidence and economic activity may be more severe and persistent than assumed in the projection. For instance, COVID-19 variants could induce a longer-lasting drag on confidence and delay the recovery in hard-to-distance service sectors.

**(ii) More persistent supply bottlenecks and cost pressures (↑)**

The spread of COVID-19 variants could further disrupt manufacturing and shipping activities, causing longer-lasting shortages of goods and labour. It could also delay the rebalancing of consumption from goods to services. A continued preference for goods consumption would exacerbate congestion in already stretched supply chains. Moreover, repeated disruptions to business operations may lead firms to adjust their supply chains in ways that could increase costs. More persistent labour shortages could also result in greater wage pressures. Taken together, these effects would lead to more persistent inflationary pressures.

(iii) **Reversal of growth in goods prices (↓)**

Pandemic-induced shifts in consumption patterns and disruptions in supply have pushed prices of goods higher. The base-case scenario assumes that these price increases faced by consumers do not reverse. However, the rebalancing of consumption from goods to services could occur faster than assumed in the projection. Combined with an expansion of transportation capacity and efforts to improve logistics, these developments could resolve supply chain disruptions faster than expected and cause some prices to decline. If this occurred, inflation would be weaker than projected. For example, in a scenario with a 30% reversal of these pandemic-induced effects on prices, inflation falls more quickly, declining to slightly below 2% in 2023.

(iv) **Stronger household spending in Canada (↑)**

The projection continues to include some degree of caution around consumption. However, over time, a reduction in pandemic-related uncertainty could boost confidence by more than expected. Consequently, households could spend more of their accumulated savings. Consumption and residential investment would then be stronger than projected and would contribute to greater inflationary pressures.

(v) **Sharp deterioration of global economic and financial conditions (↓)**

With high levels of global indebtedness and elevated equity valuations, a pullback in risk appetite could trigger a sharp tightening of global financial conditions. Increased inflationary pressures and the associated uncertainty surrounding how soon advanced economies will reduce monetary policy stimulus could trigger capital outflows, especially from some EMEs. Such outflows would create financial stress, leading to slower growth. In addition, efforts by Chinese authorities to address vulnerabilities and engineer a soft landing in the property sector could weigh on growth more than expected. These shocks could have negative spillover effects on the global economy and would be transmitted to the Canadian economy through weaker exports, lower commodity prices and a deterioration in the terms of trade.





# Monetary Policy Report

April 2022





# Canada's inflation-control strategy

## Inflation targeting and the economy

- The objective of Canada's monetary policy is to promote the economic and financial well-being of Canadians. Canada's experience with inflation targeting since 1991 has shown that the best way that monetary policy can achieve this goal is by maintaining a low and stable inflation environment. Doing so fosters confidence in the value of money and contributes to sustained economic growth, a strong and inclusive labour market and improved living standards.
- In 2021, the Government of Canada and the Bank of Canada renewed the flexible inflation-targeting strategy of the monetary policy framework for a further five-year period, ending December 31, 2026.<sup>1</sup>
- The inflation target was renewed at the 2% midpoint of the 1%–3% control range, with inflation measured as the 12-month rate of change in the consumer price index (CPI).
- The Government and the Bank agreed that the best contribution monetary policy can make to the economic and financial well-being of Canadians is to continue to focus on price stability. The Government and the Bank also agreed that monetary policy should continue to support maximum sustainable employment, recognizing that maximum sustainable employment is not directly measurable and is determined largely by non-monetary factors that can change through time.
- Further, the Government and the Bank agreed that because well-anchored inflation expectations are critical to achieving both price stability and maximum sustainable employment, the primary objective of monetary policy is to maintain low, stable inflation over time.

## Inflation targeting is symmetric and flexible

- Canada's inflation-targeting approach is *symmetric*, which means the Bank is equally concerned about inflation rising above or falling below the 2% target.
- Canada's inflation-targeting approach is also *flexible*. Typically, the Bank seeks to return inflation to target over a horizon of six to eight quarters. However, the most appropriate horizon for returning inflation to target will vary depending on the nature and persistence of the shocks buffeting the economy.
- The 2021 agreement with the Government specifies that the 2% inflation target remains the cornerstone of the framework.
- The agreement further notes that the Bank will continue to use the flexibility of the 1%–3% control range to actively seek the maximum sustainable level of employment, when conditions warrant. The Bank will also continue to leverage the flexibility inherent in the framework to help address the challenges of structurally low interest rates by using a broad set of policy tools. The Bank will use this flexibility only to an extent that is consistent with keeping medium-term inflation expectations well anchored at 2%.

## Monetary policy tools

- Because monetary policy actions take time to work their way through the economy and have their full effect on inflation, monetary policy must be forward-looking.

- The Bank normally carries out monetary policy through changes in the target for the overnight rate of interest (the policy rate). The Bank also has a range of monetary policy tools it can use when the policy rate is at very low levels. These tools consist of guidance on the future evolution of the policy rate, large-scale asset purchases (quantitative easing and credit easing), funding for credit measures, and negative policy rates. The potential use and sequencing of these tools would depend on the economic and financial market context.
- All of the Bank's monetary policy tools affect total demand for Canadian goods and services through their influence on market interest rates, domestic asset prices and the exchange rate. The balance between this demand and the economy's production capacity is, over time, the main factor that determines inflation pressures in the economy.

## Communications

- Consistent with its commitment to clear, transparent communications, the Bank regularly reports its perspectives on the economy and inflation. Policy decisions are typically announced on eight pre-set days during the year, and full updates of the Bank's outlook are published four times each year in the *Monetary Policy Report*.
- The Bank is committed to explaining when it is using the flexibility of the inflation-targeting strategy.
- Given the uncertainty about the maximum sustainable level of employment, the Bank will consider a broad range of labour market indicators.<sup>2</sup> The Bank will also systematically report to Canadians on how labour market outcomes have factored into its policy decisions.

## Monitoring inflation

- In the short run, the prices of certain CPI components can be particularly volatile and can cause sizable fluctuations in CPI inflation.
- In setting monetary policy, the Bank seeks to look through such transitory movements in CPI inflation and focuses on a set of "core" inflation measures that better reflect the underlying trend of inflation. In this sense, these measures act as an operational guide to help the Bank achieve the CPI inflation target. They are not a replacement for CPI inflation.
- The Bank's three preferred measures of core inflation are CPI-trim, which excludes CPI components whose rates of change in a given month are the most extreme; CPI-median, which corresponds to the price change located at the 50th percentile (in terms of basket weight) of the distribution of price changes; and CPI-common, which uses a statistical procedure to track common price changes across categories in the CPI basket.

<sup>1</sup> For more details, see *Joint Statement of the Government of Canada and the Bank of Canada on the Renewal of the Monetary Policy Framework* (December 13, 2021); *Monetary Policy Framework Renewal—December 2021*; and T. Macklem, "Our Monetary Policy Framework: Continuity, Clarity and Commitment" (speech to the Empire Club of Canada, Toronto, December 15, 2021).

<sup>2</sup> See, for example, the [range of indicators](#) that the Bank is using to track the recovery of the labour market from the effects of the COVID-19 pandemic.

The *Monetary Policy Report* is available on the Bank of Canada's website at [bankofcanada.ca](http://bankofcanada.ca).

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# Monetary Policy Report

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April 2022

This is a report of the Governing Council of the Bank of Canada:

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## Overview

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The Canadian economy has strong momentum, and employment is robust. While COVID-19 continues to affect people's health and the economy, high vaccination rates are lessening severe impacts. Household consumption spending is strengthening as most public health containment measures are being lifted, and exports are expected to benefit from solid foreign demand.

The unprovoked Russian invasion of Ukraine is causing enormous human suffering and has introduced significant uncertainty to the outlook for the global economy. The effects of the war are weighing on global activity and have resulted in greater volatility in financial markets. The war has also pushed commodity prices higher and further disrupted supply chains.

As a result, inflation has increased in most economies, including Canada's. Energy and food prices continue to rise, and ongoing supply constraints are interacting with robust demand to put upward pressure on a broadening range of prices.

### Key messages

- The outlook for CPI inflation in Canada is higher than previously projected. Inflation is expected to average just below 6% through the first half of 2022 and remain well above the control range through the rest of the year. It should then steadily decline to about 2½% in the second half of 2023 and to the 2% target in 2024. This decline reflects decreases in energy prices, a dissipation of global supply chain constraints and a rebalancing of supply and demand in the Canadian economy.
- Labour market conditions in Canada are tight. Employment and participation rates are near or above their pre-pandemic levels, and the unemployment rate is at a record low. Overall, the Canadian economy is moving into excess demand.
- Canadian economic activity is expected to remain strong. Consumer spending, exports and business investment are projected to grow solidly. This is supported by healthy foreign demand, high commodity prices and the easing of supply disruptions.
- Higher interest rates should moderate spending and gradually reduce excess demand in the Canadian economy.
- Alongside an easing of supply challenges, high immigration levels and a solid recovery in business investment are expected to support strong potential output growth.
- The Bank is paying particular attention to how inflation expectations are evolving. While long-term expectations remain anchored on the target, near-term expectations have risen along with inflation.



## Global economy

Russia's unprovoked invasion of Ukraine is taking a tragic human toll. It is also disrupting the global economic recovery just as most economies are emerging from the impact of the Omicron variant of COVID-19. The war has exacerbated global supply shortages by restricting global transportation and imports of products from both Ukraine and Russia. Consequently, the prices of oil, grains and other commodities have risen sharply, and financial volatility has increased.

The global outlook has been downgraded from the January Report (**Box 1**). Revisions are pronounced for oil-importing economies and regions with closer trade ties to Russia and Ukraine, particularly Eastern Europe and, to a lesser extent, the euro area. The US outlook has also been revised down due largely to the anticipated tightening of monetary policy in response to higher-than-expected inflation.

### Box 1

## Changes to the economic projection since the January Report

### Global GDP outlook

Projected growth in global gross domestic product (GDP) in 2022 remains roughly unchanged relative to the January Report. The negative effects of the war in Ukraine are roughly offset by a smaller drag from COVID-19 containment measures in emerging-market economies. Global growth for 2023 has been revised down significantly because the negative consequences of the war are expected to persist through higher commodity prices as well as trade and financial channels. The downward revision to the US outlook also reflects a faster and more pronounced tightening of monetary policy in response to higher-than-expected inflation. Overall, the level of global GDP at the end of 2023 has been revised down by about 1%.

### Canadian GDP outlook

GDP growth is revised up by about  $\frac{1}{4}$  percentage point to  $4\frac{1}{4}\%$  in 2022 and revised down by about  $\frac{1}{4}$  percentage point to  $3\frac{1}{4}\%$  in 2023. Overall, these revisions leave the level of real GDP roughly unchanged by the end of 2023.

Higher energy prices have led to positive revisions to exports and investment in the oil and gas sector. These revisions are roughly offset by the effect of lower foreign demand on non-commodity exports and the impact from higher interest rates on household spending.

### Canadian CPI inflation outlook

Consumer price index (CPI) inflation is anticipated to be substantially higher than projected in January. The outlook for CPI inflation is revised up by 1.1 percentage points to 5.3% in 2022 and by 0.5 percentage points to 2.8% in 2023. These revisions are primarily related to the consequences of the invasion of Ukraine, which has driven up commodity prices and exacerbated supply disruptions.

Global growth is projected to moderate from about 7% in 2021 to 3½% in 2022 and 2½% in 2023 (**Table 1**). This should occur as the bounce back in activity from the acute phase of the pandemic wanes and the Russia–Ukraine conflict weighs on the outlook. The Bank expects global growth to strengthen to 3¼% in 2024 once the war’s initial impact on growth subsides.

Inflation continued to rise in the first quarter and remains high in most regions, with strong positive contributions from energy and food prices (**Chart 1**). Robust demand for goods and widespread supply shortages also remain important sources of inflationary pressure globally.

**Table 1: Projection for global economic growth**

	Share of real global GDP* (%)	Projected growth† (%)			
		2021	2022	2023	2024
<b>United States</b>	16	5.7 (5.6)	2.8 (3.7)	1.9 (2.5)	1.5
<b>Euro area</b>	12	5.3 (5.2)	3.0 (4.0)	2.3 (2.6)	2.6
<b>Japan</b>	4	1.7 (1.7)	2.0 (2.7)	2.5 (1.0)	1.3
<b>China</b>	18	8.1 (8.1)	4.3 (3.8)	4.9 (5.3)	5.0
<b>Oil-importing EMEs‡</b>	33	8.5 (8.1)	4.2 (3.5)	2.2 (3.7)	3.5
<b>Rest of the world§</b>	16	5.0 (4.9)	2.4 (3.3)	1.0 (2.5)	3.0
<b>World</b>	100	7.0 (6.8)	3.5 (3.6)	2.5 (3.4)	3.2

\* GDP shares are based on International Monetary Fund (IMF) estimates of the purchasing-power-parity valuation of country GDPs for 2020 from the IMF’s October 2021 *World Economic Outlook*. The individual shares may not add up to 100 due to rounding.

† Numbers in parentheses are projections used in the previous Report.

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

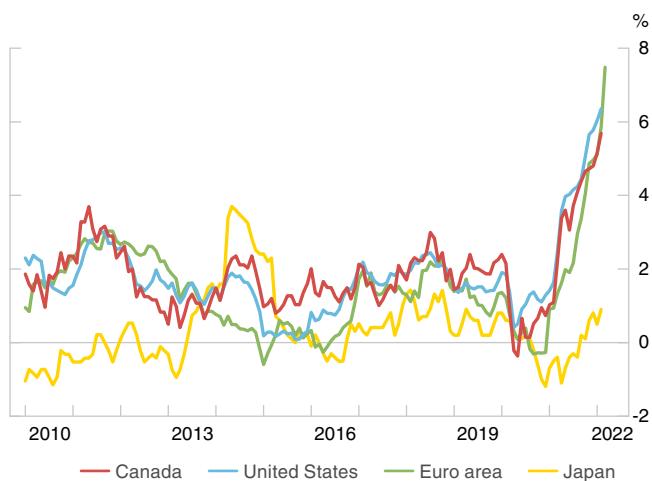
§ “Rest of the world” is a grouping of other economies not included in the first five regions. It is composed of oil-exporting EMEs (such as Russia, Nigeria and Saudi Arabia) and other advanced economies (such as Canada, the United Kingdom and Australia).

Source: Bank of Canada

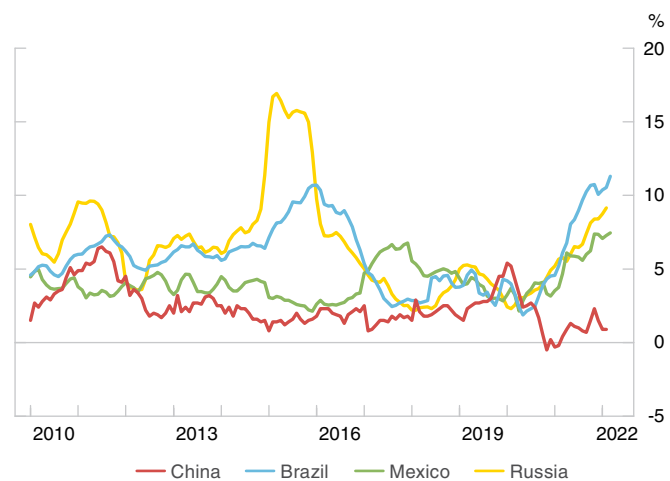
### Chart 1: Inflation has continued to increase in many economies

Year-over-year percentage change, monthly data

a. Advanced economies



b. Emerging-market economies



Note: The rate of inflation is calculated based on personal consumption expenditures inflation for the United States, the Harmonised Index of Consumer Prices inflation for the euro area and CPI inflation for all other countries.

Sources: Statistics Canada, US Bureau of Economic Analysis, Eurostat, Ministry of Internal Affairs and Communications (Japan), National Bureau of Statistics of China, Instituto Brasileiro de Geografia e Estatística, INEGI (Mexico) and Federal State Statistics Service (Russia) via Haver Analytics

Last observations: euro area, Brazil and Mexico, March 2022; others, February 2022

## Sharp increase in commodity prices

Russia and Ukraine are significant exporters of commodities. Market concerns about supply disruptions caused by the war in Ukraine have led to a sharp rise in most commodity prices (**Chart 2**).

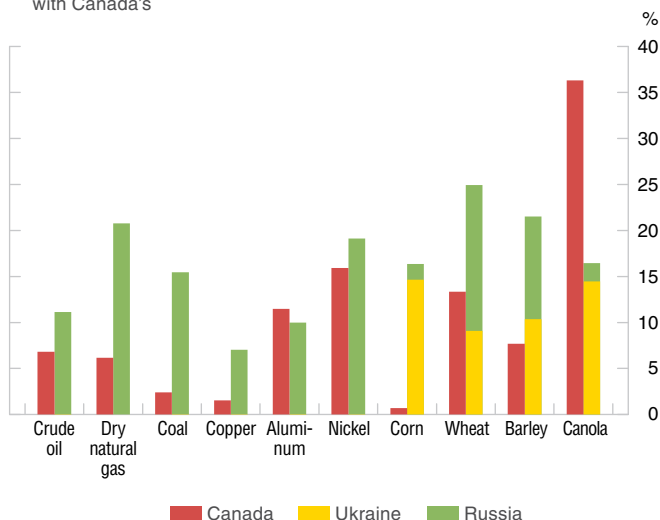
Oil prices have been volatile since the January Report. Before Russia’s invasion, oil prices were already rising because oil demand was outpacing the growth in supply. The Russian invasion led to sharply higher prices, with the daily price of Brent crude oil peaking at nearly US\$130 a barrel in early March. The Brent oil price has since fallen to around US\$105 as the scope of sanctions on Russian oil has become clearer and the United States and other countries announced large releases of their strategic petroleum reserves. The recent COVID-19 outbreak in China has also raised concerns about the strength of oil demand.

The Bank assumes that the price of Brent crude oil will fall from US\$105 per barrel in the second quarter of 2022 to about US\$90 at the end of 2024 (**Box 2**). West Texas Intermediate and Western Canadian Select crude oil prices are assumed to follow similar patterns, remaining US\$5 and US\$15, respectively, below Brent prices. This profile assumes that the war’s impact on oil prices diminishes over time and is broadly consistent with market expectations.

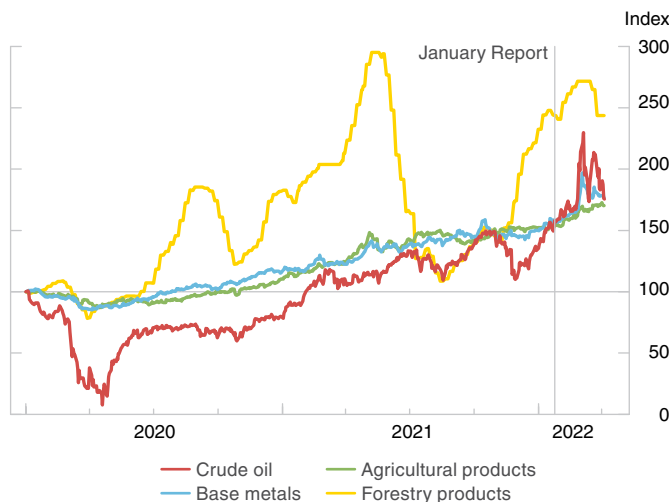
Uncertainty around the assumed outlook for oil prices is particularly high. Prices could rise further if Russian oil exports are weaker than expected or if global oil production does not increase enough to meet demand. A resolution of the conflict in Ukraine, a rapid increase in global production or a drop in oil consumption could lead to a faster decline in prices.

**Chart 2: Commodity prices rose due to fears of supply disruptions from Ukraine and Russia**

a. Ukraine’s and Russia’s shares of global commodity exports compared with Canada’s



b. Index: January 3, 2020 = 100, daily data



Note: In panel a, calculations are based on data available from reporting countries. Export shares for non-energy commodities are calculated from nominal (US-dollar) export values from UN Comtrade data. The measure of base metals is for unwrought metal. All series plotted in panel b are components of the Bank of Canada commodity price index. The crude oil index is a weighted average of the benchmarks for West Texas Intermediate, Western Canadian Select and Brent.

Sources: US Energy Information Administration, UN Comtrade Database and Bank of Canada

Last observations: panel a, crude oil, 2018; others, 2019; panel b, April 7, 2022

## Box 2

## Key inputs to the projection

The Bank of Canada's projection is always conditional on several key assumptions, and changes to these will affect the outlook for the Canadian economy. The Bank regularly reviews these assumptions and how they may impact the economic projection. The key inputs into the Bank's projection are as follows:

- Public health restrictions have been largely removed in many countries. It is assumed that remaining measures will be lifted over the course of 2022 for most of the world. Containment measures in China are expected to loosen more gradually—and even periodically tighten—over 2022.
  - In Canada, most public health restrictions have been lifted. Pandemic-related effects on demand—notably consumer caution and reluctance to travel—are assumed to fade over 2022 and 2023.
  - As in the January projection, spending on household consumption is assumed to be boosted by an additional \$40 billion as individuals draw down a portion of the extra savings accumulated during the pandemic.
  - The projection does not incorporate the measures announced in the April 2022 federal budget. Preliminary analysis suggests the budget's impact will be positive but modest relative to the Bank's projection.
  - Oil prices are assumed to decrease over the projection horizon from their current elevated levels. The price of Brent stays near its recent average of US\$105 per barrel in the second quarter of 2022 before declining to about US\$90 by the end of 2024. The prices for West Texas Intermediate (WTI) and Western Canadian Select (WCS) follow similar dynamics, with a constant spread below the price for Brent of US\$5 and US\$15, respectively. In the January Report, the prices were assumed to be US\$80 for Brent, US\$75 for WTI and US\$65 for WCS.
  - By convention, the Bank does not forecast the exchange rate in the *Monetary Policy Report*. As in the January Report, the Canadian dollar is assumed to remain at 79 cents US over the projection horizon, close to its recent average.
  - The pandemic is having both temporary and lasting effects on the supply side of the Canadian economy. As in recent reports, the Bank distinguishes between supply and potential output to account for the relatively short-lived nature of some of the decrease in supply caused by pandemic-related factors, such as public health measures and supply disruptions.
- ▶ The Bank's assessment of potential output growth, a longer-term concept, looks through the short-lived effects of pandemic-related factors. Potential output growth (excluding temporary factors) is assumed to average about 2% per year over 2022–24. Details on the Bank's assessment of potential output growth are provided in the **Appendix** on page 28.
  - ▶ The projection assumes that short-term factors are reducing the supply of goods and services. For instance, supply disruptions are assumed to reduce supply, with a peak impact of about 2% in both the fourth quarter of 2021 and the first quarter of 2022 and a still-elevated impact of 1¾% in the second quarter. This effect is anticipated to dissipate by mid-2023, two quarters later than assumed in January. Moreover, measures taken to contain the Omicron variant of COVID-19 coupled with elevated worker absences due to the rise in cases are estimated to have decreased supply temporarily in the first quarter of 2022 (see **Chart 13** on page 19).
  - ▶ Estimates of overall growth in supply can be obtained by combining the estimates of the temporary effects of these short-term factors with the assessment of potential output. Supply growth is projected to average about 2½% over 2022–24.
- Gross domestic product (GDP) is estimated to have grown at a stronger-than-potential pace in the first quarter of 2022 amid elevated supply disruptions. As a result, the Bank estimates that the output gap—the difference between GDP and supply—was between -0.25% and 0.75% in the first quarter, higher than the estimate of -0.75% to 0.25% for the fourth quarter of 2021.
  - The nominal neutral policy interest rate is defined as the real neutral rate plus 2% for inflation. The real neutral rate is defined as the rate consistent with both output remaining sustainably at its potential and inflation remaining at target, on an ongoing basis. It is a medium- to long-term equilibrium concept. In this Report, the Bank has updated its estimated range of the nominal neutral interest rate in conjunction with the annual reassessment of potential output. This range is judged to be 0.25 percentage points higher than assessed in April 2021 (see **Appendix**). For Canada, the projection is based on the assumption that the nominal neutral rate is at the midpoint of the revised range of 2% to 3%.

The Bank's non-energy commodity price index has increased by about 10% since the January Report. The increase in prices of base metals and agricultural commodities mainly reflects the supply disruptions caused by Russia's invasion of Ukraine. While unchanged relative to the January Report, lumber prices remain high because of strong housing demand in North America and continued transportation bottlenecks. Markets expect non-energy commodity prices to remain elevated over the projection horizon because of uncertain supply from Russia and Ukraine as well as strong global demand.

## More volatile financial markets

Financial conditions have tightened since the January Report, mainly as a result of higher current and expected interest rates in many regions. Increased uncertainty about the impact of the war in Ukraine has also led to more volatility in the prices of many financial assets. In early March, in response to the invasion of Ukraine, corporate credit spreads widened and most equity price indexes dropped sharply. Credit spreads and equity prices have returned to near pre-war levels in most regions. Canadian equity indexes have outperformed those of other countries due to their high exposure to energy and other commodities. The Canadian dollar has been relatively stable against the US dollar despite rising commodity prices (**Box 2**).

Expectations of higher inflation and tighter monetary policy have pushed up yields of government bonds globally, in particular for short-term bonds. This has narrowed the spread between long- and short-term government bond yields in North America.

## Broad inflationary pressure in the United States

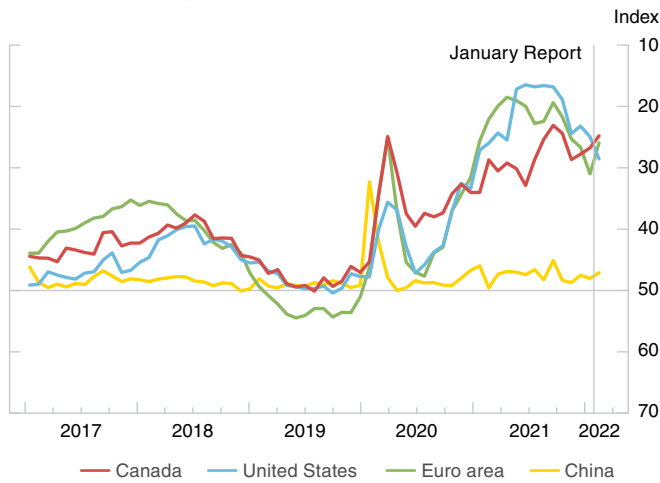
US domestic demand has been growing at a robust pace. Job gains remain strong amid a tight labour market. Nominal wage growth continues to be vigorous, but high inflation is eliminating gains in real compensation.

US gross domestic product (GDP) is forecast to expand by 2¾% in 2022, well above the estimated rate of potential output growth (see the **Appendix** on page 28). Because the United States is a net exporter of petroleum products and has limited trade exposure to Russia and Ukraine, the war should have only a modest negative impact on growth. Consumption is anticipated to rise at a healthy pace, supported by employment growth and some household spending of the savings accumulated during the pandemic. Solid private domestic demand should also drive robust business investment growth. Recent increases in mortgage rates are, however, expected to dampen growth in residential investment. GDP growth is projected to moderate to about 2% in 2023 and 1½% in 2024 as US authorities withdraw fiscal and monetary policy stimulus.

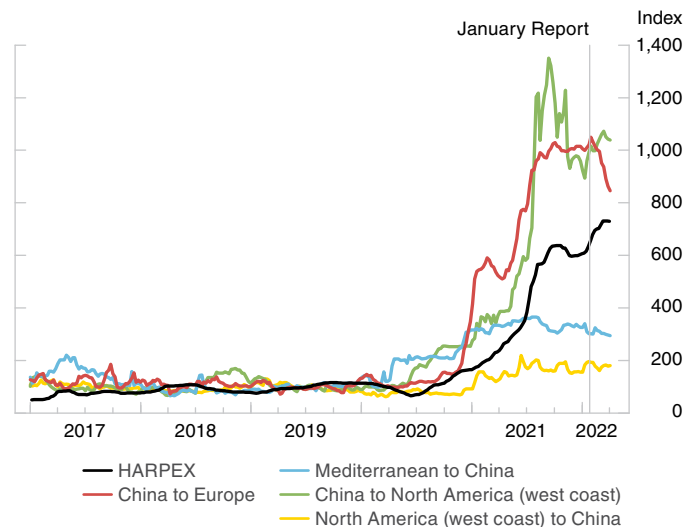
Total and core measures of US personal consumption expenditures (PCE) inflation have continued to increase and are at their highest levels in nearly 40 years. Large increases in energy prices as well as supply constraints amid high demand for goods continue to be important contributors to inflationary pressures. Relative to the January Report, delivery times have shortened modestly, and order backlogs are slowly being cleared (**Chart 3**). However, shipping and input costs remain high. The war is expected to exacerbate pressures on supply chains and put additional upward pressure on inflation in the near term. In the projection, the Bank assumes that supply challenges continue to ease but persist until mid-2023. Inflation is projected to start decreasing in the third quarter but is expected to stay above 2% over the projection horizon as the economy remains in excess demand.

**Chart 3: Supply bottlenecks and transportation costs remain high**

a. PMI: Manufacturing suppliers' delivery times, monthly data



b. Transportation costs, index 2019 = 100, weekly data



Note: The Purchasing Managers' Index (PMI) is a diffusion index of business conditions. For suppliers' delivery times, an inverted index is used to show that a reading less than (greater than) 50 indicates an increase (decrease) in delivery times compared with the previous month. All series in panel b are from the Freightos Baltic Index except the HARPEX (Harper Petersen Charter Rates Index). The Freightos Baltic Index provides market ocean freight rates for different trade lanes. The HARPEX reflects the worldwide price development on the charter market for container ships.

Sources: IHS Markit and HARPEX via Haver Analytics and Freightos Baltic Index via Bloomberg Finance L.P.

Last observations: PMI, March 2022; HARPEX, April 1, 2022; Freightos Baltic Index, April 3, 2022

In response to strong inflationary pressures, the Federal Reserve raised the federal funds rate by 25 basis points in March. It also announced that additional increases will be needed and that it will begin reducing its holdings of Treasury and other securities in the near future.

### Growing headwinds in the euro area

Household and business confidence in the euro area are being hit hard by the increased uncertainty caused by the war in Ukraine, higher energy prices and continuing supply challenges. GDP is nevertheless expected to grow at a faster pace than potential output over the projection horizon as the economy continues to recover from the pandemic.

Both core and total inflation have risen more quickly than anticipated in recent months and are now well above target. Higher energy and food prices explain a significant portion of the recent increase, although inflationary pressure has become more broad-based across goods and services. The recent increase in energy prices and additional supply constraints related to the invasion of Ukraine are expected to push inflation higher in the near term.

### Modest growth in China

China's GDP is expected to grow at a modest pace of 4¼% in 2022. Growth is held back in large part by the ongoing correction of its property market and stringent measures to contain a resurgence of COVID-19. Housing markets remain weak, reflecting soft demand and uncertainty about the financial viability of major property developers. High energy prices should also weigh on household and business spending. Chinese stock markets recently reacted sharply to concerns about regulatory changes, financial vulnerabilities and the geopolitical implications of the war in Ukraine. Policy-makers have announced steps to improve confidence and shore up markets.



Growth is projected to recover to about 5% in 2023 and 2024 as the drag on growth from the property sector diminishes. Uncertainty remains high about both the impact of China's "zero-COVID" policy and the fragility of the property sector. Either of these factors could dampen growth by more than expected over the projection horizon.

## Weaker growth in emerging-market economies and the rest of the world

Oil-importing emerging-market economies (EMEs) are recovering from the impact of the Omicron variant more quickly than expected. However, the war in Ukraine and high energy prices are expected to severely hamper growth in 2022 and 2023. Within the group, emerging Europe will be most affected because of its proximity to the conflict, its closer trade ties with both Ukraine and Russia and the war's direct impact on Ukraine's economy. In some EMEs, the drag from rising energy prices should be partially offset by increased revenues from exports of non-energy commodities. Higher interest rates in many EMEs in response to increasing inflationary pressures are also weighing on growth prospects.

Growth in the rest of the world group will be held back by the sharp contraction of the Russian economy due to economic sanctions. However, other oil-exporting countries are expected to benefit from increased oil revenues.

## Canadian economy

The Canadian economy continues to grow strongly. Growth in the second quarter is being boosted by the removal of public health restrictions, solid foreign demand and higher commodity prices.

Labour markets are tight. Employment growth has been strong, with jobs more than recovering from the effects of the Omicron variant of COVID-19. Labour shortages are widespread across firms, leading to rising wage growth.

A broad set of indicators suggests that slack has been absorbed and the economy is moving into excess demand. Faced with robust demand and supply constraints, firms are raising prices in response to higher input costs. This increases the risk that expectations of elevated inflation could become entrenched.

Overall, economic growth is robust and moderates through the projection horizon. Growth is expected to be 4¼% this year before slowing to a solid pace of 3¼% in 2023. A recovery in services consumption, exports and investment supports growth (**Table 2**). At the same time, alongside the easing of supply constraints, strong investment and population growth are projected to strengthen potential output growth. In response to ongoing inflationary pressures, higher interest rates are expected to moderate growth in domestic demand to better align it with the growth of supply. GDP growth is projected to ease to about 2¼% in 2024.

**Table 2: Contributions to average annual real GDP growth**

Percentage points\*\*

	2021	2022	2023	2024
<b>Consumption</b>	2.8 (2.9)	2.9 (3.3)	2.2 (2.3)	1.4
<b>Housing</b>	1.3 (1.3)	-0.5 (-0.7)	-0.2 (0.0)	0.2
<b>Government</b>	1.3 (1.3)	0.4 (0.4)	0.5 (0.5)	0.3
<b>Business fixed investment</b>	0.2 (0.0)	0.7 (0.7)	0.6 (0.7)	0.7
<b>Subtotal: final domestic demand</b>	5.6 (5.5)	3.5 (3.7)	3.1 (3.5)	2.6
<b>Exports</b>	0.4 (0.4)	1.2 (1.8)	1.4 (0.8)	0.9
<b>Imports</b>	-2.2 (-2.1)	-1.4 (-2.0)	-1.6 (-1.3)	-1.0
<b>Subtotal: net exports</b>	-1.8 (-1.7)	-0.2 (-0.2)	-0.2 (-0.5)	-0.1
<b>Inventories</b>	0.7 (0.8)	0.9 (0.5)	0.3 (0.5)	-0.3
<b>GDP</b>	4.6 (4.6)	4.2 (4.0)	3.2 (3.5)	2.2
<b>Memo items (percentage change):</b>				
Range for potential output, including temporary factors‡	2.1–2.5	1.3–2.3	2.9–3.9	2.3–2.9
Real gross domestic income (GDI)	8.8 (8.8)	5.9 (4.5)	2.2 (2.8)	1.5
CPI inflation	3.4 (3.4)	5.3 (4.2)	2.8 (2.3)	2.1

\* Numbers in parentheses are from the projection in the previous Report.

† Numbers may not add to total due to rounding.

‡ See **Appendix** on page 28 for details.

Sources: Statistics Canada and Bank of Canada calculations and projections



The war in Ukraine is affecting the Canadian economy predominantly through higher commodity prices (**Box 3**). Households are feeling this impact through increased prices for gasoline, fuel oil and food.

Consumer price index (CPI) inflation is forecast to average just under 6% in the first half of 2022. Factors driving inflation include sharp increases in energy and food prices as well as supply disruptions and strong demand for goods. As these pressures dissipate and monetary policy accommodation is removed, CPI inflation is anticipated to ease to about 2½% in the second half of 2023 before declining to the 2% target in 2024. In this projection, inflation is both higher and more persistent than in the January Report (**Box 1**).

## Box 3

### The impact of Russia's invasion of Ukraine on the Canadian economy

In addition to its tragic human toll, the war in Ukraine is negatively affecting economies around the world. However, for commodity exporters, the negative impacts on global growth are offset by the effects of higher commodity prices.

The conflict is affecting Canadian economic activity and inflation through several channels (**Table 3-A**).

**Table 3-A: The impacts of Russia's invasion of Ukraine on Canadian growth and inflation**

Channels		Real GDP	Inflation
Higher commodity prices	Improved terms of trade	↑	↑
	Increased commodity production	↑	↑
	Direct CPI effects	↓	↑
	Higher production costs	↓	↑
More persistent supply chain disruptions	Higher production costs, lower output	↓	↑
<b>Total effects</b>		-	↑

#### Impacts from higher commodity prices

For a net commodity exporter such as Canada, rising commodity prices are typically associated with a boost to economic activity and increased inflationary pressures. Higher commodity prices affect the following channels:

- **Terms of trade:** The prices of Canada's exports should increase. This improvement in the terms of trade means more income flowing into Canada—which can be spent on domestic and imported goods and services.
- **Commodity production:** Production, exports and investment in commodity-related sectors will rise, supporting Canadian employment and incomes.

- **Direct consumer price index (CPI):** Some components of the CPI, such as gasoline, natural gas, food and transportation, will face a direct impact.
- **Production costs:** These costs rise whenever commodities are used as inputs. This is expected to dampen economic activity and contribute to further inflationary pressures.

In the current context, the boost to Canadian economic growth from higher energy prices may be more subdued. The pickup in production and investment in the oil and gas sector is expected to be muted given uncertainty about long-term demand. Moreover, while commodity exporters will benefit from higher prices, the overall impact on global growth is anticipated to be negative. As a result, softer demand for Canada's non-commodity exports is expected to offset some of the anticipated lift from higher commodity prices.

While economic activity will increase less than usual, the impacts on inflation may be larger. The Canadian dollar typically strengthens with rising commodity prices. A stronger dollar would usually dampen inflationary pressures by lowering the domestic price of imported products relative to domestically produced goods and services. Currently, however, the Can\$/US\$ exchange rate has remained relatively unchanged since the start of the war.

#### Further stress on global supply chains

The war and the resulting trade restrictions are expected to worsen and prolong some global supply chain disruptions, especially for commodities. While the magnitude of this effect is uncertain, it will weigh on the recovery in global growth, and prices will face additional upward pressure.

(continued...)

**Box 3 (continued)**

The course of the war and its implications for economic activity are highly uncertain. As long as commodity prices remain elevated, they will support some increased investment and activity in the resource sector. They will also boost domestic income and aggregate demand. However, these effects are likely to be dampened by softer global growth and more persistent supply chain disruptions.

In addition, other factors could become important depending on how the situation evolves. For example, immigration levels could rise with the movement of refugees from the conflict. Supply reductions and price

increases in global energy and commodity markets could also have long-term implications for investment in, and the development of, alternative sources.

**Implications for inflation**

The implications of the war in Ukraine for inflation in Canada are clear and large. These include the impacts of commodity-linked prices, increased production costs and more pervasive supply chain disruptions. Together these add 0.7 percentage points to CPI inflation in 2022.

**Stronger second-quarter growth**

Economic growth is expected to pick up to about 6% in the second quarter of 2022 from a solid pace of 3% in the first quarter (**Table 3** and **Chart 4**). The effects of the Omicron variant weighed on economic activity in the first weeks of the year, but these effects were short-lived, and household consumption was resilient. Growth is on track for a strong consumption-led pickup in the second quarter as pandemic restrictions are removed. This is despite supply disruptions and labour shortages continuing to hold back the production and availability of a wide range of goods (**Chart 5**).

Housing market activity remained strong in the first quarter. The pandemic-induced increase in demand for more housing space, along with still-low borrowing rates and high disposable income, has boosted activity. Resales are expected to soften somewhat in the second quarter as borrowing rates rise. Low levels of both builders' inventories and existing homes for sale should support new construction and renovations in the near term.

**Table 3: Summary of the quarterly projection for Canada\***

	2021		2022			2021	2022	2023	2024
	Q3	Q4	Q1	Q2		Q4	Q4	Q4	Q4
<b>CPI inflation (year-over-year percentage change)</b>	4.1 (4.1)	4.7 (4.7)	5.6 (5.1)	5.8		4.7 (4.7)	4.5 (3.0)	2.4 (2.2)	2.1
<b>Real GDP (year-over-year percentage change)</b>	3.8 (4.0)	3.3 (3.2)	2.8 (2.4)	5.3		3.3 (3.2)	3.8 (4.2)	2.9 (2.7)	1.7
<b>Real GDP (quarter-over-quarter percentage change at annual rates)<sup>†</sup></b>	5.5 (5.4)	6.7 (5.8)	3.0 (2.0)	6.0					

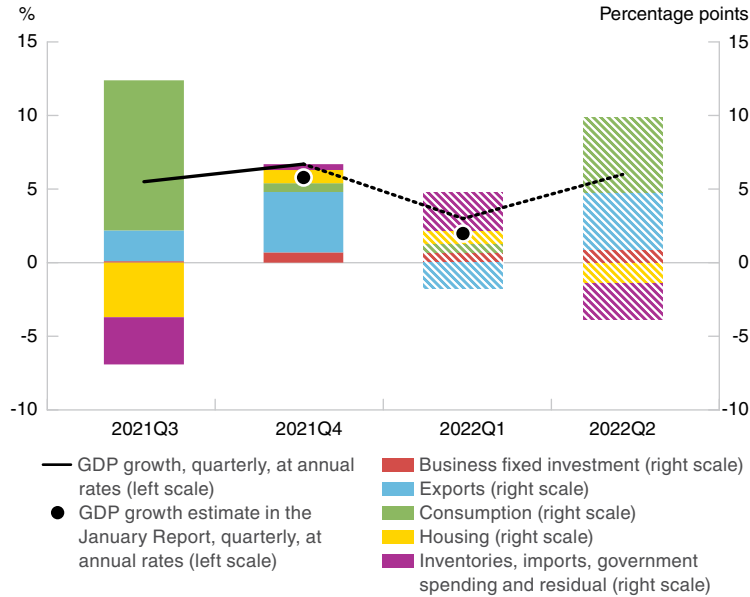
\* Details on the key inputs to the base-case projection are provided in **Box 2**. Numbers in parentheses are from the projection in the previous Report.

† Over the projection horizon, 2022Q1 and 2022Q2 are the only quarters for which some information about real GDP growth was available at the time the projection was conducted. For longer horizons, fourth-quarter-over-fourth-quarter percentage changes are presented. They show the Bank's projected growth rates of CPI and real GDP within a given year. As a result, they can differ from the growth rates of annual averages shown in **Table 2**.

Sources: Statistics Canada and Bank of Canada calculations and projections

**Chart 4: Growth is expected to pick up strongly in the second quarter**

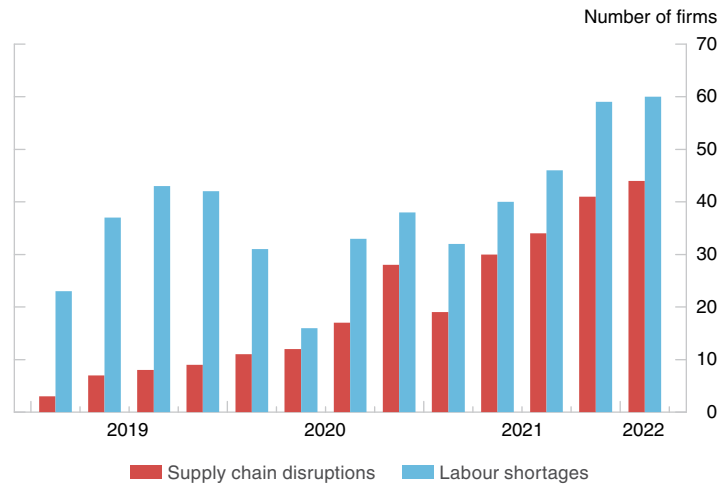
Contribution to real GDP growth, quarterly data



Sources: Statistics Canada and Bank of Canada calculations and estimates Last data plotted: 2022Q2

**Chart 5: Supply disruptions and labour shortages continue to weigh on production**

Number of firms reporting bottlenecks, Business Outlook Survey, quarterly data



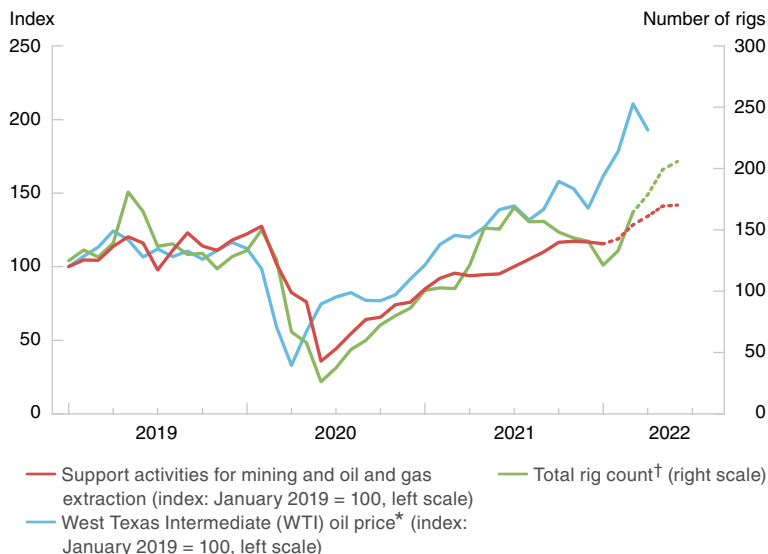
Note: The [Business Outlook Survey \(BOS\)](#) samples about 100 firms. Firms were asked the question, “What would be the most important obstacles or bottlenecks to being able to meet an unexpected increase in demand?” Mentions of a fully utilized labour force and an inability to find suitable new labour at the current wages are counted as labour shortages. Mentions of raw material constraints, transportation difficulties and logistics bottlenecks are counted as supply chain disruptions.

Source: Bank of Canada

Last observation: 2022Q1

**Chart 6: Oil production is increasing with higher prices**

Monthly data



\* The price for WTI in April 2022 is the average between April 1 and 8.

† The total rig count has been seasonally adjusted by the Bank of Canada.

Sources: Baker Hughes, NYMEX via Bloomberg Last observations: WTI oil price, April 2022  
Finance L.P., Statistics Canada and Bank of Canada Last data plotted: total rig count and support activities  
calculations and estimates for mining and oil and gas extraction, June 2022

Exports and business investment are expected to grow strongly in the second quarter as they continue to recover toward pre-pandemic levels. Higher energy prices are boosting growth in energy exports and investment (**Chart 6**). Outside the energy sector, solid foreign demand and a rebound in exports of motor vehicles are supporting exports.

### Tight labour markets

Employment bounced back sharply in recent months. Overall measures of labour market health are strong when compared with a wide range of benchmarks.<sup>1</sup> For instance, employment and total hours worked have surpassed pre-pandemic levels (**Chart 7**). Moreover, many of the groups hit hardest by the pandemic have seen robust recoveries, notably young women.

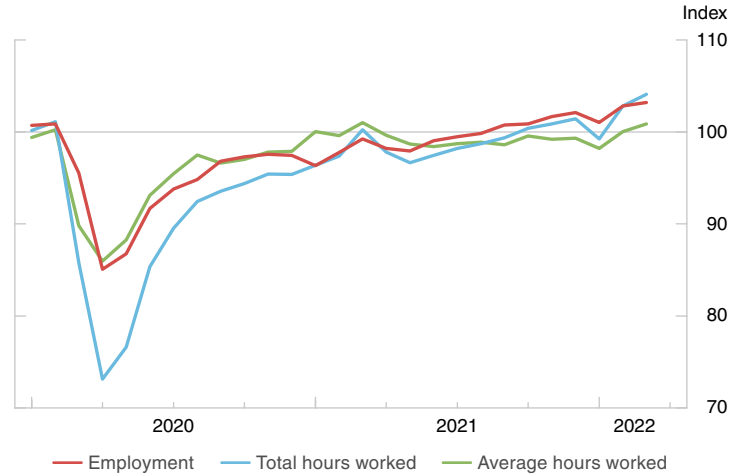
In the Bank of Canada's Business Outlook Survey (BOS) for the first quarter of 2022, indicators of labour shortages remain elevated. Most firms experiencing labour shortages expect them to persist until at least 2023. While roughly two-thirds of respondents plan to increase the size of their workforce to meet strong demand, many cited difficulty finding workers.

Wage growth has risen to near pre-pandemic levels (**Chart 8**). Wage growth is expected to increase further alongside elevated job vacancies, workers' increased willingness to switch jobs and a record-low unemployment rate. The strengthening in wages is consistent with the latest BOS, where firms report having difficulty attracting and retaining staff.

<sup>1</sup> For additional details, please see E. Ens, C. Luu, K. G. See and S. L. Wee, "Benchmarks for Assessing Labour Market Health," Bank of Canada Staff Analytical Note No. 2022-2 (April 2022).

**Chart 7: Employment and hours worked are above pre-pandemic levels**

Index: 2019 average = 100, monthly data

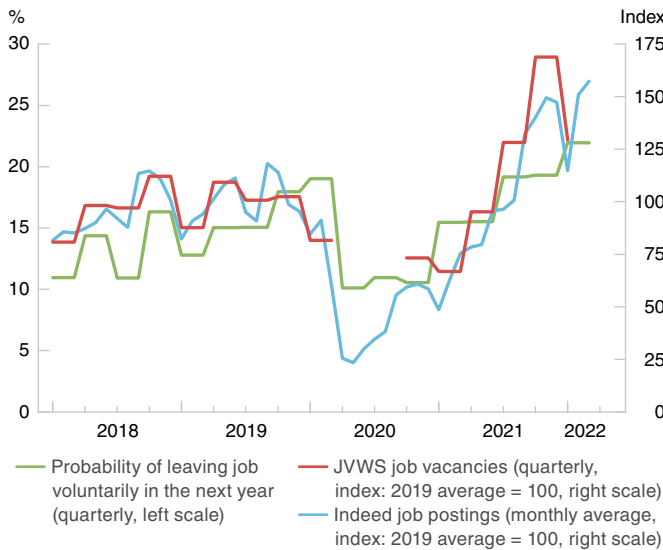


Sources: Statistics Canada and Bank of Canada calculations

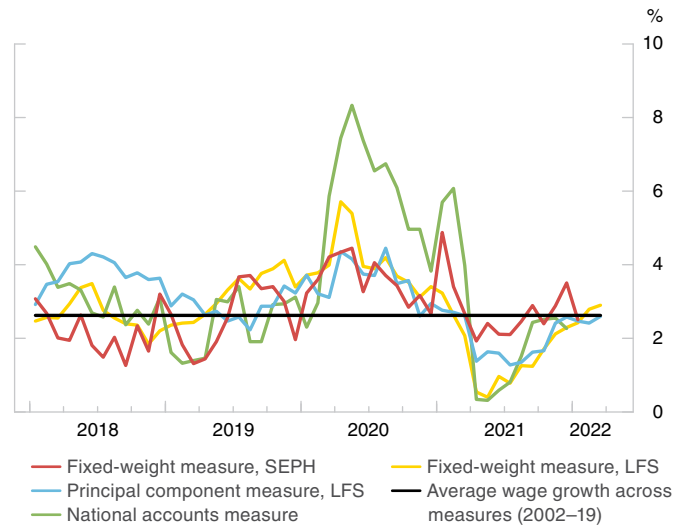
Last observation: March 2022

**Chart 8: A tight labour market is leading to rising wage growth**

a. Responses to the CSCE;\* ratios of JVWS job vacancies and Indeed online job postings to unemployment, not seasonally adjusted



b. Wage growth measures, year-over-year percentage change, monthly data



\* Respondents to the [Canadian Survey of Consumer Expectations \(CSCE\)](#) were asked, “What do you think is the percent chance that you will leave your job voluntarily during the next 12 months?” The chart presents the median response.

Note: JVWS is the Job Vacancy and Wage Survey; LFS is the Labour Force Survey; SEPH is the Survey of Employment, Payrolls and Hours. Quarterly JVWS job vacancies data have been extended to January 2022 based on Statistics Canada’s monthly estimate. Due to data limitations at the onset of the pandemic, JVWS job vacancies data are unavailable for the middle quarters of 2020. The LFS fixed-weight measure is constructed using 2019 employment weights for wages based on employees’ job status (full or part time), job permanency (permanent or temporary), industry of employment, and occupation, while the LFS principal component measure is based on the estimated common trend of annual growth among these series. The national accounts wage measure is constructed as total wages and salaries at a monthly frequency from the Canadian System of Macroeconomic Accounts divided by total hours worked from SEPH.

Sources: Statistics Canada, Indeed, Bank of Canada and Bank of Canada calculations

Last observations: CSCE, 2022Q1; JVWS and SEPH, January 2022; Indeed and LFS, March 2022; national accounts wage measure, December 2021

## Canadian economy moving into excess demand

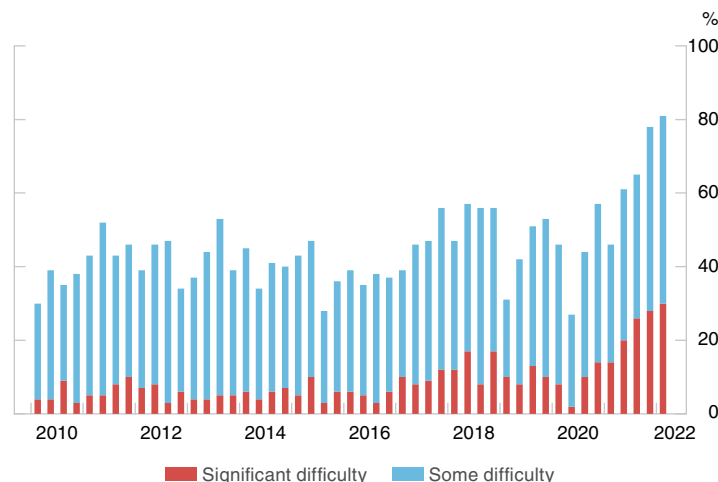
A broad set of measures suggests that economic slack has been absorbed and that the economy is starting to operate beyond its productive capacity.

Canadian firms are increasingly facing capacity pressures amid a tight labour market and pervasive supply chain challenges. Roughly 8 out of 10 respondents to the BOS said they would have difficulty meeting an unexpected increase in demand—a new survey high (**Chart 9**). More firms intend to pass cost increases related to supply chain disruptions and rising wages into their output prices. Core measures of inflation have all risen materially above 2%.

Taking these respective demand and supply pressures into account, the Bank estimates that the output gap has risen to between -0.25% and 0.75% for the first quarter of 2022, up from the estimate of -0.75% to 0.25% for the last quarter of 2021 (**Box 2**). With robust growth expected in the second quarter, the economy is moving into excess demand.

### Chart 9: Reports of capacity pressures are at record levels in the Business Outlook Survey

Percentage of respondents,\* quarterly data



\* Percentage of respondents to the Business Outlook Survey reporting some or significant difficulty meeting an unexpected increase in demand or sales. See the [Business Outlook Survey—First Quarter of 2022](#) for more details.

Source: Bank of Canada

Last observation: 2022Q1

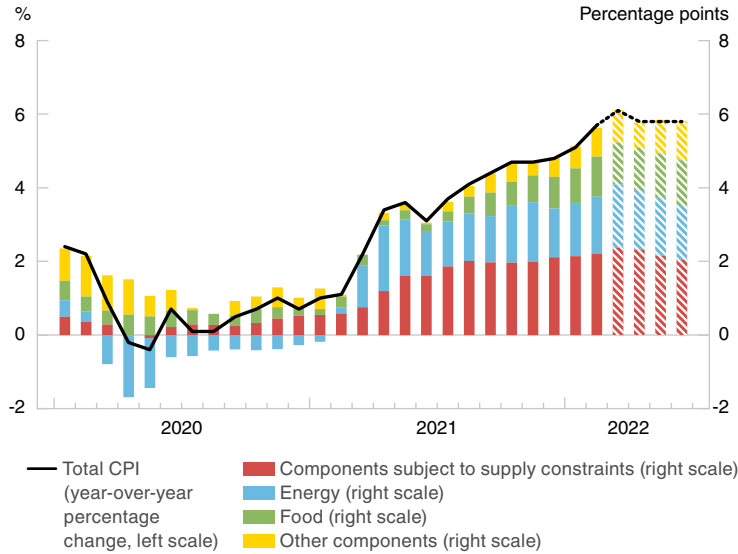
## CPI inflation at multi-decade high

Elevated energy and food prices are expected to push CPI inflation to just under 6% in the first half of 2022 (**Chart 10**). Russia's invasion of Ukraine has driven up commodity prices. In Canada, households are feeling this through higher prices for gasoline and fuel oil. The impacts on the cost of wheat, corn and soybeans will also boost food prices in coming quarters, compounding the effects of last year's drought and supply bottlenecks.

Pervasive supply constraints, together with strong global and domestic demand, are also contributing to the rise in prices of a wide range of goods and services (**Box 4**). As a result, price pressures are broadening, with about two-thirds of CPI components growing above 3% (**Chart 11**).

**Chart 10: Food and energy prices and supply constraints are pushing up inflation**

Contribution to CPI inflation, in percentage points, monthly data



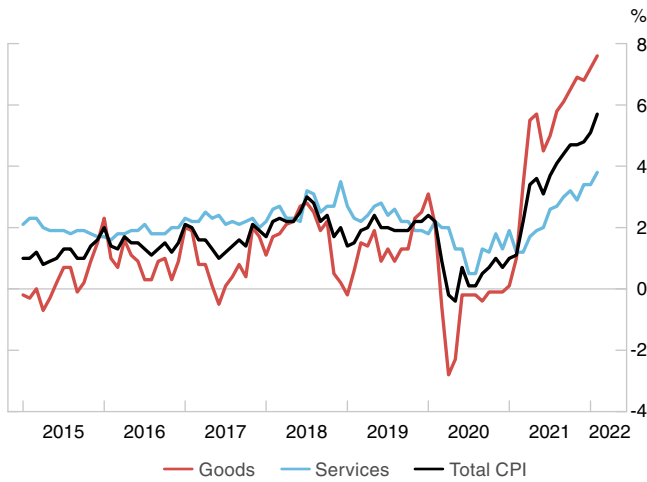
Note: "Components subject to supply constraints" includes motor vehicles, durable and semi-durable goods, alcohol purchased in stores, and home repair and replacement costs.

Sources: Statistics Canada and Bank of Canada calculations and estimates Last data plotted: June 2022

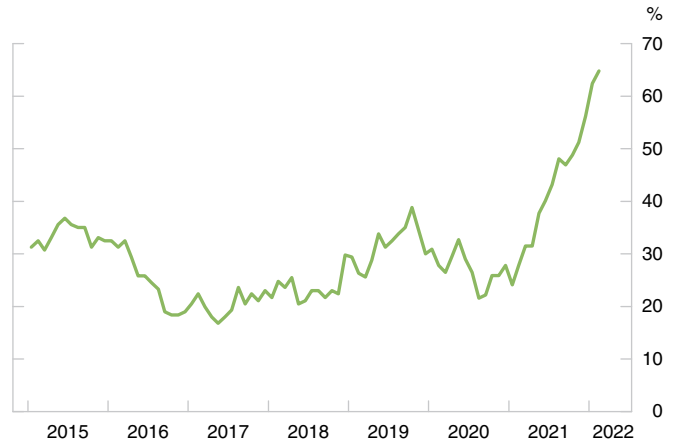
**Chart 11: Price pressures are broadening**

Monthly data

a. CPI inflation of goods and services, year-over-year percentage change



b. Share of CPI components growing above 3% on a year-over-year basis



Sources: Statistics Canada and Bank of Canada calculations

Last observation: February 2022

Box 4

### Domestic and global determinants of inflation in Canada

Consumer price index (CPI) inflation hit a three-decade high in February 2022, reaching 5.7% on a year-over-year basis. The run-up in inflation reflects global factors, such as strong demand and supply chain disruptions, as well as domestic factors. Understanding the impacts of these factors can help better assess how long inflationary pressures will remain elevated and how to adjust the response in Canadian monetary policy.

Goods inflation hit 7.6% in February, twice as high as services inflation. Oil prices are set in global markets, and the pass-through to the price of gasoline in Canada is typically rapid and high. Domestic food prices are also affected because they are linked to global agricultural prices as well as domestic crop conditions and local supply constraints. Energy and food price inflation are at 24% and 7.4%, respectively; together, they are contributing roughly 2.5 percentage points to CPI inflation.

Durable goods prices have also been rising quickly (Chart 4-A). Shortages of semiconductor chips are leading to lower production of and higher prices for motor vehicles—a clear global supply shock. In other

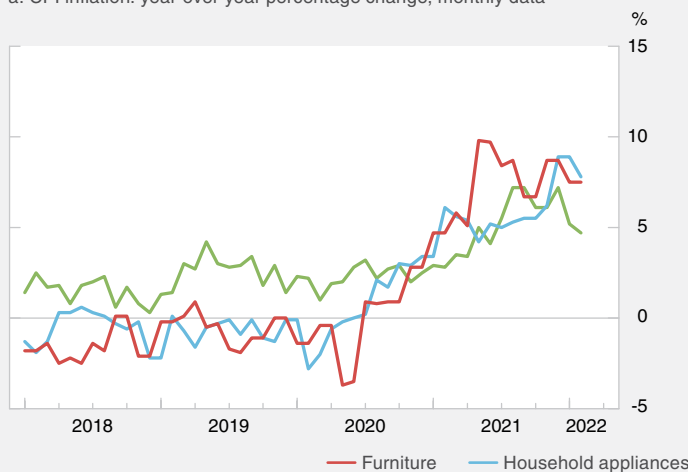
durable goods markets, strong global demand is playing an important role, compounded by supply challenges. Two examples are furniture and household appliances, which together make up nearly 3% of the CPI. Prices for these goods have been rising quickly alongside sales.

In contrast, domestic factors are the key driver for services prices. Although inflation of these prices is running well below that of goods prices, it has also picked up. The strongest gains have been seen in homeowners' replacement costs, which are rising at a pace close to 13% (Chart 4-B). While the inputs for construction, such as lumber and copper, reflect global factors, housing is also influenced by domestic demand and supply conditions. These include demand factors, such as population growth, historically low borrowing rates and an increased preference for more housing space. They also include supply constraints, such as labour shortages and, in some cases, limited availability of land for development. The strength in housing price inflation is also finding its way into rent inflation, which has risen to over 4%.

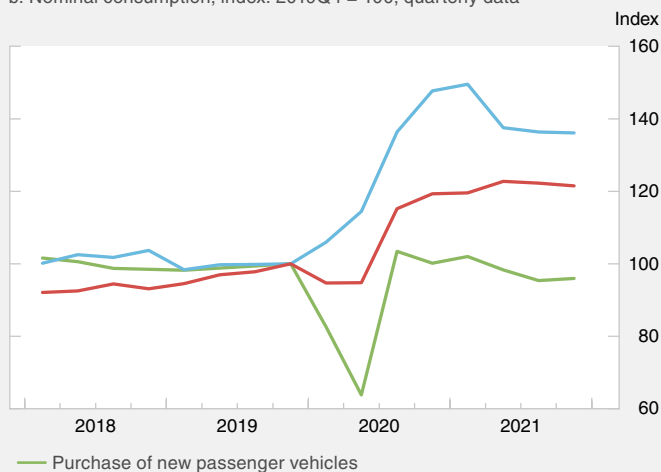
(continued...)

**Chart 4-A: Durable goods prices and spending reflect supply constraints interacting with high demand**

a. CPI inflation: year-over-year percentage change, monthly data



b. Nominal consumption, index: 2019Q4 = 100, quarterly data



Sources: Statistics Canada and Bank of Canada calculations

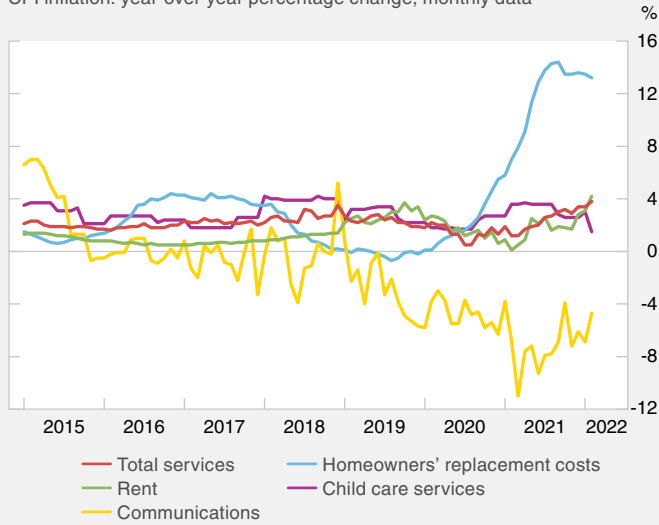
Last observations: CPI inflation, February 2022; consumption, 2021Q4



Box 4 (continued)

**Chart 4-B: Services inflation has picked up and continues to be driven by strong gains in homeowners' replacement costs**

CPI inflation: year-over-year percentage change, monthly data



Sources: Statistics Canada and Bank of Canada calculations

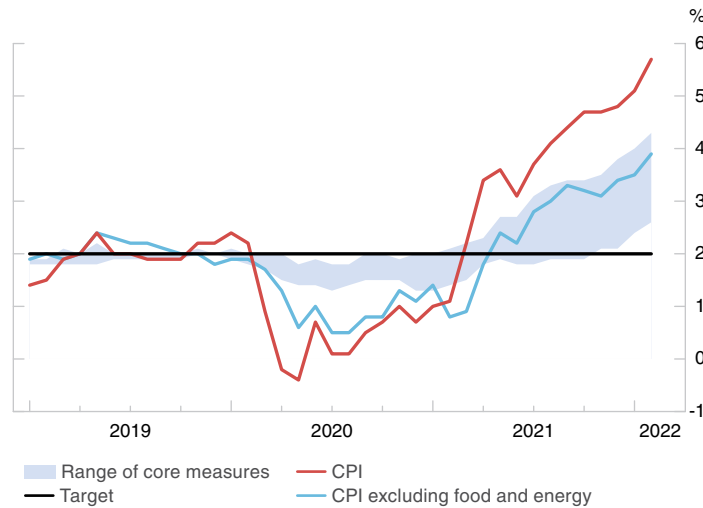
Last observation: February 2022

Other services prices, however, are rising at a slower pace. For example, child care and personal care services are growing at less than 2% and 3%, respectively, because price developments in these categories primarily reflect pressures on domestic wages. Moreover, some categories, such as communications, have seen prices fall despite higher real spending because of ongoing digitalization.

Overall, the pickup in inflation has been concentrated in traded goods prices. This reflects both global and domestic conditions. Domestically driven price pressures have emerged in services prices. We see this in homeowners' replacement costs, rents and other services as the economy is moving into excess demand.

**Chart 12: Inflation measures have continued to rise**

Year-over-year percentage change, monthly data



Sources: Statistics Canada and Bank of Canada calculations

Last observation: February 2022

Measures of core inflation continue to rise alongside widening inflationary pressures, with CPI-trim, CPI-median and CPI-common at 4.3%, 3.5% and 2.6%, respectively (**Chart 12**). The increases reflect more widespread price pressures and are consistent with an economy that is moving into excess demand.

## Strong economic growth and easing inflation

Growth is projected to be 4¼% in 2022, easing to a still-solid pace of 3¼% in 2023, supported by robust domestic demand and exports. The tight labour market and improved terms of trade are expected to boost aggregate income and wealth. In turn, high income and a drawdown of some pandemic-related savings will drive domestic spending. In addition, an increase in potential output will further support growth in domestic income and demand.

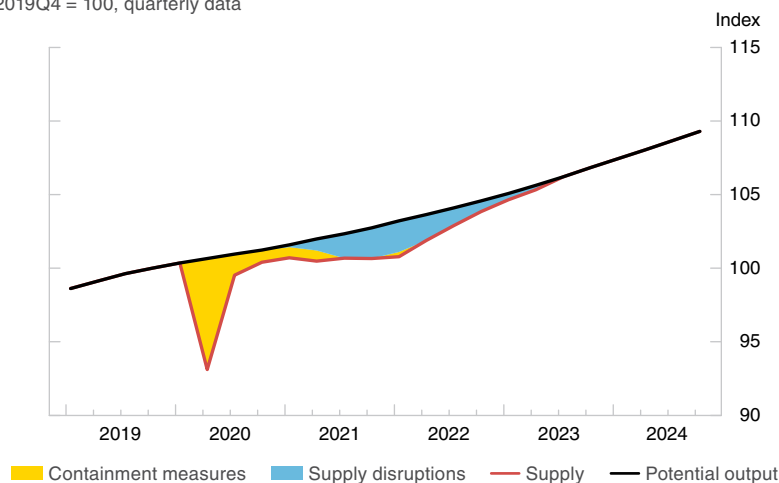
Pandemic-related restrictions and supply disruptions have weighed on output. With employment growing faster than output, productivity growth has been weak. However, public health restrictions have now been largely removed, and supply disruptions are expected to dissipate gradually by mid-2023 (**Chart 13**). As caution around the pandemic fades and supply shortages ease, GDP is expected to grow faster than employment, and output per worker to rise.

Together with robust business investment and higher immigration, this rise in labour productivity growth is projected to boost supply growth from about 1¾% this year to roughly 3¼% in 2023 (see **Appendix** on page 28). This will provide room for solid economic growth with declining inflation.

Higher interest rates in Canada and the normalization of monetary policy globally are expected to moderate domestic demand growth. GDP and supply growth will both ease to about 2¼% and 2½%, respectively, in 2024.

**Chart 13: Supply disruptions are expected to dissipate gradually by mid-2023**

Index: 2019Q4 = 100, quarterly data



Note: "Supply disruptions" includes the short-term effects on supply of supply chain disruptions and labour market mismatch. "Containment measures" also includes the effects on supply of worker absences due to COVID-19. "Supply" is potential output including temporary factors. See **Box 2** for details.

Source: Bank of Canada calculations, estimates and projections

## Expansion led by strong consumption growth

Job gains and the spending of some of the savings accumulated during the pandemic will support consumption growth (Chart 14). Moreover, the lifting of public health restrictions should lead to a continued rebound in spending on hard-to-distance services in the second half of 2022. Consumption of these services will grow at a slower but still-solid pace thereafter, as pandemic-induced caution fades.

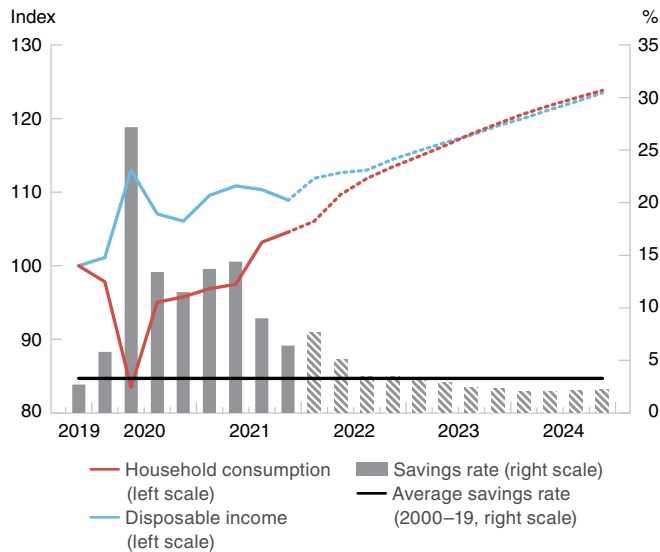
In contrast, overall goods consumption is forecast to grow at a more moderate pace. As a result, the balance of consumption between goods and services will return toward pre-pandemic levels over the projection horizon. While consumption growth for most goods will moderate, spending on motor vehicles should pick up as supply challenges in the auto sector are resolved.

Housing activity is projected to ease from its current level but remain elevated, supported by population growth. Resales are expected to soften as borrowing rates rise and the pandemic-induced demand for more housing space wanes. Meanwhile, the unwinding of supply chain bottlenecks should support new construction as sourcing building materials becomes easier. This growth in housing supply, combined with slowing demand, should help rebalance housing markets over time and help moderate house price growth.

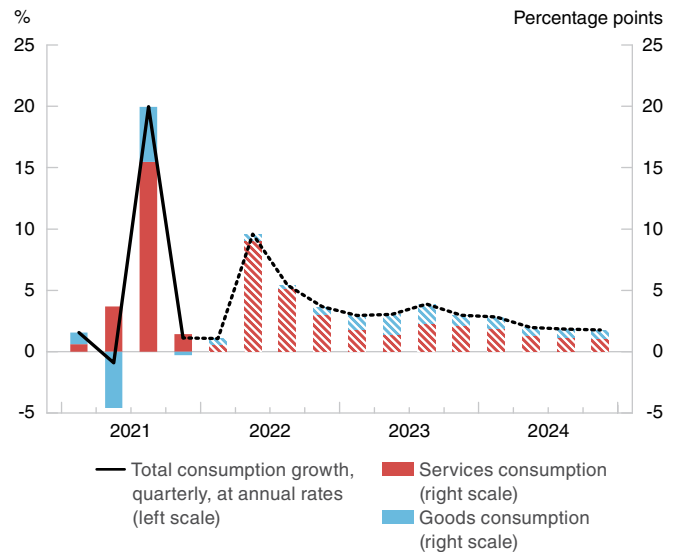
**Chart 14: Consumption growth is forecast to be strong**

Quarterly data

a. Nominal data; index: 2019Q4 = 100 for consumption and income



b. Contribution to real consumption growth



Sources: Statistics Canada and Bank of Canada calculations and projections

## Robust export growth

Export growth is expected to be strong in 2022 and 2023, boosted by elevated commodity prices and solid foreign demand coupled with easing supply constraints (**Chart 15**). Later in the projection, exports are anticipated to continue to grow but at a slower pace.

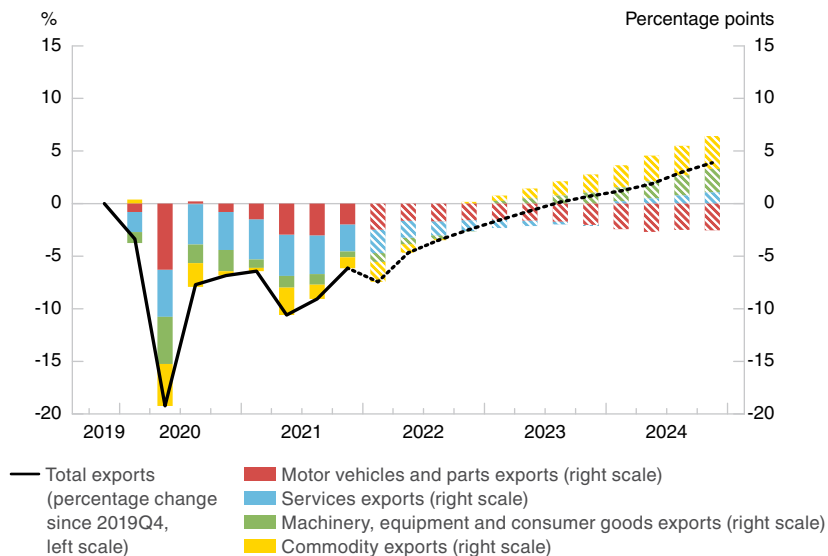
Energy exports are projected to grow strongly because of high prices and increased transportation capacity. Canadian producers are expected to make full use of existing production and transportation capacity to boost energy exports in 2022. Expansions in crude-by-rail and pipeline capacity, including the scheduled completion of the Trans Mountain Expansion project, will support growth later in the projection horizon.

Non-energy goods exports should grow solidly, supported by the gradual dissipation of global supply disruptions. However, exports of motor vehicles are expected to remain flat after the second quarter of 2022, reflecting supply issues, before declining later in the projection due to restructuring in the sector. Services exports and imports are anticipated to strengthen as travel recovers, but the recovery is expected to take time given the slow return of international tourism.

Goods imports will be supported by strong domestic demand as well as the willingness of firms to invest and rebuild inventories as supply chain issues ease.

**Chart 15: Solid foreign demand and elevated commodity prices should support the recovery in exports**

Contribution to the deviation of real total exports from the 2019Q4 level, in percentage points, quarterly data



Sources: Statistics Canada and Bank of Canada calculations and projections

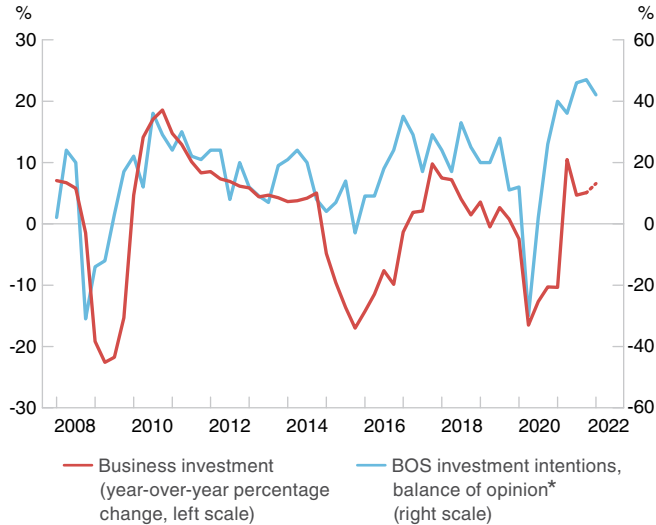
## Stronger business investment after pandemic lows

Business investment is expected to grow strongly (**Chart 16**). Investment growth in the oil and gas sector is anticipated to be robust as a result of high energy prices. Heightened global concerns over secure energy supplies should also benefit Canadian producers. However, investment will be restrained by labour shortages and ongoing uncertainty about long-term demand and the transition to a low-carbon economy.

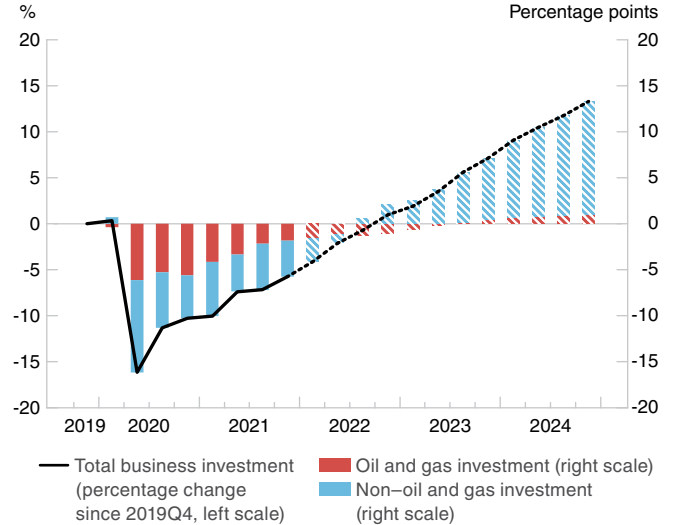
**Chart 16: Business investment is expected to grow strongly**

Quarterly data

a. Business investment and BOS investment intentions on machinery and equipment



b. Contribution to the deviation of real total business investment from the 2019Q4 level, in percentage points



\* Percentage of respondents to the [Business Outlook Survey \(BOS\)](#) that expect higher investment spending on machinery and equipment over the next 12 months minus the percentage that expect lower investment spending.

Sources: Statistics Canada, Bank of Canada and Bank of Canada calculations and projections

Last observation: BOS, 2022Q1  
Last data plotted in panel a: business investment, 2022Q1

Outside the oil and gas sector, investment will be supported by robust demand, the gradual easing of supply constraints and improved business confidence. The outlook is consistent with the results of the BOS, as most businesses said they intend to increase their spending on machinery and equipment. This level of investment intentions was a near-record high for the survey. More firms also reported plans to invest in digital technologies and automation to improve productivity given tight labour markets and rising input costs.

Inventory investment is projected to contribute to growth in 2022 and 2023 as businesses, notably retailers, restock following pandemic shortages.

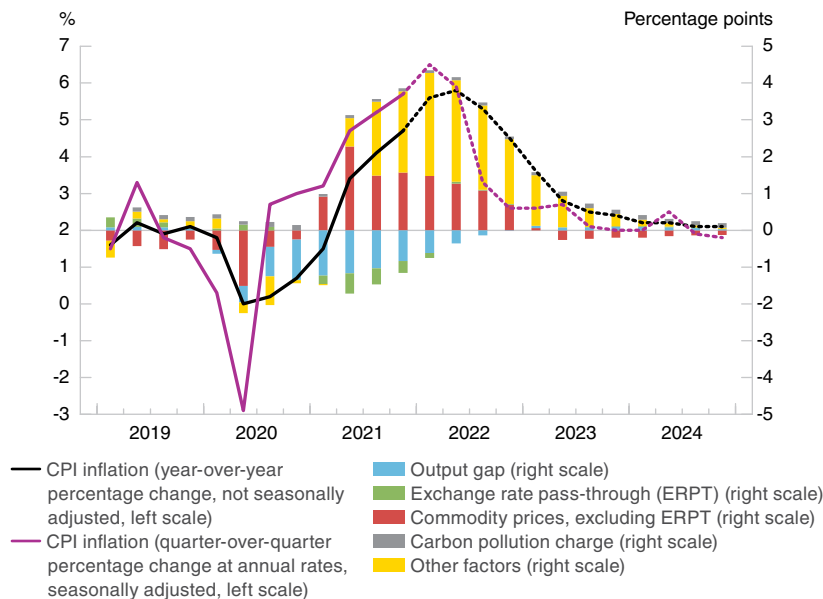
**CPI inflation to decline from second-quarter peak**

Inflation is expected to ease over the projection horizon as the effects of high energy prices and supply disruptions fade and monetary policy tightening moderates demand (**Chart 17**).

With oil prices assumed to decline after the second quarter of 2022, the boost from higher gasoline prices should fade quickly in coming quarters. Upward pressure from supply challenges is also expected to dissipate over 2023. This is consistent with the assumption that the prices for goods affected by supply challenges will not experience price reversals. This anticipated easing in inflationary pressures can be seen in the dynamic of annualized quarter-over-quarter inflation rates, which fall from around 6% in the second quarter of 2022 to about 2½% in the fourth quarter. Year-over-year inflation is anticipated to decrease from about 5¼% in the second quarter of 2022 to about 2½% in the second half of 2023. Inflation is then expected to decline to the 2% target in 2024.

**Chart 17: CPI inflation to ease as the effects of supply disruptions and high energy prices fade and monetary stimulus is reduced**

Contribution to the deviation of year-over-year inflation from 2%, quarterly data



Note: “Other factors” includes, in particular, the impacts of various supply-related disruptions on inflation, such as the effects of semiconductor shortages on motor vehicle prices, of shipping bottlenecks on goods prices, and of unfavourable weather conditions on food prices. Numbers may not add to total due to rounding.

Sources: Statistics Canada and Bank of Canada calculations, estimates and projections

## Rising short-term and stable long-term inflation expectations

Inflation has been above 3% since the second quarter of 2021. When combined with the outlook, this suggests that inflation is expected to be above the top end of the inflation control range for two years. There is a concern that high and persistent inflation can affect long-term inflation expectations. This matters because inflation expectations are an important factor behind future inflation.

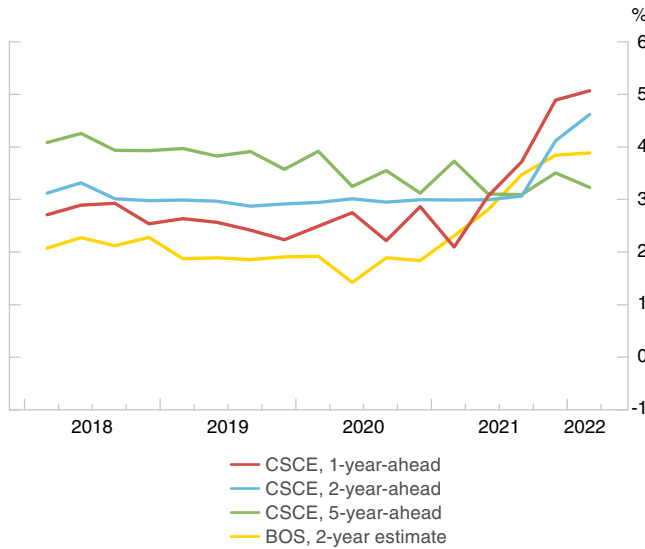
The inflation expectations of consumers have increased at the one-year horizon (**Chart 18**). Evidence about the evolution of inflation expectations at the two-year horizon is mixed. Inflation expectations of professional forecasters remain relatively stable, but those of consumers and businesses have increased significantly. Most respondents to both the BOS and the Canadian Survey of Consumer Expectations for the first quarter of 2022 anticipate inflation will be well above 3% on average over the next two years.

Current high inflation has not, however, resulted in increases in survey-based expectations at longer horizons. Most respondents to the BOS anticipate inflation will be close to the 2% target in three years because of improvements in supply chains and the Bank’s interest rate actions. Inflation expectations also remain relatively stable at the five-year horizon for both consumers and professional forecasters.<sup>2</sup>

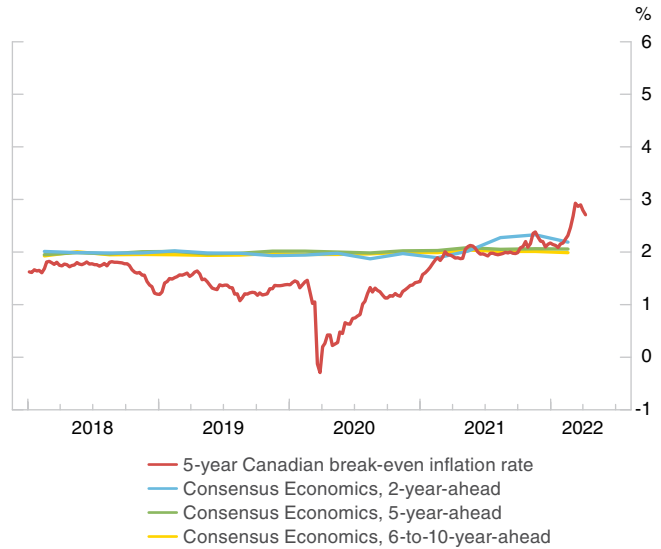
<sup>2</sup> It is common in household surveys of inflation that the absolute level is higher than the inflation target. As such, it is the directional change that matters most. For instance, see C. D. Carroll, “Macroeconomic Expectations of Households and Professional Forecasters.” *Quarterly Journal of Economics* 118, no. 1 (2003): 269–298.

**Chart 18: Short-term inflation expectations are rising, while longer-term expectations are more stable**

a. Inflation expectations, Canadian Survey of Consumer Expectations (CSCE) and Business Outlook Survey (BOS)



b. Canadian break-even inflation rate (weekly average of daily data) and Consensus Economics inflation expectations (quarterly data)



Note: The BOS 2-year estimate is based on firms' responses to the BOS question, "Over the next two years, what do you expect the annual rate of inflation to be, based on the consumer price index?" Firms can select from pre-determined ranges and provide a point estimate. In cases where a firm selects a range only: if the range is closed, a midpoint is used; if the range is open-ended, the average expectation of other firms in that range is used. The 5-year Canadian break-even inflation rate is the difference between the yields of a nominal bond and a real return bond of the same maturity, both issued by the Government of Canada. Break-even inflation rates provide a signal about the expected path of inflation as perceived by market participants, but they are also affected by fluctuations in inflation risk and liquidity premiums. Consensus Economics provides inflation forecasts for the next 5 years followed by an inflation forecast for the next 6 to 10 years. These forecasts are transformed into fixed-horizon forecasts (2-year, 5-year) by weighted average.

Sources: Bloomberg Finance L.P., Consensus Economics, Bank of Canada and Bank of Canada calculations

Last observations: Consensus Economics, January 2022; BOS and CSCE, 2022Q1; break-even inflation rate, April 8, 2022

The five-year break-even inflation rate (BEIR) has increased to near 3%. At this level, the five-year BEIR is consistent with a rise in inflation over the near term followed by a decline toward the 2% target. In this respect, the five-year BEIR is indicative that longer-term inflation expectations are consistent with the Bank's projection for inflation.

## Evolution of the Bank of Canada's balance sheet

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Since November 2021, the Bank has been in the reinvestment phase. This means that the Bank has been purchasing Government of Canada (GoC) bonds solely to replace maturing bonds. This requires approximately \$4 billion to \$5 billion in purchases every month, across both the primary and secondary markets.

Ending the reinvestment phase and initiating quantitative tightening means that the Bank will stop purchasing GoC bonds. Maturing bonds will not be replaced when they roll off the balance sheet. As a result, the Bank's balance sheet will shrink over time, with roughly 40% of the Bank's GoC bond holdings maturing within the next two years.

The longer-run level of settlement balances will be higher than it was before the pandemic. This reflects a variety of factors, including a shift in investor preferences toward safe and liquid assets, changes to the payment system in Canada and regulatory requirements that encourage greater use of central bank deposits.



## Risks to the inflation outlook

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The disruptions related to the COVID-19 pandemic have diminished, but Russia's unprovoked invasion of Ukraine has introduced a major new source of uncertainty. Global trade is being disrupted, confidence is declining, and financial markets have been volatile. Moreover, the tragic situation in Ukraine has ignited fears of wider escalation and risks to global economic integration.

A quick end to the war would be positive for global growth and would reduce inflationary pressures. In contrast, a prolonged or worsening conflict would lower confidence, add further stress to supply chains and boost inflation.

Regarding COVID-19, greater population-wide immunity has led to the removal of public health restrictions and the reopening of economies in most jurisdictions around the world. While the likelihood of another severe downturn has diminished, the virus continues to circulate and mutate. Even without a resurgence of cases, reopening an economy remains complex, and pervasive supply constraints have yet to be unwound.

Some of the risks identified in previous reports have been partially incorporated into the projection. For example, the base-case scenario includes more persistent supply-side disruptions and an upward revision to residential investment.

Outside of the pandemic and the war in Ukraine, the Bank sees several upside and downside risks to the outlook for inflation. The Bank views these risks as roughly balanced. Nonetheless, the upside risks are of greater concern because inflation is very high. Until inflation moves significantly lower, there is an elevated risk that Canadians will start to believe that it will stay high over the long term. Higher inflation expectations could in turn lead to more pervasive increases in labour costs and inflationary pressures and could become embedded in ongoing inflation.

Drawing from a larger set of risks, the Bank presents here a selection of those identified as most important for the projected path of inflation.

### (i) More persistent supply bottlenecks and cost pressures (↑)

Disruptions such as the spread of COVID-19 variants could further affect manufacturing and shipping activities, causing persistent shortages of goods and labour. In particular, some countries that have had relatively low infection rates to date, such as China, could be subject to more frequent and widespread lockdowns. A drawn-out war in Ukraine could also create additional supply bottlenecks or worsen existing ones even further. Over time, repeated disruptions to business operations may lead firms to adjust their supply chains in ways that could increase costs. More persistent labour shortages could also result in wages rising much faster than productivity growth. Taken together, these effects would lead to greater and longer-lasting inflationary pressures.

(ii) **Reversal of growth in goods prices (↓)**

The base-case scenario assumes that the sharp increase in the level of prices of durables seen since the pandemic began will persist. However, as supply chain bottlenecks dissipate, these prices could decline. Moreover, oil prices and transportation costs could decrease more sharply, or goods consumption could slow faster than projected. If this occurred, inflation would be lower than projected.

(iii) **Stronger household spending in Canada (↑)**

The projection continues to include some degree of caution around consumption. However, further reductions in pandemic-related uncertainty could boost confidence by more than expected. Consequently, households could spend more of their accumulated savings. Consumption and residential investment would then be stronger than projected and would contribute to greater inflationary pressures.

(iv) **Sharp deterioration of global financial conditions (↓)**

Global indebtedness levels, equity valuations and inflationary pressures are all high. These, combined with reduced policy support, could result in a pullback in risk appetite and a sharp tightening of global financial conditions. This would constrain access to credit for vulnerable EMEs or other highly indebted borrowers. In addition, China's efforts to address vulnerabilities and engineer a soft landing in the property sector could weigh on financial markets more than expected. These shocks could have negative spillover effects on the global economy and would be transmitted to the Canadian economy through a sharp tightening of financial conditions, weaker exports, lower commodity prices and a deterioration in the terms of trade.

## Appendix: Potential output and the neutral rate of interest

Potential output in Canada and globally is expected to strengthen over the projection horizon (**Table A-1**). Relative to the April 2021 *Monetary Policy Report*, the Bank of Canada's estimate of potential output growth in Canada has been revised down for 2021 and revised up for 2022 to 2024.

The estimated range for the Canadian nominal neutral rate of interest has been revised up by 25 basis points compared with the April 2021 assessment. This reflects a combination of a higher global neutral rate and a stronger outlook for potential output.<sup>3</sup>

**Table A-1: Projection for potential output growth**

	Projected growth* (%)				
	2020	2021	2022	2023	2024
<b>Canada</b>					
Excluding temporary effects of the pandemic	1.5 (1.4)	1.3 (1.5)	1.7 (1.3)	2.0 (2.0)	2.3 (2.2)
Including temporary effects of the pandemic	-1.0 (-1.1)	2.3 (3.7)	1.7 (1.6)	3.3 (2.0)	2.5 (2.2)
<b>World</b>	2.4 (2.3)	2.7 (2.7)	2.9 (3.0)	2.9 (3.0)	2.9
<b>United States</b>	1.2 (1.2)	1.3 (1.3)	1.6 (1.8)	1.7 (1.8)	1.8
<b>Euro area</b>	1.0 (0.9)	1.2 (1.1)	1.4 (1.2)	1.3 (1.1)	1.1
<b>Japan</b>	0.5 (0.5)	0.6 (0.6)	0.7 (0.7)	0.8 (0.7)	0.8
<b>China</b>	5.5 (5.5)	5.5 (5.5)	5.2 (5.4)	5.1 (5.4)	4.9
<b>Oil-importing EMEs<sup>†</sup></b>	2.6 (2.5)	3.1 (3.2)	3.4 (3.8)	3.7 (3.8)	3.7
<b>Rest of the world<sup>‡</sup></b>	1.4 (1.3)	1.7 (1.5)	1.9 (1.8)	1.8 (1.9)	1.8

\* Estimates from the April 2021 assessment appear in parentheses.

† The oil-importing emerging-market economies (EMEs) grouping excludes China. It is composed of large EMEs from Asia, Latin America, the Middle East, emerging Europe 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 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).

Source: Bank of Canada

<sup>3</sup> For more details, see G. Faucher, C. Hajzler, M. Kuncil, D. Matveev, Y. Park and T. Taskin, "Potential Output and the Neutral Rate in Canada: 2022 Reassessment," Bank of Canada Staff Analytical Note No. 2022-3 (April 2022) and K. Boutilier, T. Carter, X. S. Chen, E. Ekanayake, L. Poirier, P. Shannon, A. Uppal and L. Xiang, "Assessing Global Potential Output Growth and the US Neutral Rate: April 2022," Bank of Canada Staff Analytical Note No. 2022-4 (April 2022).

## Modest increase in global potential output growth

Global potential output growth is expected to continue recovering from the pandemic, rising from 2.7% in 2021 to 2.9% over the following three years (Table A-1). The recovery is observed in all regions except China, where potential output growth should continue moderating, largely reflecting population aging and slower capital accumulation. In the United States, potential output growth is expected to rise from 1.3% in 2021 to 1.8% in 2024. This increase is mainly due to easing immigration restrictions and accelerating trend labour productivity growth as impacts from the pandemic fade and firms invest in new and digital technologies.

Compared with the April 2021 assessment, global potential output growth is marginally lower over the projection horizon. This reflects downward revisions to potential output for China, the United States and emerging-market economies. These downward revisions are partially offset by upward revisions for other regions.

## Canadian potential output growth to strengthen

In Canada, the growth of potential output, including the effects of temporary factors, is expected to decline from 2.3% in 2021 to 1.7% in 2022 because of lingering supply chain issues.<sup>4</sup> It is then projected to increase to 2.7% on average over 2023 to 2025. The resolution of supply disruptions explains much of this anticipated pickup, alongside stronger population growth due to higher immigration levels.

Relative to the April 2021 assessment, potential output growth (including temporary factors) is revised down by 1.4 percentage points in 2021, but is revised up by an average of 0.6 percentage points over 2022 to 2024 (Table A-2).

**Table A-2: Comparison of Canadian potential output estimates relative to April 2021**

Annual rates (%)

	Including temporary factors			Excluding temporary factors		
	Annual growth	Range for growth	Revisions to the level (%)	Annual growth	Trend labour input growth	Trend labour productivity growth
<b>2021</b>	2.3 (3.7)	2.1–2.5	-1.2	1.3 (1.5)	0.5 (0.4)	0.8 (1.1)
<b>2022</b>	1.7 (1.6)	1.3–2.3	-1.1	1.7 (1.3)	1.2 (0.7)	0.5 (0.7)
<b>2023</b>	3.3 (2.0)	2.9–3.9	0.2	2.0 (2.0)	1.1 (0.7)	0.9 (1.3)
<b>2024</b>	2.5 (2.2)	2.3–2.9	0.5	2.3 (2.2)	1.2 (0.7)	1.1 (1.4)
<b>2025</b>	2.3	2.1–2.6	-	2.3	1.1	1.2

Note: Estimates of potential output growth excluding temporary factors remove the impacts of supply chain disruptions, labour market mismatch and containment effects. Estimates from the April 2021 assessment appear in parentheses. Numbers may not sum due to rounding. The range for potential output growth represents the methodological range implied by the risk scenarios presented in G. Faucher, C. Hajzler, M. Kuncl, D. Matveev, Y. Park and T. Taskin, "Potential Output and Neutral Rate in Canada: 2022 Reassessment," Bank of Canada Staff Analytical Note No. 2022-3 (April 2022).

Source: Bank of Canada

<sup>4</sup> In this Report, the Bank also uses the term "supply" when referring to potential output including the effects of temporary factors. For more details, see Box 2.

The downward revision in 2021 largely reflects pressures from global supply chain disruptions that emerged over the year and that are expected to remain elevated in the first half of 2022 before gradually easing. The faster-than-anticipated labour market recovery and lower expected impact of the pandemic on labour market scarring contribute to upward revisions in trend labour input from 2022 to 2024.

Potential output is highly uncertain because some of its components are unobservable and difficult to forecast. To reflect this uncertainty, a range is constructed around midpoint estimates. The outlook for potential output is subject to both upside and downside risks. In particular, Russia's invasion of Ukraine could have a larger-than-anticipated impact on global supply chains, weighing on potential output growth even more.

International travel and quarantine restrictions that are still in place in many countries could continue to present challenges for Canada in reaching its immigration targets, posing a downside risk to growth in trend labour input. In contrast, refugees from Ukraine, who to date are concentrated throughout Europe, could migrate to Canada in greater numbers than currently expected, which may strengthen potential output.

## Higher neutral rate of interest

The Bank estimates that the nominal neutral rate in Canada currently lies in a range of 2% to 3%, 25 basis points higher than in the April 2021 assessment.<sup>5</sup> This upward shift reflects a combination of the revised US neutral rate (described below) and key domestic factors, including stronger growth of trend labour input and trend output over the long term.<sup>6</sup>

The small open nature of the Canadian economy implies that its neutral rate is linked with the global neutral rate, which the Bank proxies using an estimate of the US neutral rate. The Bank's estimate for the nominal US neutral rate currently lies within a range of 2% to 3%, 25 basis points higher than in the April 2021 assessment.<sup>7</sup> This is largely because the medium-term impact of the COVID-19 recession on US income inequality is now projected to be smaller than that estimated in April 2021.

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<sup>5</sup> Unlike the potential output assessment, the Bank's neutral rate assessment is conducted only on a forward-looking basis. It therefore aims to estimate the level of the neutral rate consistent with Bank staff's current medium- to long-term outlook rather than with a complete historical path.

<sup>6</sup> For more details, see G. Faucher, C. Hajzler, M. Kuncel, D. Matveev, Y. Park and T. Taskin, "[Potential Output and the Neutral Rate in Canada: 2022 Reassessment](#)," Bank of Canada Staff Analytical Note No. 2022-3 (April 2022).

<sup>7</sup> For more details, see K. Boutilier, T. Carter, X. S. Chen, E. Ekanayake, L. Poirier, P. Shannon, A. Uppal and L. Xiang, "[Assessing Global Potential Output Growth and the US Neutral Rate: April 2022](#)," Bank of Canada Staff Analytical Note No. 2022-4 (April 2022).





# Monetary Policy Report

July 2022





# Canada's inflation-control strategy

## Inflation targeting and the economy

- The objective of Canada's monetary policy is to promote the economic and financial well-being of Canadians. Canada's experience with inflation targeting since 1991 has shown that the best way that monetary policy can achieve this goal is by maintaining a low and stable inflation environment. Doing so fosters confidence in the value of money and contributes to sustained economic growth, a strong and inclusive labour market and improved living standards.
- In 2021, the Government of Canada and the Bank of Canada renewed the flexible inflation-targeting strategy of the monetary policy framework for a further five-year period, ending December 31, 2026.<sup>1</sup>
- The inflation target was renewed at the 2% midpoint of the 1%–3% control range, with inflation measured as the 12-month rate of change in the consumer price index (CPI).
- The Government and the Bank agreed that the best contribution monetary policy can make to the economic and financial well-being of Canadians is to continue to focus on price stability. The Government and the Bank also agreed that monetary policy should continue to support maximum sustainable employment, recognizing that maximum sustainable employment is not directly measurable and is determined largely by non-monetary factors that can change through time.
- Further, the Government and the Bank agreed that because well-anchored inflation expectations are critical to achieving both price stability and maximum sustainable employment, the primary objective of monetary policy is to maintain low, stable inflation over time.

## Inflation targeting is symmetric and flexible

- Canada's inflation-targeting approach is *symmetric*, which means the Bank is equally concerned about inflation rising above or falling below the 2% target.
- Canada's inflation-targeting approach is also *flexible*. Typically, the Bank seeks to return inflation to target over a horizon of six to eight quarters. However, the most appropriate horizon for returning inflation to target will vary depending on the nature and persistence of the shocks buffeting the economy.
- The 2021 agreement with the Government specifies that the 2% inflation target remains the cornerstone of the framework.
- The agreement further notes that the Bank will continue to use the flexibility of the 1%–3% control range to actively seek the maximum sustainable level of employment, when conditions warrant. The Bank will also continue to leverage the flexibility inherent in the framework to help address the challenges of structurally low interest rates by using a broad set of policy tools. The Bank will use this flexibility only to an extent that is consistent with keeping medium-term inflation expectations well anchored at 2%.

## Monetary policy tools

- Because monetary policy actions take time to work their way through the economy and have their full effect on inflation, monetary policy must be forward-looking.

- The Bank normally carries out monetary policy through changes in the target for the overnight rate of interest (the policy rate). The Bank also has a range of monetary policy tools it can use when the policy rate is at very low levels. These tools consist of guidance on the future evolution of the policy rate, large-scale asset purchases (quantitative easing and credit easing), funding for credit measures, and negative policy rates. The potential use and sequencing of these tools would depend on the economic and financial market context.
- All of the Bank's monetary policy tools affect total demand for Canadian goods and services through their influence on market interest rates, domestic asset prices and the exchange rate. The balance between this demand and the economy's production capacity is, over time, the main factor that determines inflation pressures in the economy.

## Communications

- Consistent with its commitment to clear, transparent communications, the Bank regularly reports its perspectives on the economy and inflation. Policy decisions are typically announced on eight pre-set days during the year, and full updates of the Bank's outlook are published four times each year in the *Monetary Policy Report*.
- The Bank is committed to explaining when it is using the flexibility of the inflation-targeting strategy.
- Given the uncertainty about the maximum sustainable level of employment, the Bank will consider a broad range of labour market indicators.<sup>2</sup> The Bank will also systematically report to Canadians on how labour market outcomes have factored into its policy decisions.

## Monitoring inflation

- In the short run, the prices of certain CPI components can be particularly volatile and can cause sizable fluctuations in CPI inflation.
- In setting monetary policy, the Bank seeks to look through such transitory movements in CPI inflation and focuses on a set of "core" inflation measures that better reflect the underlying trend of inflation. In this sense, these measures act as an operational guide to help the Bank achieve the CPI inflation target. They are not a replacement for CPI inflation.
- The Bank's three preferred measures of core inflation are CPI-trim, which excludes CPI components whose rates of change in a given month are the most extreme; CPI-median, which corresponds to the price change located at the 50th percentile (in terms of basket weight) of the distribution of price changes; and CPI-common, which uses a statistical procedure to track common price changes across categories in the CPI basket.

<sup>1</sup> For more details, see *Joint Statement of the Government of Canada and the Bank of Canada on the Renewal of the Monetary Policy Framework* (December 13, 2021); *Monetary Policy Framework Renewal—December 2021*; and T. Macklem, "Our Monetary Policy Framework: Continuity, Clarity and Commitment" (speech to the Empire Club of Canada, Toronto, December 15, 2021).

<sup>2</sup> See, for example, the [range of indicators](#) that the Bank is using to track the recovery of the labour market from the effects of the COVID-19 pandemic.

The *Monetary Policy Report* is available on the Bank of Canada's website at [bankofcanada.ca](http://bankofcanada.ca).

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# Monetary Policy Report

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July 2022

This is a report of the Governing Council of the Bank of Canada:  
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## Overview

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Inflation around the world has continued to rise quickly, largely due to increases in the prices for energy and food. Global supply chain challenges have also persisted, and when combined with strong demand, this has led to a broadening in price pressures.

Global growth is slowing due to Russia's aggression in Ukraine and continued supply chain disruptions. As well, high inflation and monetary policy tightening in many countries are beginning to moderate demand.

With the removal of most public health restrictions in Canada, economic activity in hard-to-distance service sectors has rebounded strongly. With the rest of the economy already more than fully recovered, the Canadian economy is now clearly in excess demand. While high inflation in Canada is largely the result of international factors, domestic demand pressures are becoming more prominent, and price pressures have broadened.

In response to high inflation and rising inflation expectations, the Bank of Canada is raising interest rates. This will temper borrowing and spending, slow demand growth, help anchor inflation expectations and ultimately reduce inflationary pressures.

### Key messages

- Inflation continues to rise, and price pressures are broadening. Consumer price index (CPI) inflation will average close to 8% in the middle quarters of 2022. Survey responses show that consumer and business expectations about inflation over the next two years have moved higher.
- The Canadian economy is overheated, and labour markets are tight. The unemployment rate is at a series low, and elevated job vacancies and widespread labour shortages are pushing up wage growth. With strong demand for their products, businesses are passing through higher input and labour costs to consumer prices.
- With global growth moderating and higher interest rates dampening domestic spending, growth in Canada is projected to slow from 3½% in 2022 to 1¾% in 2023 and 2½% in 2024. This allows supply to catch up with demand, reducing domestic inflationary pressures.
- Domestic price pressures are expected to abate, global supply chain problems are anticipated to resolve gradually, and energy prices are projected to decline. Inflation in Canada is anticipated to decrease to roughly 3% by the end of 2023 and return to the 2% target by the end of 2024.
- The Bank is guarding against the risk that high inflation becomes entrenched because if it does, restoring price stability will require even higher interest rates, leading to a weaker economy.

## Global economy

The global economy is facing multiple headwinds. Inflation is high worldwide and continues to increase, largely due to surging energy and food prices. Supply challenges are contributing to inflationary pressures as demand is recovering from the pandemic. Global economic activity is estimated to have declined in the second quarter of 2022 because of the war in Ukraine and the lockdown of some major cities in China to limit the spread of COVID-19. Growth in US private domestic demand is also estimated to have slowed sharply. Many central banks are tightening monetary policy to combat increasingly broad-based inflationary pressures. As a result, financial conditions have tightened, and this is weighing on global growth.

Growth should rebound in the third quarter as restrictions ease in China, but higher interest rates and the war in Ukraine will continue to restrain activity. The Bank projects global growth to moderate to about 3¼% in 2022 and 2% in 2023—a slower pace than projected in the April Report mostly because of tighter monetary policy (**Table 1** and **Box 1**). Global growth is expected to strengthen to 3% in 2024 once the war's impact on growth subsides.

**Table 1: Projection for global economic growth**

	Share of real global GDP* (%)	Projected growth† (%)			
		2021	2022	2023	2024
<b>United States</b>	16	5.7 (5.7)	1.9 (2.8)	1.1 (1.9)	1.1 (1.5)
<b>Euro area</b>	12	5.3 (5.3)	2.7 (3.0)	1.0 (2.3)	2.5 (2.6)
<b>Japan</b>	4	1.7 (1.7)	1.5 (2.0)	2.3 (2.5)	1.5 (1.3)
<b>China</b>	18	8.1 (8.1)	3.6 (4.3)	5.4 (4.9)	5.2 (5.0)
<b>Oil-importing EMEs‡</b>	33	8.6 (8.5)	4.5 (4.2)	1.5 (2.2)	3.2 (3.5)
<b>Rest of the world§</b>	16	5.1 (5.0)	2.7 (2.4)	0.6 (1.0)	2.8 (3.0)
<b>World</b>	100	7.0 (7.0)	3.3 (3.5)	2.0 (2.5)	3.0 (3.2)

\* GDP shares are based on International Monetary Fund (IMF) estimates of the purchasing-power-parity valuation of country GDPs for 2020 from the IMF's October 2021 *World Economic Outlook*. The individual shares may not add up to 100 due to rounding.

† Numbers in parentheses are projections used in the previous Report.

‡ The oil-importing emerging-market economies (EMEs) grouping excludes China. It is composed of large EMEs from Asia, Latin America, the Middle East, emerging Europe 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 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).

Source: Bank of Canada

## Box 1

## Changes to the economic projection since the April Report

### Global GDP outlook

Projected growth in global gross domestic product (GDP) has been revised down significantly since the April Report. It is reduced by about  $\frac{1}{4}$  of a percentage point in 2022,  $\frac{1}{2}$  a percentage point in 2023 and  $\frac{1}{4}$  of a percentage point in 2024. Overall, the level of GDP at the end of 2024 is roughly  $\frac{3}{4}\%$  lower.

The following factors explain the downward revisions to the outlook:

- Given the stronger-than-expected inflation, monetary policy is now expected to be tighter over the projection horizon in both advanced and emerging-market economies. As well, credit conditions tightened more than anticipated.
- Government spending in the United States is weaker, partly due to a slower rollout of infrastructure spending.
- China's growth forecast for 2022 is lower because COVID-19 containment measures affecting major cities have lasted longer than anticipated.

### Canadian GDP outlook

GDP growth in 2022 and 2023 has been revised down significantly to  $3\frac{1}{2}\%$  and  $1\frac{3}{4}\%$ , respectively. The forecast for growth has been lowered by about  $\frac{3}{4}$  of a percentage point in 2022 and by about  $1\frac{1}{2}$  percentage points in 2023. Growth in 2024 has been revised up by  $\frac{1}{4}$  of a percentage point to  $2\frac{1}{2}\%$ . These revisions leave the level of real GDP about  $1\frac{3}{4}\%$  lower in 2024.

The following key factors contribute to the reduced GDP profile:

- Supply has been revised down over the projection horizon (see **Box 2**).
- Inflation is higher, financial conditions are tighter, and household wealth is lower. As a result, the outlook for household expenditures has been revised down over the projection horizon.
- The effects of supply chain disruptions on economic activity—notably in the manufacturing sector—are lasting longer than expected.
- Foreign demand has been revised down in 2023 and 2024 partly due to tighter global financial conditions, leading to lower exports and business investment.

### Canadian CPI inflation outlook

Consumer price index (CPI) inflation is anticipated to be substantially higher than projected in April. The outlook for CPI inflation has been revised up by almost 2 percentage points to 7.2% in 2022, by 1.8 percentage points to 4.6% in 2023, and by 0.2 percentage points to 2.3% in 2024. These revisions mainly reflect more persistent and broad-based inflationary pressures than previously estimated. They also reflect higher commodity prices and wider-than-usual gasoline refinery margins as well as rising inflation expectations. In addition, higher estimates of excess demand in 2022 raise the inflation forecast in 2022 and into 2023.

## Still-elevated energy prices

Energy prices remain volatile (**Chart 1**). Since the April Report, Brent crude oil prices have fluctuated between about US\$100 and US\$125 per barrel. Oil prices fell in early May due to reduced demand from China in the wake of COVID-19 containment measures. Supply concerns, including the European Union's ban on Russian oil imports, subsequently pushed prices up. Over the past month, prices have fallen due to concerns about a significant slowdown in global growth.

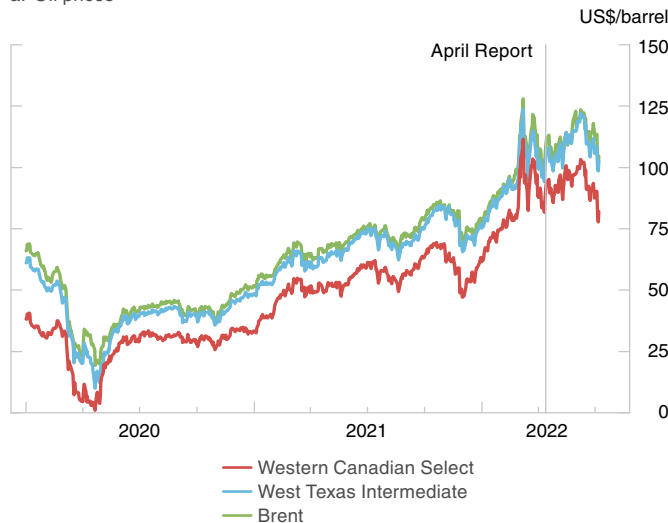
Prices of natural gas have also been volatile. While they remain high in Europe and Asia due to concerns about Russia's supply of natural gas, prices fell recently in North America. Prices of refined products, such as gasoline and diesel, are disproportionately higher than oil prices because of low inventories and reduced refining capacity as well as war-related disruptions.

Looking ahead, Brent oil prices are assumed to fall slowly to US\$100 by the end of 2024 (**Box 2**). Prices for West Texas Intermediate (WTI) and Western Canadian Select (WCS) are assumed to follow similar patterns, remaining

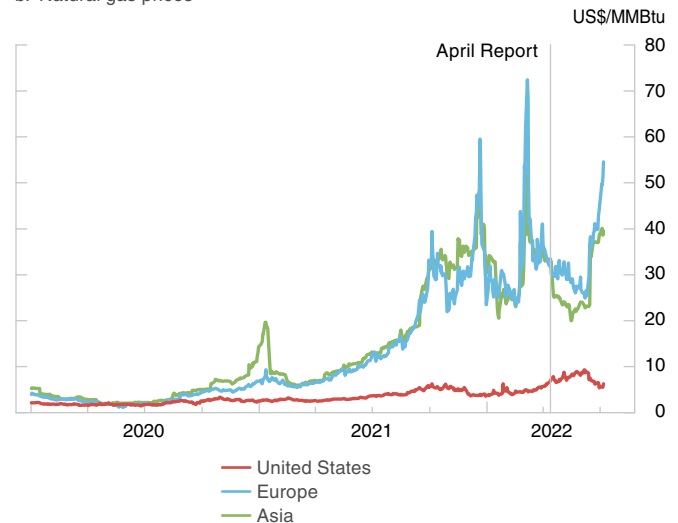
**Chart 1: Energy prices remain volatile**

Daily data

a. Oil prices



b. Natural gas prices



Note: Oil price data for April 20, 2020, are excluded because disruptions in the oil futures market led to negative values of around -US\$48 for Western Canadian Select and -US\$38 for West Texas Intermediate on that day. Price data for all other days in the date range are included. European natural gas prices are converted from euros per megawatt hour to US dollars per metric million British thermal units (MMBtu). Prices in the United States are based on the Henry Hub benchmark, European prices are based on the Dutch Title Transfer Facility natural gas benchmark, and Asian prices are based on the Japan–Korea Marker for liquefied natural gas.

Sources: NYMEX and Intercontinental Exchange via Haver Analytics and Bank of Canada calculations

Last observation: July 7, 2022

US\$5 and US\$20 below Brent prices, respectively. With this outlook, the Bank assumes that the impact of war-related factors on oil prices diminishes gradually.

Risks around the outlook for oil prices are two-sided. Russia may face additional sanctions for its invasion of Ukraine that could further reduce Russian oil production. This would put more upward pressure on oil prices. In contrast, price pressures could be lower if the war-related uncertainty dissipates faster than expected or if Russia exports more of its oil to Asia.

Since the April Report, the Bank's non-energy commodity price index has fallen by roughly 15%. Prices for base metals have declined sharply because of concerns about global demand, particularly demand from China. Lumber prices also fell abruptly due to weakening housing activity in North America. Prices of agricultural products have declined, reflecting favourable weather that is boosting harvest prospects. Even with the recent decline, prices for most non-energy commodities are still likely to stay above their pre-pandemic levels over the projection horizon.

**High and widespread inflation globally**

Inflation is high and becoming more broad-based across goods and services in most regions. Short-term inflation expectations are elevated in many countries. Surging energy and food prices remain key contributors to inflation. Elevated demand is leading to a broadening of inflationary pressures, allowing high energy prices to pass through to other prices.

## Box 2

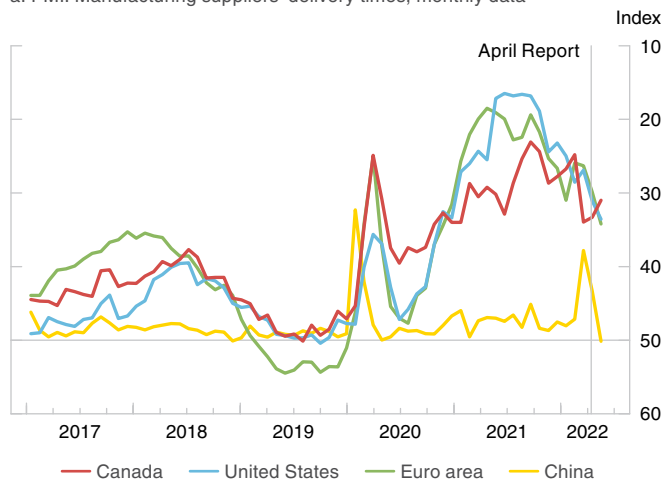
## Key inputs to the projection

The Bank of Canada's projection is always conditional on several key assumptions, and changes to these will affect the outlook for the Canadian economy. The Bank regularly reviews these assumptions and how they may impact the economic projection. The key inputs into the Bank's projection are as follows:

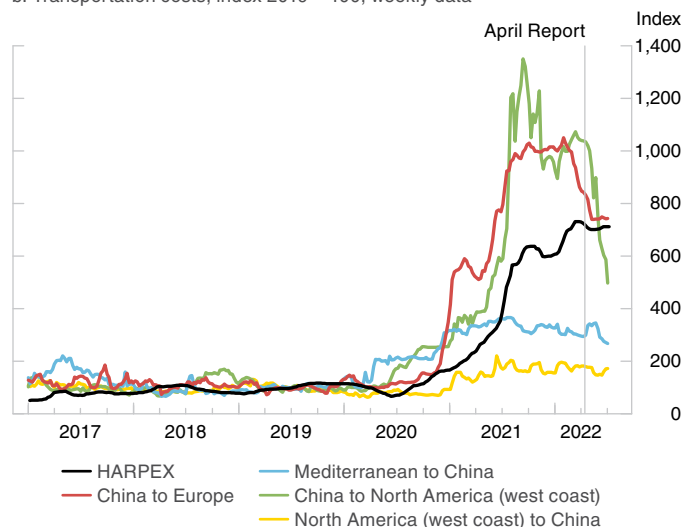
- Public health restrictions have largely been removed in many countries. It is assumed that remaining measures will be lifted over the course of 2022 in most of the world. Containment measures in China, however, are expected to loosen more gradually—and even periodically tighten—over 2022 and 2023.
  - In Canada, most public health restrictions have been lifted. Pandemic-related effects on consumer caution and travel are assumed to continue to fade over the projection horizon.
  - The projection incorporates information from all available provincial and federal budgets.
  - Oil prices are assumed to gradually decrease over the projection horizon from their current elevated levels. The price of Brent stays near US\$115 per barrel for the third quarter of 2022 and then declines to about US\$100 by the end of 2024. The prices for West Texas Intermediate (WTI) and Western Canadian Select (WCS) follow similar dynamics, with a constant spread below the price for Brent of US\$5 and US\$20, respectively. Brent and WTI oil prices are about US\$10 above the level assumed in the April Report. The spread between WTI and WCS is US\$5 wider than assumed in the April Report, reflecting a broad-based rise in the premium of light oil over heavy oil.
  - By convention, the Bank does not forecast the exchange rate in the *Monetary Policy Report*. The Canadian dollar is assumed to remain at 78 cents US over the projection horizon, close to its recent average and slightly below the 79 cents US assumed in the April Report.
  - The pandemic is having both temporary and lasting effects on the supply side of the Canadian economy. As in recent reports, the Bank distinguishes between supply and potential output to account for the episodic nature of some supply decreases that are caused by pandemic-related factors, such as public health measures and supply chain disruptions.
- The Bank's assessment of potential output, a longer-term concept, looks through the short-lived effects of factors related to the pandemic. As in the April Report, potential output growth (excluding temporary factors) is expected to average about 2% per year over 2022–24.
  - The projection assumes that short-term factors, such as supply chain disruptions, are reducing the supply of goods and services. These factors are assumed to have a maximum negative impact of about 2½% on the level of supply in the second and third quarters of 2022. This effect is expected to start decreasing in the fourth quarter and to dissipate beyond the projection horizon. Both the magnitude and the persistence of the effects of supply disruptions are larger than in the April Report. Supply chain disruptions are estimated to have larger and longer-lasting implications for business operations than previously assumed.
  - Estimates of overall growth in supply can be obtained by combining the estimates of the temporary effects of these short-term factors with the assessment of potential output. Supply growth is projected to be around ¾% in 2022 and to average roughly 2¾% over 2023–24.
- Gross domestic product (GDP) is estimated to have grown at a stronger-than-potential pace in the second quarter of 2022 amid supply chain disruptions. As a result, the Bank estimates that the output gap—the difference between GDP and supply—was between 0.5% and 1.5% in the second quarter. This is further into positive territory than the estimate of -0.25% to 0.75% for the first quarter of 2022.
  - The nominal neutral policy interest rate is defined as the real neutral rate plus 2% for inflation. The real neutral rate is defined as the rate consistent with both output remaining sustainably at its potential and inflation remaining at target, on an ongoing basis. It is a medium- to long-term equilibrium concept. For Canada, the projection is based on the assumption that the nominal neutral rate is at the midpoint of the estimated range of 2% to 3%. This range was last reassessed in the April 2022 Report.

**Chart 2: Supply bottlenecks are easing modestly**

a. PMI: Manufacturing suppliers' delivery times, monthly data



b. Transportation costs, index 2019 = 100, weekly data



Note: The Purchasing Managers' Index (PMI) is a diffusion index of business conditions. For suppliers' delivery times, an inverted index is used to show that a reading less than (greater than) 50 indicates an increase (decrease) in delivery times compared with the previous month. All series in panel b are from the Freightos Baltic Index except the HARPEX (Harper Petersen Charter Rates Index). The Freightos Baltic Index provides market ocean freight rates for different trade lanes. The HARPEX reflects the worldwide price development on the charter market for container ships.

Sources: S&P Global and HARPEX via Haver Analytics and Freightos Baltic Index via Bloomberg Finance L.P.

Last observations: PMI, June 2022; HARPEX, July 8, 2022; Freightos Baltic Index, July 3, 2022

Widespread supply shortages continue to be an important source of global inflationary pressure. While shipping costs have moderated and supplier delivery times have improved slightly in recent months (**Chart 2**), lockdowns in China and the war in Ukraine have caused new supply disruptions. The Bank assumes that global supply challenges will ease over the next year.

Inflation is projected to rise further and to peak in most regions in the third quarter of this year. It is expected to gradually decline thereafter because, in the projection, the effects of past increases in energy and food prices dissipate, energy prices decline, supply challenges ease, and demand slows.

### Tighter global financial conditions

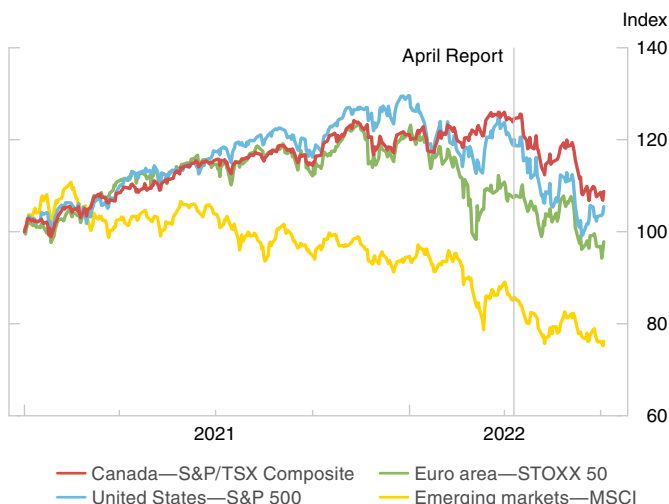
Global financial conditions are more restrictive than in the April Report. Equity prices have declined, and corporate bond spreads have widened (**Chart 3**). Global government bond yields have experienced significant volatility since the April Report. They initially rose as central banks in advanced and emerging economies continued to tighten monetary policy. Yields on longer-term government bonds have retreated somewhat over the past few weeks due to concerns about the prospects for global growth but remain higher than in April. The Canadian dollar depreciated against the US dollar, although less so than most other currencies.



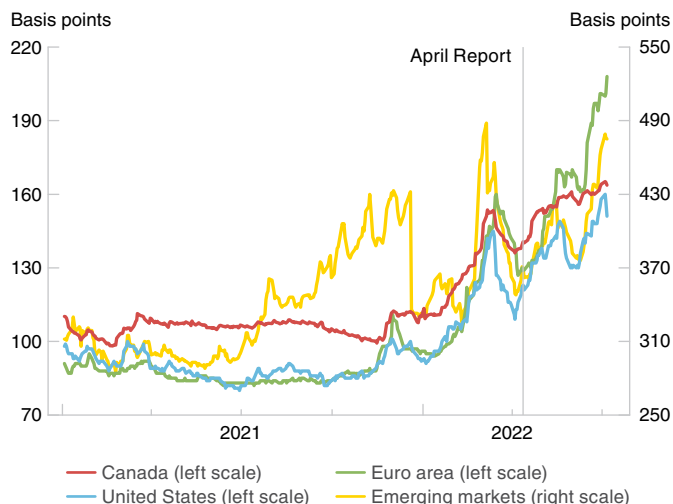
**Chart 3: Financial conditions have tightened**

Daily data

a. Equity prices, index: January 4, 2021 = 100



b. Corporate credit spreads



Note: The spreads for the United States and emerging markets are the option-adjusted spreads between US-dollar-denominated bonds and US Treasury securities. Spreads for Canada and the euro area are relative to Canadian and German sovereign yields, respectively. All corporate yields are based on investment-grade bonds, except for those of emerging markets that include a number of high-yield bonds.

Sources: Bloomberg Finance L.P. and Bank of Canada calculations

Last observation: July 7, 2022

## Sharp slowdown after robust growth in the United States

The US economy is in excess demand, and the labour market is tight. Job openings are near record levels, and the unemployment rate is close to a 40-year low. Wage growth has been rising rapidly over the past year, though not by enough to keep up with inflation. However, consumption and housing activity have weakened considerably in recent months as high inflation and the rising path of interest rates reduce demand.

To combat high inflation, the Federal Reserve has increased the target range for the federal funds rate by 150 basis points since the start of 2022. In June, the Federal Reserve also started reducing the size of its balance sheet—a process known as quantitative tightening.

The US economy is on track to grow by about 2% in 2022, supported by the ongoing recovery and households spending their previously accumulated savings. Consumption and business investment are expected to slow as higher interest rates work their way through the economy. GDP growth in the United States is anticipated to moderate to about 1% in 2023 and in 2024.

## War disruptions and rising inflation in the euro area

The war in Ukraine and associated uncertainty are weighing heavily on the euro area economy. Surging energy prices and trade disruptions are dampening production. High inflation is eroding household purchasing power and hurting consumer confidence. In response to elevated inflation, the European Central Bank ended its net asset purchases and announced plans to raise its policy rates in the coming months. Overall, growth is projected to slow from 2¾% in 2022 to 1% in 2023. Growth is expected to pick up in 2024 as the effects of the war and elevated energy prices fade.



## Lockdowns in China

China's economy likely contracted in the second quarter because of strict measures to contain outbreaks of COVID-19. Lockdowns in important manufacturing and trading hubs temporarily hampered production and trade and have compounded challenges with global supply chains. Mobility restrictions and the ongoing correction in the property sector are weighing on domestic demand.

Authorities have introduced several policies to stimulate growth, including additional infrastructure spending, targeted tax cuts and lower mortgage rates. China's economy should rebound in the third quarter of 2022 because of this policy stimulus and the recent easing of lockdown measures. Uncertainty about the growth outlook remains high, given the fragility of the property sector and the risk of even more intense lockdowns if another wave of COVID-19 occurs.

## Multiple headwinds in emerging-market economies

The war in Ukraine, high energy prices and, to a lesser extent, China's lockdowns are hampering growth in oil-importing emerging-market economies (EMEs), particularly in Europe and Asia. The sharp tightening of financial conditions in many EMEs is also weighing on domestic demand. As a result, growth is expected to moderate in 2022 and 2023 before picking up in 2024 as the effects of these headwinds dissipate.

Activity in the rest-of-the-world group is held back by tighter global financial conditions and by the sharp contraction of the Russian economy due to economic sanctions. However, other oil-exporting countries are expected to benefit from increased oil revenues.

## Canadian economy

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Inflation continues to rise and broaden in Canada, reflecting widespread cost pressures. Global factors—including high prices for energy, food and tradable goods—are driving most of the surge. In addition, excess demand in the Canadian economy is playing a more significant role. It is making firms more likely to pass cost increases on to consumers, leading to a broadening of inflationary pressures.

Businesses and consumers increasingly think that inflation will be higher for longer, and they are more uncertain about the future path of inflation. This points to an increasing risk that elevated inflation will become entrenched.

CPI inflation is forecast to average around 8% in the middle quarters of 2022. It is then projected to ease to roughly 3% by the end of 2023 and return to target by the end of 2024. Inflation declines as the impact of higher energy prices dissipates, supply challenges recede, and monetary policy in Canada and abroad reduces domestic and foreign demand. In this projection, inflation is considerably higher and more persistent than in the April Report (see **Box 1** on page 3 and the **Appendix** on page 26).

Growth has been robust over the past year as the Canadian economy recovered from the worst effects of the pandemic. Strong housing markets, high commodity prices and the easing of public health restrictions have boosted economic activity. However, economic growth is now showing signs of slowing. The effects of higher prices and interest rates have begun to weigh on household spending. In particular, a sharp slowdown in the housing market is underway.

Overall, economic growth is forecast to be strong in 2022 at about 3½% and to moderate to about 1¾% in 2023 and 2½% in 2024 (**Table 2**). Growth slows largely due to the impact of high inflation and tighter financial conditions on consumption and housing activity. A weaker outlook for global growth also weighs on exports and business investment. The Canadian growth outlook is revised down in 2022 and 2023 relative to the April Report.

**Table 2: Contributions to average annual real GDP growth**  
Percentage points\*\*

	2021	2022	2023	2024
<b>Consumption</b>	2.8 (2.8)	2.8 (2.9)	1.0 (2.2)	1.5 (1.4)
<b>Housing</b>	1.3 (1.3)	-0.7 (-0.5)	-0.6 (-0.2)	0.2 (0.2)
<b>Government</b>	1.5 (1.3)	0.4 (0.4)	0.5 (0.5)	0.3 (0.3)
<b>Business fixed investment</b>	0.2 (0.2)	0.7 (0.7)	0.2 (0.6)	0.6 (0.7)
<b>Subtotal: final domestic demand</b>	5.8 (5.6)	3.2 (3.5)	1.1 (3.1)	2.6 (2.6)
<b>Exports</b>	0.4 (0.4)	0.9 (1.2)	1.3 (1.4)	0.8 (0.9)
<b>Imports</b>	-2.3 (-2.2)	-1.6 (-1.4)	-0.7 (-1.6)	-0.9 (-1.0)
<b>Subtotal: net exports</b>	-1.9 (-1.8)	-0.7 (-0.2)	0.6 (-0.2)	-0.1 (-0.1)
<b>Inventories</b>	0.7 (0.7)	1.0 (0.9)	0.1 (0.3)	-0.1 (-0.3)
<b>GDP</b>	4.5 (4.6)	3.5 (4.2)	1.8 (3.2)	2.4 (2.2)
<b>Memo items (percentage change):</b>				
Range for potential output, including temporary factors‡	2.1–2.5 (2.1–2.5)	0.5–2.0 (1.3–2.3)	1.8–3.3 (2.9–3.9)	2.0–3.5 (2.3–2.9)
Real gross domestic income (GDI)	8.8 (8.8)	6.0 (5.9)	0.3 (2.2)	1.6 (1.5)
CPI inflation	3.4 (3.4)	7.2 (5.3)	4.6 (2.8)	2.3 (2.1)

\* Numbers in parentheses are from the projection in the previous Report.

† Numbers may not add to total due to rounding.

‡ See **Box 2** for details.

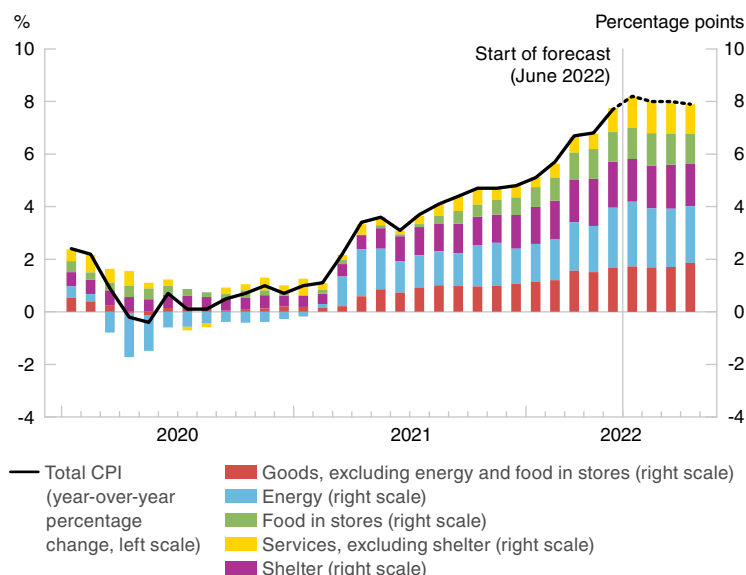
Sources: Statistics Canada and Bank of Canada calculations and projections

## CPI inflation at a 40-year high

CPI inflation has continued to rise and is now expected to reach about 8% in the third quarter of 2022 (**Chart 4**). Global factors remain the largest drivers. These include Russia’s invasion of Ukraine, which has further pushed up food and gasoline prices. As well, tradable goods prices, including high freight costs, continue to put pressure on global costs.

**Chart 4: Shelter, food, energy and goods prices are pushing up inflation**

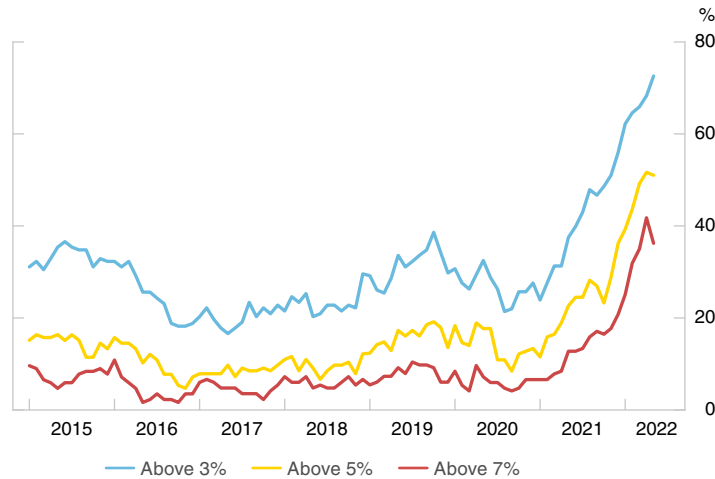
Contribution to CPI inflation, in percentage points, monthly data



Sources: Statistics Canada and Bank of Canada estimates and calculations Last data plotted: September 2022

**Chart 5: Price pressures are broad-based**

Share of CPI components growing above 3%, 5% and 7% on a year-over-year basis, monthly data



Sources: Statistics Canada and Bank of Canada calculations

Last observation: May 2022

Domestic demand conditions are also contributing to elevated inflation. The pandemic saw a profound shift in consumer preferences toward goods and low-contact services. In addition to the strength in goods prices, shelter prices, which include rent, have risen significantly over the past year. With the recent removal of health restrictions, prices for hard-to-distance services, such as traveller accommodations, have also been increasing.

Overall, demand remains robust. It has enabled many firms to raise prices—passing on to consumers higher costs, including the recent spike in energy prices. As a result, inflation has broadened, with almost three-quarters of CPI categories growing above 3% and more than half growing above 5% (**Chart 5**).

Measures of core inflation have increased further since the April Report. CPI-trim, CPI-median and CPI-common are at 5.4%, 4.9% and 3.9%, respectively. The rise in CPI-common—which puts more weight on services and domestic conditions—reflects growing excess demand in Canada.

**Higher and more dispersed inflation expectations**

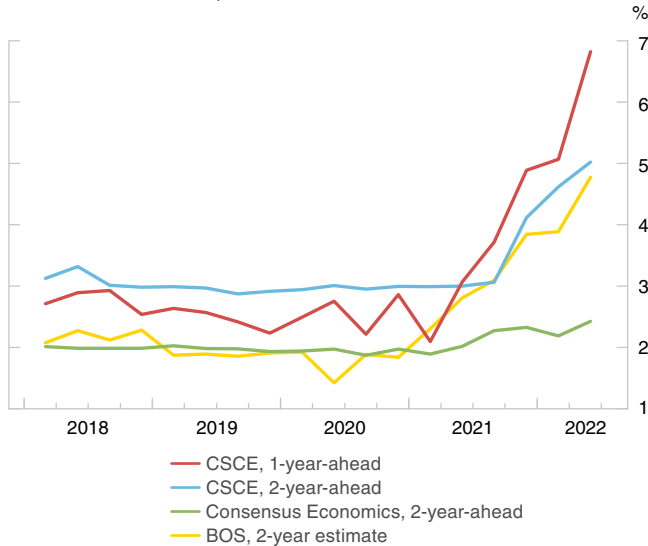
Inflation expectations have a direct impact on inflation because they are factored in when firms set wages and prices. To assess inflation expectations, the Bank relies on various survey results and market-based information. Consumer and business surveys indicate that median inflation expectations over the next two years have increased (**Chart 6**). Inflation expectations of professional forecasters have also increased at the two-year horizon, albeit much more modestly than those of households and firms. Household and business surveys also show a wider distribution of inflation expectations among respondents. In particular, a large number of participants in the Business Outlook Survey (BOS) for the second quarter of 2022—considerably more than in previous surveys—now think that inflation will be at or well above 4% over the next two years (**Chart 7**).<sup>1</sup> These survey results suggest greater uncertainty about the future path of inflation, increasing the risk that inflation expectations become de-anchored.

<sup>1</sup> As well, the Canadian Survey of Consumer Expectations shows that the distribution among household survey respondents has also widened. However, the increase in dispersion for households is less clear-cut than that of businesses.

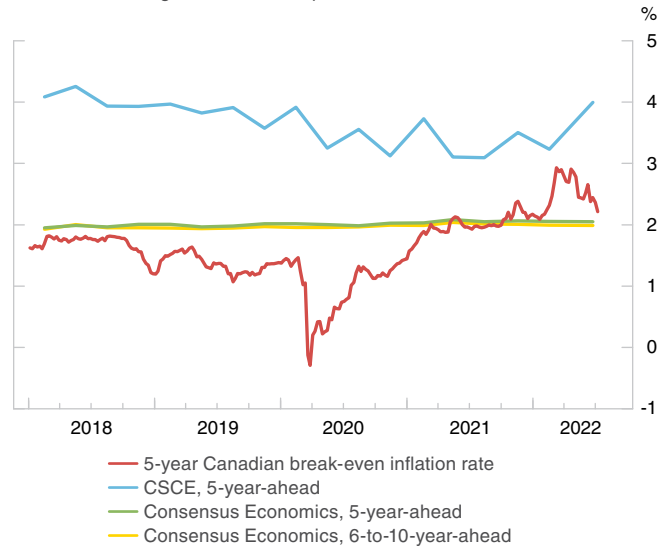
**Chart 6: Inflation expectations of consumers and firms have increased**

Quarterly and weekly data

a. Short-term inflation expectations



b. Medium- to long-term inflation expectations



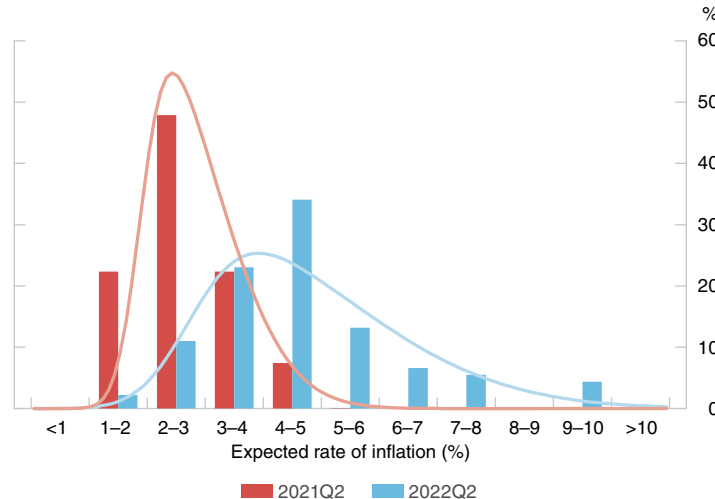
Note: CSCE is the Canadian Survey of Consumer Expectations; BOS is the Business Outlook Survey. The BOS 2-year estimate is based on firms' responses to the BOS question, "Over the next two years, what do you expect the annual rate of inflation to be, based on the consumer price index?" Firms can select from predetermined ranges and provide a point estimate. In cases where a firm selects a range only: if the range is closed, a midpoint is used; if the range is open-ended, the average expectation of other firms in that range is used. The 5-year Canadian break-even inflation rate is the difference between the yields of a nominal bond and a real return bond of the same maturity, both issued by the Government of Canada. The break-even inflation rate is a weekly average of daily data. Consensus Economics provides inflation forecasts for the next 5 years followed by an inflation forecast for the next 6 to 10 years. These forecasts are transformed into fixed-horizon forecasts (2-year, 5-year) by weighted average.

Sources: Bloomberg Finance L.P., Consensus Economics, Bank of Canada and Bank of Canada calculations

Last observations: Consensus Economics, April 2022; BOS and CSCE, 2022Q2; break-even inflation rate, July 8, 2022

**Chart 7: The distribution of inflation expectations has widened and shifted higher**

Share of firms from the Business Outlook Survey with 2-year inflation expectations in each range, quarterly data



Note: The BOS 2-year estimate is based on firms' responses to the BOS question, "Over the next two years, what do you expect the annual rate of inflation to be, based on the consumer price index?" Firms can select from predetermined ranges and provide a point estimate. In cases where a firm selects a range only: if the range is closed, a midpoint is used; if the range is open-ended, the average expectation of other firms in that range is used. Lines on the chart represent fitted skew-normal distributions of inflation expectations in each quarter.

Sources: Bank of Canada and Bank of Canada calculations

Last observation: 2022Q2

Survey participants continue to point to global factors as the primary reason for higher expected inflation. However, they increasingly mention domestic factors, such as strong demand and persistent labour shortages.

The surveys show that inflation expectations at longer horizons have increased but remain in line with their pre-pandemic levels. While BOS results indicate that businesses now think inflation will remain above 2% for longer, the majority of respondents still expect inflation to return to target within the next three years. Market-based measures of longer-term inflation expectations are also in line with the Bank’s inflation target. The five-year break-even inflation rate has decreased recently to about 2¼%. At this level, it is consistent with a rise in inflation over the near term followed by a decline toward the 2% target.

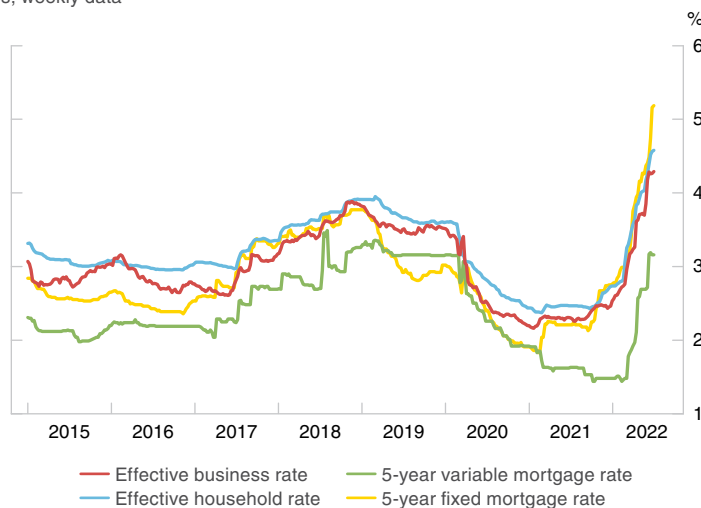
### Tighter financial conditions

The Bank has tightened monetary policy in response to the strength of inflationary pressures, beginning to increase its policy rate in March and initiating quantitative tightening on April 25.<sup>2</sup>

Higher policy rates, market expectations of further rate increases, and quantitative tightening in Canada and elsewhere have contributed to rapid increases in borrowing costs for businesses and households (**Chart 8**). Households seeking to renew or take on a new mortgage now face five-year fixed mortgage rates at their highest level since 2010. According to the Canadian Survey of Consumer Expectations for the second quarter of 2022, consumers expect that accessing credit 12 months from now will be more difficult.

**Chart 8: Borrowing rates for households and businesses have risen sharply**

Interest rates, weekly data



Note: For more information on the effective household and business interest rates, see [Interest Rate Statistics](#) on the Bank of Canada’s website.

Sources: Lender Spotlight and Bank of Canada Last observations: effective business and household rates: July 8, 2022; 5-year fixed and 5-year variable rates: July 5, 2022

<sup>2</sup> Under quantitative tightening, the Bank is shrinking its balance sheet by letting maturing bonds roll off. By July 8, the Bank’s holdings of Government of Canada bonds had declined from around \$425 billion at the time of the last Report to about \$400 billion, and settlement balances had dropped from around \$230 billion to about \$175 billion during the same period. Quantitative tightening complements the increase in the policy rate by reducing the degree of monetary stimulus. This occurs in a predictable way because information about the Bank’s holdings of maturing bonds is available to the public.

## Slower growth in the third quarter

Following several robust quarters, economic growth is expected to slow from about 4% in the second quarter to about 2% in the third (**Table 3** and **Chart 9**). Consumption growth moderates as the boost from pent-up demand for in-person services eases. High inflation is also squeezing household budgets, and rising interest rates are increasing the cost to finance purchases of big-ticket items and making savings more attractive.

**Table 3: Summary of the quarterly projection for Canada\***

	2021	2022					2021	2022	2023	2024
	Q4	Q1	Q2	Q3	Q4		Q4	Q4	Q4	
<b>CPI inflation (year-over-year percentage change)</b>	4.7 (4.7)	5.8 (5.6)	7.6 (5.8)	8.0		4.7 (4.7)	7.5 (4.5)	3.2 (2.4)	2.0 (2.1)	
<b>Real GDP (year-over-year percentage change)</b>	3.2 (3.3)	2.9 (2.8)	4.7 (5.3)	3.9		3.2 (3.3)	2.6 (3.8)	1.8 (2.9)	2.7 (1.7)	
<b>Real GDP (quarter-over-quarter percentage change at annual rates)†</b>	6.6 (6.7)	3.1 (3.0)	4.0 (6.0)	2.0						

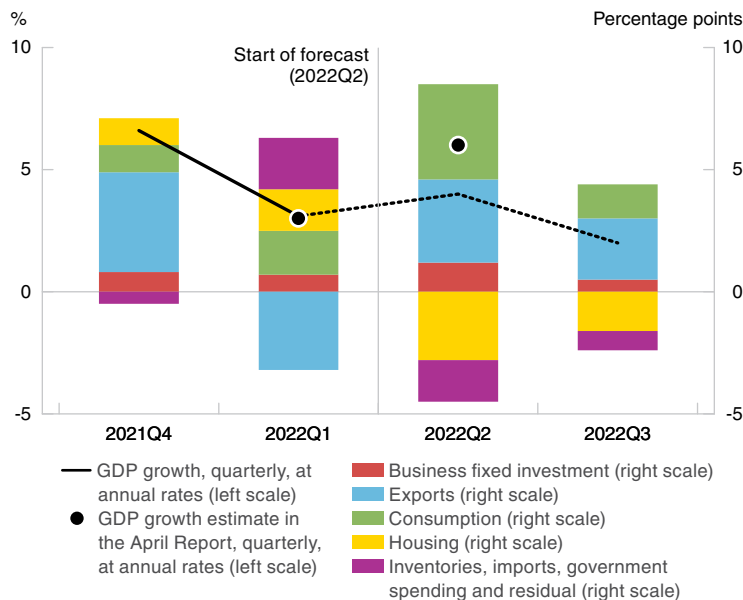
\* Details on the key inputs to the base-case projection are provided in **Box 2**. Numbers in parentheses are from the projection in the previous Report.

† Over the projection horizon, 2022Q2 and 2022Q3 are the only quarters for which some information about real GDP growth was available at the time the projection was conducted. For longer horizons, fourth-quarter-over-fourth-quarter percentage changes are presented. They show the Bank’s projected growth rates of CPI and real GDP within a given year. As such, they can differ from the growth rates of annual averages shown in **Table 2**.

Sources: Statistics Canada and Bank of Canada calculations and projections

**Chart 9: Growth is expected to slow in the third quarter**

Contribution to real GDP growth, quarterly data

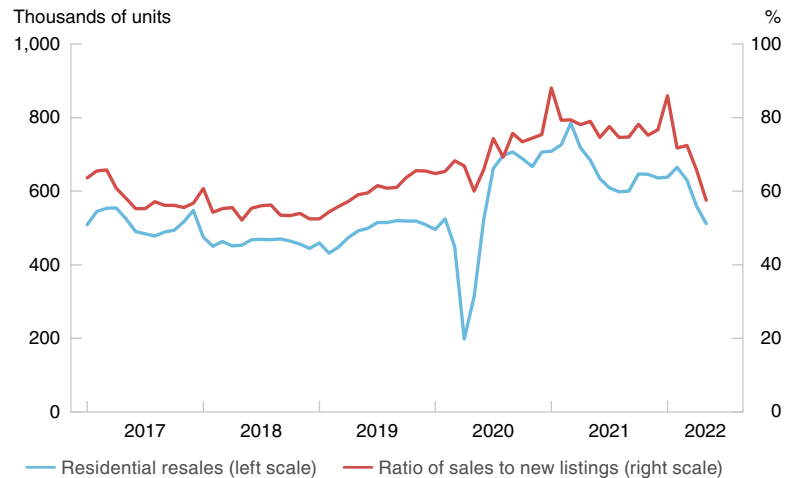


Sources: Statistics Canada and Bank of Canada estimates and calculations

Last data plotted: 2022Q3

**Chart 10: Housing market activity is slowing substantially**

Seasonally adjusted, monthly data



Note: Residential resales are seasonally adjusted at annual rates.

Source: Canadian Real Estate Association

Last observation: May 2022

Housing market activity is weakening substantially from its unsustainable pace during the pandemic (**Chart 10**). Resales are falling across most regions and prices are declining in some markets as borrowing rates rise and household confidence declines. Some areas outside downtown cores, which had previously seen large price increases, are now experiencing a decline in prices.<sup>3</sup>

Exports and business investment continue to grow strongly, with the latter expected to reach pre-pandemic levels in the third quarter. Recent strength in US industrial production and an easing of travel restrictions should provide support for exports over the near term. As well, elevated energy prices are boosting exports and investment in the energy sector as firms seek to make full use of existing production capacity. Near-term business investment is also supported by a ramping up of work at LNG Canada's Kitimat site and continued work modernizing electric vehicle manufacturing.

**Canadian economy in excess demand**

A broad set of measures indicates that the economy is operating beyond its productive capacity.

The labour market is tight along all dimensions.<sup>4</sup> Most indicators suggest the labour market has surpassed maximum sustainable employment (**Chart 11**), including the unemployment rate, which is at a series low. In turn, labour shortages are pushing wages higher. In the BOS for the second quarter of 2022, a near-record number of firms see labour shortages as more intense than they were a year ago. The ratios of vacancies and job postings to

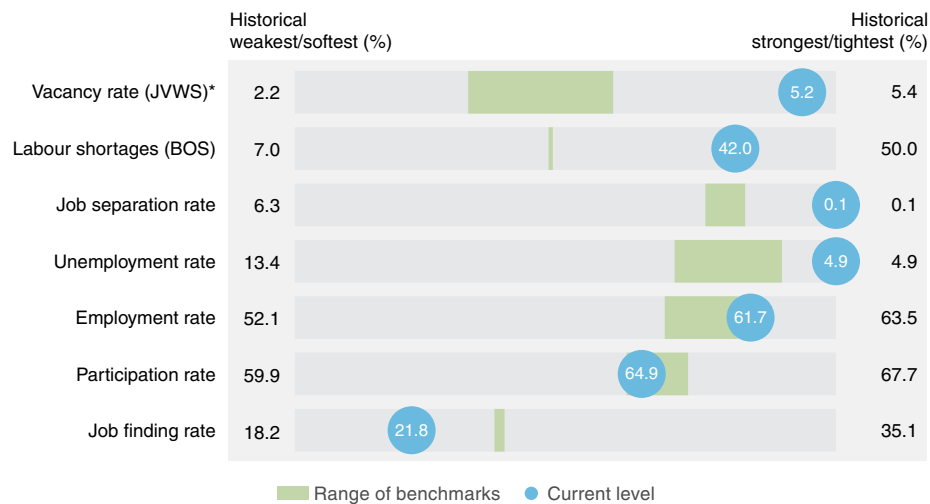
<sup>3</sup> The move to remote work in many sectors of the economy, combined with a desire for more living space, likely encouraged many households to seek properties away from downtown areas. For more details, see L. Morel, "Analyzing the house price boom in the suburbs of Canada's major cities during the pandemic," Bank of Canada Staff Analytical Note No. 2022-7 (June 2022).

<sup>4</sup> For a detailed discussion of ways to assess labour market conditions, see E. Ens, C. Luu, K. G. See and S. L. Wee, "Benchmarks for assessing labour market health," Bank of Canada Staff Analytical Note No. 2022-2 (April 2022).



**Chart 11: The labour market is tight**

Selected labour market measures compared with their historical strongest/tightest and historical weakest/softest



\* Vacancy rate data are from 2015 onward and may affect trend estimates.

Note: BOS is the Business Outlook Survey. JVWS is the Job Vacancy and Wage Survey. Included in the chart are ranges of values, represented by green bars, intended to benchmark labour market health. Measures above (below) their respective ranges would be consistent with a labour market operating above (below) what would be expected based on historical performance, indicative of labour market strength (weakness). Benchmark ranges are based on data up until February 2022 (2022Q1) for monthly (quarterly) data. The values reported for each variable's historical strongest/tightest and weakest/softest are based on data from 2003 or earliest data available after 2003, up until the latest observation. For details on the benchmarks included, see E. Ens, C. Luu, K. G. See and S. L. Wee, "Benchmarks for assessing labour market health," Bank of Canada Staff Analytical Note No. 2022-2 (April 2022). Data for all series are from Statistics Canada's Labour Force Survey (LFS) unless otherwise noted. LFS data are seasonally adjusted.

Sources: Statistics Canada, Bank of Canada and Bank of Canada calculations

Last observations: LFS, June 2022; BOS, 2022Q2; JVWS, 2022Q1

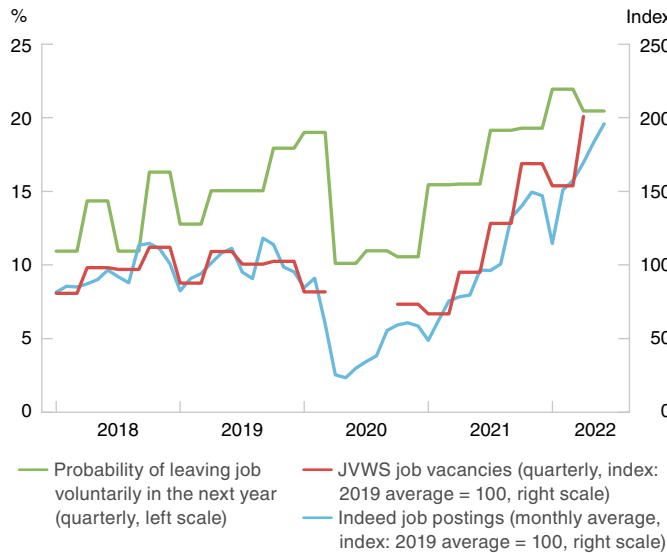
unemployed workers have also risen to record levels. As a result of this tightness, wage growth is strengthening and broadening across sectors (**Chart 12**).

Businesses continue to report capacity constraints, including labour shortages and supply chain challenges (**Chart 13**). Supply constraints are still weighing on production and sales. This is particularly acute in the auto sector, where it continues to be difficult to source semiconductors and get motor vehicles to retailers.

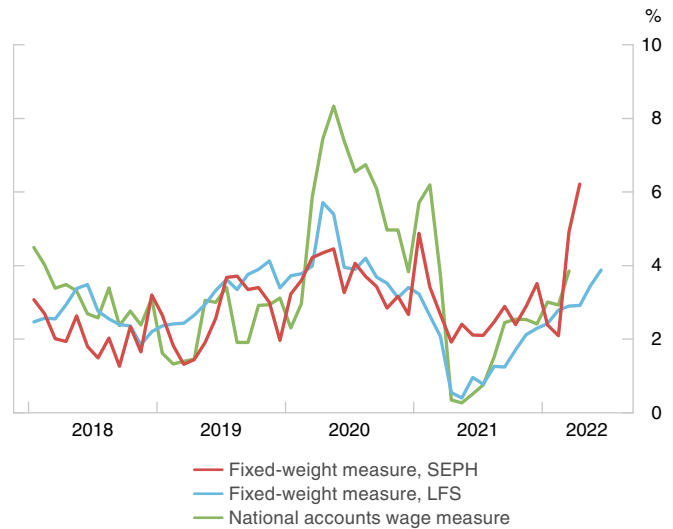
The Bank estimates that the output gap—the difference between GDP and supply—has risen further into positive territory in the second quarter of 2022, to between 0.5% and 1.5%. This is up from the estimate of -0.25% to 0.75% for the first quarter (**Box 2**). With economic growth anticipated to be roughly in line with supply growth in the third quarter, the economy remains in excess demand.

**Chart 12: Labour shortages are pushing up wage growth**

a. Responses to the CSCE;\* ratios of JVWS job vacancies and Indeed online job postings to unemployment, not seasonally adjusted



b. Wage growth measures, year-over-year percentage change, monthly data



\* Respondents to the [Canadian Survey of Consumer Expectations \(CSCE\)](#) were asked, “What do you think is the percent chance that you will leave your job voluntarily during the next 12 months?” The chart presents the median response.

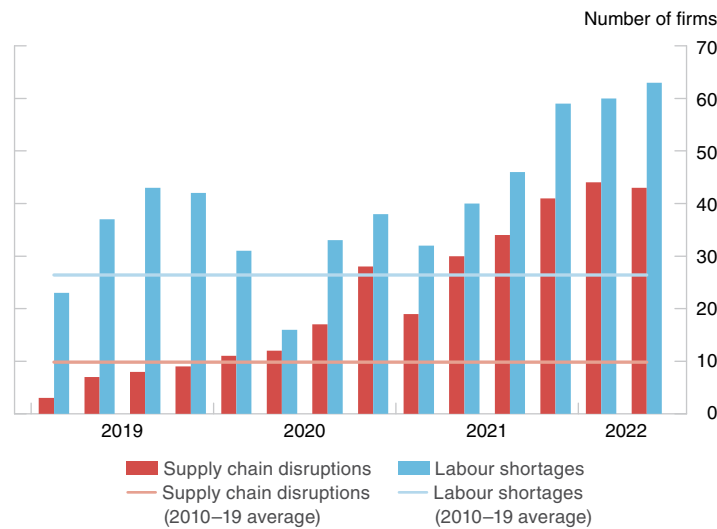
Note: JVWS is the Job Vacancy and Wage Survey; LFS is the Labour Force Survey; SEPH is the Survey of Employment, Payrolls and Hours. Quarterly JVWS job vacancies data have been extended to April 2022 based on Statistics Canada’s preliminary monthly estimate. Due to data limitations at the onset of the pandemic, JVWS job vacancies data are unavailable for the middle quarters of 2020. The LFS fixed-weight measure is constructed using 2019 employment weights for wages based on employees’ job status (full or part time), job permanency (permanent or temporary), industry of employment and occupation. The national accounts wage measure is constructed as total wages and salaries at a monthly frequency from the Canadian System of Macroeconomic Accounts divided by total hours worked from SEPH.

Sources: Statistics Canada, Indeed, Bank of Canada and Bank of Canada calculations

Last observations: CSCE, 2022Q2; national accounts wage measure, March 2022; JVWS and SEPH, April 2022; Indeed and LFS, June 2022

**Chart 13: Businesses continue to report elevated capacity constraints**

Number of firms reporting bottlenecks, Business Outlook Survey, quarterly data



Note: The [Business Outlook Survey \(BOS\)](#) samples about 100 firms. Firms were asked the question, “What would be the most important obstacles or bottlenecks to being able to meet an unexpected increase in demand?” Mentions of a fully utilized labour force and an inability to find suitable new labour at the current wages are counted as labour shortages. Mentions of raw material constraints, transportation difficulties and logistics bottlenecks are counted as supply chain disruptions.

Source: Bank of Canada

Last observation: 2022Q2

## Slower demand coupled with pickup in supply

The Canadian economy is anticipated to grow by about 3½% over 2022, boosted by pent-up domestic demand. Growth then slows to about 1¾% in 2023 in response to higher interest rates, lower commodity prices and declining foreign demand. Economic growth reaches 2½% in 2024 as household spending improves.

Supply growth is forecast to rebound from about ¾% in 2022 to about 2¾% on average over 2023–24. It strengthens over the projection horizon as global transportation bottlenecks and shortages of critical inputs ease. The easing of supply constraints, together with robust business investment, drives a rebound in productivity from its recent lows. Meanwhile, higher immigration will boost labour supply.

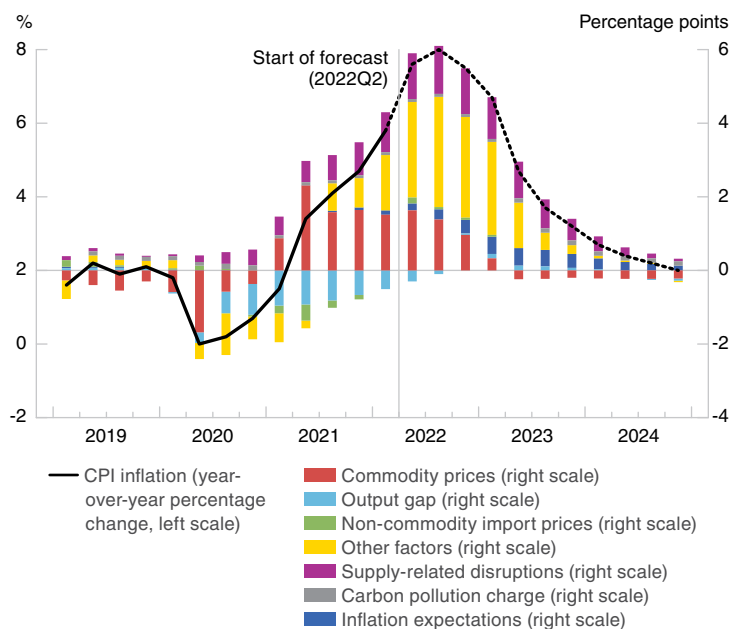
Excess demand in the Canadian economy eases over the projection horizon as demand moderates and supply strengthens. The output gap is expected to close in 2023 and move into modest excess supply in 2024.

## Inflation lower in late 2022 and at target by the end of 2024

Inflation is expected to decline over the projection horizon (**Chart 14** and **Chart 15**). Inflation falls from about 8% in the third quarter of 2022 to roughly 3% by the end of 2023. A decline in oil prices and lower house prices pull down quarter-over-quarter inflation in the second half of 2022. This helps lay the foundation for the decline in inflation. Inflation returns to the 2% target by the end of 2024 as global price pressures and domestic demand ease.

**Chart 14: CPI inflation is forecast to slow as the effects of high commodity prices and other global cost pressures ease**

Contribution to the deviation of year-over-year inflation from 2%, quarterly data

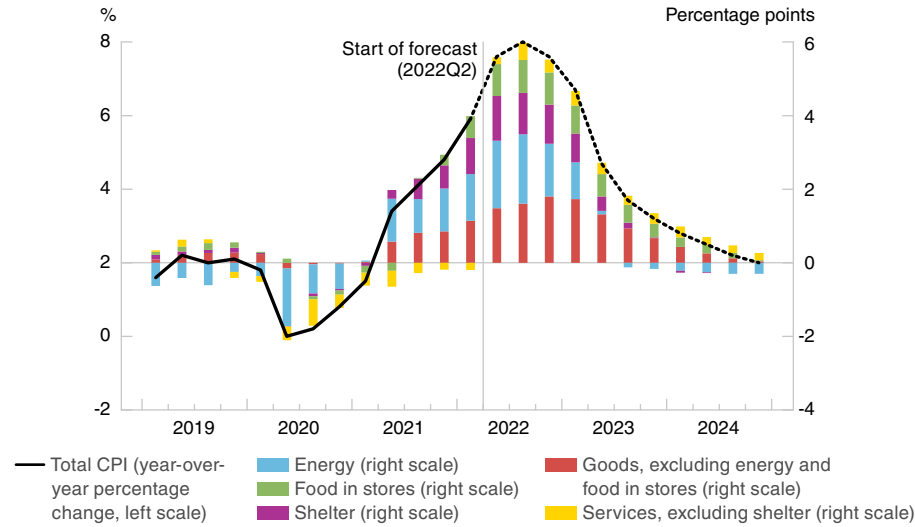


Note: *Supply-related disruptions* are estimated using the Federal Reserve Bank of New York’s [Global Supply Chain Pressure Index](#). *Inflation expectations* are estimated using a dynamic factor model that covers several indicators of inflation expectations across households, firms, professional forecasters and market-based sources. *Other factors* include previously underestimated demand pressures, such as from large imbalances in the housing market that have significantly raised shelter costs, changes to the production network (e.g., reshoring) and greater pass-through from oil or import prices. *Non-commodity import prices* include the impact of the Can\$/US\$ exchange rate. Numbers may not add to total due to rounding.

Sources: Statistics Canada and Bank of Canada calculations, estimates and projections

**Chart 15: CPI inflation is projected to start easing in late 2022 as energy prices decline**

Contribution to the deviation of year-over-year inflation from 2%, quarterly data



Note: Contributions are forecast using historical relationships between CPI components and macroeconomic variables in the base-case projection. Numbers may not add to total due to rounding.

Sources: Statistics Canada and Bank of Canada calculations, estimates and projections

Inflation is forecast to ease, reflecting several forces. Oil prices are projected to fall gradually, with the Brent price back down to \$100 by the end of 2024. Global supply bottlenecks abate, and the tightening of monetary policy abroad weighs on foreign demand. Consequently, inflation of tradable goods prices declines.

Higher interest rates in Canada will soften demand, reducing domestic inflationary pressures. Inflation of services prices, including shelter price inflation, eases. Considerable uncertainty continues to surround this outlook, as has been the case throughout the pandemic (see the **Appendix** on page 26).

### Sizable pullback in housing activity

The contraction in housing activity is expected to continue in the second half of 2022 and into 2023. Resales and house prices decline as borrowing rates rise and the pandemic-induced boost in demand wanes. Residential construction, including renovations, is also predicted to drop over the next year. Housing activity and prices are forecast to stabilize later in the projection horizon as both population and income growth boost housing demand.

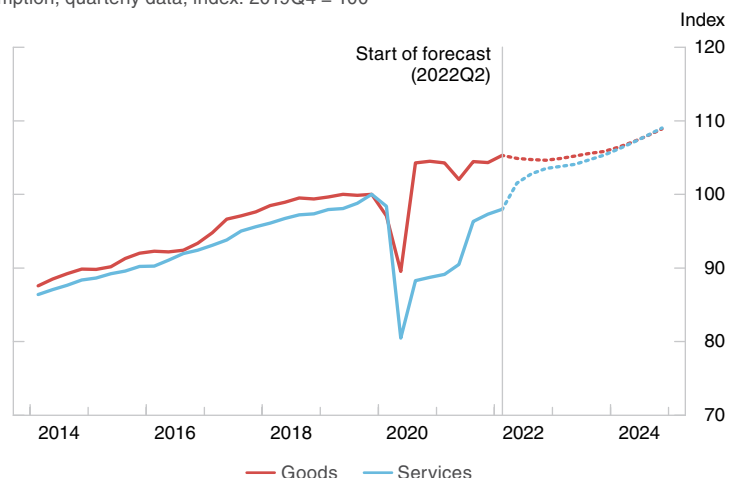
## Softer consumption growth

Consumption grows at a modest pace over the projection horizon. Spending on travel and other hard-to-distance services rises as consumers become less concerned about physical distancing. This will contribute to a rebalancing of the consumption of goods and services (**Chart 16**). A drawdown in some of the savings accumulated during the pandemic also supports household spending.<sup>5</sup> For example, motor vehicle purchases are expected to pick up as supply shortages resolve and pent-up demand is met.

However, consumption growth is anticipated to slow from its current strong pace. High inflation means that households will allocate more of their disposable income to necessities such as food and gasoline, leaving them with less money to spend on other items. And higher interest rates mean that some households will postpone major purchases, pay down debt or save more.<sup>6</sup> As well, some households—particularly those that took on a sizable mortgage when rates were lower—will face significantly larger payments when they renew their mortgages. The slowdown in housing activity will also weigh on the consumption of goods such as furniture and appliances.

**Chart 16: Consumption is rebalancing toward services**

Real consumption, quarterly data, index: 2019Q4 = 100



Sources: Statistics Canada and Bank of Canada calculations and projections

## Moderate export growth

Export growth is expected to remain strong throughout the remainder of 2022, boosted by elevated commodity prices and a pickup in international travel. Later in the projection horizon, export growth slows as foreign demand declines (**Chart 17**).

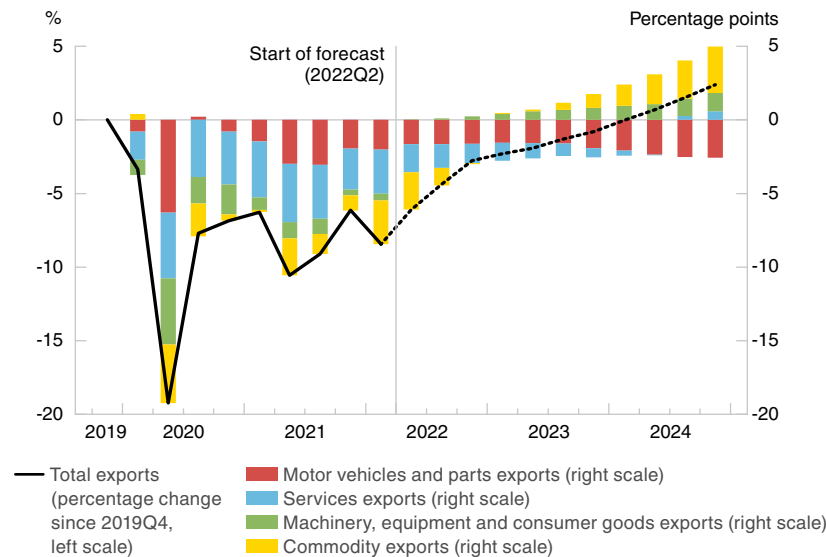
Non-energy exports should grow solidly as global supply disruptions dissipate. However, exports of motor vehicles will slow growth in the second half of 2023 and in 2024 when some manufacturing facilities close temporarily to retool for the production of electric vehicles. Exports and imports of services strengthen and reach pre-pandemic levels in 2024 while international travel continues to recover.

<sup>5</sup> However, consumers are incentivized to save more than previously expected given increased uncertainty and higher interest rates offering better returns.

<sup>6</sup> These assessments are consistent with results from the *Canadian Survey of Consumer Expectations—Second Quarter 2022*.

**Chart 17: Elevated commodity prices and easing supply disruptions support the recovery in exports**

Contribution to the deviation of real total exports from the 2019Q4 level, in percentage points, quarterly data



Sources: Statistics Canada and Bank of Canada calculations and projections

Energy exports are projected to grow strongly due to high prices and increased transportation capacity. Expected expansions in pipeline capacity—including the Trans Mountain Expansion project—and in volumes of crude-by-rail will support growth later in the projection horizon.

Imports are anticipated to remain solid, backed by robust business investment, ongoing restocking by businesses, and firms' desire to hold more inventory to buffer themselves against future supply disruptions.

**Robust business investment**

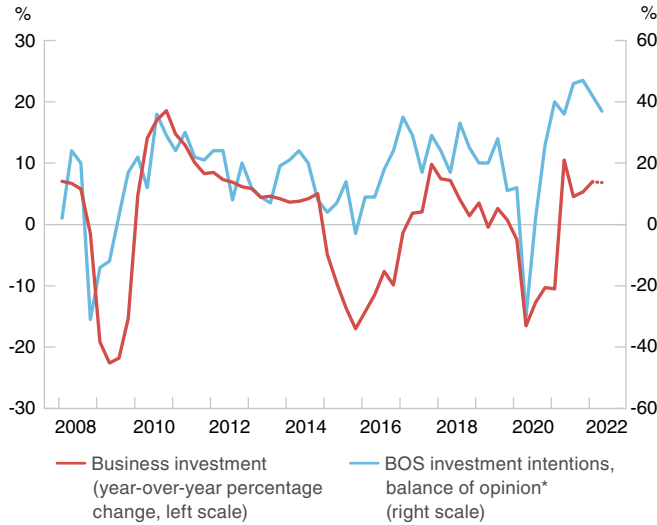
Outside the oil and gas sector, the investment outlook is bolstered by solid demand, robust business confidence and a push to alleviate capacity constraints (**Chart 18**). This outlook is consistent with the results of the BOS, with firms planning investments in digital technologies to improve productivity given tight labour markets and high input costs.

Investment growth in the oil and gas sector is anticipated to be robust, though more muted than during past periods of high prices. Producers of conventional oil and natural gas are expected to focus on expanding production capacity in fields where infrastructure is readily available. Investment in the oil sands is expected to be limited to improving the use of existing capacity and expanding current projects. Oil sands projects tend to require more capital and emit higher levels of greenhouse gases, making them sensitive to uncertainty about long-term demand and the transition to a low-carbon economy.

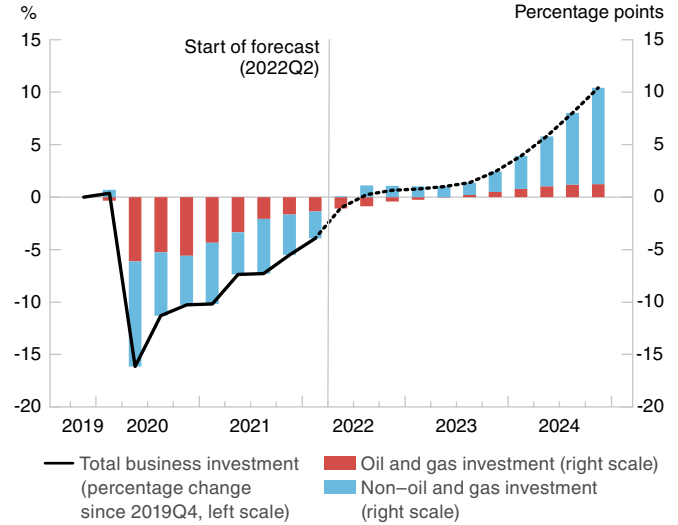
**Chart 18: Business investment is expected to grow strongly**

Quarterly data

a. Business investment and BOS investment intentions for machinery and equipment



b. Contribution to the deviation of real total business investment from the 2019Q4 level, in percentage points



\* Percentage of respondents to the [Business Outlook Survey \(BOS\)](#) that expect higher investment spending on machinery and equipment over the next 12 months minus the percentage that expect lower investment spending.

Sources: Statistics Canada, Bank of Canada and Bank of Canada calculations and projections

Last observation: BOS, 2022Q2  
Last data plotted in panel a: business investment, 2022Q2

## Risks to the inflation outlook

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The global economy faces many challenges. The pace of monetary policy tightening has accelerated in many countries as inflationary pressures have continued to rise and broaden. These pressures are contributing to greater volatility in financial markets and growing concerns about the path for the global recovery. Also, even as disruptions related to the COVID-19 pandemic have continued to ease, Russia's invasion of Ukraine remains a major source of uncertainty.

Some of the risks identified in previous reports have been partially incorporated into the projection. The base-case scenario includes more persistent supply challenges, greater pass-through of cost increases, tighter global financial conditions and the impact of higher inflation expectations.

The Bank sees two main risks to the outlook for inflation. On the upside, if left unchecked, persistently high inflation could result in a wage-price spiral. On the downside, the slowdown in the global economy could be more severe than expected, especially if the US economy slows more than expected.

Drawing from a larger set of risks, this section discusses other risks that may affect the projected path of inflation. The upside risks are of greater concern because inflation is persistently high, and evidence is mounting that expectations of inflation are drifting upward.

(i) **Main upside risk: Higher inflation becomes entrenched (↑)**

Until inflation drops significantly, the risk is greater that Canadians will believe it will stay high over the long term. Higher inflation expectations could lead to more pervasive increases in prices and labour costs, and these in turn could become embedded in higher inflation. **Box 3** provides a scenario of what could happen if longer-term inflation expectations become de-anchored and a wage-price spiral takes hold. In this case, mutually reinforcing wage and price pressures would amplify high inflation, and a greater degree of monetary policy tightening and a more pronounced slowdown of the economy would be needed to bring inflation back to target.

(ii) **Main downside risk: More severe global slowdown (↓)**

The global economy could slow more than anticipated. The euro area is at risk of recession as energy shortages lead to even higher prices, undermining consumer demand. Economy-wide disruptions could occur if rationing is implemented. At the same time, the impact of tighter financial conditions on household confidence and spending could be greater than expected. This could lead to slower growth in many regions. If more forceful actions are required to restrain inflation



in the United States, US growth could slow more than projected. As well, lockdowns in China could be more frequent and have a larger negative impact on growth than currently assumed. These shocks would be transmitted to the Canadian economy through weaker foreign demand, lower commodity prices and a deterioration in the terms of trade.

## Other risks

### (iii) Stronger household spending in Canada (↑)

In the base-case scenario, consumption grows at a modest pace and housing activity sees a sizable pullback. For many households, higher inflation and interest rates are squeezing budgets. However, a considerable proportion of households have accumulated large excess savings and are therefore more capable of absorbing higher prices. With the reopening of the economy, the boost from pent-up demand could be more sustained than anticipated if this group spends even more of its accumulated savings. Consumption and residential investment would then be stronger than projected and would contribute to greater inflationary pressures.

### (iv) Reversal of increases in goods prices (↓)

The base-case scenario assumes that the spike in goods prices since the beginning of the pandemic will persist. However, these prices could decline as supply chain bottlenecks dissipate and demand moderates. Oil prices and transportation costs could decrease more sharply than expected or growth in goods consumption could slow more than projected, particularly in the United States. If either of these scenarios occurs, inflation would be lower than projected.

Some large global retailers are reporting high levels of inventory after building up their stocks to avoid shortages. This could suggest some downside risk if retailers offer deep discounts to clear excess inventory.

### (v) Sharper decline in housing activity and consumption in Canada (↓)

While the base case projects a significant decline in housing activity, a steep drop in homebuyer sentiment could amplify the decline in house prices. Significant drops in house prices would reduce household wealth and access to credit as well as undermine consumer confidence. This would weigh on demand, especially from highly indebted households that have taken out sizable mortgages to purchase a home. Higher borrowing rates and reduced access to credit could also have larger-than-expected dampening effects on household spending, business investment and employment.

Box 3

### Scenario with a wage-price spiral

With inflation high and broadening, inflation expectations have moved upward. These rising inflation expectations are occurring while the labour market is tight and wage growth is strong. This increases the risk that a self-reinforcing wage-price spiral could ensue—a key upside risk to the inflation outlook.

In this risk scenario, when inflation remains persistently high, more households and firms base their inflation expectations only on the most recent inflation data. As a result, longer-term inflation expectations become de-anchored and stay above the target.<sup>1</sup>

De-anchored inflation expectations lead firms to set prices even higher. Similarly, in response to higher expected inflation, workers bargain for persistently higher wage growth to protect against anticipated losses in purchasing power. The resulting stronger wage growth feeds into production costs and prompts firms to raise prices even further. This process boosts inflation expectations, perpetuating the spiral.

The longer inflation remains well above target, the more likely it is that a wage-price spiral will occur. This likelihood also increases if firms have multi-year wage agreements in place with high wage increases in every year.

<sup>1</sup> This contrasts with the base case, which has long-run inflation expectations remaining well anchored to the inflation target.

### Increased risk of recession

This risk scenario examines what could happen if a wage-price spiral occurred. The spiral prompts inflation expectations, wages and prices to ratchet upward. With de-anchored expectations, inflation stays higher than it would have been with easing demand and flat or declining commodity prices.

To break the vicious circle, monetary policy works to re-anchor long-term inflation expectations to the 2% target. This is done by setting monetary policy much tighter than in the base case and creating additional excess supply.

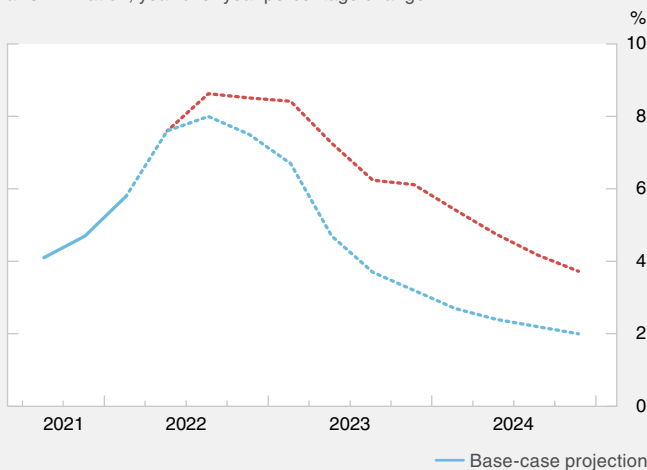
**Chart 3-A** (panel a) shows that, in this illustrative risk scenario, overall inflation peaks at 8.6%, higher than in the base case. By the end of 2023, inflation is at 6%, about 3 percentage points higher than in the base case. Growth of real gross domestic product is significantly weaker, reaching a trough of about -2.5%, and Canada experiences a four-quarter recession (**Chart 3-A**, panel b).

The Bank of Canada is keenly aware of the possibility of a wage-price spiral and is firmly committed to ensuring that this dynamic does not set in. This requires setting monetary policy much tighter than in the base case to ensure that long-run inflation expectations remain well anchored. With inflation expectations firmly anchored to the inflation target, the likelihood of a wage-price spiral is greatly diminished.

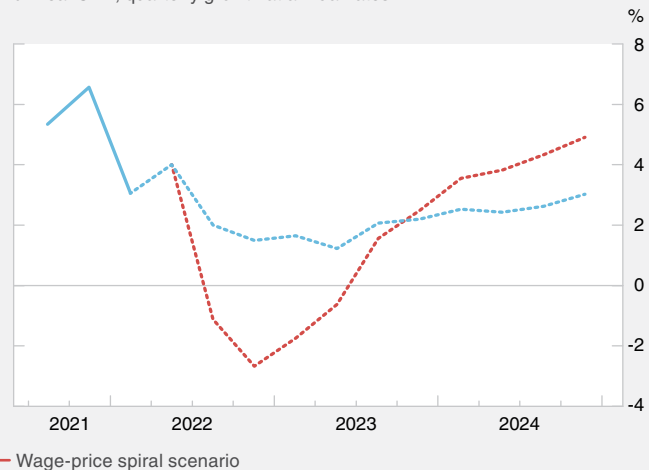
**Chart 3-A: In the wage-price spiral scenario, inflation is higher and growth is slower**

Quarterly data

a. CPI inflation, year-over-year percentage change



b. Real GDP, quarterly growth at annual rates



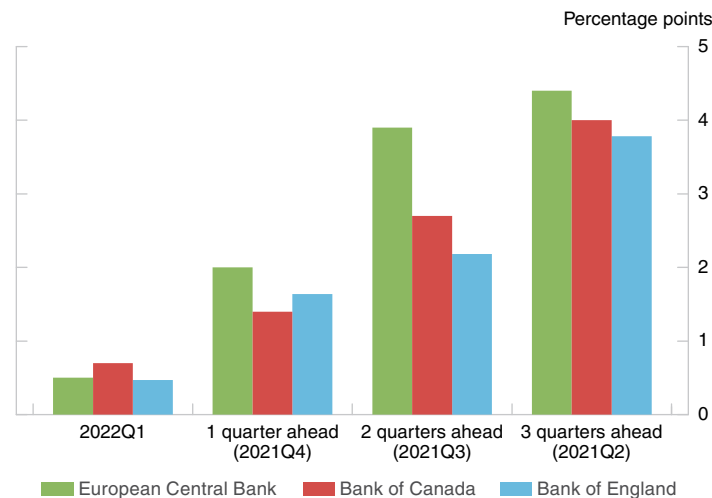
Sources: Bank of Canada and Bank of Canada calculations and projections

## Appendix: Main factors behind inflation forecast errors

The Bank of Canada, like other central banks, has underpredicted inflation since spring 2021 (**Chart A-1**). Precisely quantifying the sources of inflation forecast errors is complex because many factors influence inflation at the same time, making it difficult to fully disentangle them. That said, global factors appear to explain about two-thirds of missed inflation through higher commodity prices, increased supply shortages and rising shipping costs (**Chart A-2**). The faster-than-expected recovery in the Canadian economy added to the Bank’s forecast errors but cannot explain most of the surprise: about one-quarter of the miss on inflation is explained by domestic factors, mostly housing costs.

**Chart A-1: Central banks have underpredicted inflationary pressures**

Year-over-year inflation projection errors for 2022Q1 for three central banks, quarterly data



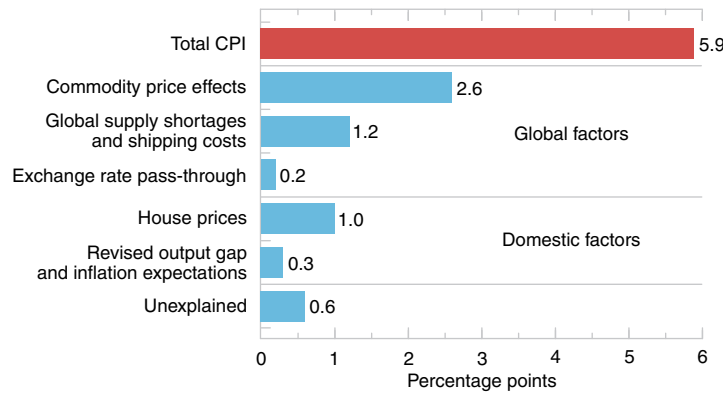
Note: The horizontal axis refers to the quarters when the forecasts were made for 2022Q1 inflation. Projection errors are the difference between the actual observed value and the projection value. This chart was inspired by Box 5 in the [ECB Economic Bulletin, Issue 3/2022](#).

Sources: European Central Bank, Statistics Canada, Bank of Canada and Bank of Canada calculations

Last observation: 2022Q1

**Chart A-2: Commodity prices and supply shortages were the largest sources of error in Canada**

Year-over-year inflation projection errors for 2022Q2, quarterly data



Note: The projection error is the difference between the actual observed value for 2022Q2 (using the Bank of Canada's assumption for June 2022) and the projected value in the April 2021 Report. *Commodity price effects* include direct impacts and unexpected pass-through of higher energy prices to other consumer prices. *House prices* refer to the direct impact of house prices through homeowners' replacement costs and other owned accommodation expenses.

Sources: Statistics Canada and Bank of Canada estimates and calculations

Last observation: 2022Q2

**Global shocks behind most errors****Higher-than-expected commodity prices**

The Bank typically uses a flat assumption about oil prices over its two- to three-year projection horizon. This assumption is based on work by Alquist et al. (2013), which shows that this approach was providing more accurate forecasts than other methods.<sup>7</sup>

Since 2020, however, the flat assumption has consistently underpredicted oil prices (**Chart A-3**). Commodity price effects alone account for over 40% of the Bank's total underprediction of inflation. Refinery margins recently deviated unexpectedly from their historical levels, leading to higher gasoline prices. And the Russian invasion of Ukraine has driven prices for oil and natural gas even higher.

In the past, a strong correlation existed between oil prices and the Canadian dollar: as oil prices rose, the dollar appreciated. This helped offset the inflationary impact of higher energy prices by making imports into Canada cheaper. But recently, this relationship has not held, which means that higher oil prices have had an even greater effect on inflation.<sup>8</sup>

In addition, other commodity prices have been unexpectedly high. For example, agricultural commodity prices have surged since 2021, largely due to unpredictable severe weather events. And the war in Ukraine has spiked wheat prices in particular.

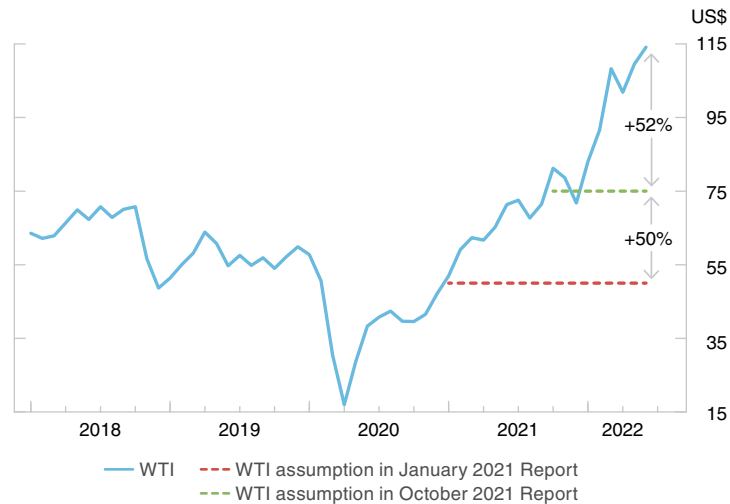
As well, higher energy prices affected shipping costs, contributing to the steep rise in the price of goods globally.

<sup>7</sup> See R. Alquist, L. Kilian and R. J. Vigfusson, "Forecasting the Price of Oil," in *Handbook of Economic Forecasting*, 2A, edited by G. Elliott and A. Timmermann (Amsterdam: North-Holland, 2013): 427–507. In recent reports, the Bank has deviated from the flat assumption about oil prices given the high volatility of oil prices due to the war in Ukraine.

<sup>8</sup> This relationship may have broken down in part because of uncertainty about demand for oil and natural gas in the long term. See T. Gravelle, "The perfect storm" (speech to the Association des économistes québécois, Montréal, Quebec, May 12, 2022).

**Chart A-3: Oil prices are much higher than expected a year ago**

West Texas Intermediate (WTI) price per barrel, monthly data

Sources: NYMEX via Haver Analytics and  
Bank of Canada calculations and projections

Last observation: June 2022

**Stronger-than-anticipated tradable goods prices**

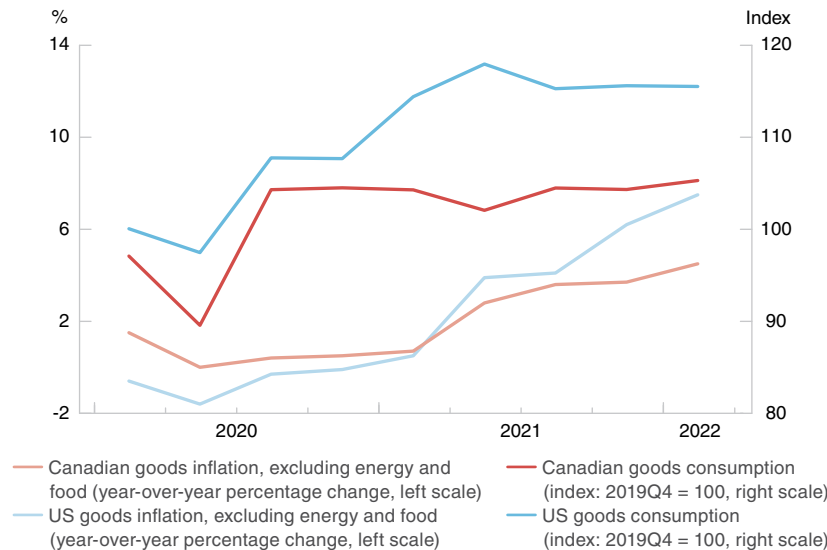
Instead of weakening as in past downturns, US consumer demand for goods unexpectedly surged well beyond pre-pandemic levels (**Chart A-4**).<sup>9</sup> Supported by fiscal policy measures, US household incomes turned out to be higher than anticipated. As well, the extent to which households shifted their spending into low-contact sectors was unexpected. Overall, strong foreign demand for tradable goods, such as appliances and furniture, has pushed up prices globally, including for Canadian consumers.

At the same time, the pandemic led to factory and port shutdowns around the world, upending supply chains for goods. The Bank had expected supply chains to be restored quickly once initial lockdown measures were lifted. However, further waves of the virus have caused continued disruptions, both globally and in Canada. In addition, the impact of supply challenges on consumer prices has been greater than anticipated. All told, roughly 20% of the forecast errors are related to global supply chain pressures.

<sup>9</sup> Because the US economy is roughly 10 times larger than the Canadian economy, the impact of strong US demand on goods inventory is much larger than would have been the case if Canadian demand had rebounded by as much.

**Chart A-4: US goods consumption surged, boosting tradable goods prices**

Quarterly data



Note: Goods inflation excluding food and energy is calculated based on CPI inflation for Canada and the personal consumption expenditure price index for the United States. Inflation components included and their definitions may differ slightly between the countries.

Sources: Statistics Canada, US Bureau of Economic Analysis and Bank of Canada calculations

Last observation: 2022Q1

## Faster-than-expected recovery in Canada

The fiscal and monetary policy response to the pandemic had stronger effects than initially anticipated.<sup>10</sup> Instead of declining, household disposable incomes and consumer confidence rose. The inability to spend on in-person services also meant that savings soared for some households. These factors contributed to more robust demand for goods than anticipated.

The large accumulation of savings, low mortgage rates and changes in homebuyer preferences led to house prices growing by more than had been expected given the amount of slack in the economy. The sharp rise in house prices has boosted consumer price index inflation by 1.2 percentage points on average since the middle of 2021.

The early arrival of vaccines in spring 2021 sped up the economic recovery. This was evident in the labour market because people were able to return to work faster than anticipated.

In 2022, with the lifting of most public health restrictions, consumer cautiousness faded more quickly than in past downturns, and pent-up demand led to robust consumption growth. With the economy already in excess demand, the effects of domestic demand on inflation became more important. These effects are contributing to a broadening of high inflation into non-shelter services such as traveller accommodation and transportation.

Overall, commodity prices are the largest factor, explaining about 45% of the forecast errors over the past year. Global supply shortages and shipping costs as well as domestic factors are also important, each contributing over 20%. That said, it is important to note that these are rough estimates that will evolve over time.

<sup>10</sup> See Bank of Canada, *Monetary Policy Report* (April 2020).

**CAC (MPI) 2-30**

<b>Part and Chapter:</b>	<b>PART VI – AAP, RM</b>	<b>Page No.:</b>	
<b>PUB Approved Issue No:</b>	<b>2., 8.</b>		
<b>Topic:</b>	<b>Actuarial Team</b>		
<b>Sub Topic:</b>			

**Preamble to IR (If Any):****Question:**

Please confirm the number of individuals presently working as part of MPI's actuarial team, including qualified actuaries, actuarial analysis, interns, support staff and others, categorized by role or title.

Please also confirm the number of individuals in the same roles that were part of MPI's actuarial team on January 1, 2020.

**Rationale for Question:**

To inform an assessment of MPI's operating costs and the capacity of its actuarial team.

**RESPONSE:**

As of September 15, 2022 there are 4 qualified actuaries – i) Chief Actuary; ii) Director Valuation & Capital Management; iii) Director, Pricing; and iv) Director, Business Insights & Analytics. The composition of the 3 actuarial directorates are:

1. Valuation & Capital Management – 3 actuarial analysts and 1 actuarial intern; 4 non-actuarial positions to support financial modelling and reinsurance (1

Manager Capital Management, 2 Financial Forecasting Specialists and 1 Reinsurance Analyst)

2. Pricing – 4 actuarial analysts and 1 actuarial intern; 2 permanent and 1 term non-actuarial positions to support rate modelling and 3 permanent positions to support Rate Administration
3. Business Insights & Analytics – 1 actuarial analyst

As of January 1, 2020 there was one qualified actuary who was supported for the actuarial function by the following positions:

- 4 Actuarial Analysts; 1 Manager Pricing; 3 Rate Administrators, 2 Rate Modellers, 1 Reinsurance Analyst, 1 Financial Forecasting Specialist and 1 Manager, Reinsurance & Forecasting

Current – 24 positions

2020 – 14 positions

Both currently and back in January 2020, there were non-actuarial functions that reported into the Chief Actuary. These are not included in the above numbers.