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Toronto Metropolitan University

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FLYING TOO CLOSE TO THE SUN

Overoptimism of tech companies during the pandemic

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Foreward

The COVID-19 pandemic tested businesses in every industry, but for the technology sector, in contrast, the period of the pandemic was one of the most expansive in recent history. Many tech firms experienced record growth, had an easier time attracting skilled workers, gaining better access to funding, and facilitating major investments, Tech firms, moreover, were generally more optimistic about their economic outlook.

Looking back with the benefit of hindsight, we saw that tech firms wielded power that other firms did not. Indeed, the pandemic made clear how much we depend on digital technology, as well as the systemic importance and enormous power of the tech giants. More important, this period also gave rise to a new market for big tech — one in which startups and smaller tech companies grew rapidly. 2021 was a blockbuster year for mergers and acquisitions in Canada's tech industry. It was also a year in which, driven by the momentum of the stock market, a proliferation of small tech firms went public. Aggregate deal values alone reached a ten-year high of $93 billion in the fourth quarter of 2021. However, that momentum of growth quickly ran out of steam.

It's hard not to wonder now whether the tech sector was the canary in the coalmine as the sector ran into a slowing global economy in 2022 and began to downsize. In sharp contrast to a year earlier, by the second quarter of 2022 the biggest tech firms had begun major staff reductions. How did the one sector that weathered the devastating impact of the pandemic so well become one of the hardest hit in the post-pandemic era, and why?

As the Business Data Lab continues to advance its mission to democratize business data and generate timely insights for decision makers, this report marks the first time we made access to our Business Data Trust available to external researchers. Leveraging custom tabulations from the Canadian Survey on Business Conditions (CSBC), this report offers a compelling case study and improves our understanding of the early stages of the pandemic experience for technology firms in Canada. We could not be more excited about this productive partnership with our colleagues at the Dais at Toronto Metropolitan University.

I hope this report serves as a worthwhile reflection on the lessons we can learn from the tech sector's exuberance during a time when the rest of the economy was singing a different tune, and what it means for the new era of growth that lies ahead for this sector, which is so crucial to the overall economy.

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Introduction

When the global pandemic hit in March 2020, it quickly became evident that technology firms were well positioned to meet a surge in new demand spurred on by the emergency and to continue conducting their business digitally. In fact, globally, while only one in every three interactions with customers were digital in December 2019, by July 2020 this had risen to almost 60%.[1]

This brief looks at the different experiences of technology firms through the pandemic period, starting from before vaccines became available up to 2022, when more regular economic activity resumed after the pandemic. To do so, we rely on data from the Canadian Survey on Business Conditions (CSBC), a quarterly survey launched by Statistics Canada in partnership with the Canadian Chamber of Commerce Business Data Lab (BDL) during the pandemic.

The CSBC collects responses from over 15,000 companies, providing timely, relevant data on business conditions in Canada and businesses' expectations and views on emerging issues. Intended to help governments, chambers of commerce and business associations across Canada devise strategies to foster the growth of Canadian business, the survey is a regular gauge of business challenges and perspectives, with the aim of informing policy interventions that respond to real-time business concerns.

Our analytical framework focuses on three main drivers. First, we examine how companies in different industries perceived business challenges and understood their levels of business confidence during the pandemic. Second, we characterize their access to financial resources and the extent to which they relied on government support programs. Third, after understanding the challenges faced and the resources available, we look at the strategic choices businesses made, at both the macro (business strategy) and micro (employment policy and remote work) levels.

We find an industry with an abundance of confidence, with many making aggressive bets about continued growth for technology firms. This is reflected in the much higher likelihood of tech companies looking to acquire other companies, a trend driven by large tech companies: one in five large tech companies considered growth by acquisition in the third quarter of 2021.

As we have seen with the benefit of hindsight, such confidence was not rewarded for all companies, as the increased digital adoption during the pandemic did not prove as pervasive or persistent as many believed at the time.[2] While many are still actively examining the reasons behind such a reversal in technological adoption, some potential factors include the demand for human connections after a historic pandemic[3], a reversion to previous trends that often occurs after exceptional events[4] and imperfection of current technological solutions in providing adequate replacement for in-person activities — leading to the standardization of a hybrid work practice instead of fully in-person or fully remote work arrangements.[5] As a result, the largest tech companies are now grappling with the reality of missing growth expectations and having to reduce their workforces, which confers real human costs on all who lose their job: the first quarter of 2023 saw the largest number of public tech company lay-offs, affecting 160,000 employees globally.[6]

This brief does not focus on the recent downturn experienced by tech companies. The evidence we present here, however, is crucial to understanding the context of the downturn — in particular, whether the downturn signals something more significant. We believe the downturn, while not a cataclysmic event, is a cautionary tale. We emphasize the need for those working at the forefront of the innovation economy to be clear-minded and to delineate between an extraordinary event (the pandemic) and a continually changing world.

The Canadian Survey on Business Conditions

The first Canadian Survey on Business Conditions was fielded in April 2020, at the onset of the pandemic, to capture the unprecedented nature of the crisis. As the situation evolved, survey questions were varied dynamically based on consultation with governments, policymakers, researchers and businesses to ensure actionable insights are provided when most needed.

The survey typically captures more than 15,000 responses each quarter, via an electronic questionnaire, using a stratified random sample of business establishments with employees, classified by geography, industry sector and size. Population totals are estimated using calibration weights.

As *Table 1* shows, there were no large variations in the share of technology businesses across different survey waves, providing a fair and consistent snapshot to compare across sectors.

TABLE 01

Number and share of survey responses by firm group, 2021 Q1 to 2022 Q2

Period	Technology firms	Non-tech goods firms	Non-tech services firms
	Number (% of total)		
Q1 2021	743 (5.1)	3,376 (23.3)	10,385 (71.6)
Q2 2021	815 (5.1)	3,607 (22.7)	11,484 (72.2)
Q3 2021	1,101 (7.0)	3,910 (24.9)	10,676 (68.1)
Q4 2021	1,075 (6.9)	3,414 (22.0)	11,040 (71.1)
Q1 2022	938 (5.6)	3,882 (23.3)	11,846 (71.1)
Q2 2022	854 (5.4)	4,149 (26.3)	10,764 (68.3)

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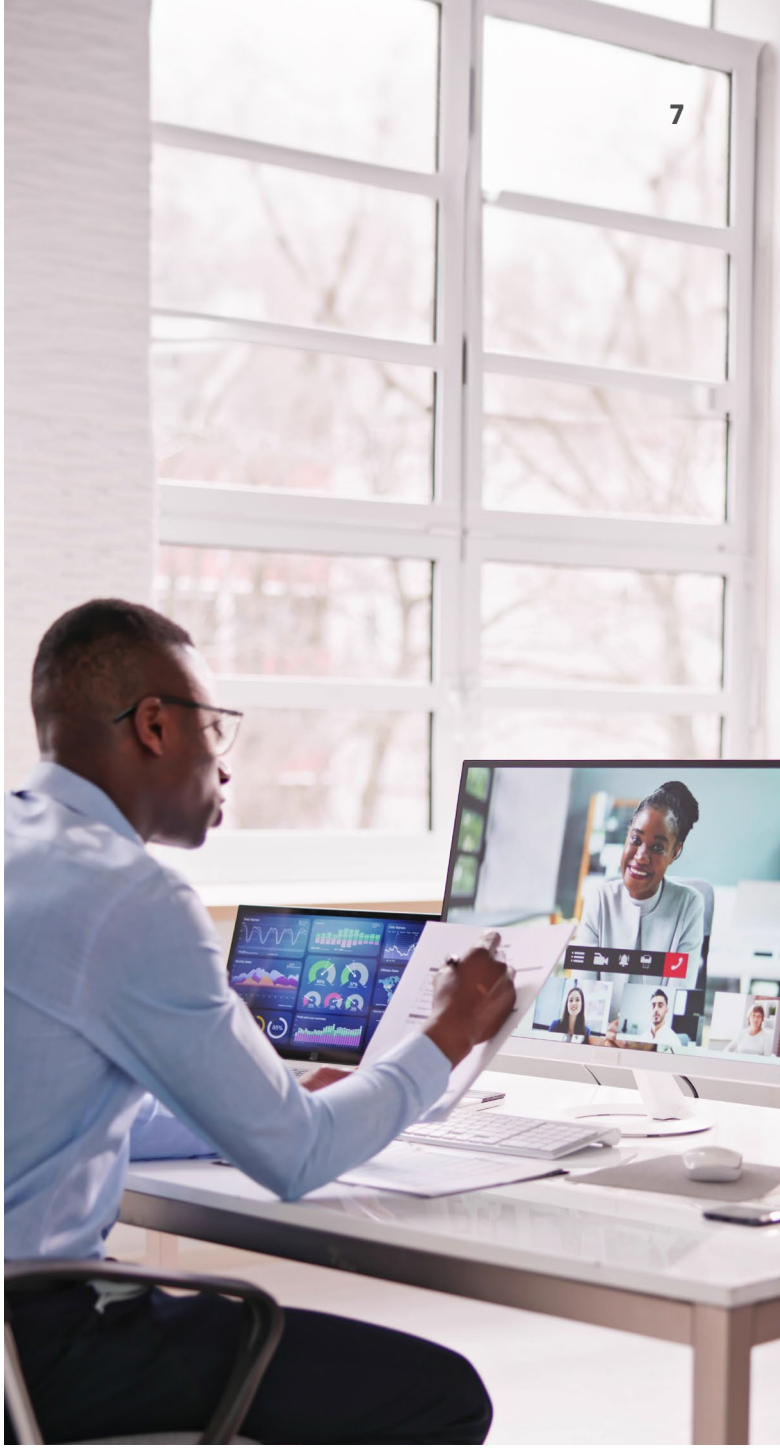
The experience of tech companies through the pandemic



Business Confidence

A rapidly changing economic outlook and evolving responses to the pandemic were core drivers of business decisions during the COVID-19 pandemic. While the public perceived technology firms as being resilient to economic hardship early in the pandemic, this perception was subverted. In late 2022, many prominent tech companies, which had grown rapidly to meet surging demand from countless households living, shopping, and working online, started laying off their employees as they rethought their pandemic-era digital spending and were confronted with broader economic challenges and stark uncertainty.[7]

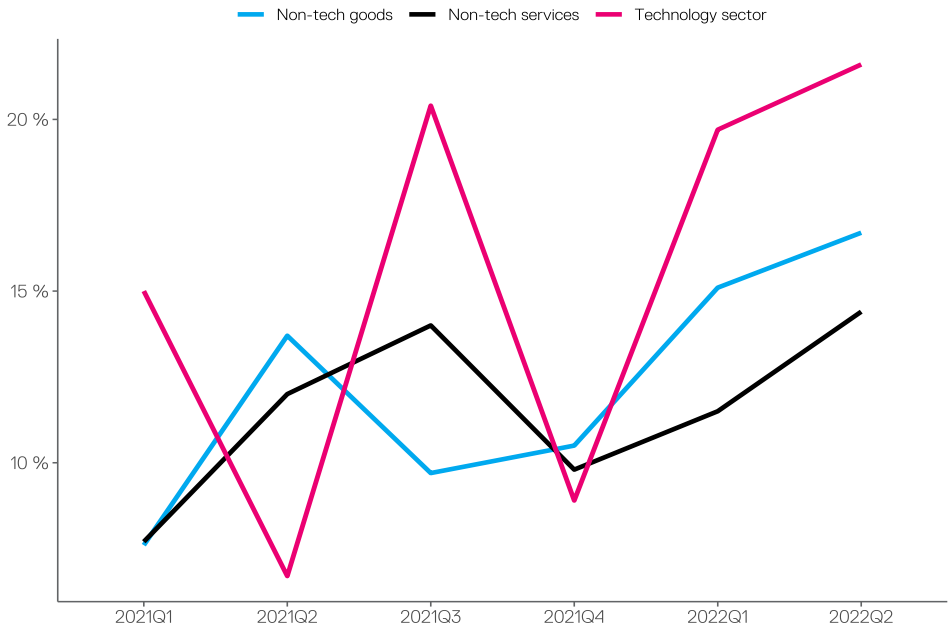
Using quarterly survey data for 2021, we examined obstacles businesses faced in the challenging environment. We saw companies face growing challenges in recruiting employees and struggling to respond to rising operational costs, particularly in an environment where obtaining financing was increasingly difficult. These challenges affected how much companies spent on capital expenditure, their employment levels and shifts in demands for their products. Here, we seek to understand how perceptions of changes and obstacles differed between technology and non-technology sectors throughout the pandemic.

When we examined the broad expectations, companies had about their financial outlook (*Figure 1*), we saw an increasingly stable outlook in the later surveys (from below 50% in the first quarter of 2021 to above 50% in the second quarter of 2022), corresponding with moving from an emergency response to the pandemic to getting used to how to operate in a pandemic economy. By the last quarter of 2021, companies across all industries experienced less variance in profitability, operating expenses, and income. Remarkably, however, throughout the period, technology firms were more likely than either non-tech goods or services companies to expect their profits to increase, even as such expectations were tempered by the disruption caused by the emergence of the Omicron variant of the virus in November 2021. Such moderation quickly recovered in 2022, however, as the Omicron variant waned quicker than expected.

Firms' expectations of increased employment growth, training expenditures and vaccines varied heavily through 2021, but technology firms showed

Figure 1

Share of firms that expected profitability to increase over the next three months, by sector, Q1 2021 to Q2 2022



expectations of persistent hiring throughout the pandemic. There were signs technology firms were not only acquiring talent, but also investing in retaining and upskilling their existing workforce. In some quarters, technology companies' expectations of increased spending on employee training was 50% higher than those held by non-tech firms.

Interestingly, while technology firms cited challenges in generally increasing their workforce, most did not experience difficulties attracting skilled workers (from 25% of firms in Q2 2021 to 35% in Q2 2022) or face persistent labour shortages (around 20% of companies throughout 2021 and 2022); see *Table 2*. In fact, firms in both the services and goods-producing industries cited those two challenges as significant and persistent (up to 45% for the goods-producing sector for attracting skilled work and between 30% and 40% by Q2 2022 for labour shortages), pointing to how they acutely felt the impact of labour shortages.

Such trends were consistent with broader labour trends observed during the pandemic, when lower-paid positions became increasingly less attractive to workers and tight labour markets meant that tech companies, which could more afford to pay higher wages[8], likely faced fewer recruiting challenges. We can explain the expectation of increased expenditures on training, then, as likely a direct wwwresult of the tech labour pool including many who might not have worked in tech previously (see *Figure 2*).

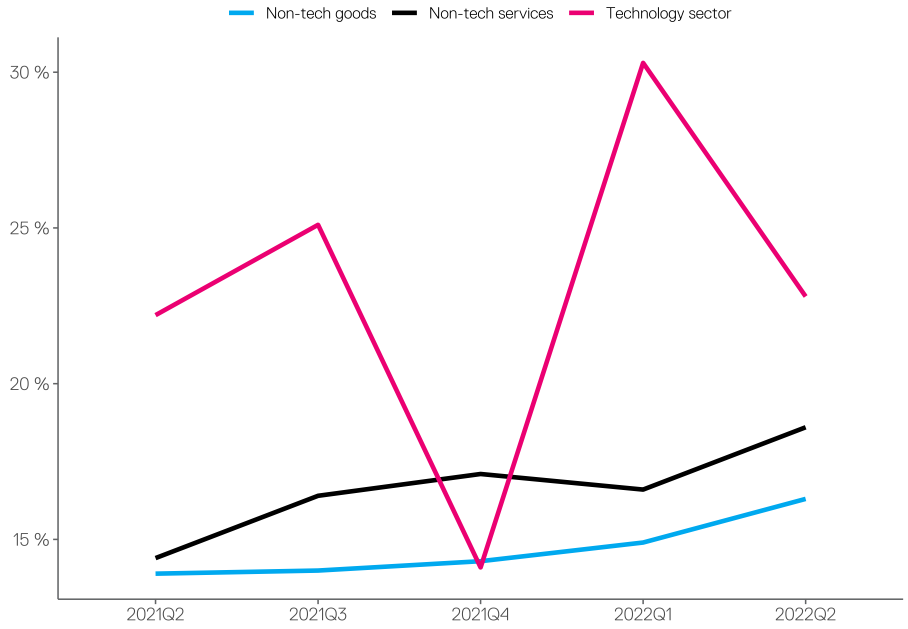
TABLE 02

Share of firms that experienced labour challenges, by sector, Q2 2021 to Q2 2022

Challenge	Technology		Goods-producing		Service-producing	
	Q2 2021	Q2 2022	Q2 2021	Q2 2022	Q2 2021	Q2 2022
Recruiting skilled employees	25.9%	37.8%	33.1%	44.2%	26.2%	34.7%
Labour shortages	15.9%	24.1%	31.4%	41.4%	22.2%	34.1%

Figure 2

Share of firms that expected expenditures on training to increase over the next three months, by sector, Q1 2021 to Q2 2022



Non-tech services firms were affected the most by the rising costs of inputs, insurance and transportation, with the highest level of perceived obstacles occurring in Q2 2022. In contrast, technology firms, likely due to the nature of their products, did not experience significant supply-chain challenges (*Table 3*). For example, between the second quarter of 2021 and the second quarter of 2022, the goods-producing sector experienced increased concerns about the cost of insurance (the share of such firms increased from 32% to 40%) and transportation (the share rising from 36% to 60%). The share of tech companies with such concerns, however, did not rise above 30% (insurance costs) and 20% (transportation costs), despite a pandemic-related disruption of the supply of microprocessors, a key industry component.

Funding

During the COVID-19 pandemic, one of the most salient issues facing businesses was access to funding. In this area, there were significant differences between tech companies and companies in other sectors. During the pandemic, many firms required access to funding as a means of survival, to make up for lost income due to business closures and record unemployment, or lost production due to supply-chain challenges.[9] Many tech firms, however, still managed to access funding for growth and to make major investments, not just directly as a response to the pandemic, but also predicting that the technological adoption seen early in the pandemic would persist. This bet seems to have been lost, however, as many large tech companies began laying off employees beginning in the summer of 2022.[10]

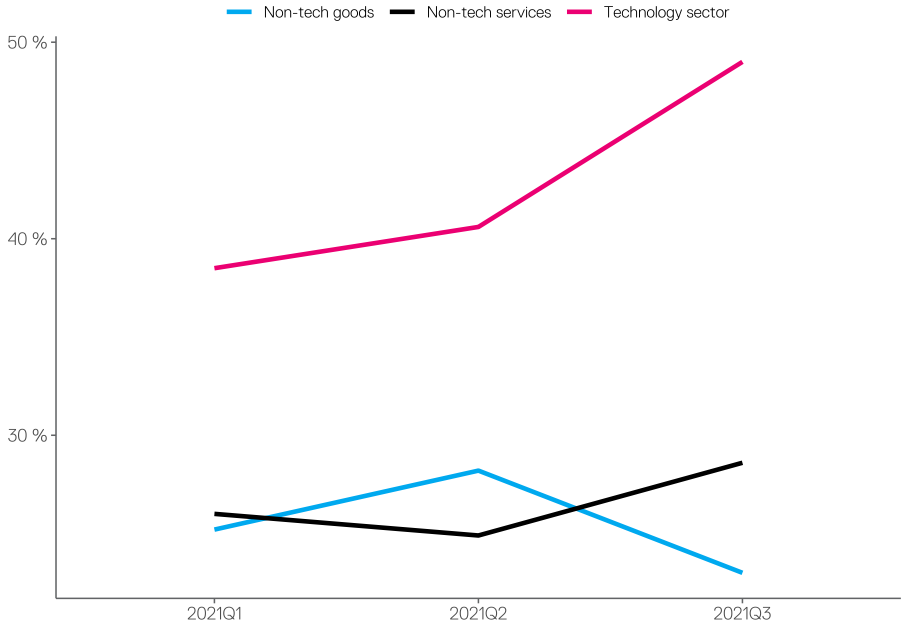
TABLE 03

Share of firms that experienced input challenges, by sector, Q2 2021 to Q2 2022

Challenge	Technology		Goods-producing		Service-producing	
	Q2 2021	Q2 2022	Q2 2021	Q2 2022	Q2 2021	Q2 2022
Cost of insurance	16.6%	24.0%	31.6%	41.4%	26.1%	31.3%
Cost of transportation	9.3%	22.0%	36%	60.4%	18.4%	32.2%

Figure 3

Share of firms that did not access funding to mitigate the impact of the pandemic, by sector, Q1–Q3 2021



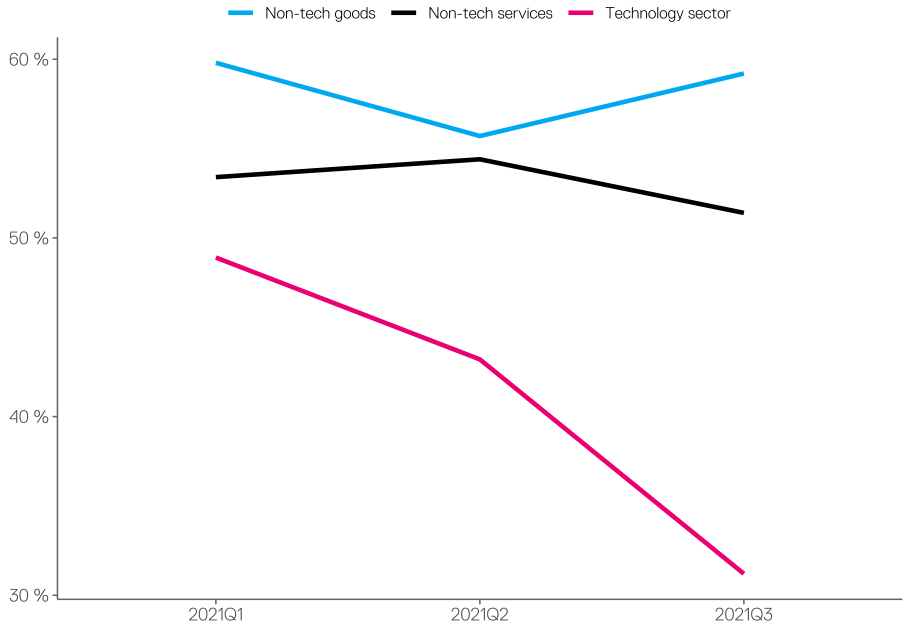
For this brief, we were interested in two main questions. First, were there meaningful differences in funding needs (accessed solely due to the adverse impact of the pandemic) by the business sector (see *Figure 3*)? Second, were there differences in how businesses obtained such funding, and what are the implications of how such funding was used?

As *Figure 3* shows, technology companies consistently were less likely to need additional sources of funding during the pandemic. And notably, as 2021 progressed and vaccines became widely available, the share of tech firms requiring funding dropped considerably, compared with the fairly consistent shares seen in non-tech firms. By the third quarter of 2021, almost 50% of tech companies did not access any funding to mitigate the effects of the pandemic compared with just under 30% for the goods-producing and services sectors.

One of the programs most used by businesses during the pandemic was the Canada Emergency Business Account (CEBA),[11] through which the federal government provided businesses with interest-free loans of up to $60,000. The share of technology companies accessing this program notably lower than that of non-technology companies (*Figure 4*).

Figure 4

Share of firms that accessed the Canada Emergency Business Account, by sector, Q1–Q3 2021



Another funding source that tech companies did access was the Canada Emergency Wage Subsidy (CEWS),[12] which covered up to 75% of an eligible payroll. While the requirements to access the program were stringent, the amount of potential support likely was an incentive for many companies to apply. Businesses did not require a drop in revenue to access the support within the first 17 months, but from the 18th month on, businesses would have had to show a drop in revenue of 10% or more due to the pandemic.

Interestingly, few companies overall received funding from financial institutions or other private sources. For example, less than 6% of tech companies accessed financial institutions for emergency capital. This demonstrates the importance of government programs in providing business support. And, although companies in the tech industry quickly ramped down their access to "general funding" or interest-free loans, many continued to access payroll support programs (*Figure 5*).

Between the CEBA and the CEWS, there were differences in patterns of access by firm size. The CEBA was accessed mainly by smaller firms, for which up to $60,000 in funding would have been material (see *Figure 6*).

Figure 5

Share of firms that accessed the Canada Emergency Wage Subsidy, by sector, Q1–Q3 2021

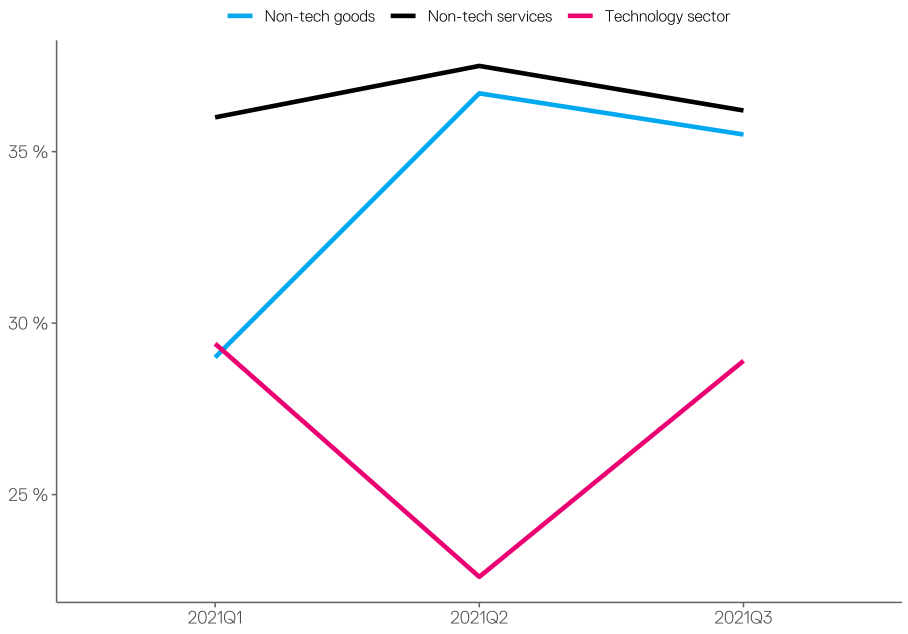


Figure 6

Share of firms that accessed the Canada Emergency Business Account, by sector and employee size, Q1 2021

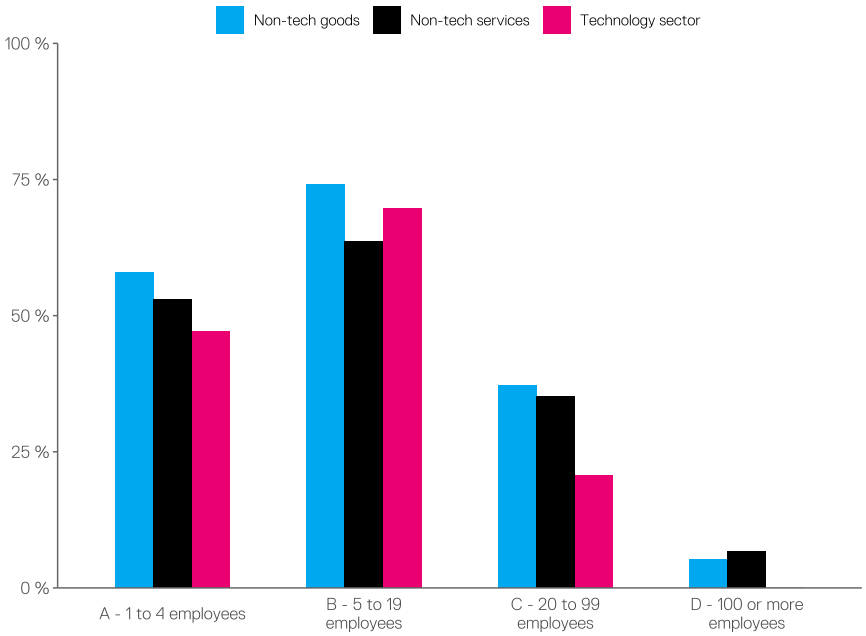
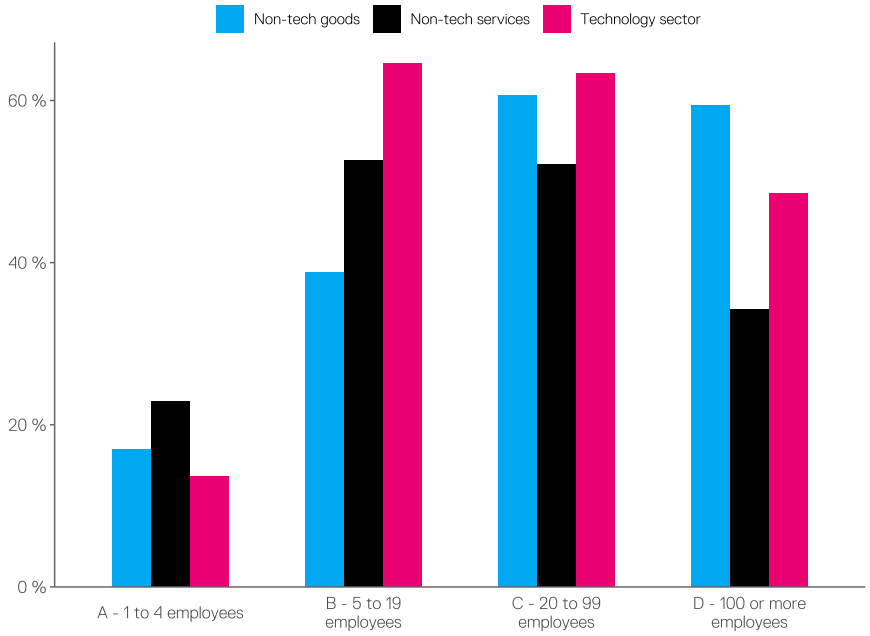


Figure 7

Share of firms that accessed the Canada Emergency Wage Subsidy , by sector and employee size, Q1 2021



The CEWS and other wage subsidy programs were accessed predominantly by medium to large companies (see *Figure 7*). This likely reflects both the relative difference in the amount of funding companies could receive — for wage subsidy programs, the amount went up proportionally with the number of employees — and the needs of firms in particular sectors.

Among firms that did not require funding (see *Figure 8*), the share of non-tech companies that did not do so because they did not need it remained consistent, while the share of tech companies that cited this reason for not accessing extra funding grew gradually during the first three quarters of 2021 (*Table 4*). This supports the narrative around the quick recovery and subsequent growth tech companies experienced during the pandemic. It is also mirrored in the declining share of tech firms citing business eligibility and the application process as reasons for not applying for funding.

TABLE 04

Reasons for companies not accessing COVID-19 support funding

Challenge	Technology		Goods-producing		Service-producing	
	Q1 2021	Q3 2021	Q1 2021	Q3 2021	Q1 2021	Q3 2021
No need of funding	62.3%	81.8%	60.2%	56.1%	63.9%	61.9%
Lack of eligibility	28.7%	10.6%	19.9%	25.7%	20.9%	24.2%
Application complexity	19.4%	7.0%	8.2%	13.5%	4.4%	5.9%

Figure 8

Share of firms that did not access emergency funding, by sector and employee size, Q1 2021

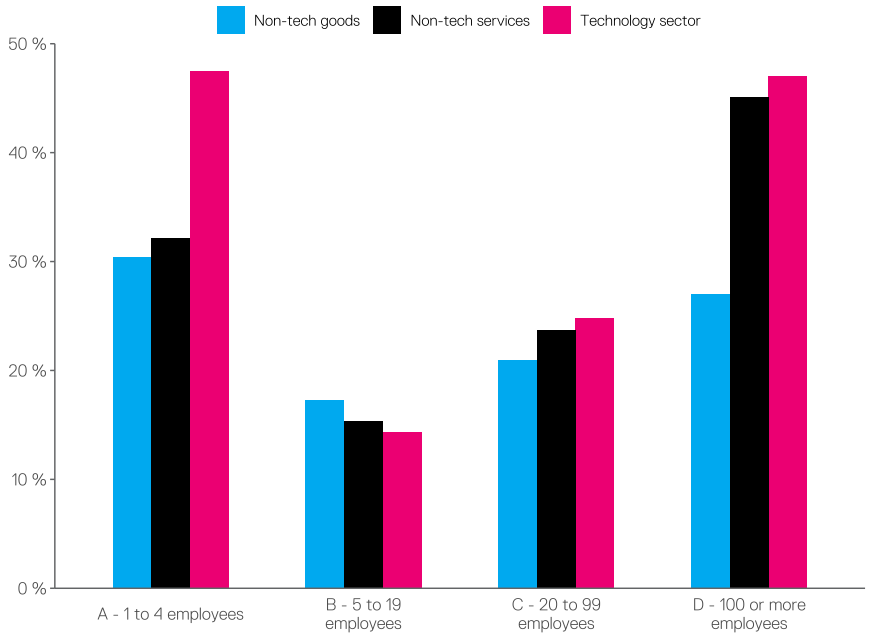
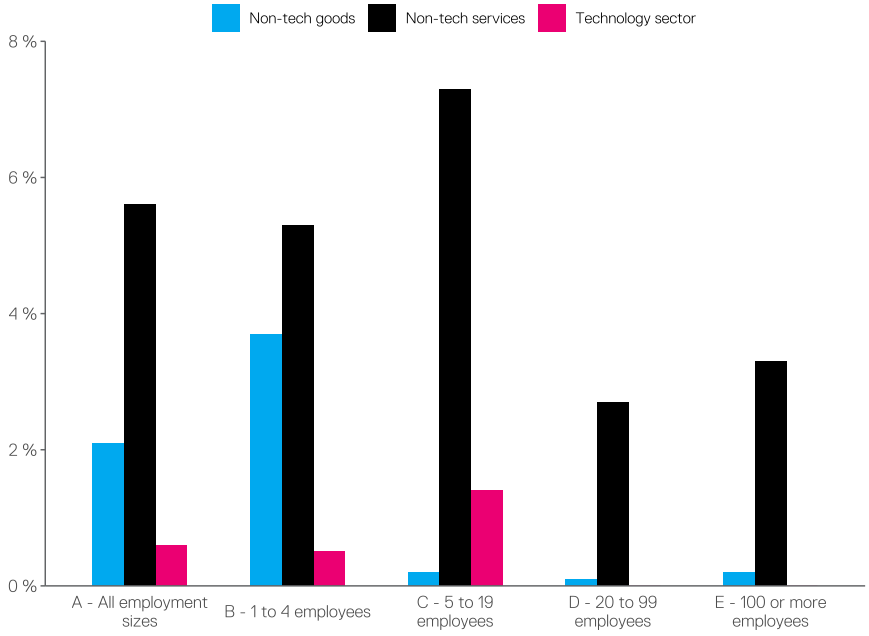


Figure 9

Share of firms that shut down in Q1 2021 and have not reopened, by sector and employee size



Organizational Changes

In addition to facing pandemic-related challenges and the possible need for emergency financial support, many businesses also underwent organizational changes. Some of these changes were temporary, others persistent or even permanent as, across sectors, businesses were forced to change, halt or expand operations during the pandemic (*Figure 9*).[13]

These firms began to restructure, invest in new employee support services and explore teleworking technology for the first time. Looking at a snapshot of organizational changes in Q1 2021, large technology firms stand out as they not only remained operational but began expanding and acquiring other firms (*Figure 10: A and B*). This snapshot can be contextualized by looking at broader quarter-over-quarter trends that demonstrate technology firms appeared not only to be more resilient than non-tech firms, but also to have had significant growth in Q1 2022.

The rate at which large tech companies (those with 100 or more employees) were looking to acquire other businesses is staggering. In the first quarter of 2021, more than 20% of these businesses, or more than 1 in 5, were looking to expand through acquiring other businesses. This likely reflects two main drivers. First, as noted earlier, tech firms were particularly optimistic about their future growth prospects, and although they experienced some challenges in bringing on new talent, they had a bright outlook of the economy. Second, the seeming availability of financing, which resulted in many of these companies not needing government support programs tied to COVID-19, meant that the extra capital was likely used to expand their businesses and make risky investments (*Figure 11: A and B*).

During this period, there were some notable instances of vertical integration — of companies' acquiring and expanding into areas that were at a different level of the value chain they originally occupied; for example, Shopify acquired a logistics start-up in May 2022.[14] One reason might be that some tech companies, seeing the disruptions of supply and value chains caused by the pandemic, chose to move to insure themselves against such risks by integrating multiple steps within the value chain.[15]

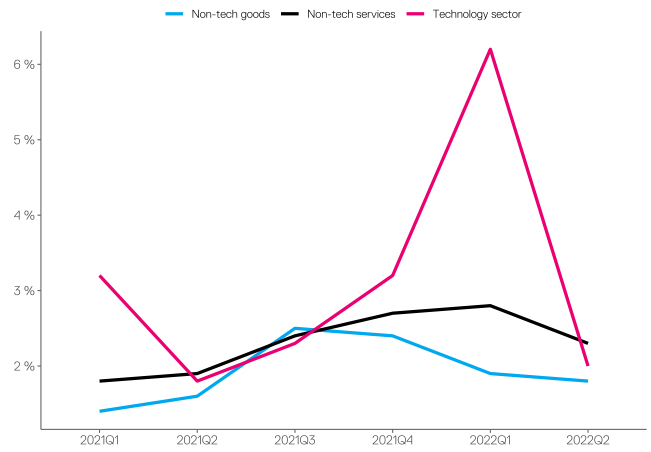
Figure 10

Share of firms that planned to acquire or invest in other businesses, by sector, Q1 2021 to Q2 2022

Panel A. Planned Acquisitions

Panel B. Planned investments

A



B

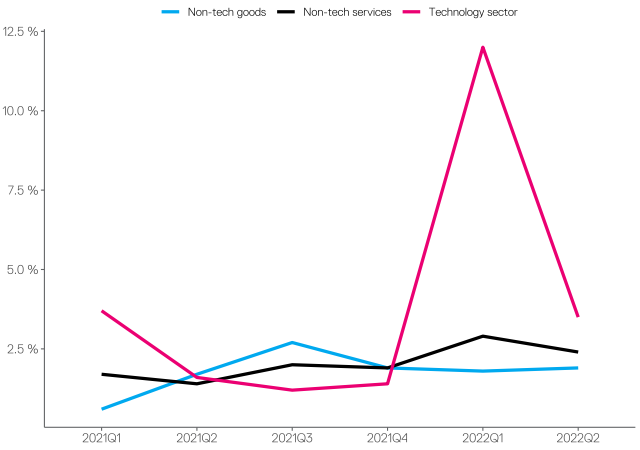


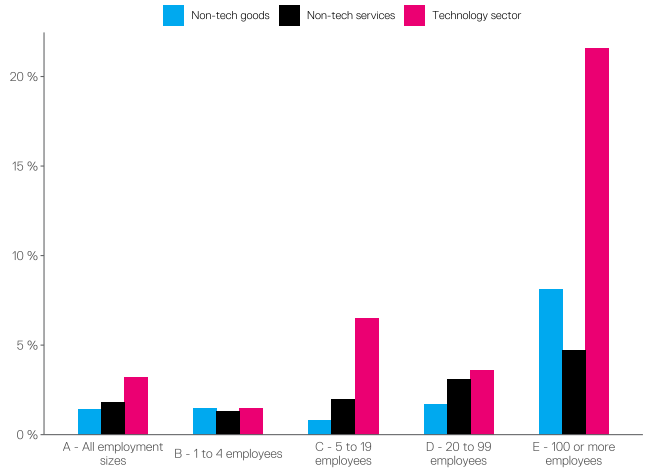
Figure 11

Share of firms that planned to acquire or invest in other businesses, by sector and employee size, Q1 2021

Panel A. Planned Acquisitions

Panel B. Planned investments

A



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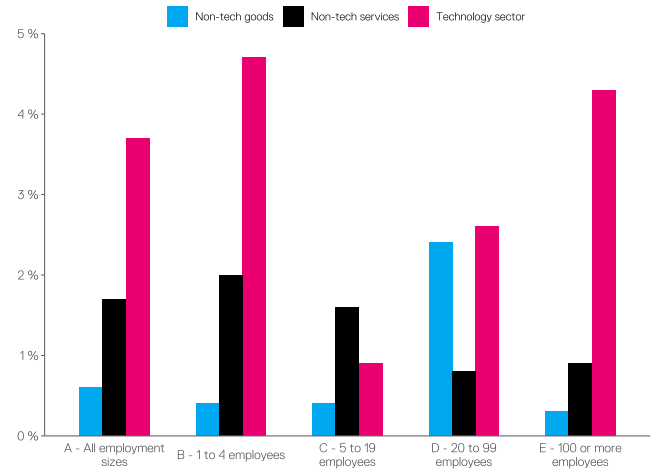

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Conclusion

The COVID-19 pandemic was an incredibly disruptive moment, affecting every person on the planet, with deep health and social consequences. It also posed never-before-confronted challenges for most businesses in Canada, which had to adapt quickly to changing situations and remain agile in the face of a rapidly evolving virus.

Within this context, technology companies, which by the nature of their industry are more used to rapid changes, behaved differently than did non-tech companies. Overall, the unprecedented reliance on technology during the pandemic led tech companies to experience a renewed sense of optimism, allowing them not only to survive, but also to plan to expand aggressively. While many companies were managing risk, tech companies were expanding their operations and seriously considering acquiring other companies. While many companies in other sectors scaled back their production in response to supply-chain disruptions, tech companies seemed to have favoured vertically integrating more of their value chain, betting on a permanent digital shift for the entire economy.

It felt like a sudden surprise, then, that, starting in the summer of 2022 and continuing into the fall, many prominent tech companies across the world announced large rounds of layoffs, citing the lack of growth in tech adoption about which they had been confident. These layoffs tended to occur particularly in large tech companies, and many who were laid off still struggle to find a new job. In contrast, smaller tech companies, as well as the labour market in general, seem to be in a stronger position.[16]

What we saw during the pandemic was a technology industry with a higher-than-normal level of confidence experience an unprecedented rate of technology adoption. Yet the workers most affected by recent rounds of layoffs seem to be those working for companies that had the financial resources to make risky bets based on this confidence, many of which did not pay out. These were not just any tech companies — they were of a particular scale, with a proven product, and often invested in expanding into other product areas.

In looking at the conditions technology companies currently face, it is important not to overreact. The recent layoffs took place without prior structural issues faced by tech companies . In addition, while it will likely take some time for tech companies to bounce back — especially in the United States, where small and medium-sized banks face difficulties, exemplified by the bankruptcy of Silicon Valley Bank — the industry is not in the deep trouble many have feared.

The rate at which people and the economy adopt technology continues to be positive, despite a temporary reversal as people shift back to their pre-pandemic routines and in-person contacts. This trend of increasing technology adoption is unlikely to stop, and tech companies will continue to have an important role to play in such an economy-wide shift.

Glossary: What comprises the tech sector?

Not so long ago the tech sector has traditionally been defined as companies which operate in the Information and Communications Technology (ICT). However, this now seems like an antiquated lens. Technology use and production has penetrated all sectors and has become ubiquitous – encompassing a diverse collection of industries.

For the purposes of this project, the technology sector was defined at the 4-digit NAICS code level, based on the employment concentration of technology workers in the 2016 census. Data obtained from the Canadian Survey on Business Conditions was pulled via custom tabulation by specific industry listed below to define each of the sectors covered in this brief: a) non-technology goods sectors; b) non-technology services; and c) technology sectors (goods and services).

This is an approach first established in Brookfield Institute's the State of Canada's Tech Sector[17], using the latest employment estimates.[18]

Canadian Survey on Business Conditions

Custom tabulations by specific industry

Custom Industry Category	Coding Logic
Non-technology goods sectors	11, 21, 23, 31-33 (excluding 4-level NAICS below)
Non-technology services	42, 44-45, 48-49, 52, 52, 53, 54, 56, 62, 71, 72, 81 (excluding 4-level NAICS below)
Technology sectors (goods and services)	**Four-digit NAICS codes**
Commercial and service industry machinery manufacturing	3333
Computer and peripheral equipment manufacturing	3341
Communications equipment manufacturing	3342
Audio and video equipment manufacturing	3343
Semiconductor and other electronic component manufacturing	3344
Navigational, measuring, medical and control instruments manufacturing	3345
Manufacturing and reproducing magnetic and optical media	3346
Electrical equipment manufacturing	3353
Aerospace product and parts manufacturing	3364
Pipeline transportation of crude oil	4861
Pipeline transportation of natural gas	4862
Software publishers	5112
Sound recording industries	5122
Pay and specialty television	5152
Wired telecommunications carriers	5171
Wireless telecommunications carriers (except satellite)	5172
Satellite telecommunications	5174
Other telecommunications	5179
Data processing, hosting, and related services	5182
Monetary authorities — central bank	5211
Pension funds	5261
Architectural, engineering, and related services	5413
Computer systems design and related services	5415
Scientific research and development services	5417
Electronic and precision equipment repair and maintenance	8112

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