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A Reference Guide for the Business Outlook Survey

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Acknowledgements

Abstract

In 1997, the Bank of Canada established regional offices to enhance communication and liaison activities across the country and to gather more effective regional input for the Bank's policy deliberations. Shortly thereafter, the regional offices began conducting the Business Outlook Survey (BOS)—a quarterly face-to-face survey of senior managers at Canadian firms. The BOS has become an important part of monetary policy deliberations at the Bank of Canada and is also well known in Canadian policy and financial circles. This paper compiles more than 20 years of experience conducting the BOS and serves as a comprehensive reference manual. More specifically, it provides a brief history of the BOS; explains and discusses the survey's sampling strategy and other elements of its design and implementation; highlights some demographic characteristics of the firms that participate; assembles a list of special topics addressed in both the quarterly BOS and the ad-hoc surveys conducted by regional offices; discusses some BOS questions not regularly published; and updates and augments an earlier assessment (Martin and Papile 2004) of the information content of BOS indicators.

Bank topics: Firm dynamics; Regional economic developments
JEL codes: C83, D22, E32

Résumé

En 1997, la Banque du Canada a ouvert des bureaux régionaux afin de développer ses activités de communication et de liaison aux quatre coins du pays, et de recueillir auprès des acteurs régionaux des commentaires utiles à la formulation de la politique monétaire. Peu après, ces bureaux ont commencé à mener chaque trimestre l'enquête sur les perspectives des entreprises, qui est réalisée sous forme d'entretiens en personne avec des dirigeants d'entreprises canadiennes. Cette enquête est devenue un élément important des délibérations sur la politique monétaire à la Banque, et elle est aussi bien connue dans les milieux décisionnels et les cercles financiers du pays. Le présent document fait la somme de plus de vingt ans d'expérience dans la réalisation de l'enquête sur les perspectives des entreprises, et il constitue donc un guide de référence complet à cet égard. Concrètement, il contient un bref historique de l'enquête; il en expose et analyse la stratégie d'échantillonnage et d'autres éléments liés à sa conception et à sa mise en œuvre; il met en lumière certaines caractéristiques des entreprises participantes, y compris des personnes interrogées; il rassemble une liste de sujets particuliers abordés dans l'enquête trimestrielle ou dans des compléments d'enquête ponctuels effectués par les bureaux régionaux; il aborde des questions de l'enquête qui ne sont pas publiées régulièrement; et il actualise et étoffe une ancienne évaluation du contenu informatif des indicateurs de l'enquête (Martin et Papile, 2004).

Sujets : *Dynamique des entreprises; Évolution économique régionale*
Codes JEL : *C83, D22, E32*

Through our surveys and conversations with business leaders, we regularly gain insights into business conditions before they show up in official statistics, which is crucial to our monetary policy deliberations.

—Bank of Canada Governor Tiff Macklem
Your Role in the Business Outlook Survey

1. History of the Business Outlook Survey

The current focus of the Bank of Canada's regional offices was conceived in the mid-1990s. At the time, the Bank was streamlining its regional cash handling and distribution operations because technological advances were greatly reducing the need for physical operations across the country (Bilkes 1997). Moreover, the adoption of inflation targets in 1991 and the economic challenges of the early 1990s (Thiessen 2001) lent support to the idea of developing a richer set of inputs for monetary policy.

In that context, the Bank refocused its regional mandate. The renewed goals were to enhance the Bank's communication and liaison activities and, of particular importance, to gather more effective regional input for the Bank's policy deliberations (Amirault and Lafleur 2000). By April 1997, five regional directors were hired and operations were established in five cities.[1] The Bank was then able to strengthen existing relationships and build new ones with key stakeholder groups. At the time, groups targeted included firms, governments, educational institutions, industry associations and the broader public.

The Bank of Canada's Business Outlook Survey (BOS) first began in September 1997 as quarterly consultations conducted by the Bank's regional offices.[2] These confidential, face-to-face visits were structured around a questionnaire to collect information about firms' expectations of sales and demand, their intentions for investment, hiring and wages, and their outlook on pricing and inflation as well as labour shortages. By 1999, new questions had been added regarding capacity pressures and credit conditions. At that time, the quarterly survey results were circulated within the Bank and had begun to play an increasing role in policy-makers' deliberations. The survey, and the expanding network of firms across the country, became a useful source of real-time information about business confidence as novel shocks hit the Canadian economy. In particular, the 9/11 terrorist attacks in 2001, the SARS (severe acute respiratory syndrome) outbreak in 2003 and, more recently, the COVID-19 pandemic in 2020 proved difficult for models to fully assess.

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[1] Governor Gordon Thiessen announced the opening of offices in Calgary and Halifax and the expansion of existing offices in Montréal, Toronto and Vancouver on April 23, 1997, at a speech delivered to the Halifax Chamber of Commerce (Bank of Canada 1997). In addition to gathering regional economic information, Bank staff at the regional offices focus on financial market intelligence and currency. For more details, see the Bank of Canada's regional offices web page.

[2] In addition to firms, industry association consultations were conducted in third quarter of 1997, 1998, 1999 and 2000. Since then, regional offices have maintained regular contact with industry associations but do not systematically survey them.

The BOS was and continues to be a hybrid between a qualitative survey tool and a traditional business tendency survey (such as in OECD 2003). On one hand, the original aim was to develop a useful and timely set of indicators for the Bank's monitoring purposes. This is particularly the case in areas where data are unobservable, scarce or available only with a lag—such as data regarding expectations, capacity constraints and non-price credit conditions. On the other hand, face-to-face visits allow Bank staff to collect detailed narratives from firms about the factors impacting their outlook and to probe into areas of concern or interest to the Bank. These conversations help to identify risks and enrich the Bank's views on the direction of the economy.

In keeping with the notion that "monetary policy is more effective when people can understand what their central bank is doing and why," (Dodge 2003) the Bank recognized the importance of communication. As a result, the Bank decided to share with the public the new indicators it was relying on for policy deliberations and first published the key survey results in spring 2004.[3] This initial publication of the *Business Outlook Survey* included a time series based on aggregate responses for several questions and a short paragraph on each, along with a high-level description of some of the supporting narrative shared by survey respondents. This was accompanied by the publication of a document describing the survey characteristics as well as an early assessment of its information content (Martin and Papile 2004). Since then, several additional topics have been included in the public release of the BOS, which now presents overviews of firms' perspectives on business activity, pressures on production capacity, prices and inflation, and credit conditions. In addition, a composite measure of responses to several BOS questions—the BOS indicator—has become part of the regular publication. As of spring 2016, BOS publications also include a box highlighting firms' responses to special topic questions or a particularly relevant indicator that informs the Bank's current narrative.

The remaining sections of this paper summarize the accumulated knowledge of over 20 years of experience conducting the BOS. Section 2 addresses some of the most common frequently asked questions about the BOS. Section 3 describes how the BOS sample is determined, and Section 4 gives some details on the statistical and other features of the BOS. Section 5 concludes. Finally, Appendix 1 presents an updated assessment of the information content of key BOS results. Appendix 2 highlights several supplementary BOS questions that are not regularly published but are part of the BOS narrative in some rounds of the survey.

2. Frequently asked questions about the BOS

This section aims to answer many frequently asked questions and provide the reader with a good base of knowledge about the survey's mechanics and uses, advantages and limitations, participants and other relevant information.

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[3] The survey, its goals and its structure had already been acknowledged publicly (Amirault and Lafleur 2000).

2.1 How is the BOS used at the Bank?

Both the narrative and quantitative information from the BOS provide useful and timely information. BOS quantitative results are an input into the quarterly economic projection and output gap estimate prepared by Bank staff and the internal documents and external reports that inform these forecasts and assessments. For instance, Cheung, Frymire and Pichette (2020) find that BOS data can be used to improve real-time output gap estimates for Canada. The narrative from the BOS results, for its part, supports the assessment of risks and serves as a reality check (Murray 2012) on economic developments. The information in the BOS is both a key element on its own and an important complement to other material that the Bank's Monetary Policy Review Committee and Governing Council rely on as they work toward a monetary policy decision (Jenkins and Longworth 2002; Macklem 2002). Indeed, research shows that monetary policy decisions in Canada are empirically linked to business sentiment as measured by the BOS.[4]

2.2 What does a typical BOS cycle look like?

In 2000, with the Bank's adoption of fixed announcement dates around monetary policy decisions (Bank of Canada 2000), the regional offices adopted the BOS cycle shown in **Chart 1**. The typical BOS analysis cycle starts with an assessment of the previous cycle and a set of discussions with senior management at the Bank, including the Canadian and international monitoring and projection teams and the commodities division. The discussion touches on current topics to monitor, major risks and emerging issues. Meanwhile, firms selected for participation in the BOS are contacted and visits are booked. While changes to probing and special topic questions are proposed and implemented in most survey rounds, the set of core questions in the survey (i.e., those published each quarter) changes very rarely and only after careful consideration.

All BOS visits are conducted over about four weeks, ending roughly 27 days before the publication of the *Monetary Policy Report* (MPR).[5] Staff in all five regional offices participate in the analysis of the results. The BOS results, along with this detailed internal analysis, are presented to Governing Council before the BOS publication is released. A high-level summary of BOS results is then posted to the Bank's website, usually about seven business days before the publication of the MPR.

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[4] Verstraete and Suchanek (2017) show that the BOS has explanatory power for monetary policy changes beyond a Taylor rule.

[5] The actual dates over which visits are conducted are published as a footnote in each BOS publication.

Chart 1: The BOS cycle

Note: BOS is Business Outlook Survey; MPR is *Monetary Policy Report*.
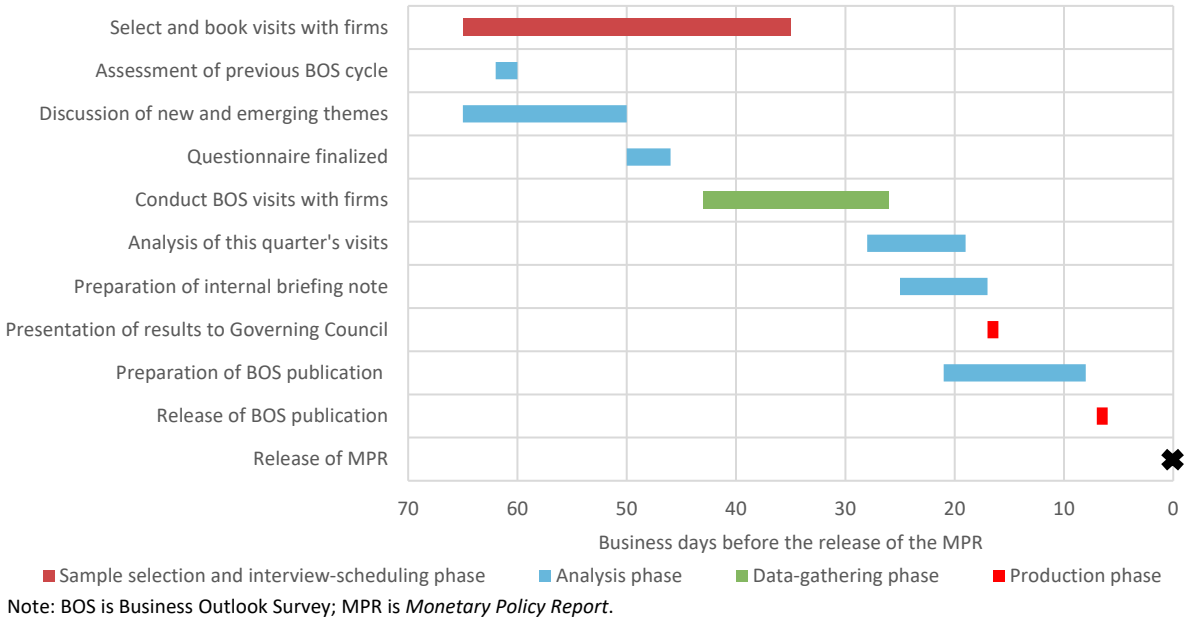
2.3 Who conducts the interviews and who is interviewed?

BOS surveys are generally conducted by two Bank staff from the regional office, usually including the Regional Director. Firm presidents and chief executive officers are the most commonly interviewed senior managers at small and medium-sized businesses, whereas at large firms the chief financial officer or vice president of finance are the most common interviewees (**Table 1**). Since the interviews touch on a broad set of topics, from sales demand to wage expectations to credit conditions, respondents must understand the many factors influencing the firm's perspective. In a significant minority of cases, more than one respondent is present at the interview. In all cases, respondents are reminded that the interview is confidential.

Table 1: Titles of BOS interviewees				
	Large firm	**Medium-sized firm**	**Small firm**	**Total**
Respondent title	**%**	**%**	**%**	**%**
President/Chief executive officer	20	36	45	33
Chief financial officer	35	25	9	23
Vice president of finance/Director of finance/Treasurer	19	15	7	14
Accountant/Comptroller/Accounting manager	1	4	4	3
Vice president (other than finance)	9	6	5	7
Owner/General manager	2	3	12	6
Chief operating officer/Chief accounting officer/All others	14	11	17	14

Note: Results are based on surveys conducted between 2016Q1 and 2020Q2. In cases where more than one interviewee is present, all are included in the table.

2.4: How are BOS responses aggregated?

Many BOS questions ask firms to judge if the variable in question is higher (or greater), lower (or lesser) or about the same as compared with some past period. For these types of questions, the BOS responses are aggregated by subtracting the share of firms that respond "lower" (or "lesser") from the share that respond "higher" (or "greater") to reach a balance of opinion. Other questions ask respondents if a characteristic applies to their firm, with responses of either "yes" or "no," or of "significant," "some" or "none." For these questions, responses are aggregated as a proportion of the sample for which the characteristic in question applies. These methodologies follow the best practices outlined by the Organisation for Economic Co-operation and Development (OECD; OECD 2003). Further, the balance-of-opinion and proportion-of-respondents questions are aggregated using principal component analysis.

Qualitative responses are synthesized in several ways. First, Bank regional analysts working with the BOS results read summaries of firms' responses to open-ended questions.[6] From these summaries, they extract common themes across firms that inform the current narrative for the Canadian economy and help identify risks or uncertainties. Beyond this, the regional analysis team uses both supervised and unsupervised machine learning text analytics tools to extract information from the BOS summaries and, when relevant, track them over time.

2.5: Why are some questions about changes in growth rates and others about changes in levels?

Several BOS questions ask firms about the direction of change in growth rates relative to an earlier period. For example, the question on future sales growth asks firms to compare their estimate for the growth of their sales volumes in the coming 12 months with the growth of the sales volumes they experienced in the past 12 months. This type of question is designed to signal whether the economic variable in question is speeding up or slowing down—key information for monetary policy. Conceptually, this approach also produces more variation in the series during extended periods of fairly stable economic growth.

Other questions ask firms about the change in level of activity. These "level change" questions help assess past or future variations of an indicator over a specified period. For example, the machinery and equipment investment question asks firms to compare the level of machinery and equipment investment spending planned for the next year with the amount spent in the previous year. In some cases, these questions are asked subsequent to a question on the change in growth rate of a particular indicator. In these instances—as in the cases of past sales growth and future sales growth—they help identify an actual contraction or expansion of that indicator and the significance of the variation.

Using the two types of questions together can reveal interesting insights because the responses can move in different directions, revealing turning points in the economy. For example, as the economy came out of the 2009 recession, responses to a level question regarding firms' sales outlook (future sales indicators[7])

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[6] Verbatim responses to open-ended questions are not captured in BOS interviews. Instead, the interviewing team summarizes and translates the firm's responses into economic concepts. This is done for brevity and to extract the most economically important information.

[7] For more information on this question, see Appendix A1.4.

remained negative, which suggested that economic conditions remained weak. However, the balance of opinion on the change in future sales growth turned positive, which suggested an inflection point and hinted that the low in economic activity had been reached.

2.6 What percentage of firms surveyed sell to households versus other businesses and governments?

Firms participating in the BOS are asked about the type of customer they mostly sell to: other businesses, households, governments or a mixture of these. **Table 2** shows that nearly half of firms surveyed sell primarily to other firms. One implication of this is that BOS output price expectations are conceptually closer to producer prices than consumer prices. Slightly more than one-third of firms have a mixed customer base—they are not dependent on a single type of customer. Overall, only 15 percent of firms sell mostly to households, but in certain sectors, such as commercial, personal and business services, and wholesale and retail trade, that proportion rises to about 25 percent and 33 percent, respectively. Large firms are more likely to sell to households or to have a mix of clientele, whereas small and medium-sized firms are more likely to sell to other businesses.

Table 2: The firm sells mostly to...

Customer Type	All	Sector*						Region					Size		
		PRIM	MFTG	CITU	TRAD	FIRE	CPBS	Atlantic	Quebec	Ontario	Prairies	British Columbia	Small	Medium	Large
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Consumers	**16**	2	3	15	35	20	22	15	18	16	132	17	14	14	20
Businesses	**48**	87	75	38	36	28	31	48	49	47	53	45	51s	52	42
Government	**2**	2	3	3	0	1	5	2	2	2	3	3	3	3	2
Mix	**34**	10	19	43	29	51	42	35	30	35	31	35	32	32	36

Note: Results are an average from 2010Q4, when the question was introduced, to 2020Q1. Totals may not sum to 100 due to rounding.

* Industry aggregates are defined by North American Industry Classification System codes as follows: primary (PRIM): 11 and 21; manufacturing (MFTG): 311–339; construction, information, transportation and utilities (CITU): 22, 23, 48, 49 and 51; trade (TRAD): 41, 44 and 45; finance, insurance and real estate (FIRE): 52–53; and commercial, personal and business services (CPBS): 54, 55, 56, 71, 72 and 81.

2.7 What proportion of firms surveyed export from their domestic operations?

To better understand the firm, and to gauge the differences in business sentiment between domestic- and export-oriented firms, Bank staff ask BOS respondents to estimate the percentage of sales from their domestic operations that is exported to the United States and other foreign countries. **Table 3** shows a nearly equal split between surveyed firms that have purely domestic sales and those with at least some

international sales exposure. About one-fifth of firms surveyed, on average, depend on foreign clients for more than half of their total sales. Manufacturing and primary sector firms are more likely to be heavily exposed to foreign markets and are also most likely to sell beyond the United States. Wholesale and retail trade as well as finance, insurance and real estate firms are more domestically focused.

Table 3: Percentage of firms by share of foreign sales															
		Sector*						Region					Size		
	All	PRIM	MFTG	CITU	TRAD	FIRE	CPBS	Atlantic	Quebec	Ontario	Prairies	British Columbia	Small	Medium	Large
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
No foreign sales	**49**	49	13	59	68	79	39	41	44	50	56	52	54	43	51
Foreign sales are 1 to 20% of total	**21**	12	22	23	18	15	35	25	25	15	21	20	17	23	22
Foreign sales are 21 to 50% of total	**10**	10	18	8	8	3	4	10	10	12	10	8	12	11	7
Foreign sales are 51%+ of total	**20**	29	46	10	6	3	23	24	21	23	14	20	17	23	21
Any sales to United States	**47**	43	84	36	30	14	58	54	45	48	41	49	41	54	46
Any sales to other countries	**31**	29	55	21	16	14	42	43	34	25	18	39	27	36	29

 Note: Results are an average from 2017Q2 to 2020Q1.

* Industry aggregates are defined by North American Industry Classification System codes as follows: primary (PRIM): 11 and 21; manufacturing (MFTG): 311–339; construction, information, transportation and utilities (CITU): 22, 23, 48, 49 and 51; trade (TRAD): 41, 44 and 45; finance, insurance and real estate (FIRE): 52–53; and commercial, personal and business services (CPBS): 54, 55, 56, 71, 72 and 81.

3. The BOS sample

This section describes how the BOS survey sample is determined and the non-random sampling process that is followed each quarter.

3.1 What is the sample frame for the BOS?

The BOS targets business sector firms in Canada, whether foreign or domestically owned, with roughly 10 or more employees.[8] Bank staff use a variety of sources to identify firms for participation in the survey, including informal networks and various databases, such as Statistics Canada's Business Register, as well as social media. Business data and insights from Dun & Bradstreet (Dun & Bradstreet 2018) are the primary

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[8] Firms with fewer than 10 employees are excluded because their expectations are more likely to be driven by idiosyncratic factors rather than broad economic trends and because these firms are often more homogeneous in their outlooks than larger firms. Still, they represent a significant portion of total economic activity and remain an under-observed part of the Canadian economy. The Bank's regional offices have experimented with internet-based surveys to specifically target this group.

sources of information used to substantiate a firm's sector, location of head office and employee count to match the quota sample described in Section 3.2.

3.2 How is the BOS sample determined?

Since the launch of the BOS, regional Bank staff have interviewed senior managers at participating firms. These interviews usually take place face-to-face at the senior managers' place of work. These in-person conversations provide a rich source of information about the rationale or motivation for certain economic behaviours or actions that other collection methods do not offer. They also allow interviewers to spot and resolve any misunderstandings and explain any complex concepts and questions. These face-to-face meetings can lead Bank staff to new thinking about economic behaviour, stimulate novel ideas for economic research and capture emerging trends. Furthermore, this interview format helps regional Bank staff build useful networks of sectoral contacts that can be quickly tapped as situations arise. It also allows firms to engage with the Bank on current issues regarding the economy in general and monetary policy more specifically, thereby supporting the Bank's goals of enhancing stakeholder dialogue and responding to emerging trends.

Given the cost implications of a face-to-face approach, however, the trade-off is that the regional offices target a smaller sample of firms than internet or other survey methods typically reach. This, in turn, raises some concerns about the BOS data. How much of the quarter-to-quarter variability in BOS results is due to the small size of the sample but is not related to the information contained in these variations? How similar are each quarterly sample's characteristics relative to those of the Canadian business sector that the BOS aims to survey? To address these valid concerns, Bank staff have used a quota sampling approach allocated by sector, region and firm size.

By sector

The most important criterion in firm selection is the sector in which the firm operates. Sectoral quota weights assigned to the BOS sample are largely based on the sectoral composition of gross domestic product (GDP) for Canada's business activity.[9] Firms are divided into six categories based on North American Industry Classification System (NAICS) codes (see note in **Chart 2**). These weights are re-evaluated every two years and are adjusted if the industrial composition of Canadian business GDP has changed significantly. This ensures that the composition of each quarterly BOS sample broadly matches that of Canadian business output. Moreover, it reduces the quarter-to-quarter variations in results that are due to sectoral differences in responses. **Chart 2** shows the share of firms by target sector for each quarter since 2001. On average, since 2007, sectoral sampling has been within one percentage point of the target quota.

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[9] BOS quota weights exclude the owner-occupied dwellings component of business GDP (roughly 10 percent). This portion of the quota has been allocated exclusively to manufacturing activity, resulting in an oversampling for this sector. While manufacturing represented about 13 percent of nominal business GDP in Canada in 2014, it represents about 22 percent of the BOS quota. This oversampling allows the Bank's regional offices to target specific subsectors of manufacturing at the three-digit NAICS code level as part of the quota. All other sectors are roughly weighted based on their business sector GDP weights.

Chart 2: Firms by industry sector (%)

Primary ▪ Manufacturing ▪ CITU ▪ Trade ▪ FIRE ▪ CPBS
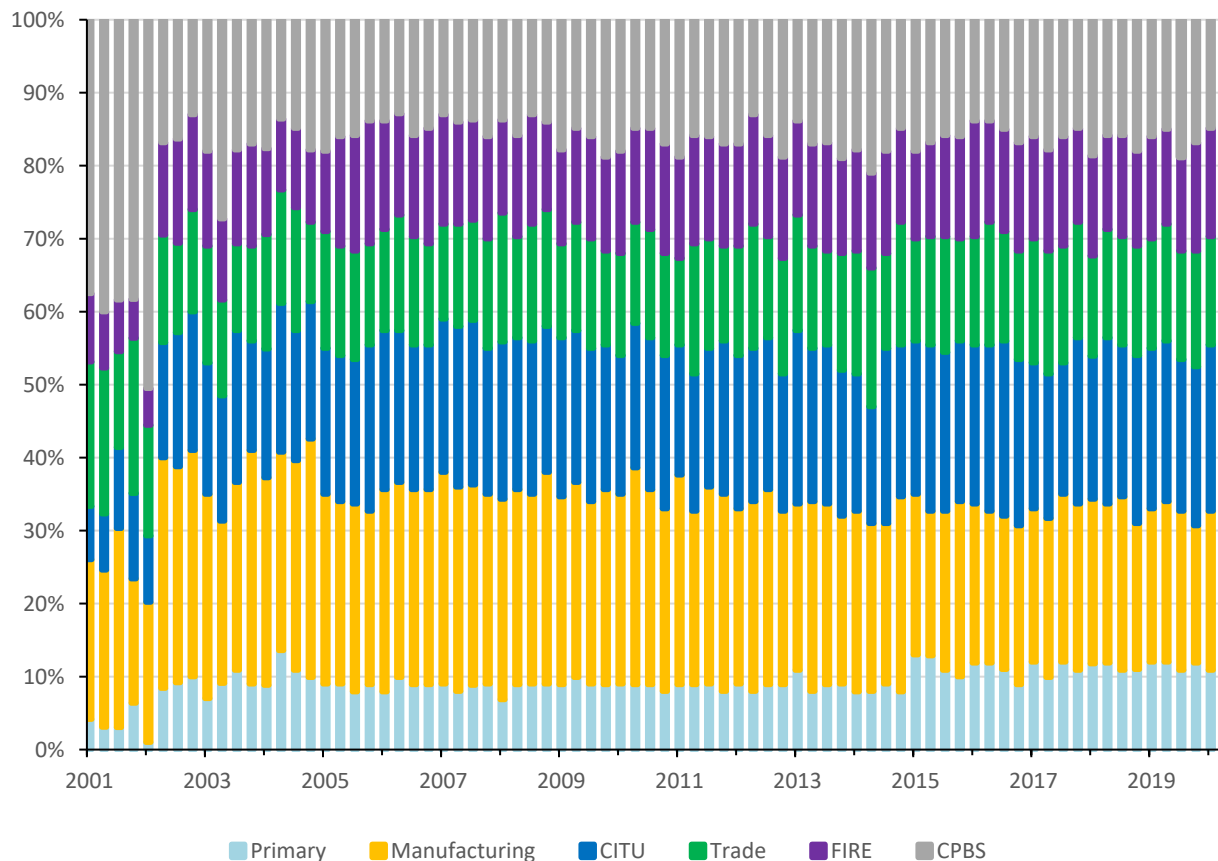
Note: Industry aggregates are defined by North American Industry Classification System codes as follows: primary: 11 and 21; manufacturing: 311–339; construction, information, transportation and utilities (CITU): 22, 23, 48, 49 and 51; trade: 41, 44 and 45; finance, insurance and real estate (FIRE): 52–53; and commercial, personal and business services (CPBS): 54, 55, 56, 71, 72 and 81.

By region

Each of the Bank's five regional offices is assigned a fixed number of firms to visit in each BOS survey round.[10] This allows the sample to reflect some of the regional diversity in the Canadian economy. In addition, it spreads the survey burden across the regional offices. The quarterly publications of BOS results exploit this diversity and often discuss regional differences in the overall national results. The trade-off in this case is that some regions, particularly Atlantic Canada and British Columbia, are oversampled.

By firm size

Finally, a third goal is to have a diverse sample of firms based on their size (see note in **Chart 3**). Large firms represent a small fraction of the total population of firms but about half of Canadian business GDP (Innovation, Science and Economic Development Canada 2019). Further, economic shocks may have varying

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[10] The Atlantic Canada regional office visits 15 firms; the Ontario regional office visits 25 firms; and the Quebec, Prairies and British Columbia regional offices each visit 20 firms.

impacts for firms of different sizes (Karasik, Leung and Tomlin 2016). The BOS sample aims to reflect these issues by targeting small, medium and large-sized firms equally, as shown in **Chart 3**. On average, firm size sampling is within three percentage points of being equally distributed. The firm size selection criterion, however, may be relaxed at times to ensure the industrial and regional composition of the sample.

Chart 3: Firms by size (%)
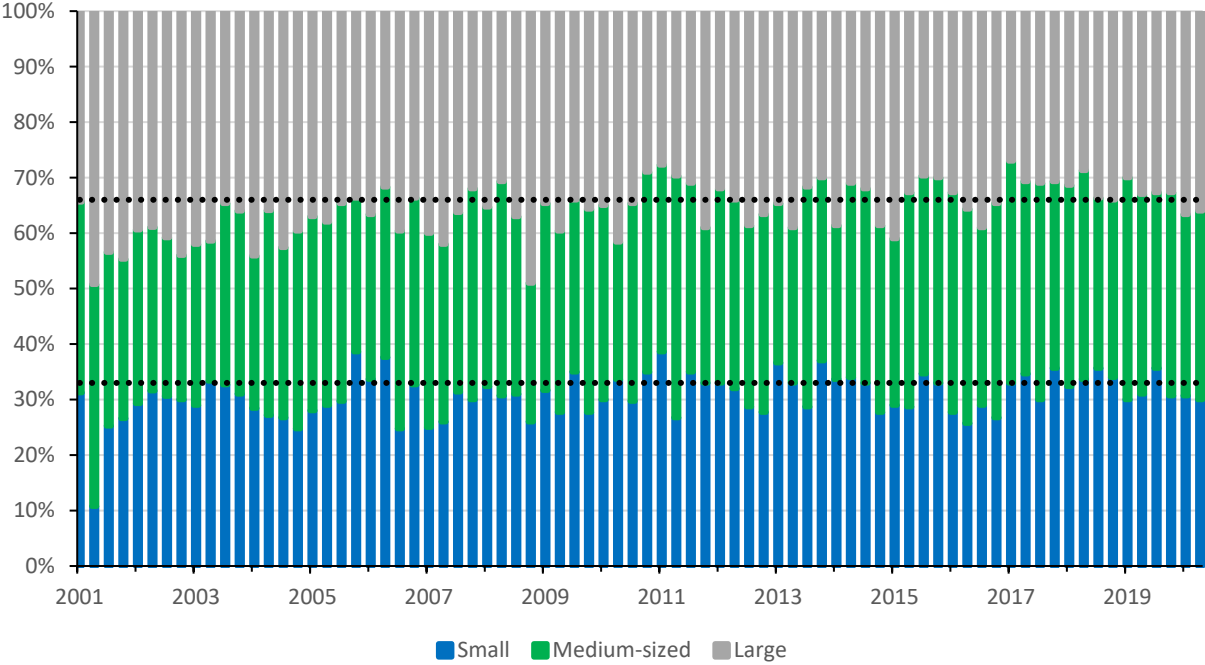
Note: Firm size aggregates are defined by number of employees as follows: small firms have 10 to 99 employees; medium-sized firms have 100 to 499 employees; and large firms have 500 or more employees.

3.3 Do specific regional offices always visit particular sectors? How does the BOS sample account for sectors that are regionally concentrated?

The allocation of the sectoral quota across the five regional offices is flexible enough to allow each office to visit firms in all sectors of the Canadian economy over time, but not every quarter. However, in cases where large national sectors are heavily concentrated in a specific region, some of the quota is permanently allocated to that regional office in all survey rounds. For example, the Ontario regional office always visits a fixed number of transportation equipment manufacturers as well as finance and insurance firms due to the large share of automobile and parts manufacturing and financial service firms in that province. The Prairies regional office has a similar dedicated quota for the oil and gas extraction industry. Other regions share the rest of these sectoral quotas on a quarter-by-quarter basis. The goal is to always have a sample that broadly reflects the composition of the Canadian economy and is sensitive to regional sectoral clusters, while allowing all Bank regional offices to visit firms in all sectors over a two-year span. Decisions on these aspects

of the sample are largely driven by national and provincial economic output considerations and are reviewed every two years. At that time, all weights are reassessed and occasionally adjusted to reflect changes in the sectoral makeup of the Canadian and regional economies.

3.4 Do firms remain in the BOS sample from survey to survey? How often are firms visited?

Firms that participate in the BOS are never included in back-to-back surveys. Furthermore, the Bank's regional offices traditionally strive for a minimum of 18 to 24 months between BOS visits with the same firm. This approach limits the burden of the survey on firms, allows new firms and their perspectives to be taken on board, and ultimately broadens the regional offices' network, supporting their intelligence-gathering function and stakeholder engagement role. Given that the population of large Canadian firms in some specific sectors is limited, those firms are generally revisited more often than small and medium-sized firms.

3.5 What is the share of newly surveyed firms in the BOS sample?

In each survey round, all regional offices aim to engage several firms that have never participated in the BOS. This is done with three goals in mind:

- to expand and update the Bank's network of contacts

- to include young and newly created firms in the BOS sample

- to reduce the chance of systematic bias in the BOS sampling

In practice, however, firms' willingness to participate in the BOS and the absence of a fixed number of new firms to survey both heavily influence the achievement of these goals. Previously unvisited firms are statistically significantly more likely not to respond to an invitation to participate in a BOS survey, with a non-response rate of roughly 52 percent, compared with 37 percent for firms that previously participated (Miller, Amirault and Martin 2017). On average, from 2016 to 2019, roughly 37 percent of firms in the BOS sample in any one quarter were those that had not previously participated.

4. Other features of the BOS

This section delves into some of the more technical aspects of the BOS sample. It examines the consequences of the non-random sampling method, the non-response rate, and how else the sample framework is used by the regional offices.

4.1 How accurate are BOS results?

As described in Section 3.2, the BOS is based on non-random quota sampling methods. To test the accuracy of the survey results in that context, de Munnik, Illing and Dupuis (2013) perform a series of Monte Carlo simulations modelling each step in the BOS selection process, and then run a fully constrained model

including all steps of the selection process.[11] The results presented in **Table 3** compare mean responses separately at each step in the selection process and the fully constrained model against the population mean. **Table 3** also includes the results for a random stratified sampling procedure for comparison. The results show that for both the balance-of-opinion and proportion-of-respondents questions, the induced bias on the fully constrained selection model is small. Results also show that the dispersion of the sampling distribution is generally close to what would be obtained if the survey had been done by using stratified random sampling. That said, these simulations assume that those firms that do not participate in the BOS—either due to non-response or because they were not contacted—are a good substitute for firms that do participate.

Table 3: Assessing the accuracy of the non-random sampling method of the BOS—a comparison of simulation results

Selection model	Balance-of-opinion questions		Proportion-of-respondents questions	
	Bias versus the pseudo-population (simulated mean deviation from population mean)	95% (66%) intervals (percentage points from population)	Bias versus the pseudo-population (simulated mean deviation from population mean)	95% (66%) intervals (percentage points from population)
Stratified sample	0.05	16.7 (8.3)	0.11	9.41 (4.66)
Regional quota	2.00	16.6 (8.2)	0.09	9.33 (4.60)
Industry quota	-2.07	17.5 (8.6)	3.84	12.25 (6.03)
Firm size quota	-2.78	17.7 (8.7)	-0.95	9.81 (4.82)
Rotation constraint	0.17	16.7 (8.2)	0.70	10.13 (4.99)
Familiarity constraint	-0.23	17.0 (8.4)	-0.23	9.62 (4.74)
Non-response	-0.10	16.7 (8.4)	-0.42	9.91 (4.80)
Fully constrained model	-0.23	16.8 (8.3)	1.93	10.01 (4.93)

Note: Adapted from de Munnik, Illing and Dupuis (2013)

4.2 What is the BOS non-response rate, and what happens when a selected firm does not participate in the survey?

On average, from 2008Q1 to 2020Q3, 52 percent of firms contacted to participate in the BOS were willing and able to do so. The remaining 48 percent did not participate for several reasons, and this non-response rate has been trending up. This increase comes largely as more firms do not answer the Bank's attempts to contact them (**Chart 4**). In part, this reflects the shift away from telephone calls and toward the use of emails to initially contact firms. Beyond this, Miller, Amirault and Martin (2017) analyze the factors that influence firms' non-response in the BOS. Findings suggest that the tenure of regional Bank staff influences firms'

[11] First, they simulate the sector, region and firm size quotas. Next, they model the urban/rural rotation cluster sampling to simulate the fact that particular geographic clusters are visited at certain times of the year. They also impose a familiarity constraint to account for repeat visits and sectors that are concentrated in specific regions. Finally, they model non-response, assuming a global non-response rate of 50 percent.

willingness to participate and that turnover in the Bank's regional offices is a key driver of the increase in unit non-response. Other factors, such as firm size, ownership status, sector and participation history also influence the non-response rate.

Bank staff are mindful that non-response is important because it can impact the representativeness of the sample. Research into this topic is ongoing and includes efforts to closely model the non-response rate and to weight results by non-response. That said, de Munnik, Illing and Dupuis (2013) use Monte Carlo simulations to estimate the impact of non-response on BOS results and find that it introduces limited bias. Further, Miller, Amirault and Martin (2017) show that firms' credit scores do not affect their willingness to respond, suggesting that there is no systematic bias toward firms that are performing well or poorly.

Given the quota selection criteria explained in Section 3.2, if a selected firm in a specific sector, region and size category does not respond to regional office staff's attempts to contact them or decides not to participate for any reason (**Chart 4**), Bank staff make every effort to replace that firm with another that has the same characteristics. In cases where Bank staff face difficulties finding new firms to participate that match the specified criteria, the criteria can be relaxed to ensure that the full BOS sample size is met in each quarter. In most cases, the firm size criterion is relaxed first, thereby preserving the sectoral and regional composition of the sample.

Chart 4: Number of firms contacted that did not participate in the survey, by reason

Number of firms
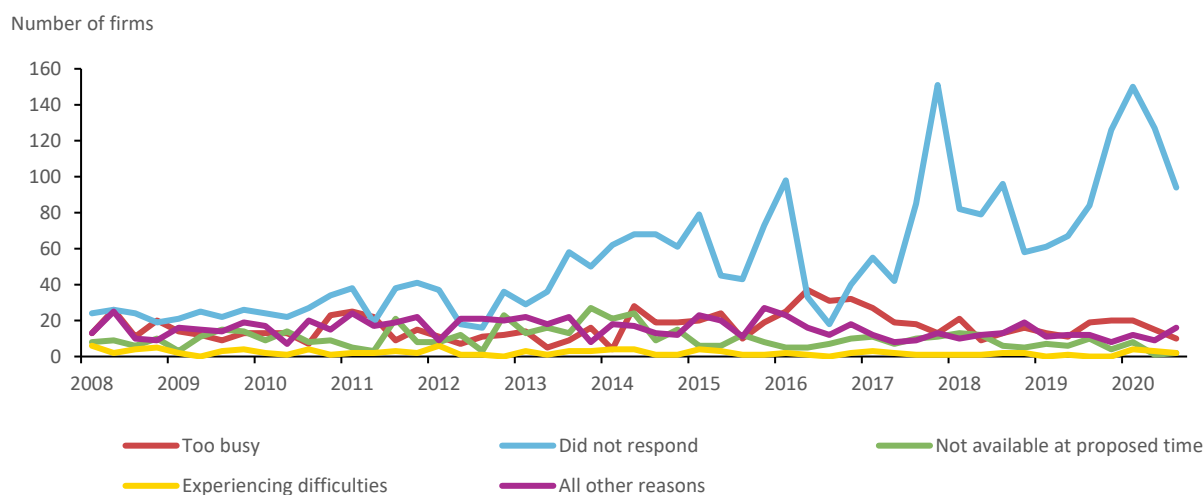
Note: All other reasons include no interest in participating, missed or cancelled meeting after confirmation, the contacted location is not the head office, privacy concerns, and other reasons mentioned infrequently.

4.3 What other topics are addressed in BOS interviews beyond those related to the quarterly monitoring of the economy?

The BOS is a timely and effective way to gather information about economic behaviour and other topical issues for which little or no data exist at the firm level. Special topic questions are added from time to time to the set of core questions asked in each quarterly survey. Several examples of topics explored are listed below:

- Over four quarters in 2002 and 2003, the BOS gathered data about the pervasiveness of US currency "dollarization" in Canadian firms' activities, at a time when the future of the nation's currency was being debated (Murray, Powell and Lafleur 2003).
- During commodity price and exchange rate shocks in 2003–04, 2006–07 and most recently 2014–16, the BOS probed firms about both the impacts of these shocks and the firms' own actions in response (Mair 2005; Bank of Canada 2016a; Bank of Canada 2016b).
- From mid-2006 to mid-2007, participating firms were asked if they were holding liquid assets in excess of what they considered to be normal levels and, if so, why (Bank of Canada 2007).
- In 2016, firms participating in the BOS were asked about the lags between investment spending and the subsequent impact on firms' productivity and performance (Agopsowicz et al. 2016).
- From 2017–19, the BOS asked about the impacts of trade and fiscal policy shifts under the new US administration on firms' operations and investment plans (Bank of Canada 2018a).
- In late 2019, firms were asked to what extent climate change affects their business operations or is taken into consideration (Bank of Canada 2020a).
- In 2020, firms were asked at the early stages of reopening about their expectations for the shape of the recovery from the COVID-19 crisis (Bank of Canada 2020b).

4.4 Can the BOS framework be used for other purposes?

Beyond the special topic questions that are occasionally added to the quarterly BOS cycle, the Bank's regional offices have tapped their own survey design and management experience and their growing network of firms to conduct several ad-hoc, stand-alone surveys. Some examples are as follows:

- From July 2002 to March 2003, 170 firms were surveyed to better understand the price-setting behaviour of Canadian firms (Amirault, Kwan and Wilkinson 2006). The survey also aimed to test, among other things, competing explanations for why prices might be sticky, using a methodology established by Blinder et al. (1998). The results were also used to inform parameter estimates in the Bank of Canada's projection models.
- From October 2007 to May 2008, 200 firms were surveyed to investigate the:
  - o factors Canadian firms weigh when setting non-union wages
  - o nature of inflation-to-wage links such as indexation in non-union wages
  - o extent and nature of downward wage rigidities in private wages (Amirault, Fenton and Laflèche 2013).

  These results also assisted in model development.
- In the aftermath of the 2008–09 global financial crisis, the Bank turned its attention to the competitiveness of Canadian firms. The Bank's regional offices surveyed 151 firms from September to December 2013, to shed light on some of the strategies for growth and productivity that Canadian firms had recently implemented or were likely to deploy in the slow macro-growth environment (Rennison, Novin and Verstraete 2014).
- In mid-March 2020, the Bank's regional offices conducted a supplementary survey of business associations, firms and other stakeholders regarding the early impacts of the COVID-19 pandemic and the oil price decline on their businesses. In total, the regional offices collected 69 responses

across all sectors of the economy. The results of these consultations were presented in the *Business Outlook Survey—Spring 2020* publication.

More recently, two stand-alone consultations conducted by the regional offices have focused on deepening the Bank's understanding of the impact of digital technologies on the Canadian economy:

- In the fall of 2016, 44 firms and several industry associations in the fast-growing information technology service exporter (ITSE) sector were surveyed (Dong, Fudurich and Suchanek 2016). Findings revealed a picture of a small, buoyant and innovative part of the Canadian economy. Survey results also showed that the relatively low exchange rate over the survey period was boosting margins and often fuelling strong employment and research and development intentions.
- In the fall of 2017 as a follow-up to the ITSE survey, the Bank's regional offices surveyed 42 firms and several industry associations in the wholesale, retail and logistics sector about their adoption of digital technologies (Dong, Fudurich and Suchanek 2017). The results showed that Canadian firms are increasingly investing in these areas to improve operational efficiencies and enhance customer experience.

In late 2014, as global oil prices fell, the Bank's regional offices—particularly the Prairies regional office located in Calgary—began conducting regular consultations with firms in the oil and gas sector. Consultations are with small to large firms within the upstream oil and gas sector, including producers, service companies and transportation firms. The results of these consultations feed into the Bank's assessment of the Canadian economy and its projection for inflation. These discussions and the BOS were cited by then-Governor Poloz as crucial elements of the Bank's decision to cut interest rates in response to the oil price shock (Poloz 2017). Similarly, after the global financial crisis, staff in the Ontario regional office began regular consultations with firms in the auto sector to better understand the impact of the shock on automotive demand. These ongoing conversations help the Bank better understand firms' production and investment plans and other cyclical or structural issues facing the sector.

4.5 How is the BOS useful in understanding economic data?

The BOS provides quantitative results that, together with the qualitative stories that accompany the responses, allow regional Bank staff to interpret and describe firm sentiment from quarter to quarter. Several BOS variables are well correlated with economic data that is conceptually relevant and of interest to the Bank. These correlations are presented in Appendix 1, updating and extending the assessment performed by Martin and Papile (2004). In almost every case, the correlations between BOS variables and economic data are the same or have improved. The strongest correlations are the following:

- The balance of opinion on the change in growth of past sales volume shows a *strong* correlation with real business sector GDP growth at t-1.
- The balance of opinion on indicators of future sales volume shows a *strong* correlation with real business sector GDP growth at t+1.
- The balance of opinion on the change in wage growth shows a *strong* correlation with employment growth, excluding public administration, health and education industries (using Statistics Canada's Survey of Employment, Payrolls, and Hours), at t+2 and t+1.

- The balance of opinion on the intensity of labour shortages shows a *strong* correlation with the output gap (extended multivariate filter) at $t+1$.

While the Bank's regional staff rely heavily on these correlations and other quantitative tools when assessing the informativeness of the BOS results, the qualitative information gathered across the five regions is also key to gauging business sentiment each survey round. This is particularly important if the quantitative results in question provide an incomplete picture of relevant economic activity or if there are mixed results across BOS indicators. In these cases, regional office staff will use qualitative responses to supplement the quantitative information and extract a more meaningful signal from the BOS. Taken together, the qualitative and quantitative information in the BOS contributes to assessing economic conditions in Canada in each quarter.

4.6 Can BOS data be combined to provide further useful signals on upcoming economic performance?

All BOS indicators are designed to capture some aspect of economic activity. Therefore, they are all interrelated in some sense. Given this, regional staff combine and analyze BOS questions through principal component analysis to extract the common underlying variations among the indicators.[12] Pichette and Rennison (2011) analyze the information content of the first principal component—the BOS indicator. They find that the approach is useful because it summarizes the BOS results and reduces the dimensionality of the data, thus conserving degrees of freedom and lessening concerns about multicollinearity in forecasting exercises. The BOS indicator is found to have a moderately strong forward-looking correlation with business investment. Furthermore, it contains information that explains quarter-over-quarter growth in real GDP and real business investment, a useful property for forecasting purposes. In the case of real GDP, the BOS indicator does not perform better than the balance of opinion on future sales in terms of forecasting. However, in the case of real business investment growth, the indicator provides a more useful signal than the balance of opinion on machinery and equipment investment intentions.

4.7 What other information is collected in the BOS?

The BOS questionnaire evolves from quarter to quarter based on topics that are important to monetary policy at the time. Only the core questions and their results—a subset of the overall survey—are regularly released as part of each quarterly BOS publication. Some of the non-core questions are removed when no longer needed, both to limit the survey's burden on firms and to make room for new questions on emerging issues. Other questions are relatively new and are still being assessed for the information they uncover. And finally, certain questions and results are published only when the information is relevant to the current narrative on the Canadian economy. The messaging in the quarterly BOS publication is often drawn from some questions that are not regularly published. Several of these indicators are shown in Appendix 2.

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[12] The principal components are illustrated in sections A1.1 and A2.1 of the appendix.

5. Taking stock and looking forward

The Bank of Canada's regional offices gather intelligence about economic activity to help the Bank monitor and develop a narrative on Canadian regional and sectoral developments and conduct monetary policy. The quarterly Business Outlook Survey is a set of face-to-face consultations with senior managers at Canadian firms that helps inform the Bank's outlook on growth, capacity pressures and inflation. It is well integrated into the Bank's internal policy deliberations and widely included in media and private sector discussions about the course of the Canadian economy.

The BOS is a hybrid tool that combines some key features of a traditional business tendency survey with those of a qualitative industry consultation. It consists of a structured conversation with business leaders across all regions and sectors. The BOS enables the Bank to systematically create a timely set of indicators on a wide range of economic concepts and trends for which data are available but with a lag, are limited or are non-existent. Beyond this, these quarterly discussions help shed light on the factors influencing firms' expectations. They also contribute to the Bank's narrative and understanding of the Canadian economy as well as its stakeholder engagement goals. The flexibility of the survey framework, the BOS's longevity of more than 20 years, and the regional offices' well-established network of firms all contribute to the Bank's ability to quickly and efficiently undertake in-depth thematic and sectoral survey work to support its goals.

In the future, the Bank's regional offices will continue to develop and renew their business survey methods, other intelligence-gathering tools and stakeholder engagement activities. Several recent and ongoing initiatives highlight what the future might hold:

- The Bank and its regional offices are part of a growing network of nearly 25 central banks cooperating as the Central Bank Business Survey and Liaison Programmes group. Beyond serving as a network to share best practices and new developments in conducting business surveys, the group collaborated on the development of the first global survey initiative, which asks firms around the world about the adoption of digital technology. Central bank business surveys that are coordinated on a global scale will help all stakeholders better understand how monetary policy interacts with economic decision making in a changing world. This is a promising area for further collaboration.

- Given the BOS sample frame, the size of the Bank's regional office teams, and the recent advances in digital technologies, regional office staff are focused on finding new and innovative ways to efficiently connect with businesses and expand the reach of the Bank's intelligence-gathering efforts. For example, to complement the BOS, regional office staff recently piloted an online survey targeting small firms and microbusinesses. Other areas being explored include the use of telepresence technologies to conduct surveys, which proved particularly useful when physical distancing measures brought about by COVID-19 precluded traditional face-to-face survey methods. The Bank uses these technologies to gather information about the pandemic's impact on the global and Canadian economies. Additional technologies have also been helpful, and further development is likely. For example, machine learning, data visualization and big data tools are increasingly being used to more rapidly analyze and illustrate BOS data trends and unlock insights

from the dataset. These efforts will support the further integration of BOS data as part of the Bank's economic monitoring toolbox. Other regional office efforts focus on better understanding the sample properties of the BOS, reducing the effects of any biases and lowering the non-response rate.

- Finally, the Bank's regional offices are contemplating how to ask more relevant BOS questions and how to shed light on evolving economic relationships in an increasingly digitized economy. For example, staff are exploring how economic concepts such as capacity pressures, labour shortages and hiring and wage intentions are evolving alongside new technologies.

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Appendix 1: Information content of the core BOS questions

In this appendix, we plot the core BOS variables alongside other economic data to illustrate their information content. In each case, the BOS data are shifted to illustrate the peak correlation with the external data presented. Correlations at different time horizons are presented below each chart. All correlations cover the period from 2003Q3 until 2020Q1,[13] except the BOS indicator and indicators of future sales, which were introduced later. Following the approach in Martin and Papile (2004), correlations are described as follows:

- *strong* correlation ranges from 0.80 to 1.00
- *moderately strong* correlation ranges from 0.60 to 0.79
- *moderate* correlation ranges from 0.40 to 0.59
- *weak* correlation ranges from 0.20 to 0.39

Most indicators show either the same or an improved assessment compared with Martin and Papile's results (2004). Beyond correlations, some indicators have been tested for their forecast performance. Pichette and Robitaille (2017) show that the BOS indicator "… provides useful signals to forecast the growth of real GDP and business investment, regardless of the vintage of data used." They further find that the BOS indicator is a "…weaker predictor of real GDP growth than the balance of opinion on future sales growth, but a better predictor of growth in real business investment than the balance of opinion on investment in machinery and equipment."

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[13] The unprecedented shock to economic activity from the COVID-19 pandemic weakened correlations between the BOS results and economic data. This anomaly is expected to be reversed over time and as historical relationships are re-established. Therefore, we have excluded economic data beyond 2020Q1 to best illustrate these historical relationships.

A1.1 The BOS indicator

Chart A-1.1: Common co-movement of BOS responses

Standardized units   Percent
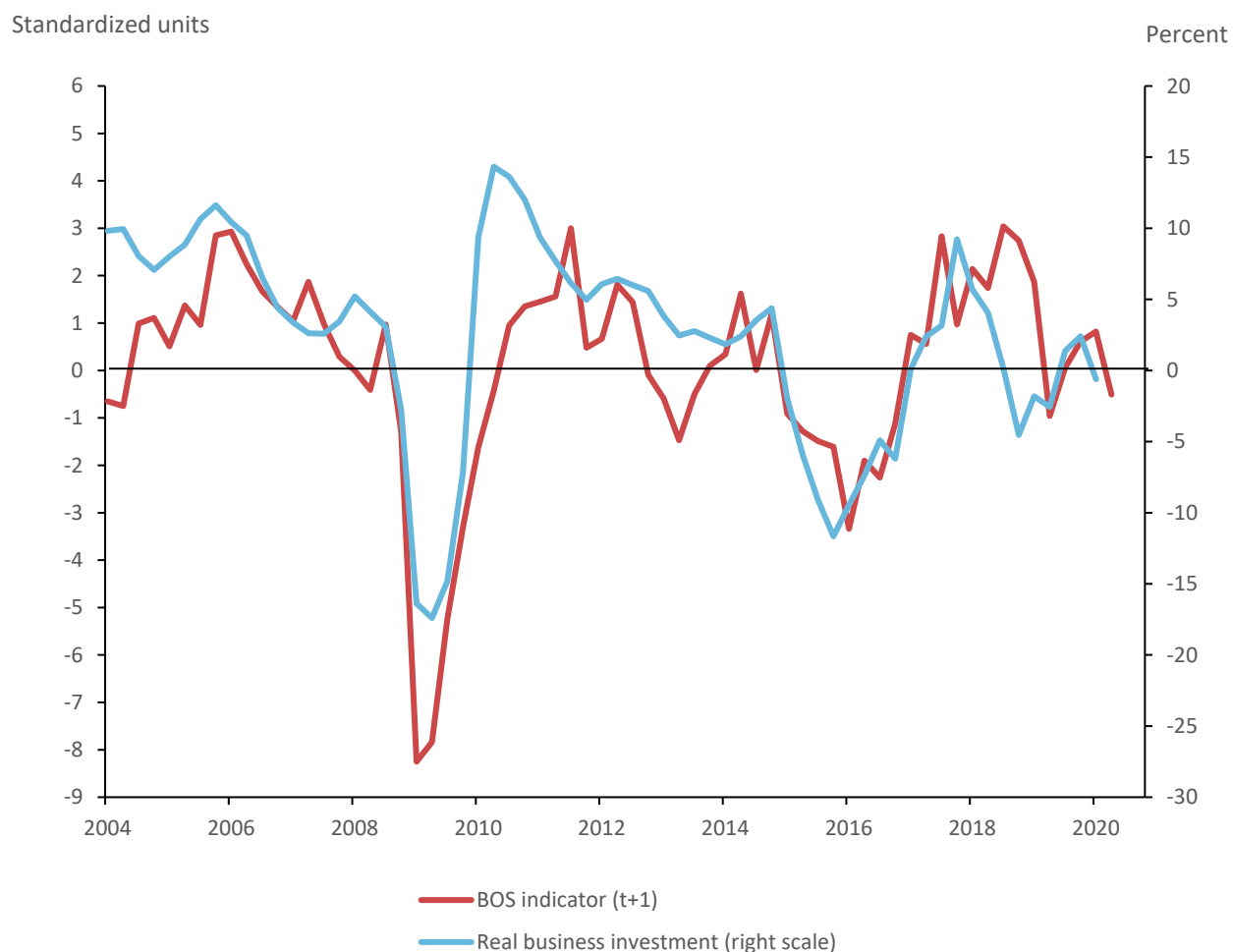
Sources: Statistics Canada and Bank of Canada calculations

Table A-1.1: Correlations[14] between the BOS indicator and year-over-year growth in real business investment (at time *t*)

t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
0.08	0.23	0.39	0.56	0.69	0.71	0.57	0.32	0.05

- The BOS indicator shows a *moderately strong* correlation with the growth of real business investment at time *t*+1 and *t*.
- Verstraete and Suchanek (2017) find that the BOS indicator has "systematic explanatory power for monetary policy decisions over and above typical Taylor rule variables."

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[14] We calculate all correlations in Appendix 1 from 2003Q3 to 2020Q1.

A1.2 Growth of past sales volume

Chart A-1.2: Balance of opinion on the change in growth of past sales volume

Over the past 12 months, did your firm's sales volume increase at a greater, lesser or the same rate as over the previous 12 months?

Past sales, BOS balance of opinion (t+1)

Real business sector GDP growth (right scale)
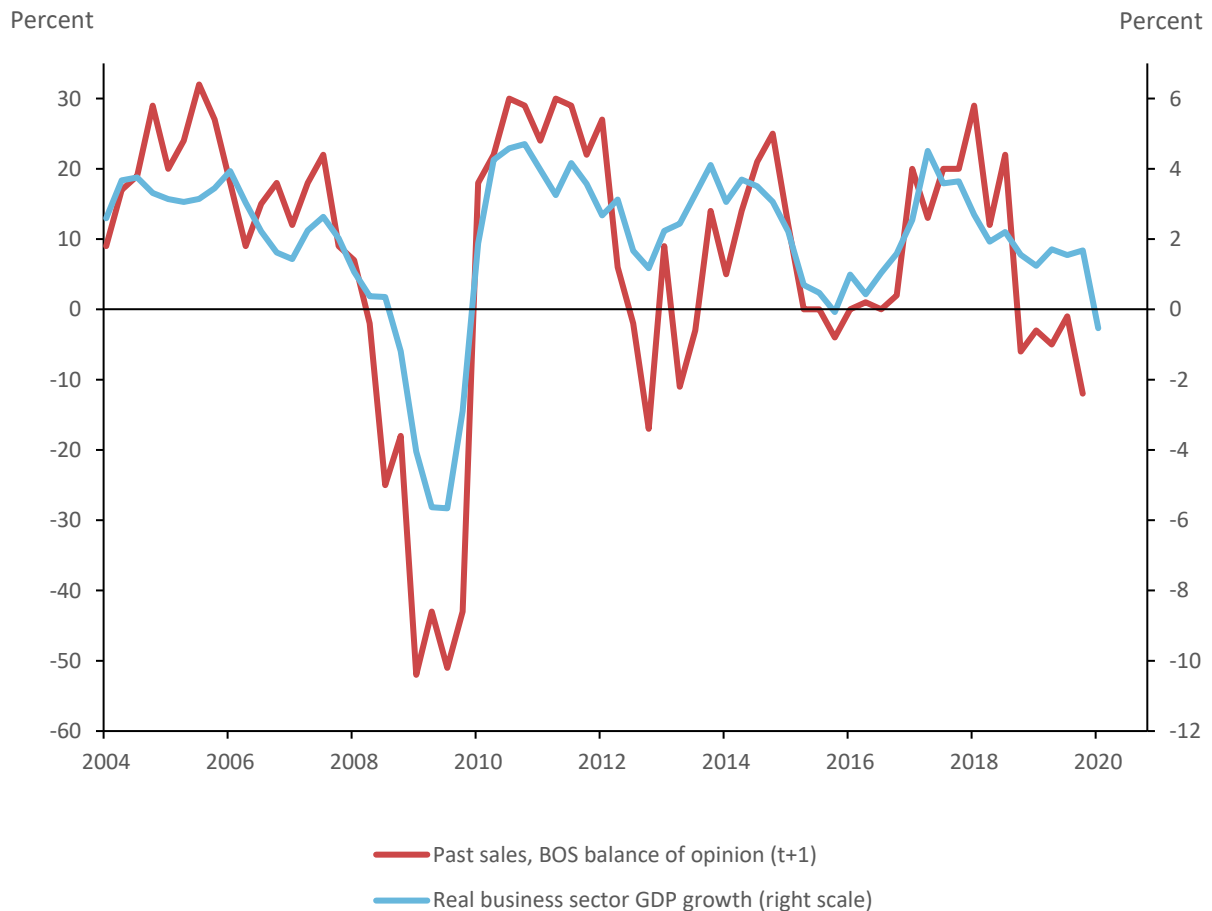
Sources: Statistics Canada and Bank of Canada calculations

Table A-1.2: Correlations between BOS balance of opinion on past sales growth and year-over-year growth of real business sector GDP (at time *t*)

t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
0.34	0.58	0.78	0.88	0.77	0.53	0.28	0.02	-0.15

- The balance of opinion on the change in growth of past sales volume shows a *strong* correlation with real business sector GDP growth at *t*-1, and a *moderately strong* correlation with the same variable at *t* and *t*-2.

A1.3 Growth of future sales volume

Chart A-1.3: Balance of opinion on the change in growth of future sales volume

Over the next 12 months, is your firm's sales volume expected to increase at a greater, lesser or the same rate as over the past 12 months?

Future sales, BOS balance of opinion (t+2)

Change in real business sector GDP growth (right scale)

Sources: Statistics Canada and Bank of Canada calculations

Table A-1.3: Correlations between BOS balance of opinion on future sales growth and the change in year-over-year growth of real business sector GDP (at time *t*)

t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
-0.31	-0.18	-0.08	0.02	0.26	0.51	0.67	0.67	0.39

- The balance of opinion on future sales volumes shows a *moderately strong* correlation with the change in real business sector GDP at *t*+2 and *t*+3.

A1.4 Indicators of future sales volume

Chart A-1.4: Balance of opinion on indicators of future sales volume

Compared with 12 months ago, have very recent indicators of future sales (order books, advance bookings, sales inquiries, etc.) improved, deteriorated or remained the same?

Future sales indicators, BOS balance of opinion (t+1)

Real business sector GDP growth (right scale)

Sources: Statistics Canada and Bank of Canada calculations

Table A-1.4: Correlations between BOS balance of opinion on indicators of future sales and year-over-year growth of real business sector GDP (at time *t*)
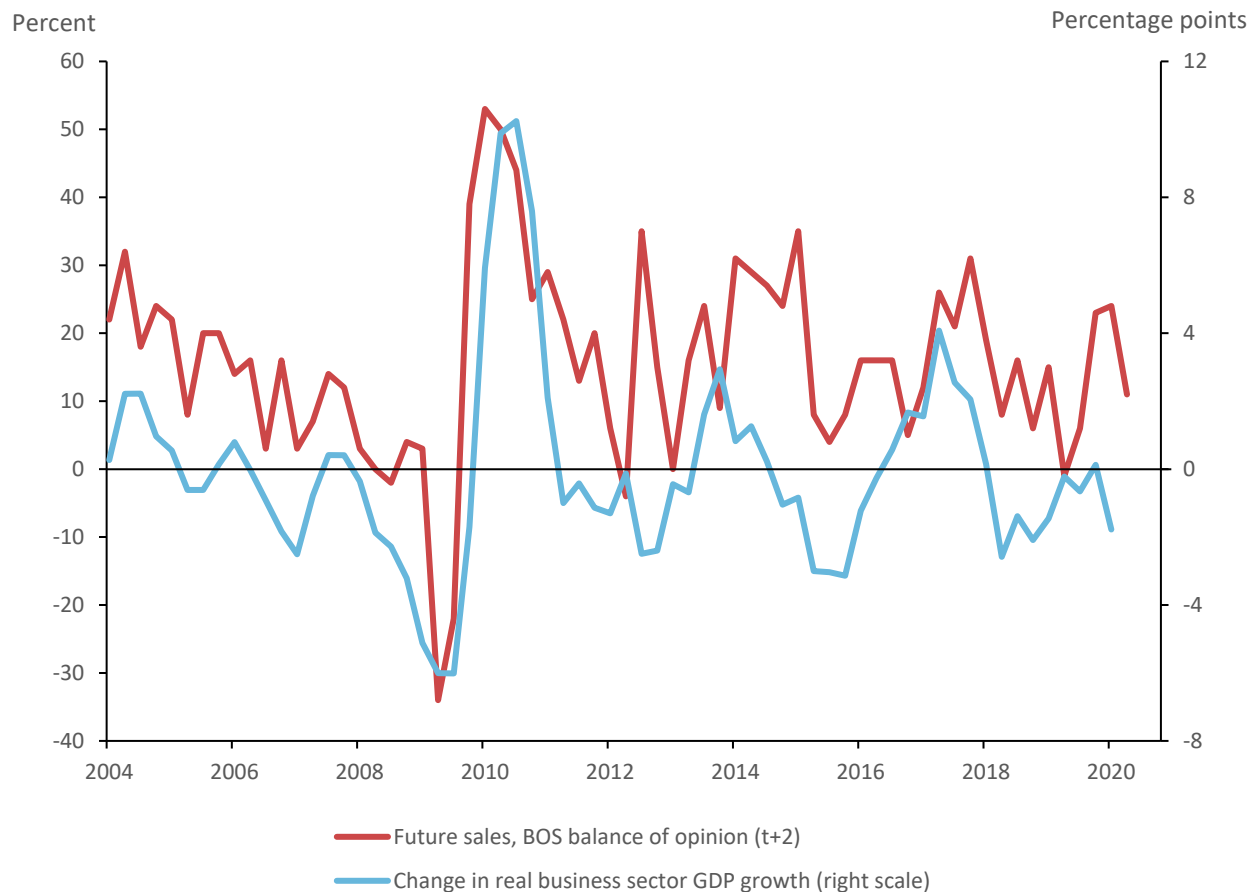
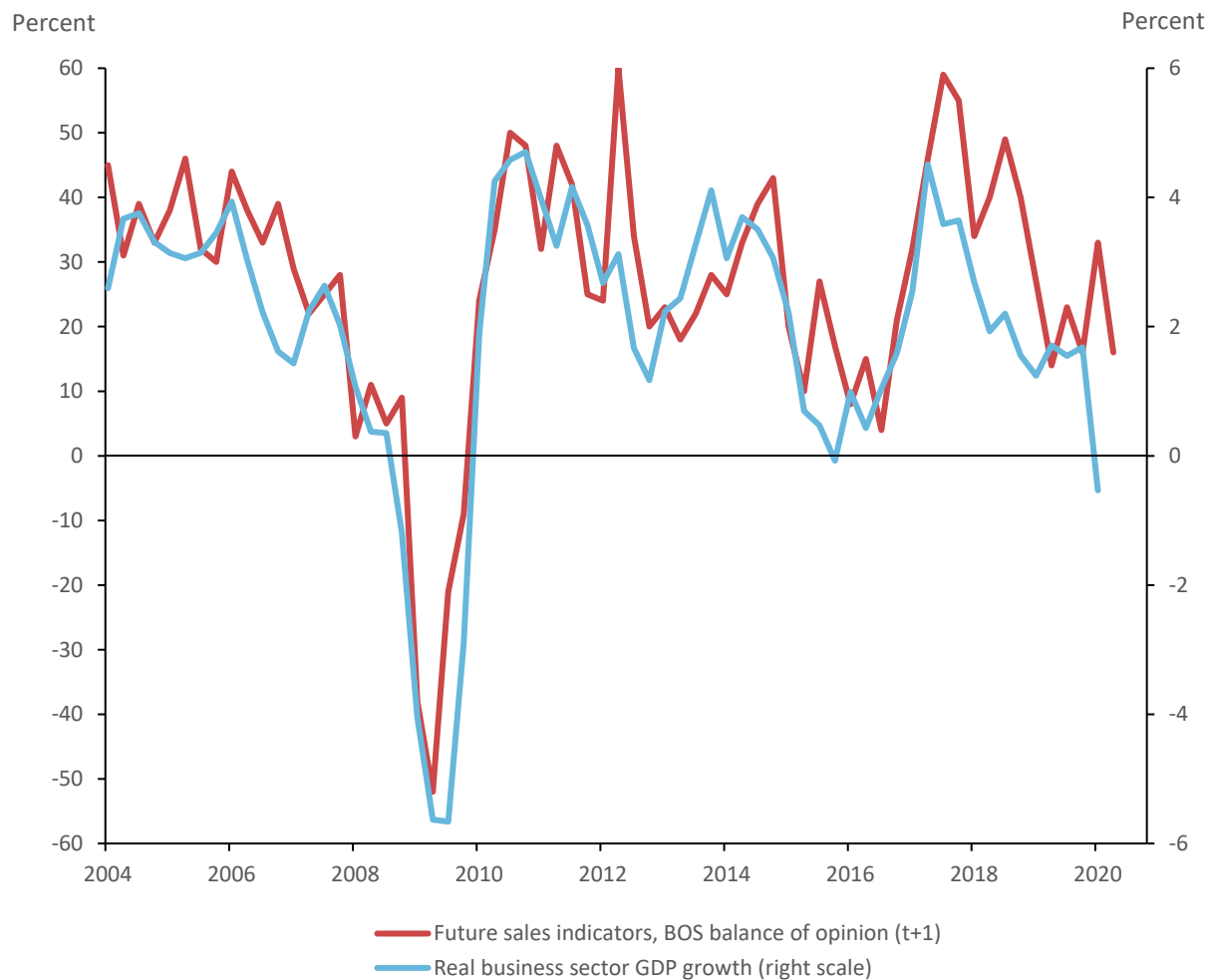| *t*-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
-0.03	0.13	0.35	0.56	0.76	0.85	0.76	0.53	0.29

- The balance of opinion on future sales indicators shows a *strong* correlation with real business sector GDP growth at *t*+1, and a *moderately strong* correlation with the same variable at *t* and *t*+2.

A1.5 Investment in machinery and equipment

Chart A-1.5: Balance of opinion on investment in machinery and equipment

Over the next 12 months, is your firm's investment spending on machinery and equipment expected to be higher, lower or the same as over the past 12 months?

— Investment in machinery and equipment, BOS balance of opinion (t+1)

— Growth in real business investment in machinery and equipment (right scale)
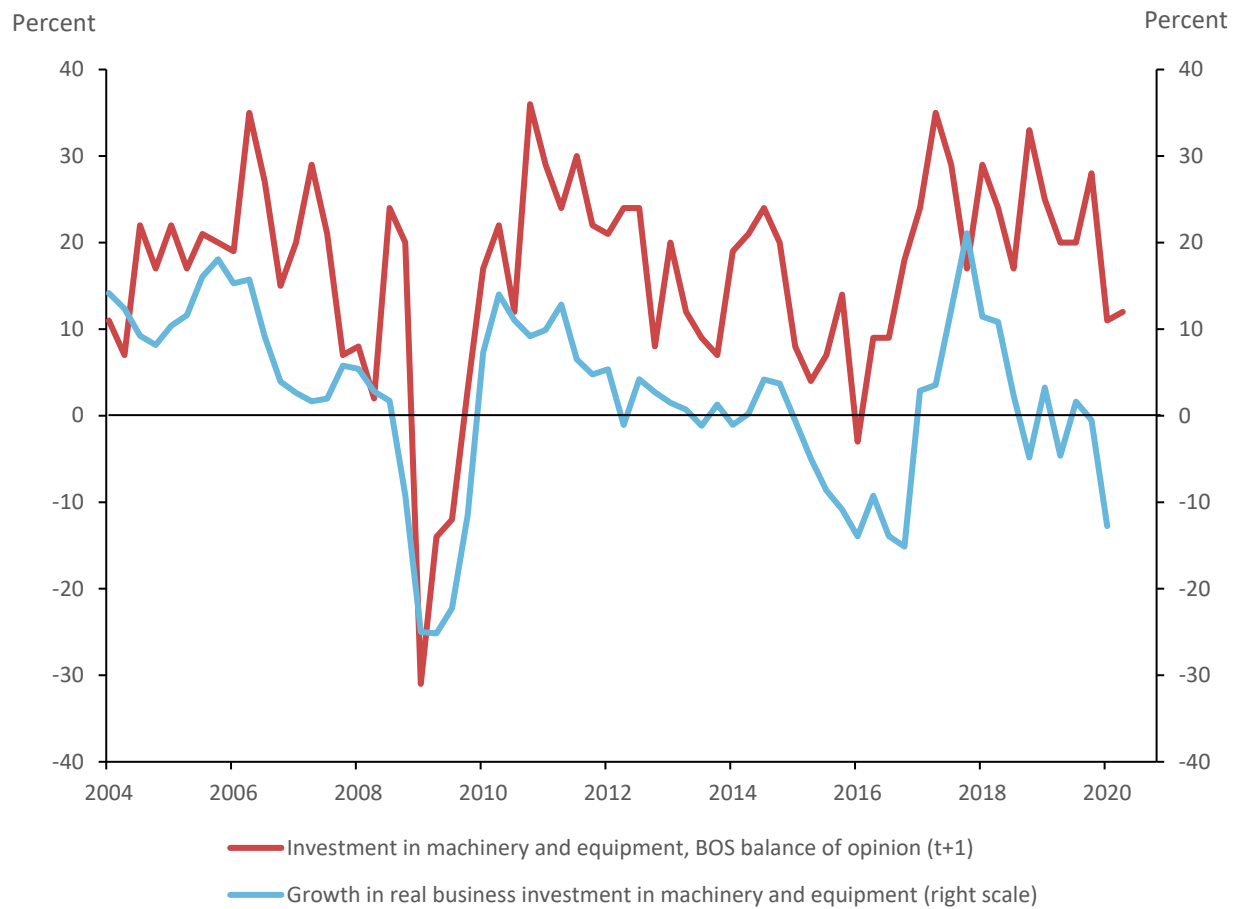
Sources: Statistics Canada and Bank of Canada calculations

Table A-1.5: Correlations between BOS balance of opinion on investment in machinery and equipment and year-over-year growth of real investment in machinery and equipment (at time *t*)

t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
-0.04	0.11	0.24	0.39	0.51	0.59	0.50	0.37	0.19

- The balance of opinion on machinery and equipment investment intentions shows a *moderate* correlation with the growth of real business investment in machinery and equipment at *t*+1.

A1.6 Employment

Chart A-1.6: Balance of opinion on employment

Over the next 12 months, is your firm's level of employment expected to be higher, lower or the same as over the past 12 months?
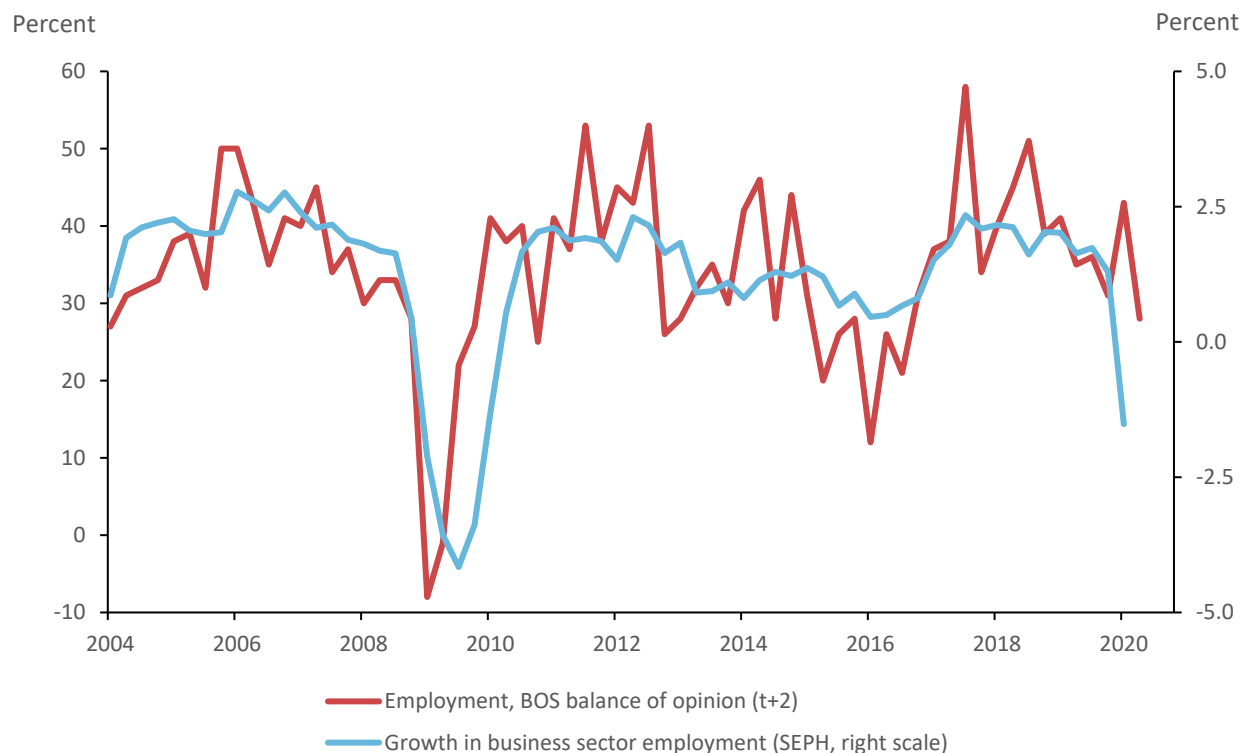
Employment, BOS balance of opinion (t+2)

Growth in business sector employment (SEPH, right scale)

Note: SEPH is the Survey of Employment, Payrolls and Hours.
Sources: Statistics Canada and Bank of Canada calculations

Table A-1.6: Correlations between BOS balance of opinion on employment and year-over-year growth of employment, excluding the public administration, health and education sectors (at time *t*)[15]

t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
-0.02	0.03	0.06	0.19	0.39	0.57	0.70	0.64	0.50

Note: The employment data used to calculate these correlations are from Statistics Canada's Survey of Employment, Payrolls and Hours.

- The balance of opinion on employment intentions shows a *moderately strong* correlation with growth of employment, excluding the public administration, health and education sectors (Survey of Employment, Payrolls, and Hours) at *t*+2 and *t*+3.

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[15] The BOS sample frame, discussed in Section 3.1, more closely matches that of the Survey of Employment, Payrolls and Hours (SEPH). The correlations between the BOS balance of opinion on employment and SEPH are closer than those between the BOS balance of opinion on employment and the Labour Force Survey (LFS).

A1.7 Wage growth

Chart A-1.7: Balance of opinion on the change in wage growth

Over the next 12 months, are your firm's increases in labour costs expected to be higher, lower or the same as over the past 12 months?

Note: SEPH is the Survey of Employment, Payrolls and Hours.
Sources: Statistics Canada and Bank of Canada calculations

Table A-1.7: Correlations between BOS balance of opinion on wage growth and year-over-year growth of employment, excluding the public administration, health and education sectors (at time *t*)

t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
-0.10	0.00	0.13	0.35	0.60	0.80	0.85	0.74	0.52

Note: The employment data used to calculate these correlations are from Statistics Canada's Survey of Employment, Payrolls and Hours.
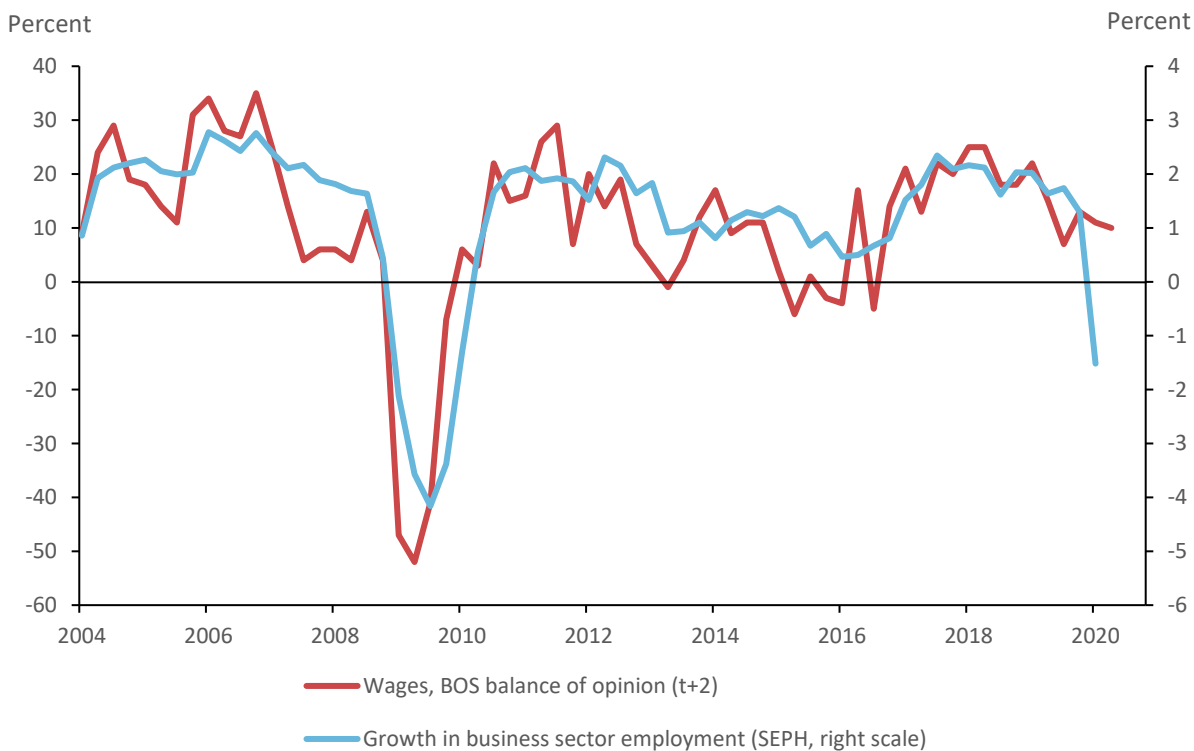
- The balance of opinion on wage growth shows a *strong* correlation with growth of employment, excluding the public administration, health and education sectors (SEPH) at *t*+2 and *t*+1, and a *moderately strong* correlation at *t*+3. It shows a *weak* correlation with business sector wages (not shown here; available upon request). For more details, see Bank of Canada 2018b.

A1.8 Capacity pressures

Chart A-1.8: Share of firms reporting capacity pressures

How would you rate your firm's current ability to meet an unexpected increase in demand or sales? No difficulty, some difficulty, or significant difficulty?

BOS share of firms reporting capacity pressures (significant pressures are double-weighted)

Output gap (extended multivariate filter, right scale)

Output gap (integrated framework, right scale)

Table A-1.8: Correlations between the percentage of firms reporting some or significant capacity pressures and the output gap (at time _t_)

	_t_-4	_t_-3	_t_-2	_t_-1	_t_	_t_+1	_t_+2	_t_+3	_t_+4
EMVF	0.26	0.40	0.57	0.71	0.77	0.74	0.64	0.56	0.44
IF	0.31	0.43	0.57	0.68	0.68	0.60	0.48	0.39	0.25

Note: Firms facing significant capacity pressures are double-weighted. EMVF is extended multivariate filter; IF is integrated framework.

- The percentage of firms reporting some or significant capacity pressures shows a *moderately strong* correlation with the output gap (EMVF) at _t_, _t_+1, _t_-1 and _t_+2, and with the output gap (IF) at _t_-1, _t_ and _t_+1.

A1.9 Labour shortages

Chart A-1.9: Share of firms reporting labour shortages

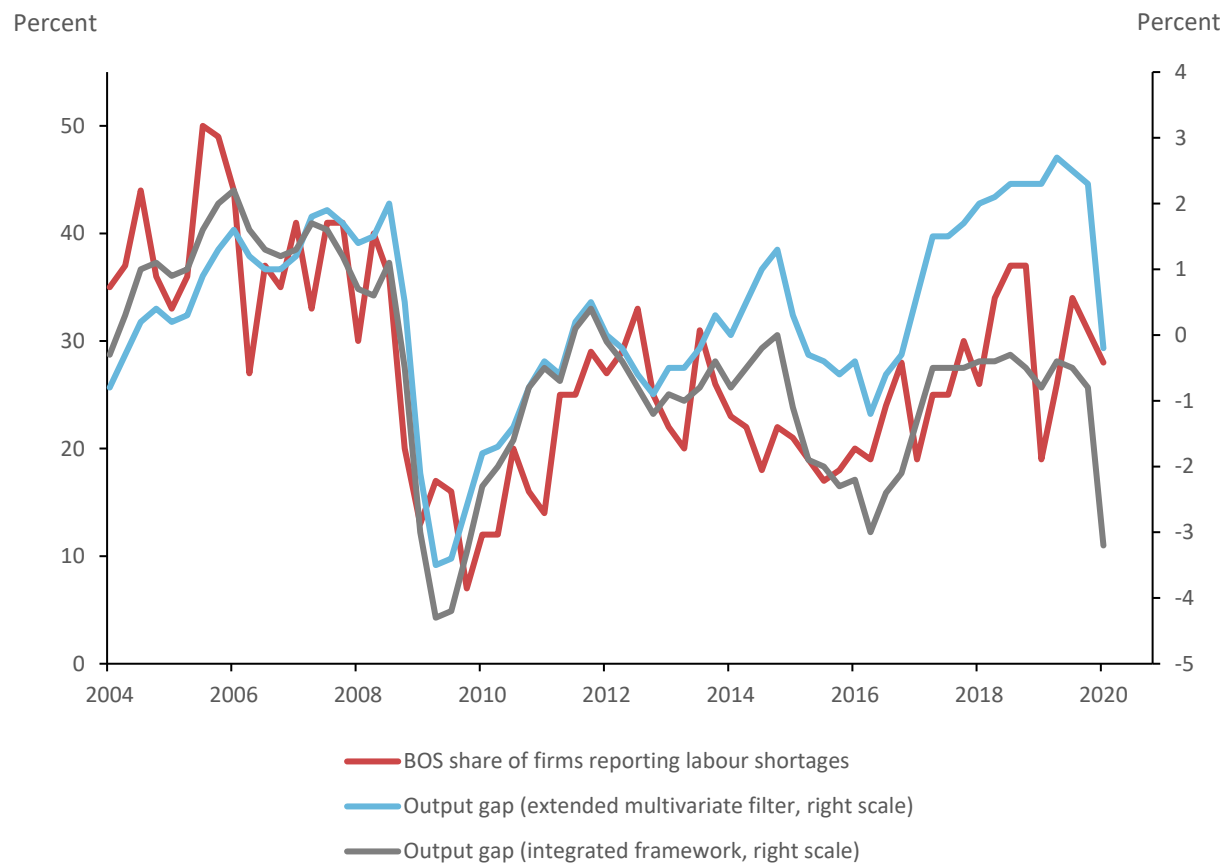*Does your firm face shortages of labour that restrict your ability to meet demand?*

Percent   Percent

BOS share of firms reporting labour shortages

Output gap (extended multivariate filter, right scale)

Output gap (integrated framework, right scale)

Table A-1.9: Correlations between the percentage of firms reporting labour shortages and the output gap (at time *t*)

	t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
EMVF	0.21	0.31	0.39	0.49	0.55	0.55	0.46	0.37	0.31
IF	0.50	0.60	0.67	0.74	0.76	0.73	0.62	0.53	0.46

Note: EMVF is extended multivariate filter; IF is integrated framework.

- The labour shortages indicator shows a *moderately strong* correlation with the output gap (integrated framework) at *t*, *t*-1, and *t*+1.

A1.10 Labour shortage intensity

Chart A-1.10: Balance of opinion on intensity of labour shortages

Compared with 12 months ago, are labour shortages generally more intense, less intense or about the same intensity?
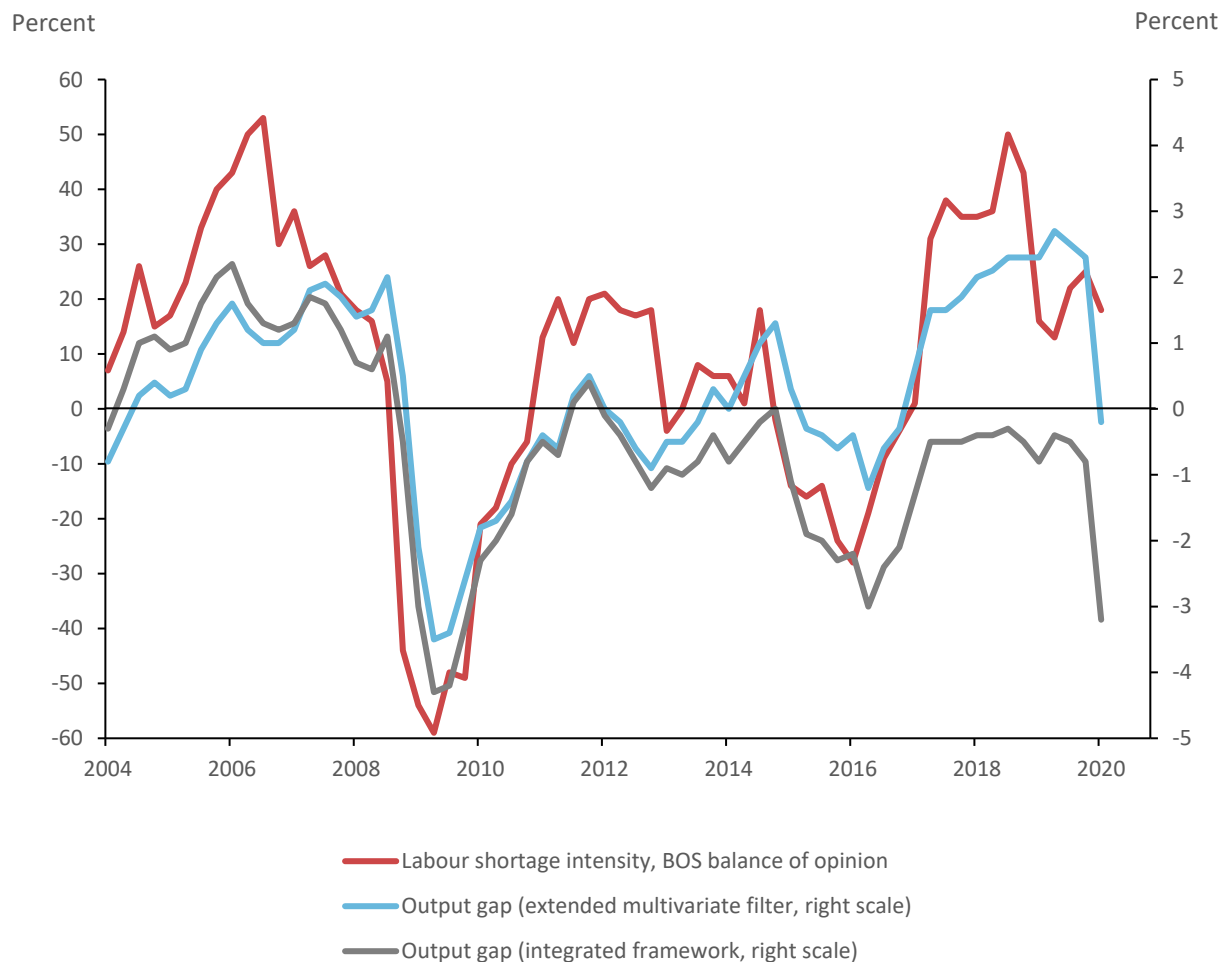

— Labour shortage intensity, BOS balance of opinion
— Output gap (extended multivariate filter, right scale)
— Output gap (integrated framework, right scale)

Table A-1.10: Correlations between BOS balance of opinion on intensity of labour shortages and the output gap (at time *t*)

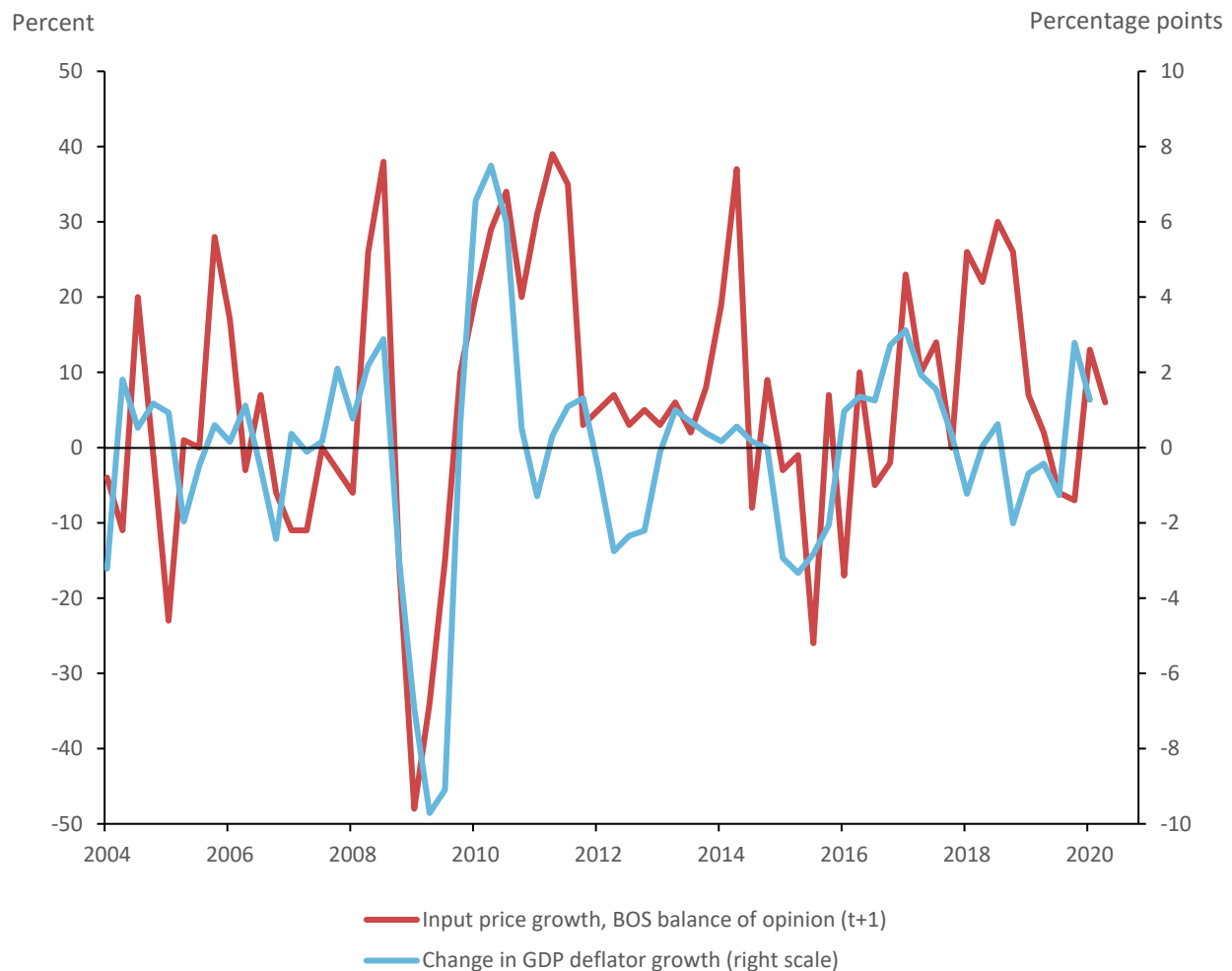|	*t*-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
EMVF	0.07	0.26	0.44	0.62	0.76	0.82	0.78	0.70	0.58
IF	0.17	0.35	0.53	0.69	0.77	0.79	0.72	0.61	0.47

Note: EMVF is extended multivariate filter; IF is integrated framework.

- The balance of opinion on the intensity of labour shortages shows a *strong* correlation with the output gap (EMVF) at time *t*+1 and a *moderately strong* correlation with the same variable at time *t*+2, *t* and *t*+3.

- It also shows a *moderately strong* correlation with the output gap (IF) at time *t*+1, *t*, *t*+2 and *t*-1.

A1.11 Growth of input prices

Chart A-1.11: Balance of opinion on the change in input price growth

Over the next 12 months, are prices of products or services purchased expected to increase at a greater rate, lesser rate or at the same rate as over the past 12 months?

Percent   Percentage points

Input price growth, BOS balance of opinion (t+1)

Change in GDP deflator growth (right scale)

Sources: Statistics Canada and Bank of Canada calculations

Table A-1.11: Correlations between BOS balance of opinion on the change in input price growth and the change in year-to-year growth of the GDP deflator (at time *t*)
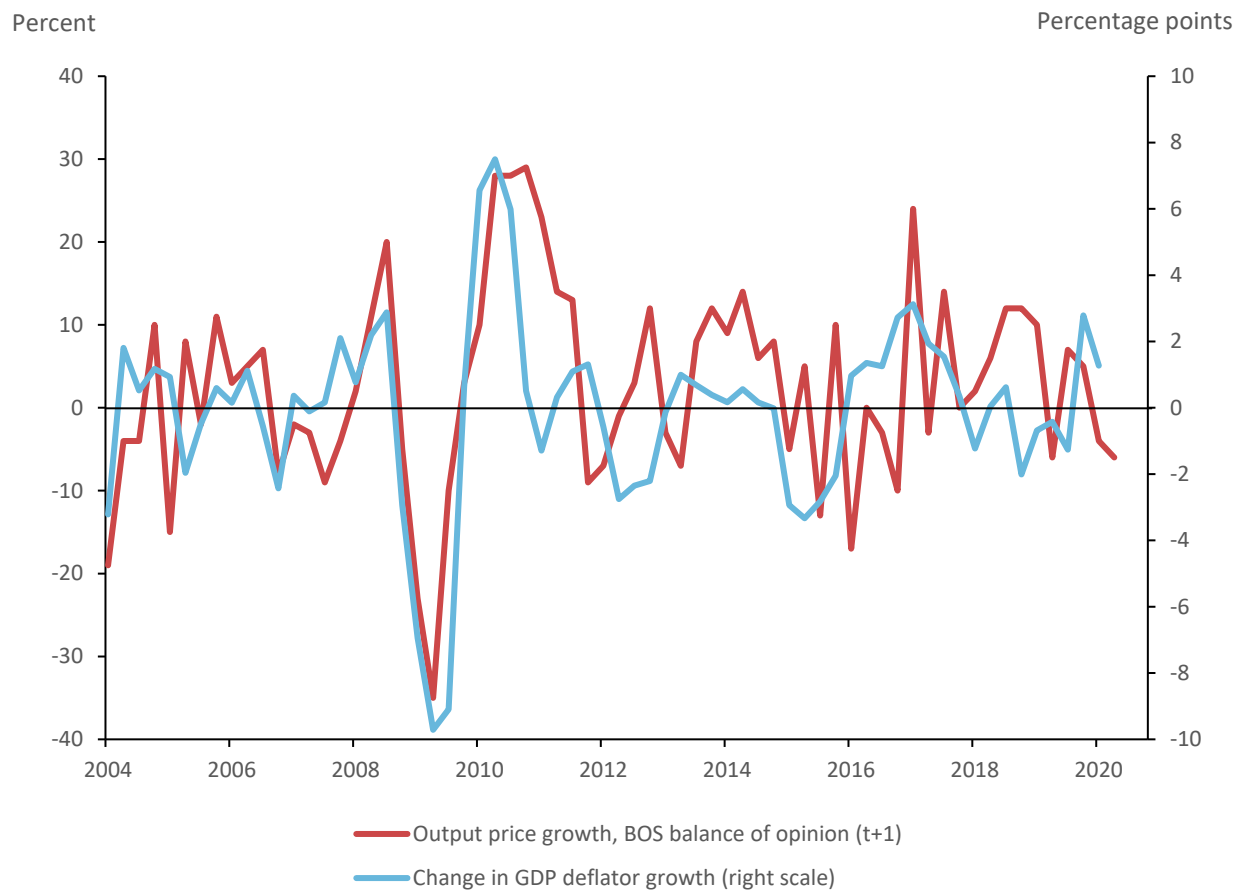
t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
-0.04	0.07	0.05	0.17	0.42	0.53	0.43	0.07	-0.37

- The balance of opinion on the change in input price growth shows a *moderate* correlation with the change in growth of the GDP deflator at *t*+1.

A1.12 Growth of output prices

Chart A-1.12: Balance of opinion on the change in output price growth

Over the next 12 months, are prices of products or services sold expected to increase at a greater rate, lesser rate or at the same rate as over the past 12 months?

Sources: Statistics Canada and Bank of Canada calculations

Table A-1.12: Correlations between BOS balance of opinion on the change in output price growth and the change in year-to-year growth of the GDP deflator (at time *t*)

t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
-0.30	-0.07	0.06	0.30	0.49	0.54	0.36	0.01	-0.32

- The balance of opinion on the change in output price growth shows a *moderate* correlation with the change in growth of the GDP deflator at time *t*+1.
- It also shows a *moderate* correlation with the total consumer price index year-over-year growth at *t*+2 (not shown here; available upon request).

A1.13 Inflation expectations

Chart A-1.13: Inflation expectations index

Over the next two years, what do you expect the annual rate of inflation to be, based on the Canadian consumer price index?

BOS inflation expectations index (t+2)
Consumer price index inflation, 2-year average (right scale)

Sources: Statistics Canada and Bank of Canada calculations

Note: Before 2001Q2, the index is the weighted average of three options: index = (percentage of respondents expecting below 1 percent) x 0.005 + (percentage of respondents expecting 1 to 3 percent) x 0.02 + (percentage of respondents expecting above 3 percent) x 0.035. After 2001Q2, the index is a weighted average of the four options: index = (percentage expecting below 1 percent) x 0.005 + (percentage expecting 1 to 2 percent) x 0.015 + (percentage expecting 2 to 3 percent) x 0.025 + (percentage expecting above 3 percent) x 0.035. There are no midpoints for the below 1 percent and above 3 percent options. Given the inflation environment of this sample, 0.5 percent and 3.5 percent were chosen to represent these options.

Table A-1.13: Correlations between the BOS inflation expectations index and the prior two-year moving average of CPI inflation (at time *t*)

t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
0.12	0.26	0.31	0.37	0.47	0.61	0.66	0.57	0.36

- The inflation expectations index shows a *moderately strong* correlation with the prior two-year moving average of consumer price inflation at *t*+2 and *t*+1.
- It also shows a *moderately strong* correlation with the output gap (integrated framework) at *t*+1 and *t* (not shown here; available upon request).

A1.14 Credit conditions

Chart A-1.14: Balance of opinion on credit conditions

Over the past three months, how have the terms and conditions for obtaining financing changed? Have they tightened, eased, or remained unchanged compared with the previous three months?

Credit conditions, BOS balance of opinion (t+2)

Real business investment (values multiplied by -1, right scale)
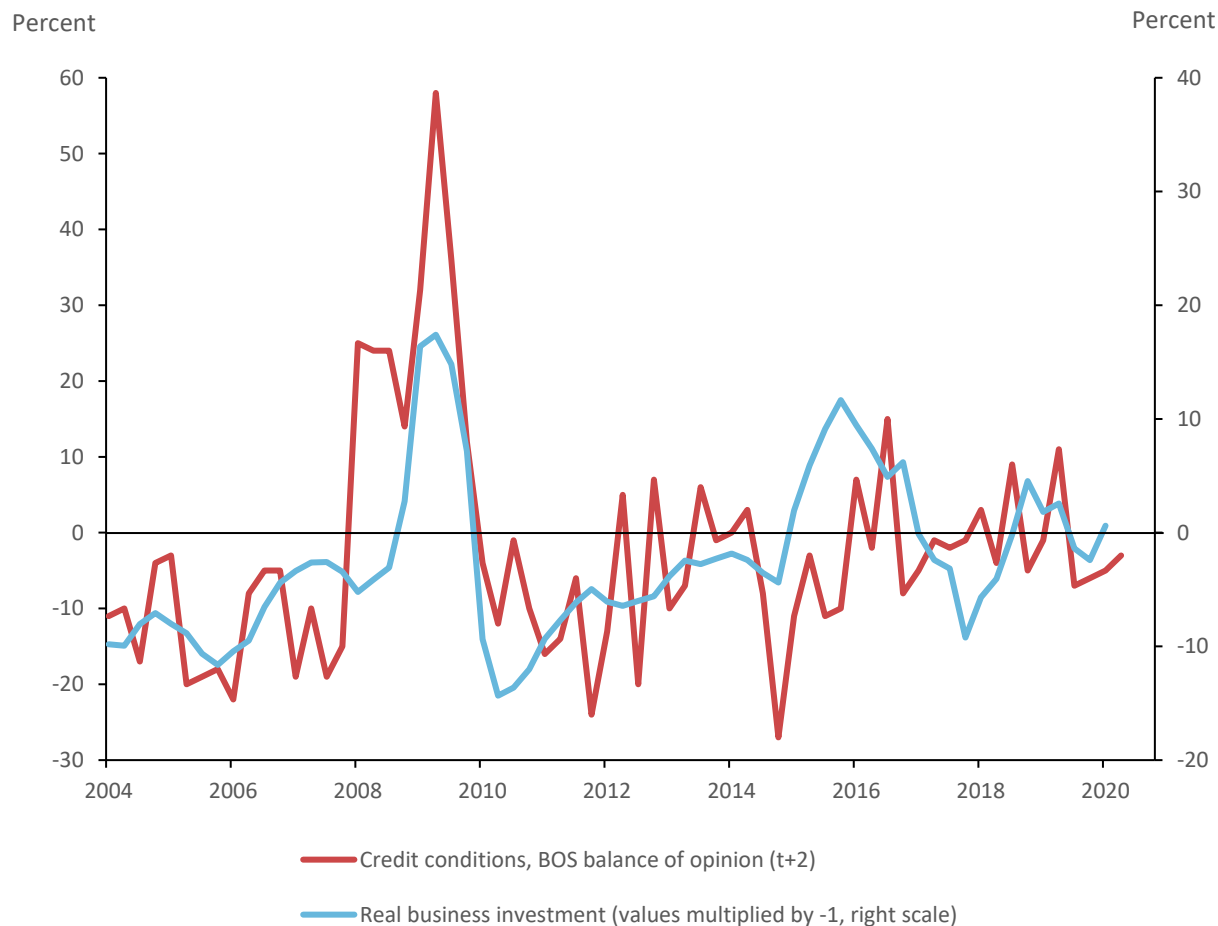
Sources: Statistics Canada and Bank of Canada calculations

Table A-1.14: Correlations between BOS balance of opinion on credit conditions and the change in year-to-year growth of business investment in machinery and equipment (at time *t*)

t-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4
0.06	0.08	0.15	0.23	0.38	0.53	0.57	0.52	0.36

- The balance of opinion on credit conditions is *moderately* correlated with the change in year-to-year growth of business investment in machinery and equipment at *t*+2 and *t*+1.

Appendix 2: Additional BOS data

This appendix presents several of the data series captured by the BOS that are not regularly published. These indicators have all appeared either in special boxes in the quarterly BOS publication or in the Bank's *Monetary Policy Report*. This appendix also includes background information on the indicators to help the reader understand how these additional BOS data are used by regional office staff.

A2.1 How do the BOS results break down regionally?

The BOS indicator is a summary measure that captures common movements in responses to the core set of survey questions. It has been published in each quarterly BOS publication since spring 2016. A regional variant of the BOS indicator relies on the same questions but separates the responses across the five regions of Canada: the Atlantic provinces; Quebec; Ontario; the Prairie provinces, Nunavut and the Northwest Territories; and British Columbia and Yukon. This allows regional office staff to analyze regional trends in the level of business sentiment. The indicator is above zero when business confidence is above its historical average.

Chart A-2.1: The regional BOS indicator and its regional contributions

Standardized units

Legend: Atlantic, Ontario, Quebec, Prairies, BC, Regional BOS indicator
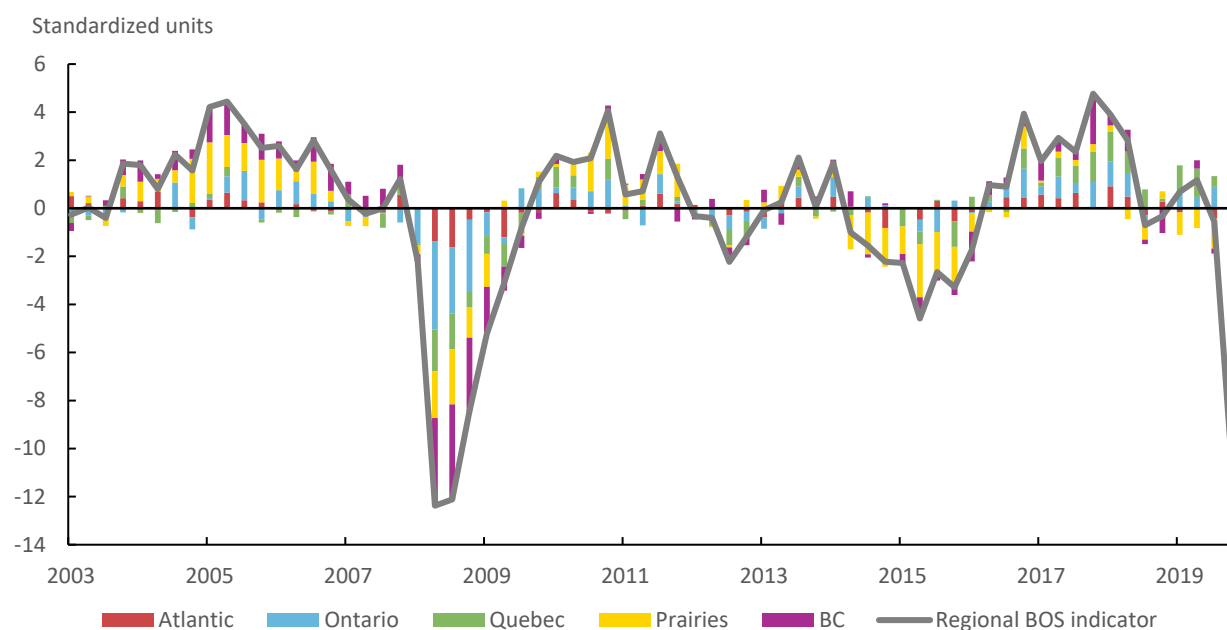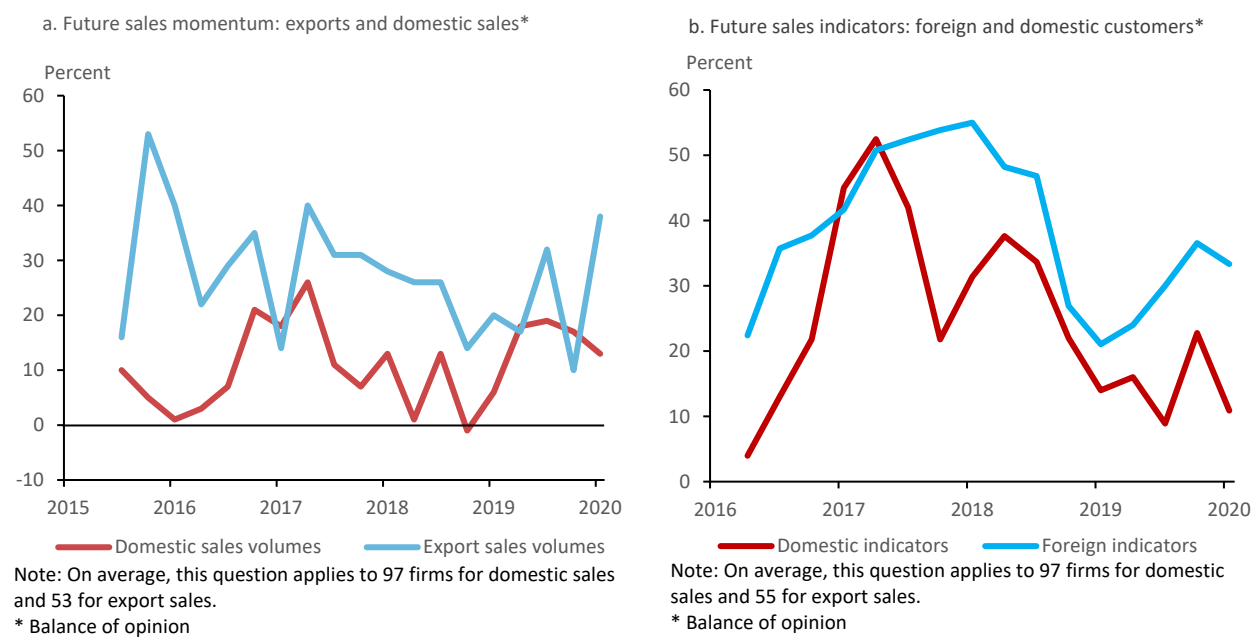
Results show the regional divergence in sentiment in 2019. On one hand, Quebec, Ontario and British Columbia often showed positive sentiment in this period, reflective of the strength of the domestic market in these regions. On the other hand, the Prairies region generally displayed negative sentiment relative to the average, weighing on overall sentiment. This reflects the challenges faced by the energy sector in this period with low oil prices and limited take-away capacity. In contrast, 2005 and 2017 were periods of broad positive sentiment, while widespread negative sentiment was revealed in 2008 and 2020.

A2.2 How do firms' sales outlooks differ between their foreign and domestic customers?

To disentangle domestic and foreign demand trends, Bank staff ask firms to differentiate their sales outlook between Canadian and foreign customers. Questions were added to the survey in 2015Q3 that ask firms about their expected change in growth of both domestic and export sales over the next 12 months. In 2016Q2, additional questions were added about firms' indicators of future domestic and export sales. Using these questions, Bank staff can open a dialogue with firms about the differences in their outlooks for export and domestic sales. Information from these discussions contributes to the quarterly BOS narrative. A full assessment of these questions is left for future work.
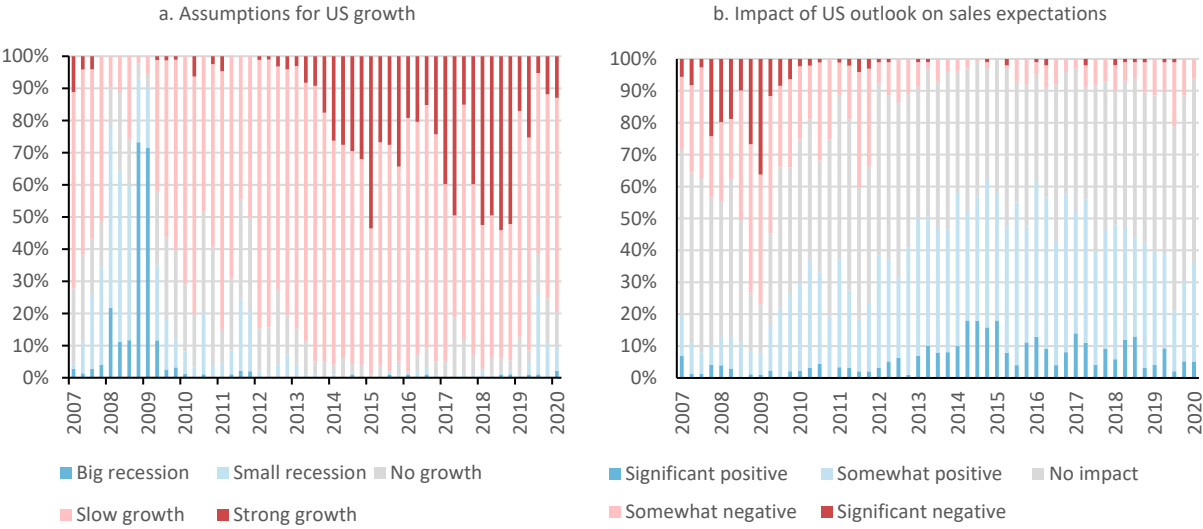
Chart A-2.2: Firms' expectations for domestic and export sales

a. Future sales momentum: exports and domestic sales*

b. Future sales indicators: foreign and domestic customers*

Note: On average, this question applies to 97 firms for domestic sales and 53 for export sales.
* Balance of opinion

Note: On average, this question applies to 97 firms for domestic sales and 55 for export sales.
* Balance of opinion

A2.3 How are firms' expectations about the US economy evolving, and what impact do firms see on their own future sales?

Canada is a small open economy that depends heavily on markets in the United States as a source of demand for its goods and services. Therefore, shocks to US economic growth can impact the sentiment of Canadian firms and their decisions. To better understand this dynamic, regional office staff ask BOS participants two related questions. Firms are asked about their assumptions or expectations for US economic growth, and to characterize the impact of those expectations on their future sales growth, whether direct or indirect (see Bank of Canada 2017).

Chart A-2.3: Firms' outlook for US sales and economic growth

a. Assumptions for US growth

Legend: ■ Big recession ■ Small recession ■ No growth ■ Slow growth ■ Strong growth

b. Impact of US outlook on sales expectations

Legend: ■ Significant positive ■ Somewhat positive ■ No impact ■ Somewhat negative ■ Significant negative

BOS results show that Canadian firms' sentiment about the US economic outlook began to deteriorate in 2007 with the start of the global financial crisis, and by 2008Q4, a strong majority of firms surveyed expected a recession. The weak US recovery following the crisis resulted in most firms expecting slow growth (**Chart A-2.3a**) Likewise, leading up to the global financial crisis, firms reported that their outlook for US economic growth was weighing on their sales outlook. In the aftermath of the crisis, the headwind began to dissipate and has more recently supported firms' sales expectations (**Chart A-2.3b**).

A2.4 What factors drive firms' sales expectations and investment intentions?

Firms' responses to BOS questions are often on a three-point scale: positive, negative or stable. But Bank staff are just as interested in why a firm has a particular outlook. Understanding the factors that support (i.e., drivers) or hold back (i.e., impediments) firms' investment plans and sales expectations helps build the Bank's narrative in these areas. To systemize the collection of this information, staff in regional offices listen carefully to the qualitative descriptions firms provide and record responses when they fall into certain categories. **Chart A-2.4** presents the main categories and recent trends.

Chart A-2.4: Drivers of firms' future sales expectations, 2018Q2 to 2020Q2
Percentage of firms

a. Drivers of firms' domestic sales
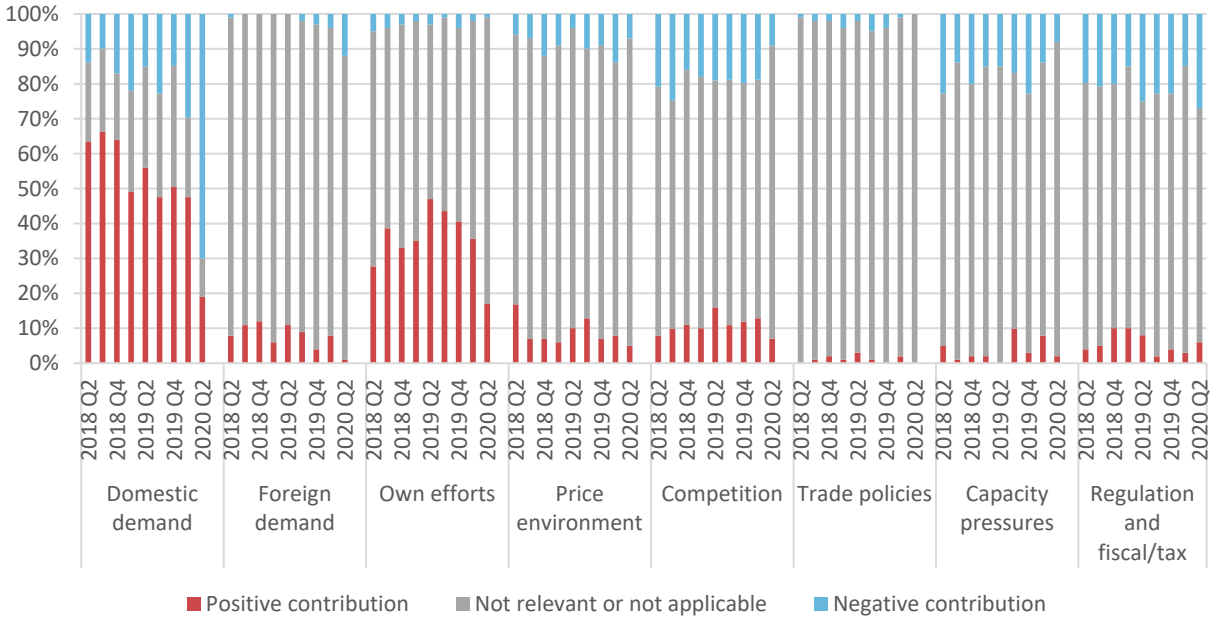
b. Drivers of firms' export sales
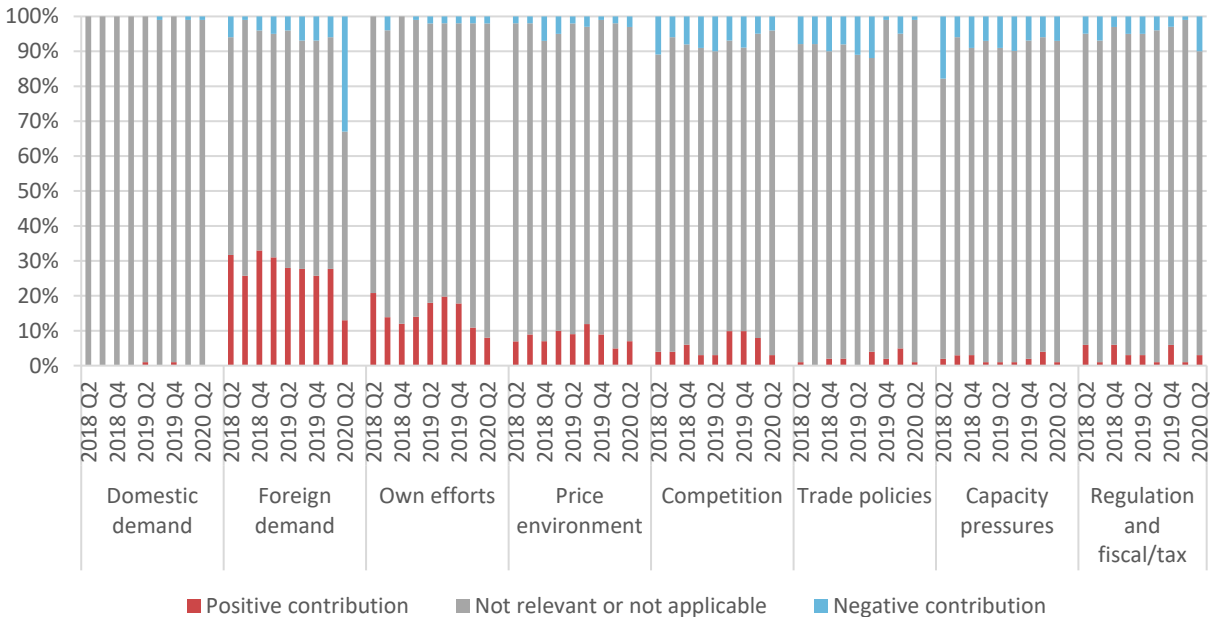
For sales expectations, firms are asked to differentiate between the drivers of their domestic sales (**Chart A-2.4a**) and those of their foreign sales (**Chart A-2.4b**).

- Firms' own efforts—including sales and promotions, new product launches or store openings and increased marketing initiatives—support their sales outlook in both domestic and foreign markets.

The strength of demand, however, can have a positive or negative impact, depending on economic conditions. For example, it was the main impediment to firms' sales in the early phase of the COVID-19 pandemic.
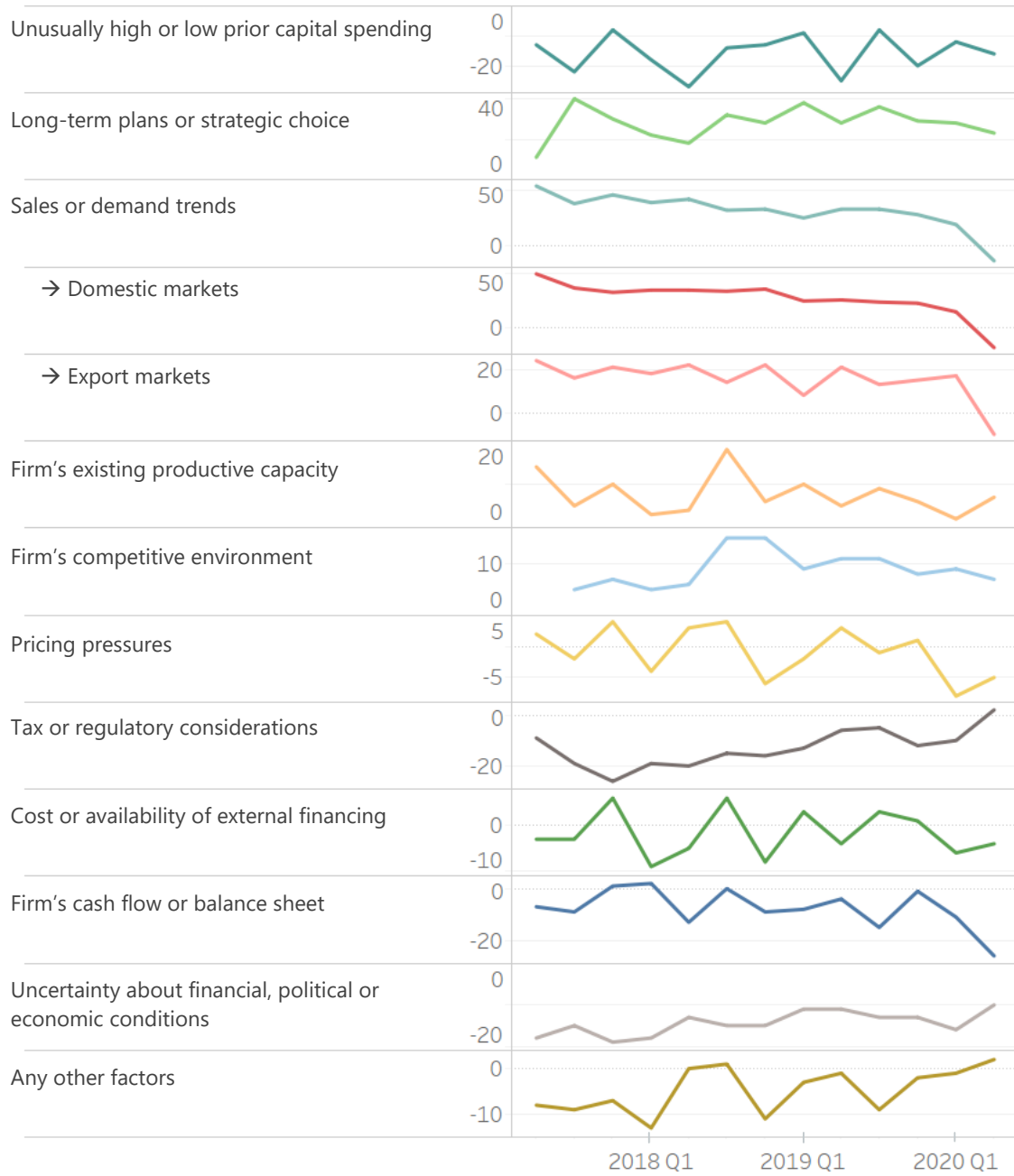
- Price expectations and pricing strategies can affect a firm's outlook. For instance, a firm may raise prices to rebuild margins or increase profits, or lower them to boost demand. Price effects also include the impact of exchange rate variations on exporters' and importers' expectations.
- Changes in competitive forces can affect a firm's sales outlook in different ways, depending on how they impact the firm's competitiveness and how the firm responds. On net, since 2018, competition has tended to weigh on firms' outlook domestically, whereas in international markets the impact has been mixed.
- Domestically, regulations and taxes tend to hold back sales, while foreign regulations and trade policies have infrequently been raised as an issue.
- Production capacity can help firms' sales outlook if production can easily be increased to meet demand. In contrast, capacity pressures can hinder firms' sales expectations if resources are not readily available to scale up production. On net, firms reported that capacity was an impediment to their sales before the pandemic, when the overall economy was operating at close to capacity.

For investment intentions, firms are asked about a number of real, financial and sentiment-based drivers (**Chart A-2.4c**).

- Firms' sales in both domestic and export markets, along with firms' long-term strategies that are often linked to their competitive environment, support firms' investment efforts. Investment from prior years generally affect firms' plans.
- Some firms planning to invest are performing well and starting to face capacity constraints, and therefore see their existing capacity limits as a catalyst for their investment plans. Competitive forces push firms to invest as they seek ways to outperform in the market.
- The cost of financing and balance sheet/cash flow considerations are, on average, neutral for investment plans. However, this masks the divergence between firms that are performing well (and can fund investments through cash or borrowing) and firms that are not.
- Uncertainty has played a significant role on firms' investment plans over the period studied.

Chart A2.4c: Drivers of investment plans

Percentage of firms citing a driver as positive minus those citing it as negative (not mutually exclusive)

- Unusually high or low prior capital spending
- Long-term plans or strategic choice
- Sales or demand trends
  - → Domestic markets
  - → Export markets
- Firm's existing productive capacity
- Firm's competitive environment
- Pricing pressures
- Tax or regulatory considerations
- Cost or availability of external financing
- Firm's cash flow or balance sheet
- Uncertainty about financial, political or economic conditions
- Any other factors
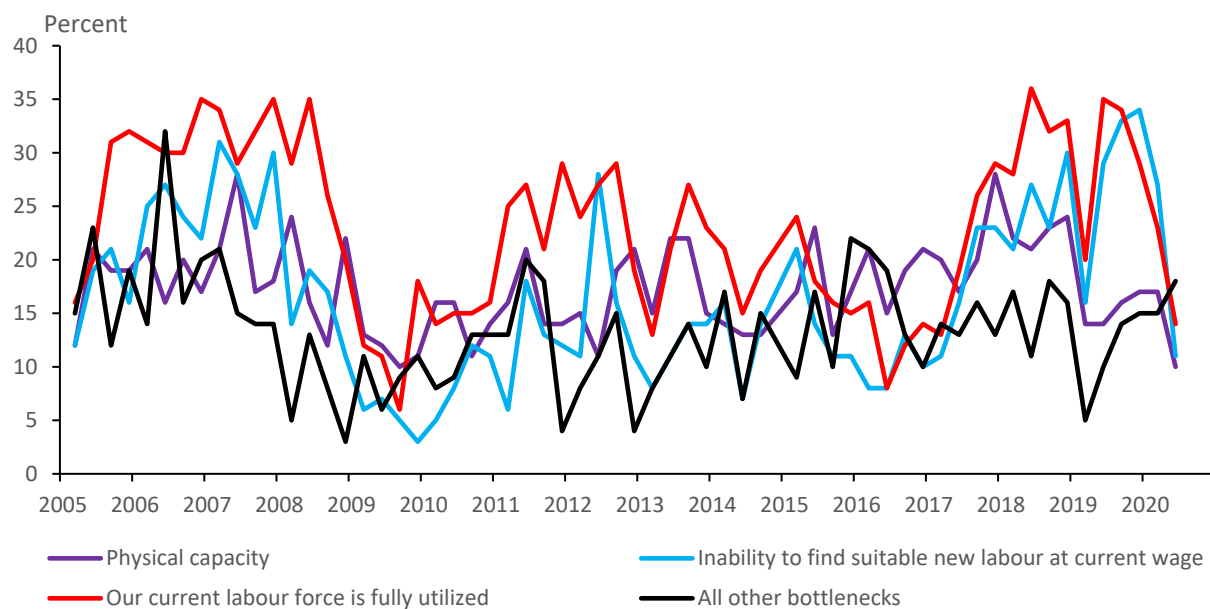
2018 Q1   2019 Q1   2020 Q1

A2.5 What supply bottlenecks do firms face in meeting additional demand?

Since 1999Q3, all firms participating in the BOS are asked to rate their ability to meet an unexpected increase in demand or sales (see Appendix A1.8). This allows the Bank to better monitor the evolution of the output gap. Since the 2004Q4 survey, when firms report that they would face *some* or *significant difficulties* meeting this increased demand, regional office staff follow up with a second question (**Chart A-2.5**) to understand the nature of supply bottlenecks (Bank of Canada 2018c).

The quarterly BOS publication often discusses the results from this probing question in its section on production capacity. These results provide useful insight into the sources of capacity constraints in the Canadian economy. For instance, the three most common types of bottlenecks mentioned by firms are a fully utilized labour force, an inability to find new labour, and physical capacity issues. These bottlenecks peaked in the years before the 2008–09 recession—a period generally considered to be one of excess demand for the Canadian economy. During the 2008–09 recession and the 2014–16 oil price shock, the two indicators of labour market bottlenecks (**Chart A-2.5**, red and blue lines) fell more sharply than the indicator of physical capacity bottlenecks (**Chart A-2.5**, purple line). The 2017 surge in Canadian output growth pushed up all three indicators. Other supply bottlenecks (**Chart A-2.5**, black line) include raw material constraints—such as quotas or an inability to source critical inputs—as well as transport, logistics, regulatory or any other type of supply constraint. These historical examples illustrate how to interpret these indicators.

Chart A-2.5: **Bottlenecks to meeting an unexpected increase in demand (%)**

What are the most important obstacles or bottlenecks to meeting an unexpected increase in demand?

Legend:
- Physical capacity
- Inability to find suitable new labour at current wage
- Our current labour force is fully utilized
- All other bottlenecks

A2.6 How have capacity pressures evolved?

The BOS plays an important role in the Bank's assessment of the current state of the output gap. A question was added to the survey in 2015Q3 regarding the evolution of firms' capacity pressures (Bank of Canada 2017). Firms are asked about the change in current capacity pressures compared with the same time last year (**Chart A-2.6**). Over time, these results are expected to shed light on some of the trends regarding the output gap.

Chart A-2.6: Firms' capacity pressures compared with 12 months ago

Compared with 12 months ago, are capacity pressures generally more intense, less intense or the same?*

Percent

—— Intensity of capacity pressures
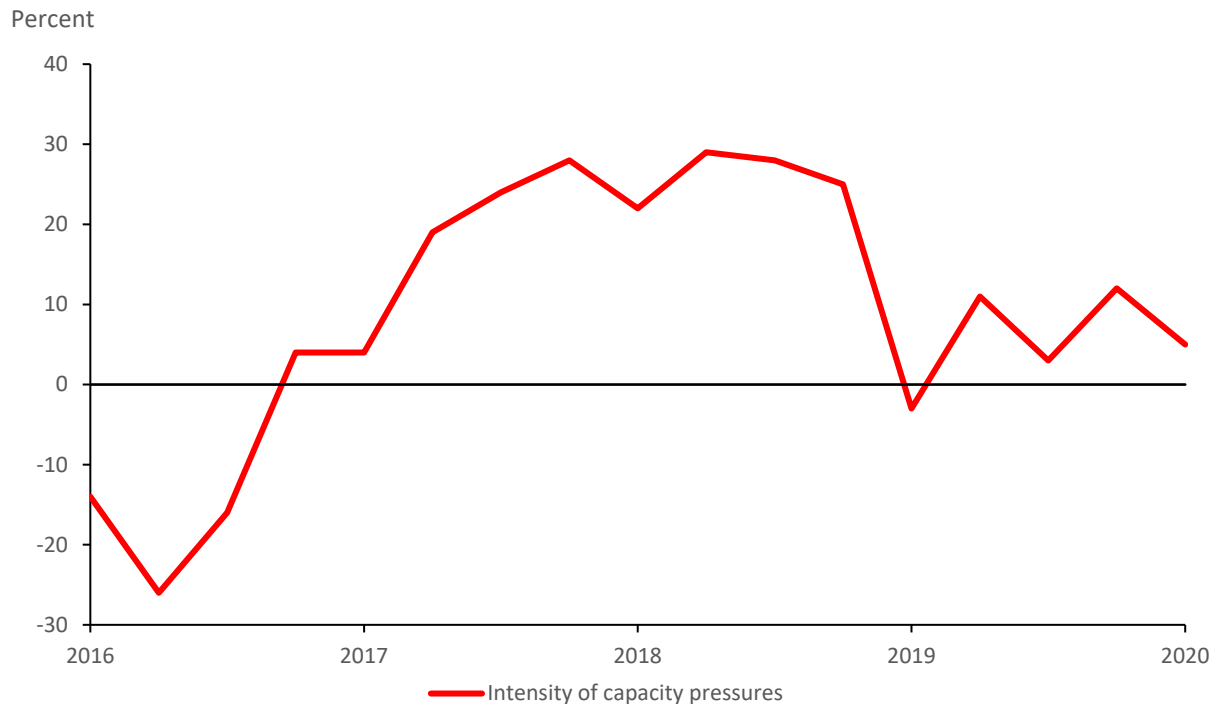
* Balance of opinion: percentage of firms reporting capacity pressures are more intense minus percentage of those reporting capacity pressures are less intense

This indicator has not yet been assessed because of the limited time span over which the question has been asked. However, it is telling that throughout 2016—after the oil price shock hit the Canadian economy—firms were reporting a reduction in the intensity of capacity pressures compared with a year ago, and that throughout 2017 and 2018—a period of strong economic growth—firms were reporting the opposite. An open-ended discussion around the dynamics of firms' capacity pressures helps to support this analysis.