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The International Exposure of the Canadian Banking System

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Abstract

Over the past decade, the six largest Canadian banks held an increasingly greater share of their assets and liabilities abroad, linking the Canadian banking system more closely to economic and financial developments elsewhere in the world. In 2023, the share of Canadian banks' foreign assets and liabilities amounted to around 50%, with foreign exposures even exceeding domestic ones for some balance sheet items and calculations. Using a combination of regulatory and commercial data sources, we document Canadian banks' foreign activities and provide an overview of potential vulnerabilities that may be associated with them. The following facts emerge: First, Canadian banks' foreign activities differ considerably from their domestic ones. While Canadian banks engage domestically mostly with real sector entities, such as households and non-financial corporations, their most common counterparties abroad are non-bank financial institutions (NBFIs). To the extent that NBFIs or their behaviours might be less known to Canadian banks—for example, because of information asymmetries— a considerable exposure to such entities could constitute a potential vulnerability. Second, Canadian banks have sizable foreign currency and foreign country exposure to the US dollar and the United States, but also notable exposures to other currencies and countries. Third, we document the presence of an indirect foreign exposure channel for Canadian banks through lending to internationally exposed firms, even if these firms are domiciled in Canada and borrow in Canadian dollars. Lastly, we present a case study highlighting how Canadian banks have expanded internationally at times when banks of many other countries retreated.

Topics: Financial institutions; International financial markets; Financial stability; International topics

JEL codes: F21, F23, F31, F32, G21, G23, G3

Résumé

Au cours de la dernière décennie, la part des actifs et passifs étrangers dans le bilan des six plus grandes banques canadiennes s'est accrue progressivement, rendant ainsi le système bancaire canadien plus sensible à la conjoncture économique et financière ailleurs dans le monde. En 2023, la proportion des actifs et passifs étrangers des banques canadiennes s'établissait à environ 50 %, les expositions étrangères dépassant même les expositions intérieures dans certains postes de bilan et calculs. Partant de diverses sources de données réglementaires et commerciales, nous décrivons les activités étrangères des banques canadiennes et présentons un aperçu des vulnérabilités pouvant y être associées. Certains faits ressortent de notre étude. Premièrement, les activités étrangères des banques canadiennes sont très différentes de leurs activités intérieures. Au pays, les banques canadiennes traitent surtout avec des entités du secteur réel, tels les ménages et les sociétés non financières, alors qu'à l'étranger, leurs contreparties sont principalement des institutions financières non bancaires. Dans la mesure où ces institutions ou leur comportement sont peut-être moins bien connus des banques canadiennes (par exemple, à cause de l'asymétrie de l'information), une forte exposition à ces entités constituerait une vulnérabilité. Deuxièmement, les banques canadiennes sont fortement

exposées au risque de change que présente le dollar américain ainsi qu'aux risques associés à leurs relations avec les États-Unis. Elles ont cependant aussi des expositions notables du fait du risque de change induit par d'autres monnaies et de leurs liens avec d'autres pays. Troisièmement, nous rendons compte de la présence d'une source indirecte d'exposition étrangère pour les banques canadiennes en raison des prêts qu'elles octroient à des entreprises ayant des liens avec l'étranger, même si celles-ci sont domiciliées au Canada et qu'elles contractent leurs emprunts en dollars canadiens. Enfin, nous présentons une étude de cas illustrant l'expansion des banques canadiennes à l'international à des périodes où les banques de nombreux autres pays choisissaient de se désengager.

Sujets : Institutions financières; Marchés financiers internationaux; Stabilité financière; Questions internationales

Codes JEL : F21, F23, F31, F32, G21, G23, G3

1. Introduction

In this paper, we aim to document Canadian banks' foreign activities and provide an overview of potential vulnerabilities that may be associated with these activities.

The Canadian banking system is highly concentrated, consisting largely of six domestic systemically important banks (D-SIBs). These D-SIBs are also referred to as the Big Six Canadian banks, and their assets account for more than 93% of the Canadian banking system.¹ Having fared relatively well through the 2008–09 global financial crisis, the Big Six have expanded their international activities extensively over the past decade.

We observe a sizable increase in their assets and liabilities in over time—roughly doubling over the past 10 years (**Chart 1**).^{2,3} On the asset side (panel a), shows that the gap between the domestic exposures and the foreign exposures from cross-border and foreign-affiliate lending appears to be narrowing for the Big Six Canadian banks. In 2019Q4, the gap even became negative for two quarters when foreign asset exposures temporarily exceeded domestic ones. In 2023Q4, the most recent quarter for which data are available, the share of foreign assets amounted to 50% of total assets.

The trend is even more pronounced for liabilities (panel b). While foreign and domestic exposures were tracking each other closely until around mid-2022, the values of foreign liabilities have since started to surpass domestic liabilities considerably. In 2023Q4, the share of foreign liabilities amounted to 54% of total liabilities. Moreover, when we include foreign inter-office positions, the 2023Q4 share increases to 55% and the share of foreign liabilities to 57%.⁴

It is possible that Canadian banks could greatly benefit from expanding internationally because it can help them to diversify existing business models and funding sources, create new opportunities to generate revenue (especially in larger markets), and better meet their clients' needs (e.g., by offering securities brokerage services with a broader coverage). In particular, the benefits of diversification could be quite sizable. The diversified business models used by Canadian banks across their retail and commercial lending, capital market operations, wealth management arms, and insurance businesses have been cited as significantly contributing to the robustness of their revenue streams in the past (Danaee et al., 2022). At the same time, an international expansion inevitably exposes Canadian banks—and consequently the Canadian banking system—to foreign economic and financial developments. Several questions arise as

¹ The Big Six banks are Bank of Montreal (BMO), Bank of Nova Scotia (Scotiabank), Canadian Imperial Bank of Commerce (CIBC), National Bank of Canada (NBC), Royal Bank of Canada (RBC), and Toronto-Dominion Bank (TD).

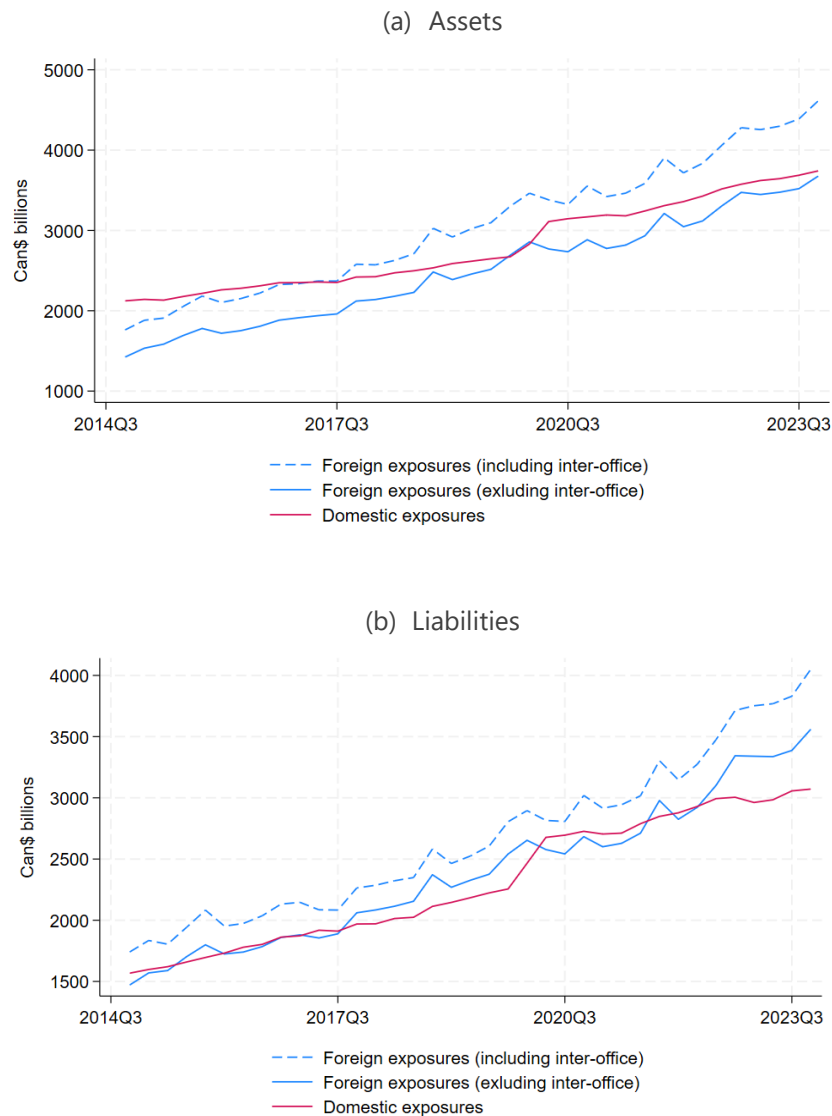
² Section 2 provides more information on the data used in in this paper as well as the definitions of assets and liabilities.

³ A common way for Canadian banks to expand internationally involves takeovers of banks that already operate in the destination country. An example is Bank of Montreal's recent takeover of Bank of the West (BMO, 2023).

⁴ An inter-office position represents the exposures between a domestic bank and its affiliates. For Canadian banks, we observe foreign inter-office positions (i.e., between a Canadian head office and the Canadian bank's foreign affiliates) but not domestic inter-office positions (i.e., between a Canadian head office and the Canadian bank's domestic affiliates). Hence, a comparison of aggregates including data on inter-office positions potentially overestimates the share of foreign exposure because it does not account for domestic inter-office positions. In **Chart 1**, we therefore use dashed lines to depict data on inter-office positions.

a result: What vulnerabilities can emerge when banks expand abroad extensively and how do they manifest themselves in the Canadian context? What are the benefits of a sustained foreign expansion? Is the net effect unambiguously positive for individual both banks and the entire banking system?

Chart 1: The exposure of Canadian banks' to domestic and foreign assets and liabilities has increased over time



Note: The panels contain data on assets and liabilities for the Big Six Canadian banks, by counterparty location. Assets capture the sum of claims, which consist of loans, securities, deposits, bank notes and other coins. Liabilities consist of the sum of deposits payable and debt securities issued, subordinated debt and repurchase agreements. For more information, see section 2.

In this paper, we aim to make progress toward answering the first of these questions. However, even that is difficult to answer definitively because—although the data on their foreign exposures are fairly detailed—the data on banks’ risk mitigation techniques are limited. Banks could reduce their risks from exposure to foreign currencies by, for example, using financial derivatives or by exploiting natural hedges. However, in the absence of such data, our analysis should be considered as a first step toward documenting Canadian banks’ foreign exposures and some of their potential associated vulnerabilities, not as a full-fledged assessment of the risks that Canadian banks currently face.

At the core of our analysis, we create an analytical framework to document Canadian banks’ international exposures in different market segments, including the domestic-market, cross-border, inter-office, and foreign-affiliate segments. In each of these segments, we identify Canadian banks’ foreign exposures and compare them with the Canadian gross domestic product (GDP) or the aggregated balance sheet of the Canadian banking system.

We then examine four potential vulnerabilities that may be associated with increased expansion along the international dimension:

- **Foreign currency exposure:** Banks lend or borrow in foreign currencies, usually abroad but also domestically. If not sufficiently hedged—either through natural hedges (e.g., matching foreign currency assets to foreign currency liabilities) or financial hedges (e.g., foreign currency derivatives)—such exposures can lead to mismatches on banks’ balance sheets. Unfavourable outcomes from unhedged exposures to foreign currencies have a long tradition in economics, such as in Latin America in the 1980s, in Asia in the 1990s and in small open economies in the 2000s (see, for example, Ahnert et al., 2021).
- **Foreign country exposure:** Banks lend to and borrow from foreign residents, potentially exposing themselves to foreign economic developments and policy changes, regardless of the currency denomination of a transaction. Foreign policy changes could take on a variety of forms, such as changes in monetary or fiscal policy, as well as changes in regulatory or other structural policies, such as competition policy, where violations are frequently associated with substantial fines. While a considerable share of foreign country exposure is likely denominated in foreign currency, the concerns associated with foreign country exposure also apply to local currency transactions. The COVID-19 shock, for example, illustrated that foreign country exposure in local currency can lead to mismatches on the balance sheets of international investors, who may unwind their positions quickly as a result (see, for example, Hofmann, Shim and Shin 2020).
- **Exposure to less familiar entities abroad:** A key factor behind the strong home bias for financial investments (French and Poterba, 1991) frequently documented in the academic literature is an information asymmetry between domestic and foreign investors (Coval and Moskowitz, 1999). Hence, while banks are likely to have a comparative advantage for obtaining detailed and timely information about their counterparties in the domestic market, they may find it more challenging to acquire similar information about their counterparties in foreign markets. Potentially useful information could range from the nature of foreign entities (e.g., ownership structures,

business models or vulnerabilities) to the behaviour of foreign counterparties in times of financial stress (e.g., how they mitigate the impact of negative shocks and how they generate liquidity). Moreover, banks may pursue different business models domestically than they do abroad, potentially engaging with different—and possibly less familiar—*types* of counterparties in foreign countries.

- **Exposure to borrowers with foreign ties:** Even if banks lend to domestic entities in domestic currency, these borrowers may themselves be exposed to foreign economies, which, in turn, could expose banks *indirectly* to any of the above vulnerabilities. For example, Canadian firms could engage with foreign economies through international trade or be active in international capital markets, and Canadian households could be exposed through holdings of foreign assets or the need to send remittances across borders. All these channels can increase the links between Canadian firms and households, on the one hand, and foreign developments, on the other hand. This could potentially result in increased credit risk for Canadian banks.⁵

We can identify the role each of the first three vulnerabilities can potentially play for Canadian banks by breaking down our aggregated banking data along the following dimensions: currency, the counterparty country, and the counterparty entity. To assess the relevance of the fourth vulnerability, we use a firm-level dataset that allows us to gauge the foreign exposures of Canadian firms. One should be mindful, however, that the existence of a vulnerability does not necessarily constitute a risk to financial stability. This is because banks can apply various risk mitigation techniques that may significantly reduce the probability of a risk materializing.

Lastly, as an example of how Canadian banks have expanded their activities abroad over the past decade, we complement our main analysis with a case study of Brexit. This case study examines how Canadian banks have responded to the Brexit shock and how their actions have potentially differed from the responses of their international peers.

To conduct the different pieces of analysis in this paper, we use data from a variety of regulatory returns, collected and provided by the Office of the Superintendent of Financial Institutions (OSFI), as well as data from a commercial vendor. Our main analysis of Canadian banks' exposures is based on the regulatory returns *Geographic Assets and Liabilities Booked in Canada (GQ)* and *Geographic Assets and Liabilities Booked Outside Canada (GR)*. We supplement these data with information from the *IRB Credit Data Wholesale Transaction (BF, RAPID2)* and the *Balance Sheet (M4)* returns. To analyze the firm sector, we rely on the commercially available *FactSet* dataset.

Our results are as follows. First, Canadian banks' foreign activities differ considerably from their domestic ones. While Canadian banks engage domestically mostly with real sector entities, such as households and non-financial corporations, their most common counterparties abroad are non-bank financial institutions (NBFIs). Considerable exposure to NBFIs could constitute a potential vulnerability since these institutions and their behaviours might be less known to Canadian banks because of information asymmetries. Second, Canadian banks not only have sizable foreign currency and foreign country exposure to the US dollar and the United States

⁵ We restrict our analysis to the corporate sector and do not discuss the role of households.

but also notable exposures to other countries and currencies. Third, we document the presence of an indirect foreign exposure channel for Canadian banks through lending to internationally exposed firms, even if these firms are domiciled in Canada and borrow in Canadian dollars. Lastly, the Brexit case study reveals that while Canadian banks appeared to significantly increase their exposures to the United Kingdom in response to the shock, their international peers were more likely to keep their UK exposures stable or even actively reduce them.

In this paper, section 2 presents the analytical framework of Canadian banks' international activities, which we use to structure our analysis. We also discuss the data sources that form the basis of this paper. Finally, section 2 presents an overview of Canadian banks' international exposures. Section 3 then breaks down these exposures along the dimensions of currency, the counterparty country, and the counterparty entity. Section 4 focuses on the international exposures of Canadian firms, highlighting the potential relevance of indirect foreign exposures for Canadian banks. Section 5 then uses the Brexit shock as a case study to illustrate how Canadian banks significantly expanded their market share in the United Kingdom. Finally, Section 6 concludes.

2. Overview of Canadian banks' foreign exposures

In this section, we provide an overview of Canadian banks' international exposures. We start by describing the data we use in our analysis. Then we introduce the analytical framework that guides our analysis, and finally we present our results.

2.1. Data

Most of our data stem from Canadian banks' regulatory return filings with OSFI. We also rely on the commercially available dataset *FactSet* to examine the international exposure of the Canadian firm sector. We discuss the different data sources in turn.

2.1.1. GQ, GR and M4 returns

Our main analysis of Canadian banks' exposures is based on the following regulatory returns:

- ***Geographic Assets and Liabilities Booked in Canada (GQ)***: This return provides foreign and Canadian currency information about the size and nature of an institution's claims, other exposures and liabilities in foreign and Canadian currencies to residents of foreign countries and Canada that are *booked in Canada*. The data are important for analyzing international banking activity and are the basis for fulfilling Canada's reporting responsibilities to the Bank for International Settlements. The GQ return is available quarterly.⁶
- ***Geographic Assets and Liabilities Booked Outside Canada (GR)***: This return provides foreign and Canadian currency information about the size and nature of a bank's claims, other exposures and liabilities in foreign and Canadian currencies to residents of foreign countries and Canada that are *booked outside Canada*. In addition to applications stated in the definition of the GQ return, information from the GR return

⁶ See OSFI (2024a).

is used to calculate the balance of payments and international investment position for Canada. The GR return is available quarterly as well.⁷

- **Balance Sheet (M4):** This return presents a financial institution’s consolidated balance sheet on the last day of each month. The categories included on the balance sheet reflect the information its major users—OSFI, the Bank of Canada, the Canada Deposit Insurance Corporation and Statistics Canada—require to analyze and monitor institutions’ individual and aggregate financial conditions. The return also requires that assets and liabilities be separated into total and foreign currencies.⁸ Because the M4 return displays a consolidated balance sheet, it excludes banks’ inter-office positions. The M4 return is available publicly.

Chart A-1 in the Appendix illustrates the relationship between the M4, GQ and GR returns. Using the balance sheet category “Lending,” the chart totals both the assets and liabilities included in the Big Six Canadian banks’ GQ and GR returns and compares those totals with the corresponding balance sheet figures from their M4 returns.⁹ Two insights emerge. First, the sum of the GQ and GR returns is highly consistent with the headline numbers shown in the M4 return. Second, the Big Six Canadian banks appear responsible for most of the lending activities. Given these findings, we can explore the foreign activities of the Big Six Canadian banks through the more disaggregated GQ and GR returns. We mainly use the M4 return to capture the overall size of Canadian banks’ (consolidated) balance sheet.

Moreover, several research papers have used the GQ and GR return data to analyze the response of Canadian banks to domestic or foreign policies and shocks. For example, Chapman and Damar (2015) focus on the international transmission of liquidity risks, Damar and Mordel (2017) on the cross-border effects of regulation, Auer et al. (2019) on the international transmission of Canadian monetary policy, and Chen and Friedrich (2023) on the effects of foreign countercyclical capital buffers on Canadian banks’ cross-border lending activities. However, these papers do not address the role of potential vulnerabilities that Canadian banks may face when expanding significantly abroad.

2.1.2. RAPID 2 return

We also rely on data from the **IRB Credit Data Wholesale Transaction Return (BF, RAPID2;** referred to simply as **RAPID2** through the rest of this paper). This return provides data on loans at the facility level for up to seven Canadian banks—the Big Six among them—and includes the size and type of each facility as well as information about the currency, geography, and borrower. Each facility is associated with a counterparty (borrower), which is also tied to a *common risk*. A common risk occurs when either of the following two conditions are met: a

⁷ See OSFI (2024b).

⁸ See OSFI (2024c).

⁹ The GQ and GR returns display their asset-side entries as “Claims,” but the M4 return shows data for both “Claims” and “Assets.” In the M4 return, the value of claims amounts to approximately 90% of the value of assets (the difference comprising, for example, the value of land, buildings or equipment owned by the bank). Given this relatively small difference, we frequently treat both concepts as synonyms in this paper for simplicity.

counterparty has a control relationship with another or the counterparties are economically interdependent.¹⁰

The RAPID2 return is available quarterly and covers the domestic market segment, the cross-border segment, and the foreign-affiliate segment. The RAPID2 return is subject to several caveats. First, the RAPID2 return is restricted to transactions where the total authorized amount across each common risk exceeds Can\$10 million.¹¹ Hence, smaller exposures are not considered in this return. Second, some standardized loans are excluded from the return, primarily those from banks' foreign activities. This could possibly lead to an underestimation of the level of foreign activities. And third, while several types of facilities are included in the return, the extent of coverage for interest rate and currency swaps is unclear.

Our analysis of the GQ, GR and RAPID2 return data focuses mostly on the on the quarter 2023Q4. As part of our analysis of the GR and GQ data in section 2, we also include the growth rate since 2014Q4 for several balance sheet items for a comparison with previous periods. Moreover, to preserve the confidentiality of the regulatory return data, all aggregations involving GQ, GR and RAPID2 data (note that the M4 return is publicly available) presented in this paper contain non-zero values from at least three different banks, and a single bank cannot contribute to more than 75% of an aggregation. If these conditions are not met, we aggregate categories to the next level higher until the conditions are met, or we present only values of selected subcategories.

2.1.3. FactSet

To analyze the firm sector, we rely on the commercially available FactSet dataset. FactSet provides data at the company level from financial statements for publicly traded firms around the world. We describe this dataset in more detail in section 4.1.

2.2. Analytical framework

In this subsection, we introduce the analytical framework that guides our analysis throughout the paper. **Chart 2** presents a stylized global economy divided into four different segments (that can be roughly thought of as markets):

- **Domestic segment:** Assets and liabilities held by the Canadian head office or other branches of Canadian banks in Canada vis-à-vis Canadian residents. These positions are all booked in Canada and can be quantified through the **GQ** return.
- **Cross-border segment:** Assets and liabilities held by the Canadian head office or other local branches of Canadian banks in Canada vis-à-vis non-residents. These positions are booked in Canada as well and can thus be quantified through the **GQ** return.
- **Foreign-affiliate segment:** Assets and liabilities held by Canadian banks' foreign affiliates vis-à-vis non-Canadian residents. These positions are booked outside Canada and can be quantified through the **GR** return.¹²

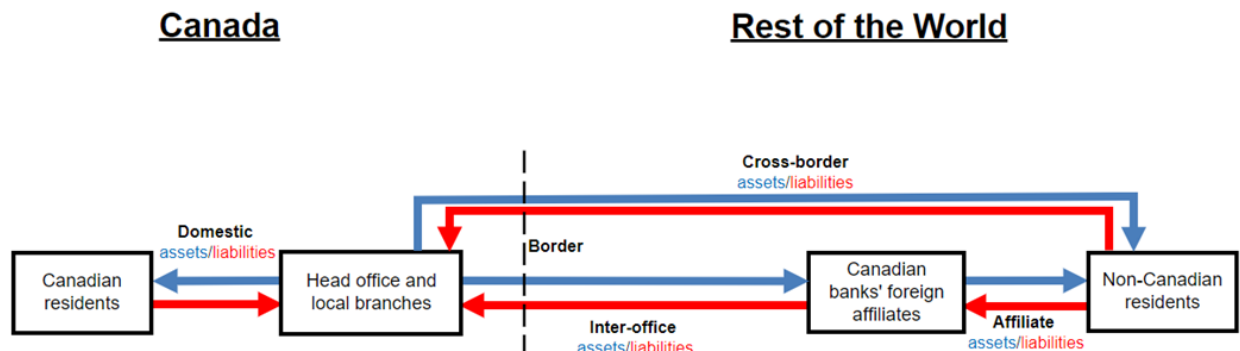
¹⁰ See OSFI (2024d).

¹¹ See OSFI (2024e).

¹² We abstract from a segment capturing the link between Canadian banks' foreign affiliates and Canadian residents because the associated magnitudes are negligible (e.g., 2023Q4, the claim exposure of Canadian banks' foreign

- **Inter-office segment:** Assets and liabilities held by head office of Canadian banks vis-à-vis their foreign affiliates. These positions are booked in Canada and can therefore be quantified through the **GQ** return.¹³

Chart 2: A stylized global economy



Each segment is represented by an aggregated bank balance sheet that displays assets and liabilities separately. **Table 1** then shows which balance sheet items are included in the calculation of assets and liabilities, respectively.¹⁴

Table 1: Breakdown of assets and liabilities

	Assets	Liabilities
Vis-à-vis other parties	Deposits, bank notes and other coin	Deposits payable and debt securities issued
	Securities	Subordinated debt
	Loans (including reverse repurchase agreements)	Repurchase agreements
Vis-à-vis other branches	Inter-office positions	Inter-office positions

affiliates to Canadian residents as a percentage of Canadian banks' foreign affiliates' total claims amounted to about 1.7%). For simplicity, we also do not include these exposures into the calculations of foreign shares or total assets throughout the paper.

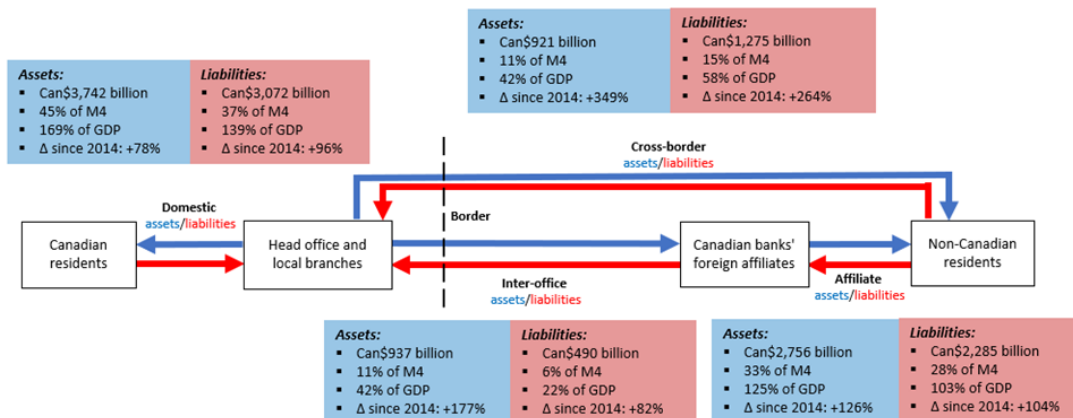
¹³ The possible overestimation of shares of foreign exposures for aggregates containing inter-office positions (as discussed in footnote 4) does not affect the breakdown into different market segments. We therefore disaggregate our data into domestic, cross-border, inter-office and foreign-affiliate exposures throughout the paper.

¹⁴ To reduce complexity, we do not consider the balance sheet category "derivatives" from the GQ return (which is also absent from the GR return). The value of this category is small, however, with total asset-side derivatives amounting to only 3.15% of banks' total claims (sum of GQ and GR). We also do not consider risk transfers in this analysis.

2.3. Results

We now provide an overview of Canadian banks' international exposures, disaggregated by market segment for the quarter 2023Q4 (**Chart 3**).

Chart 3: General overview of foreign exposures



Source: Banks' regulatory filings (GRGQ and M4). Observation date: 2023Q4.

For each segment, we present the asset and liabilities amounts in Canadian dollars (Can\$), as a percentage of total assets taken from the M4 return (% of M4), as percentage of the Canadian GDP in 2023 (% of GDP), and the change over the last decade (Δ since 2014).¹⁵

Three key takeaways can be derived from this chart. First, foreign activities are key to Canadian banks' business models because, in several cases, they are even larger than Canadian banks' domestic activities. For instance, Canadian banks' domestic assets correspond to 169% of Canadian GDP (or 45% of the M4 balance sheet). In contrast, Canadian banks' cross-border and foreign-affiliate assets add up to 167% of GDP (or 44% of M4). This amounts to a foreign exposure share for Canadian banks' assets of 50%. Moreover, when inter-office assets, amounting to 42% of GDP, are included in the calculation, this share increases further to 55%. Similarly, Canadian banks' domestic liabilities amount to 139% of GDP (or 37% of M4), while the sum of cross-border and foreign-affiliate liabilities amounts to 161% of GDP (or 43% the M4). This corresponds to a foreign exposure share for Canadian banks' liabilities of 54%, which increases even further to 57% once inter-office exposures are included. Overall, these figures suggest that the business models of the Big Six Canadian banks are highly international and that their exposures to foreign economies and financial systems are considerable.

Second, foreign-affiliate activities—assets and liabilities booked by Canadian banks' foreign affiliates in foreign countries against non-Canadian residents—are the most predominant foreign activities by a sizable margin. This shows that the Big Six Canadian banks enter foreign markets directly through affiliates and do not only conduct their foreign activities from their

¹⁵ We use 2014Q4 as the reference quarter because several of the regulatory returns were modified significantly just before that date. Inter-office positions are not part of the consolidated M4 return. However, to get a better sense of the magnitudes, we still list the "% of M4" information for the inter-office segment.

Canadian head office. This strategy can help increase Canadian banks' understanding of foreign markets and may provide better opportunities to manage potential foreign currency mismatches (e.g., by raising foreign currency deposits).

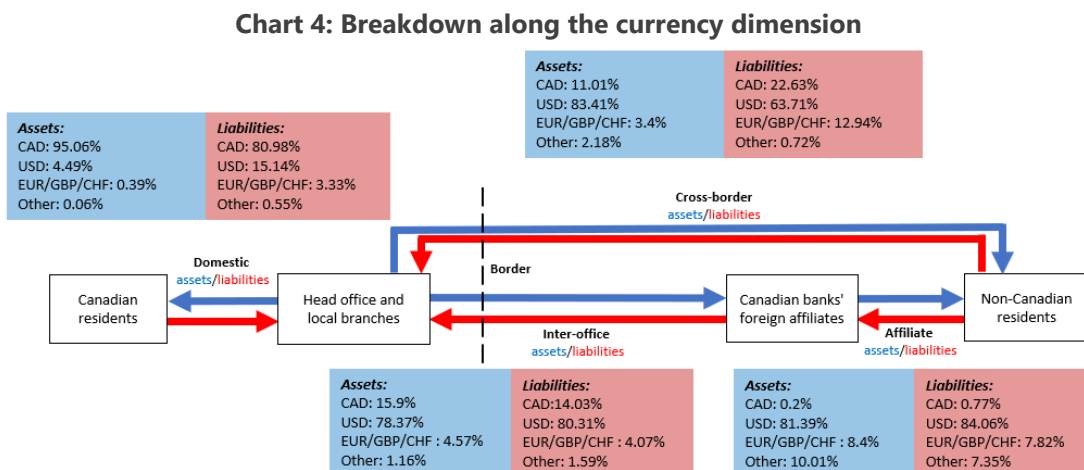
Finally, it is evident that Canadian banks' foreign activities not only are large but also exhibit very high growth rates when compared with domestic activities. For example, while domestic assets show a sizable growth rate of 78% since 2014, foreign assets exhibit triple-digit growth rates during this period, amounting to 126% for foreign-affiliate assets, 177% for inter-office assets and an even higher 349% for cross-border assets. Such high growth rates indicate that, going forward, an even greater share of Canadian banks' assets and liabilities will likely be located outside of Canada, adding more emphasis to the issues discussed in this paper.

3. A further breakdown of Canadian banks' international exposures

In this section, we break down Canadian banks' international exposures by currency, counterparty country, and counterparty entity. Each of these breakdowns maps directly to one of the first three vulnerabilities highlighted in the introduction. The currency dimension allows us to speak about foreign currency exposure, the counterparty country dimension about foreign country exposure, and the counterparty entity dimension about the exposure to less familiar entities abroad (the exposure to borrowers with foreign ties is addressed in section 4). We now discuss each dimension in turn.

3.1. Currency

We start with a breakdown of Canadian banks' exposures by currency. **Chart 4** illustrates the different currency exposures for each market segment.



Note: CAD is Canadian dollar, USD is United States dollar, GBP is British pound, CHF is Swiss franc. Source: Banks' regulatory filings (GRGQ and M4). Observation date: 2023Q4.

Unsurprisingly, the Canadian dollar (CAD) exposures are highest in the domestic market, amounting to about 95% for domestic assets and about 81% for domestic liabilities. The next most important currency exposure in this segment is to the United States dollar (USD), which accounts for 15% of the exposures on the liability side. Together with exposures to other foreign currencies—in particular, the euro, the British pound (GBP), and the Swiss franc (CHF),—the total foreign currency exposure on the liability side of the domestic market amounts to approximately 20% (and around 5% on the asset side).

Turning to the three foreign segments—cross-border, inter-office, and Canadian banks' foreign-affiliate activities—the Canadian dollars share falls significantly and, in some cases, even becomes negligible (e.g., the share of assets and liabilities in Canadian dollars for Canadian banks' foreign affiliates amounts to only 0.2% and 0.8%, respectively). Again, the US dollar dominates the currency exposure of Canadian banks in all foreign markets and reaches values of around 80%. The highest US dollar exposure is observed for Canadian banks' foreign-affiliate liabilities with a value of 84%. The exposures to foreign currencies other than the US dollar, most notably the euro, the British pound, and the Swiss franc (among other foreign currencies), also reach considerable values in several cases. For example, they account for around 13% on the liability side of the cross-border and 15% on the liability side of the foreign-affiliate segment. The asset side of Canadian banks' foreign affiliates is even more exposed, reaching a value of foreign non-US dollar exposure of over 18%.

While foreign currency exposures are not necessarily a concern per se (as long as they are well hedged or otherwise managed), several questions emerge. First, with some of the foreign currency exposures greater than 80%, Canadian banks and their activities become increasingly subject to foreign economic developments (and foreign policy actions). For example, a US dollar asset held by a Canadian bank may more likely respond to changes in US monetary policy than in Canadian monetary policy. Hence, it is important to maintain a good understanding of the sensitivities of different balance sheet components to foreign economic developments and policies, especially during times of financial stress.¹⁶ Second, in both the cross-border and the domestic markets, we observe significant differences in the shares of the same currency across assets and liabilities. Most notable is the difference of 19 percentage points between US dollar assets and US dollar liabilities in the cross-border market.¹⁷ While such differences could indicate that banks actively diversify their assets or funding sources across currencies, it would be helpful to understand the degree to which they are accompanied by corresponding risk mitigation strategies, such as the use of financial hedges (e.g., derivatives) or natural hedges (e.g., notable amounts of US dollar income). And third, while the main focus in this area is on exposures to the US dollar, we also observe differences in the share of foreign non-US dollar exposures across assets and liabilities, such as for the euro, British pound, and Swiss franc (e.g.,

¹⁶ For example, Forbes, Friedrich, and Reinhardt (2023) show that banks and corporations with a higher share of funding in US dollars experienced significantly greater stress during the COVID-19 shock.

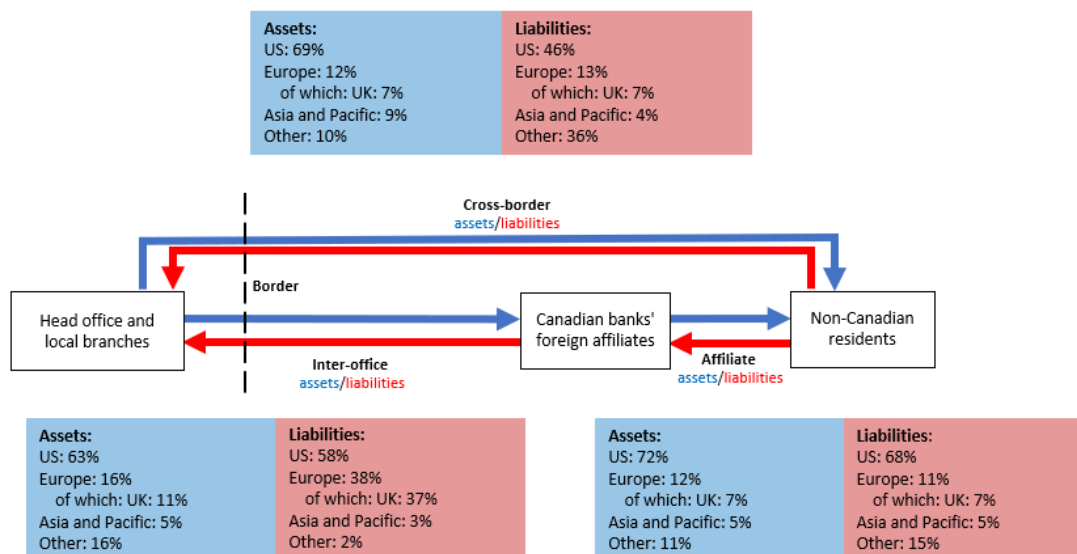
¹⁷ This analysis covers a large portion of the banks' balance sheet, but we do not observe the full picture. As discussed above, the GQ and GR returns align well with the M4 return but do not include some of the smaller M4 balance sheet items, such as the value of land, buildings or equipment of a bank. Moreover, we do not include all information from the GQ and GR returns, such as the balance sheet item *derivatives* from the GQ return, for example. The analysis also abstracts from risk transfers. (See footnote 9 and footnote 14 for details.).

close to 10% for cross-border liabilities). Again, a more meaningful assessment of the risks that these differences may pose requires more data and better insights into banks' foreign currency hedging activities.

3.2. Counterparty country

We now examine the counterparty country dimension, which represents the geographic exposures of Canadian banks. **Chart 5** highlights these exposures. Because our market segments are defined by the booking location of the transactions, the domestic market does not have any foreign country exposure by construction (while the foreign country exposure of the three foreign segments is 100% in each case).

Chart 5: Breakdown along the counterparty country dimension



Source: Banks' regulatory filings (GRGQ and M4). Observation date: 2023Q4.

In line with our findings of the dominance of the US dollar along the currency dimension, Canadian banks are geographically most exposed to the United States, which is by far the most important counterparty country. Interestingly, considerable differences in the extent of the US exposure exist across markets. The US exposure ranges between 63% and 72% on the asset side across all three foreign segments. On the liability side, we observe similar magnitudes, with 68% for the foreign-affiliate market but significantly lower values for the inter-office (58%) and cross-border segments (46%). However, we also see that Canadian banks' foreign country exposures are not exclusively vis-à-vis the United States. In fact, in certain market segments, exposures to other countries can be sizable. With respect to cross-border liabilities, for example, the foreign exposure to countries other than the United States amounts to more than half of the total foreign exposure in that segment.

Several observations emerge from our analysis. A geographical diversification Canadian banks' assets and liabilities appears to generate several benefits. However, potential vulnerabilities could arise if there is a high absolute exposure of both assets and liabilities to a single

counterparty country—this could, for example, subject Canadian banks to economic or regulatory developments in that country (e.g., a change in foreign monetary policy or changes in foreign laws or regulations, respectively). Moreover, a geographical mismatch between assets and liabilities could be of concern if asset-side counterparty countries experience different economic trajectories than liability-side counterparty countries, and thus, the valuations of Canadian banks’ assets and liabilities may evolve differently as a result.

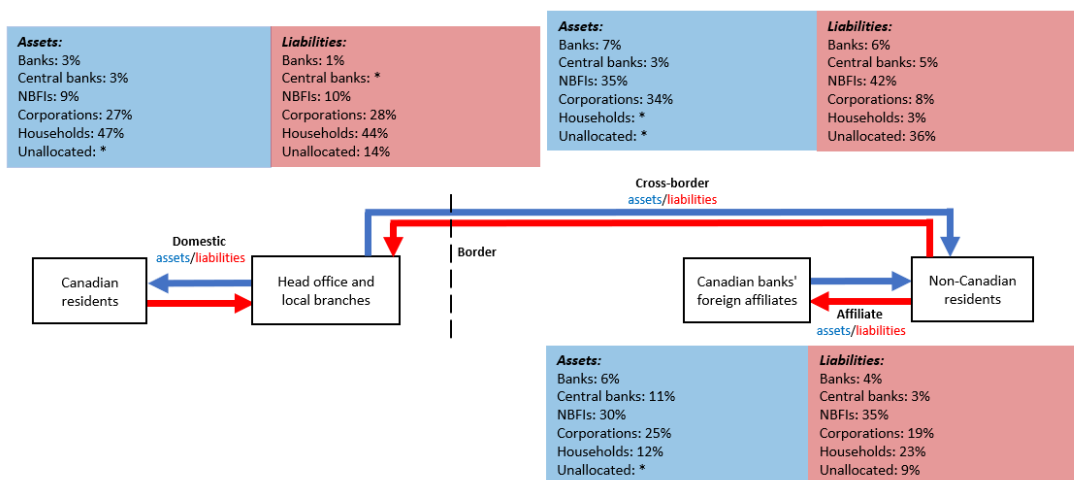
3.3. Counterparty entity

Lastly, we examine the counterparty entity dimension that maps to the vulnerability *exposure to less familiar entities abroad*.¹⁸ We explore this topic along three different sub-dimensions. First, we conduct a breakdown by counterparty sector (e.g., households, firms, and non-bank financial institutions) using the GQ and GR datasets we have relied on so far. Second, we break the data down by industry, using the RAPID2 dataset. And third, we use the RAPID2 dataset to break down the facility dimension. These three breakdowns characterize Canadian banks’ relationships with foreign entities from different angles and contribute to a better understanding of the underlying activities.

3.3.1. Counterparty sector dimension

Chart 6 illustrates how Canadian banks’ activities differ along the international dimension of counterparty sector.¹⁹

Chart 6: Breakdown along the counterparty sector dimension



Note: * indicates data removed for confidentiality reasons. Source: Banks’ regulatory filings (GRGQ and M4). Observation date: 2023Q4.

In the Canadian market segment, 47% of assets and 44% of liabilities are vis-à-vis households, and 27% of assets and 28% of liabilities vis-à-vis non-financial corporations. Hence, well over two-thirds of Canadian banks’ balance sheet exposures in the domestic market are allocated

¹⁸ The counterparty sector of the inter-office flows are the banks themselves, so we do not display this segment here.

¹⁹ The original data include *government* as an additional counterparty sector. We omit this sector to comply with the confidentiality rules that govern the regulatory data.

to these two counterparty sectors. It appears that Canadian banks understand their domestic counterparties very well and can generate sizable returns from their business with these counterparties. For example, in 2023, the return on equity of the business line *Canadian personal and commercial banking* for the Royal Bank of Canada and Toronto-Dominion Bank amounted to 27.8% and 36.8%, respectively.^{20, 21}

However, in the international context, the picture looks very different. For both the cross-border segment and the foreign-affiliate segment, asset and liability exposures to NBFIs dominate the ranking.²² In particular, the NBF sector is counterparty to 35% of Canadian banks' cross-border assets, to 42% of their cross-border liabilities, to 30% of Canadian banks' foreign-affiliate assets, and to 35% of their foreign-affiliate liabilities. Moreover, for certain international segments, a sizable share of counterparties is part of the *unallocated* sector, which is used whenever the counterparty cannot be identified. This is particularly true for cross-border liabilities, where the unallocated sector amounts to 36%.²³

Overall, these findings suggest that the business models of Canadian banks abroad differ considerably from their domestic ones.²⁴ In the best case, this could be a feature that leads to more diversification across activities and counterparties. However, in less favourable circumstances, the high exposure to foreign NBF entities could create a potential vulnerability. This could be particularly true if such foreign NBFs were associated with stronger information asymmetries than traditional counterparties in the Canadian market or if they behaved differently than expected during times of stress. Evidence from the literature suggests that the NBF sector is less regulated, more complex, and riskier than the traditional banking sector. For example, Carstens (2021) and Arora et al. (2021) argue that the NBF sector is less regulated than the traditional banking sector. Related to this, Acharya, Cetorelli and Tuckman (2024) provide evidence that NBF and bank businesses are highly interwoven, making NBFs complex entities that are potentially difficult to assess and fully understand. Moreover, Forbes, Friedrich and Reinhardt (2023) show that banks and non-financial corporations with a higher share of funding from NBFs experienced significantly greater stress during the COVID-19 shock than banks or non-financial corporations that borrowed from more traditional sources, such as the household sector. It is therefore important that all market participants significantly exposed to NBF counterparties—particularly to foreign NBF counterparties—improve their understanding of the NBF sector as a whole and manage their exposures prudently.

²⁰ RBC (2023). See page 40, table 18 "Personal & Commercial Banking," Key Ratios – ROE, 2023. Moreover, the majority of the personal and commercial banking business line appears to be driven by Canadian activities, as chart and text on page 37 indicate that the share of non-Canadian banking activities (i.e., Caribbean and U.S. banking) amount to only 5% of this business line.

²¹ TD (2023). Page 38, Table 16 "Canadian Personal and Commercial Banking," Return on common equity.

²² In the GQ and GR returns, the definition of NBF covers private and public financial institutions other than banks engaged primarily in the provision of financial services and activities auxiliary to financial intermediation such as fund management. More specifically, the list of entities includes, for example, insurance companies, trustee and other pension plans, investment dealers, mutual funds, hedge funds, closed-end funds, mortgage investment companies, real estate investment trusts, sales finance and consumer loan companies, as well as credit unions, and multilateral development banks. See OSFI (2024a) and OSFI (2024b) for more details.

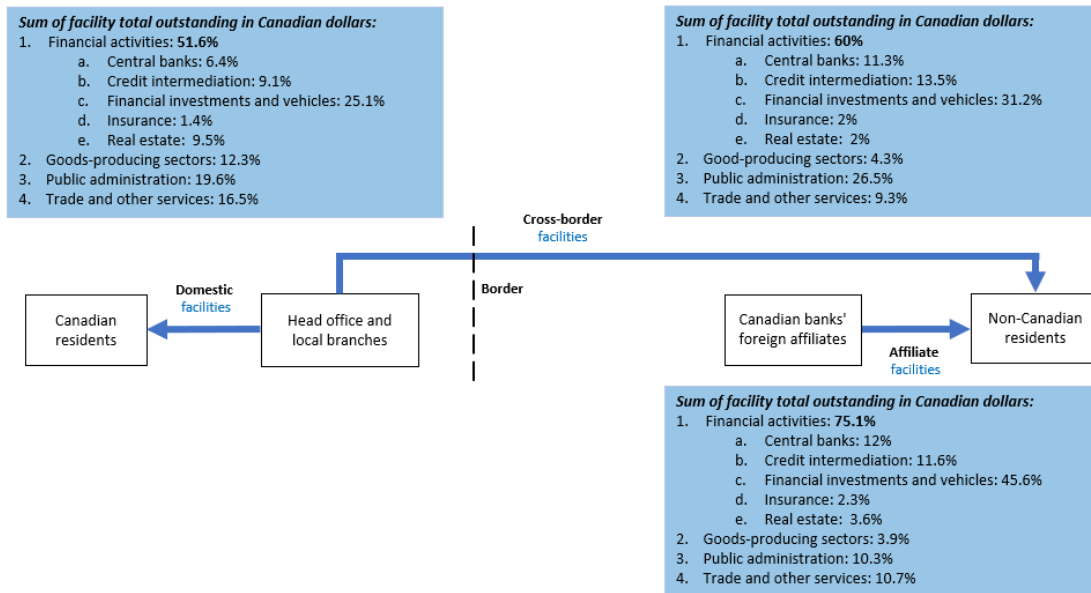
²³ About three percentage points of the unallocated liabilities in cross-border debt refer to subordinated debt. Here, the counterparty sector should be known to the banks, but this information is not recorded in the GQ return.

²⁴ This statement refers to the Canadian banking sector. There could be still considerable heterogeneity across banks.

3.3.2. Counterparty industry dimension

Next, we supplement our analysis of the GQ and GR regulatory returns using data from the RAPID2 regulatory return, which features loan-level data (called *facilities*) and allows for a more detailed breakdown of borrower industries. We present these results in **Chart 7**.

Chart 7: Breakdown of facilities along the counterparty industry dimension



Source: Banks' regulatory filings (GRGQ and M4) and RAPID2. Observation date: 2023Q4.

In this chart, we categorize borrower industries based on NAICS codes.²⁵ *Financial activities* comprises the sum of NAICS code 52 (*Finance and insurance*) and NAICS code 53 (*Real estate and rental and leasing*; henceforth referred to as *Real estate*). Within the *Financial activities* category, we break down code 52 into (*lending to*) *Central banks*; *Credit intermediation*; *Insurance*; and *Financial investments and financial vehicles*, which cover NAICS codes 521 to 526.²⁶

The data show that in the domestic market segment, the industry classification *Financial activities* amounts to around 50% of total facilities outstanding for the segment. This number increases for the cross-border segment to 60% and for the foreign-affiliate segment to 75%. A further breakdown of the *Financial activities* classification reveals sizable shares for the subcategory *Financial investments and financial vehicles*, which amounts to 25% for domestic facilities, 31% for cross-border facilities, and 46% for foreign-affiliate facilities. This suggests that most Canadian banks' financial activities abroad relate to, for example, (i) facilities extended to market-based entities, such as funds, trusts or other financial vehicles holding

²⁵ NAICS refers to North American Industry Classification System, Canada, 2022, Version 1.0. <https://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=1369825>.

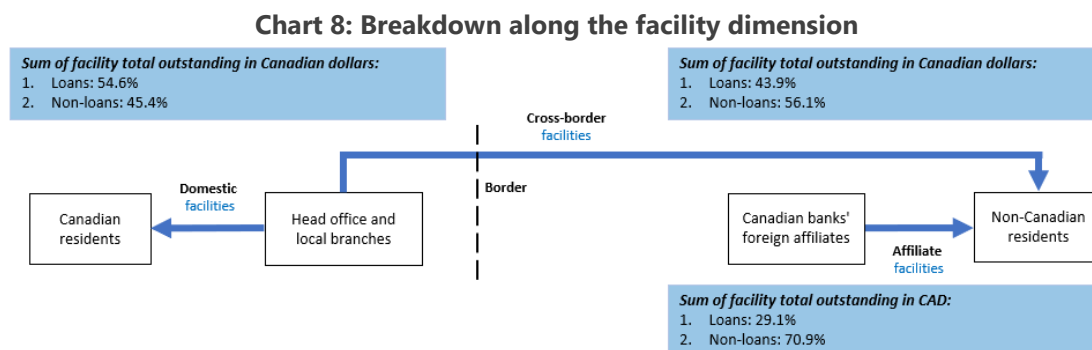
²⁶ *Financial investments and financial vehicles* is an artificial sum category that needs to be introduced to report the results without identifying the activities of individual banks. It consists of the sum of code 523, *Securities, commodity contracts, and other financial investment and related activities* and Code 526, *Funds and other financial vehicles*.

portfolio assets for the benefit of others, (ii) facilities associated with the purchase and sale of securities, as well as (iii) asset management.

3.3.3. Facility dimension

Lastly, we turn to a breakdown along the facility dimension. **Chart 8** presents the corresponding results. The confidentiality rules of the RAPID2 return allow for only a high-level breakdown of the data into loan and non-loan facilities.²⁷ However, this breakdown is quite illustrative. In the domestic market segment, loans make up most facilities, with a share of 55%. This share is considerably lower in the foreign activity segments, with 44% for the cross-border segment and 29% for the foreign-affiliate segment. The remaining 56% and 71% of facilities, respectively, relate to domestic and foreign non-loan facilities. These include derivatives, asset-based securitizations, and securities finance transactions. Hence, this facility breakdown also supports our earlier findings that Canadian banks' activities abroad are more market-based than their domestic activities.²⁸

Overall, the findings presented in the previous two subsections support the broader picture that emerged from our analysis described in section 3.3.1—namely that Canadian banks' foreign activities often involve NBFI entities as counterparties. Specifically, the industry perspective highlights that most Canadian banks' cross-border or foreign-affiliate facilities are closely associated with the financial sector. This is particularly true for entities and activities linked to financial markets instead of with the real economy (as would be the case when banks would lend predominantly to the household or the non-financial corporate sector).



Source: Banks' regulatory filings (GRGQ and M4) and RAPID2. Observation date: 2023Q4.

²⁷ To calculate the loan category, we combine the following RAPID2 facilities: *Revolver Loan, Term Loan—Bullet, Term Loan—Amortizing, Bridge Loan, Demand Loan, Overdraft, Project Finance Facility, Receivable Financing Facility, Debtor in Possession Facility, and Other Loan Facility*. The non-loan category contains the remaining facilities.

²⁸ Evidence from the GQ and GR returns mirrors these findings: In the domestic market segment, loans account for 79% of all claims. However, for the cross-border and the foreign-affiliate segments, the share of loans falls to 46% and 58%, respectively.

4. Canadian firms' foreign exposures

So far, we have focused on Canadian banks' direct foreign exposures. However, the fourth vulnerability—exposure to borrowers with foreign ties—highlights a potential indirect foreign exposure channel for Canadian banks through the firm sector. For this reason, this section focuses on the foreign exposure of Canadian firms. The underlying idea is that Canadian banks can still be indirectly exposed to foreign developments or shocks, even when Canadian banks lend only to Canadian firms that are domiciled in Canada and that borrow in Canadian dollars.

4.1. Data

This section builds on firm-level data from the FactSet dataset. FactSet provides company-level data from financial statements for publicly traded firms around the world. To be able to trace the indirect foreign exposure of Canadian banks to Canadian firms, we limit our sample to firms that are domiciled in Canada and that have their primary stock listing in Canada. Moreover, we use data over the period from 2010 to 2023 to ensure that we cover a wide range of exchange rate dynamics (instead of a snapshot at one point in time). Our resulting sample consists of 283 firms.²⁹

We use the following variables to capture a firm's international exposure:

- **International assets as a percentage of total assets:** Represents total or identifiable assets of foreign operations before adjustments and eliminations
- **International sales as a percentage of total sales:** Represents sales generated from operations in foreign countries
- **International operating income as a percentage of total operating income:** Represents operating income generated from operations in foreign countries before adjustments and eliminations
- **Currency adjustments as a percentage of total assets:** Relates to the income statement and represents realized foreign currency gains and losses, which emerge when the exchange rate changes between purchase and sale dates
- **Foreign exchange effects as a percentage of total assets:** Relates to the cash flow statement and presents the effect of translating from one currency to another on the cash flow of a company (effects of the exchange rate on foreign cash balances)

²⁹ The number of firms in the raw data that meet these criteria is larger than in our sample. However, we arrive at this number after removing duplicate firms, inactive firms and commercial banks from the sample (we remove the latter to not confound our messages with the bank analysis in earlier sections of this paper).

4.2. Results

Our first exercise, shown in **Table 2**, breaks down the international exposures of Canadian firms by industry and relates these breakdowns to the balance sheets of Canadian banks.³⁰ Column 2 of the table relies on RAPID2 data and shows the share of Canadian banks' lending to Canadian firms in each industry (as a share of Canadian dollar lending to Canadian firms across all industries).³¹ The numbers range from 34.7% for the finance and insurance industry to 2.3% for the wholesale trade industry.

Table 2: International exposures by industry

Industry	Share in RAPID2 (Can\$ lending only)	International assets (% of total)	International sales (% of total)
Finance and insurance	34.7%	11%	16%
Public administration	13.8%	0%	28%
Real estate	13.6%	5%	21%
Other services	8.5%	17%	51%
Construction	7.1%	20%	74%
Retail trade	5.7%	5%	13%
Transportation and warehousing, utilities	4.9%	8%	13%
Manufacturing	3.6%	25%	67%
Mining, quarrying, oil and gas	3.0%	31%	33%
Agriculture, forestry, fishing and hunting	2.6%	36%	63%
Wholesale trade	2.3%	1%	8%

Note: Table contains data from RAPID2 (Column 2) and FactSet (Column 3 and Column 4). The FactSet sample includes 283 firms from 2010 to 2023. The RAPID 2 data contains 313,402 firms over the period 2013Q4 to 2023Q4. We highlight in bold all foreign exposures in Column 3 and Column 4 that are equal to or larger than 20%.

Next, based on FactSet data, columns 3 and 4 show the share of international assets as a percentage of total assets and the share of international sales as a percentage of total sales, respectively, for each industry. For the international assets variable, 4 out of 11 industries stand out, with an international asset exposure of 20% or above. They are agriculture, forestry, fishing and hunting (36%); mining, quarrying, oil and gas (31%); manufacturing (25%); and construction (20%). For the international sales variable, 7 out of 11 industries carry a foreign exposure of

³⁰ Note that this exercise is only a back-of-the-envelope calculation and does not rely on a precise firm-level matching between the RAPID2 and FactSet datasets. The table is constructed by displaying banks' portfolio shares for each industry based on RAPID2 data in column 2 and the international exposure shares for each industry based on FactSet data in columns 3 and 4. It could therefore be considered an industry-level matching.

³¹ The RAPID2 dataset covers mostly facilities extended by Canadian banks to the corporate sector but also includes facilities to the government and other financial institutions. These entities are likely captured by the industry classifications *public administration* and *finance and insurance*, respectively.

20% or above. The three highest international exposures are in construction (74%); manufacturing (67%); and agriculture, forestry, fishing, and hunting (63%). Moreover, the international sales exposure of these sectors exceeds their domestic exposure considerably.

We combine the information from columns 2 to 4 and add up all Canadian banks' shares of Canadian dollar lending with exposures of 20% or more and find a total share of 52%. This suggests that more than half of Canadian banks' lending to the corporate sector in Canadian dollars recorded in the RAPID2 dataset could be indirectly exposed to foreign developments or shocks.³² Moreover, in some cases—such as for lending to the construction; manufacturing; or agriculture, forestry, fishing, and hunting industries—the foreign exposures can be considerable.

Our second exercise aims to provide a better understanding of the characteristics of internationally exposed firms (**Table 3**). In the first three columns of this table, we display the names, the sample, and the corresponding median values for all five international exposure variables for firms—namely, *International assets as a percentage of total assets*, *International sales as a percentage of total sales*, *International operating income as a percentage of total operating income*, *Currency adjustments as a percentage of total assets*, and *Foreign exchange effects as a percentage of total assets*.

The samples differ across rows because, for each international exposure variable, we compare the characteristics of firms that are more internationally exposed (based on their location in the distributions of the international exposure variables) to the characteristics of all firms in our sample. The firm characteristics, in turn, are shown in the five right-most columns of the table and comprise the *Number (#) of employees*, *Asset size*, *Gross income margin*, *Sales-to-asset ratio*, and *Debt-to-asset ratio*.

We start with the first three international exposure variables (i.e., international assets, international sales, and international operating income). In each case, we compare the mean of the firm characteristics for firms in the 90th percentile of the international exposure variable distributions to the mean of the firm characteristics for all firms. We observe that firms that are more internationally exposed are characterized by a larger number of employees, more assets, and a lower debt-to-asset ratio than the average firm in the sample. This makes firms that are more exposed internationally appear to be more resilient to shocks (i.e., safer). However, we also observe that firms that are more internationally exposed have lower gross income margins and lower sales-to-asset ratios, which could indicate a lower profitability.

³² As discussed in section 2.1., the RAPID2 dataset comes with several caveats (e.g., it covers only transactions where the total authorized amount across common risks exceeds Can\$10 million) and therefore may only represent a subset of Canadian banks' lending portfolios. It should also be noted that our firm sample is biased to larger firms, which in turn are more likely to be active abroad. As such, the actual exposure of Canadian banks' lending portfolio to firms with foreign ties could be lower.

Table 3: Characteristics of firms with international ties

International exposure variable	Sample	Median value of international exposure variable	Asset size	Number of employees	Gross income margin	Sales-to-asset ratio	Debt-to-asset ratio
Share of international assets	90 th percent-tile	83.3	5,910	9,066	35.3	0.29	27.3
	All	0	3,883	5,978	38.2	0.42	33.1
Share of international operational income	90 th percent-tile	90.6	4,002	8,263	35.7	0.30	26.9
	All	0	3,543	4,539	41.8	0.30	34.6
Share of international sales	90 th percent-tile	100	4,351	11,763	34.6	0.41	25.1
	All	0	4,519	6,370	37.8	0.48	34.8
Share of foreign currency adjustment	90 th percent-tile	1.7	1,976	2,580	38.3	0.42	28.8
	10 th percent-tile	-1.5	2,131	2,904	34.4	0.53	37.5
	All	0.0	3,652	5,888	33.3	0.49	31.0
Share of foreign exchange effects	90 th percent-tile	0.6	1,368	3,898	35.6	0.74	25.6
	10 th percent-tile	-0.7	2,276	4,771	35.3	0.58	23.8
	All	0.0	5,041	7,250	36.2	0.52	32.1

Note: Numbers in bold indicate “safer” firms, which are larger (by number of employees or asset size), have higher gross income margins or sales and have less debt. The sample covers 283 firms over the period 2010Q1-2023Q4. Depending on the row, the sample covers a percentile (the 10th percentile or the 90th percentile) of the firm distribution or the entire firm sample (All). Hence, the “Median value of international exposure variable” column presents the median of the international exposure variable for the respective percentile or for all firms in our sample. The five right-most columns (firm characteristics) show the mean of each characteristic.

For the two remaining international exposure variables (share of foreign currency adjustment and share of foreign exchange effects), we compare in each case the mean of the firm characteristics for firms in the 10th and 90th percentiles of the international exposure variable distributions to the mean of the firm characteristics for all firms. The reason for this is that foreign currency adjustments and foreign exchange effects can be either positive or negative, suggesting that the firms with the highest international exposure can appear on either end of the variable distribution. Here, we observe that smaller firms (when measured by both number of employees and asset size) are more exposed to foreign currency adjustments and foreign exchange effects. The picture for the remaining characteristics is more mixed, with patterns that are less clear. For example, for the international exposure variable “share of foreign currency adjustment,” the firm characteristic debt-to-asset ratio shows the lowest value at the 90th percentile but the highest value at the 10th percentile. This could suggest a possible relationship between foreign currency adjustment realizations and firms’ debt-to-asset ratios that might be worth exploring further.

Overall, our analysis of the international foreign exposure of a sample of Canadian firms shows that firms with international exposures through assets, sales, or operating income are generally larger and less indebted. In contrast, firms that are more internationally exposed through foreign currency adjustments or foreign exchange effects tend to be smaller. In particular, the latter finding could raise questions about how well these smaller firms are able to hedge effectively against currency fluctuations and, in the worst case, could pose a credit risk to bank balance sheets.

5. Case study on the global expansion of Canadian banks: The Brexit shock

In previous sections of this paper, we documented the extent of the international expansion of Canadian banks and discussed possible vulnerability implications. However, we have not yet discussed how this expansion took place. In this section, we use the unanticipated outcome of the Brexit referendum in 2016 as an example of an international shock that may have induced Canadian banks to expand their exposures to the United Kingdom while most of their international peers retreated. While this episode may not be fully representative of the overall expansion of Canadian banks, it still highlights an important mechanism in the expansion process.

5.1. Background on the Brexit shock

The theoretical possibility of Brexit first emerged in 2013, when the British prime minister at the time, David Cameron, promised voters to hold an in-versus-out referendum on the United Kingdom’s membership in the European Union, conditional on his Conservative Party winning the 2015 general election. In June 2016, the referendum was held, and 52% of the British public unexpectedly voted to leave the European Union. In March 2017, the British government formally triggered Article 50 of the European Union’s Lisbon Treaty, which started a two-year process for the United Kingdom to leave the European Union. The deadline for leaving was

extended several times, but in October 2019 all parties agreed to a withdrawal deal, which came into effect in January 2020.³³

Several factors make the Brexit shock an appealing case study in this context. First, the outcome of the Brexit referendum was largely unanticipated. Pre-vote predictions were heavily in favour of the United Kingdom staying in the European Union, so the referendum results were a large surprise. The magnitude of this surprise was especially reflected in a sudden 10% depreciation of the British pound against the US dollar, which occurred after it became clear that the referendum would turn out to be in favour of leaving (*The Guardian*, 2016). Second, the shock originated outside Canada, so its impact on Canadian banks would be more likely to appear through international channels rather than through Canada's domestic policy responses to the event. And third, because the United Kingdom was Canada's fourth largest trading partner in 2016, the economic and financial links between the two countries were sizable enough for Canadian banks to consider reacting to developments in the United Kingdom.³⁴

Lastly, we select the Brexit referendum itself (i.e., 2016Q2) as the treatment date for our event study because it appeared to be the event that had the strongest impact on forming the expectations of market participants.

5.2. Canadian banks' response versus that of their international peers

The outcome of the Brexit referendum did not appear to have a negative impact on Canadian banks. None of the Big Six banks, for example, seemed to have experienced a decrease in assets in the years following Brexit. Moreover, according to Canadian banks' 2016 annual reports, the results of the Brexit referendum did not appear to have a major impact on their operations—albeit there was some heterogeneity. On the one hand, the Royal Bank of Canada (RBC) identified Brexit as the top risk in its 2016 annual report (RBC, 2016, p. 48) and noted that “the macroeconomic headwinds discussed [Brexit, oil, U.S. election] may lead to higher PCL [provisions for credit losses] in our wholesale and retail loan portfolios” (RBC, 2016, p. 11). On the other hand, the Canadian Imperial Bank of Commerce (CIBC) expected only a few differences between their two stress-test scenarios, one involving the United Kingdom exiting the European Union and the other involving the United Kingdom remaining in the European Union (CIBC 2016, pp. 64–65).

To assess how Canadian and foreign banks interacted with the United Kingdom after Brexit, we examine the dynamics of banks' foreign claims on the United Kingdom as reported in the consolidated banking statistics provided by the Bank for International Settlements (BIS). These data, encompassing 32 countries, measure international banking activity from a nationality perspective, focusing on the location of the banking group's parent company.³⁵

³³ See Associated Press (2020) for a timeline of events listed in this paragraph.

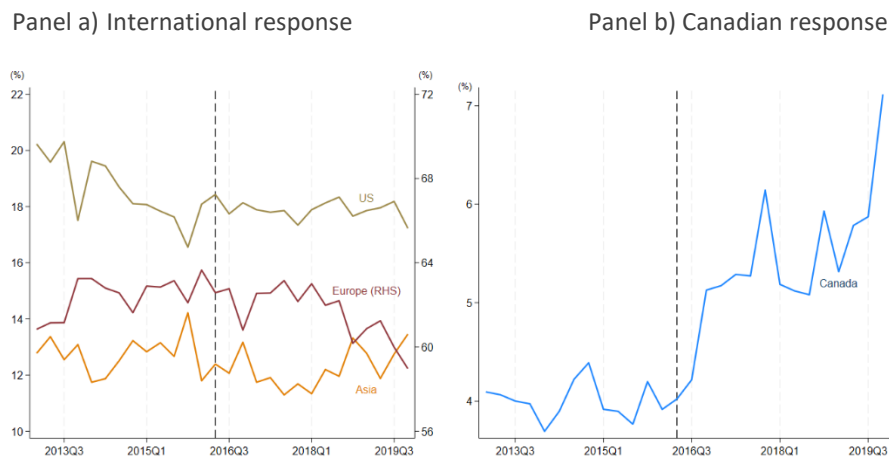
³⁴ See Statistics Canada (2024). In 2016, the United Kingdom was Canada's fourth largest trading partner (for both imports and exports) behind the United States, the European Union and China.

³⁵ For example, an affiliate of one of the Big Six Canadian banks located in the United States is classified as a Canadian bank in the consolidated banking statistics because its parent company is Canadian.

Foreign claims in this dataset include credit extended to borrowers located outside a banking group's home country and are broken down into three components. First, local claims in local currency, which, for Canada, include claims by Canadian banks located in the United Kingdom to entities located in the United Kingdom in British pounds. Second, local claims in foreign currency, which involves claims made by Canadian banks in the United Kingdom to entities located in the United Kingdom but in currencies other than the British pound. And third, cross-border claims, which are claims from Canadian banks located in Canada to entities in the United Kingdom. Total foreign claims of Canadian banks then represent the sum of these three components.

Chart 9 shows the dynamics of foreign and Canadian banks' shares of UK claims (relative to their total claims) after the Brexit shock. European banks in particular—which were most directly affected by the shock—saw their shares of UK claims decline significantly from 63% to 58% in subsequent years. The share of UK claims by US banks, in contrast, remained relatively stable, and the UK share of Asian banks even saw a slight increase. However, the share of UK claims in any of these cases does not increase as much as it does for Canadian banks, whose claims on UK residents increased from 4% to 7% between 2016Q2 and 2019Q4. As a result, Canadian banks gained a larger market share in the United Kingdom while most of their international peers reduced, or at least did not materially expand, their UK business.

Chart 9: The response to the Brexit shock: Canadian banks compared with their international peers



Note: Data are from the consolidated banking statistics provided by the Bank for International Settlements over the period 2013Q1-2019Q4. The chart shows total claims from domestic banks on UK residents. The concept of "domestic banks" is based on the country where the banking group's parent is headquartered. The vertical black line indicates the date of the Brexit referendum.

5.3. Event study based on Canadian regulatory data

Next, we use an event-study approach and Canadian regulatory data to examine banks' responses to the Brexit shock more formally. While we do not observe the behaviour of foreign banks in these data (discussed in the previous subsection), the more granular Canadian regulatory data allow us to understand the response of Canadian banks in more detail.

5.3.1. Data

We again base our analysis on data from the Canadian GQ and GR returns. As in earlier sections of this paper, we classify Canadian banks' foreign activities into three distinct segments: cross-border, inter-office, and foreign-affiliate activities. We refer to the sum of these three components as total foreign claims. We conduct our analysis at the bank-country-level (i.e., Bank1-booked to-US, Bank1-booked to-UK, Bank2-booked to-JPN) at quarterly frequency.³⁶ The list of counterparty countries includes a larger number of small economies with low transaction values vis-à-vis Canada. To prevent this feature from driving our results, we focus only on bank-country pairs with more than Can\$50 million in total claims during the sample period. Moreover, as the raw values of certain balance sheet items display strong trends over time, we transform all values to quarter-over-quarter growth rates by taking the first difference of their natural logarithm.

Our resulting panel dataset contains 50 bank-country pairs, with about 8 counterparty countries per bank, on average (varying between 2 and 15), and ranges from 2014Q4 to 2019Q4, which includes the Brexit shock in 2016Q2.

5.3.2. Methodology

To capture the dynamic responses of Canadian banks to the Brexit shock, including both their immediate and long-term responses, we rely on an event-study regression approach. This approach is based on the following equation:

$$y_{ict} = \beta_0 + \alpha_{ic} + \gamma_t + \sum_{N=-1}^{14} \beta_N (QuarterNsinceBrexit_t \times UK_c) + \epsilon_{ict}.$$

The dependent variable y_{ict} is the growth rate of a balance sheet item, such as total foreign claims, or one of its components. The dependent variable varies along three dimensions: i is banks, c is the counterparty country, and t is the quarterly time variable. On the right-hand side of the equation, we include a set of quarterly time dummies, $QuarterNsinceBrexit_t$ for $N = -1, 0, 1, \dots, 14$. The variable $QuarterNsinceBrexit_t$ equals 1 if a given quarter t is N quarters after the Brexit shock and 0 otherwise. (A negative N indicates the period before the shock.) These time dummies are interacted with the dummy variable UK_c , which equals 1 if the counterparty country is the United Kingdom and 0 otherwise. The coefficients on these interaction terms, β_N , are our key parameters of interest. For instance, β_0 represents the immediate effect of the Brexit shock on our dependent variable, and β_2 shows the effect two quarters after the Brexit shock.

We include two sets of fixed effects as additional controls in the specification—one for the bank-country dimension (α_{ic}) and the other for the time dimension (γ_t). The bank-country fixed effects absorb bank-specific factors and country-specific factors as well as any combination of those. Hence, this includes all factors that relate to how a bank conducts business in a foreign country as long as these effects remain constant over time. The time fixed effects control for unobserved factors that affect all banks in a similar way, such as Canadian or UK monetary policy.

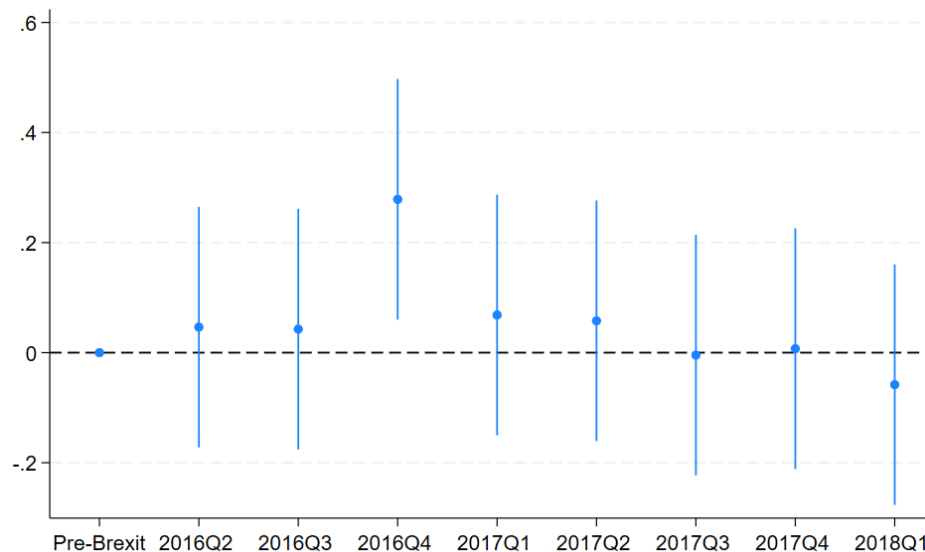
³⁶ We therefore aggregate over all currencies in the first part of our exercise.

Our main coefficient is β_N , which represents the growth rate of Canadian banks' claims on UK counterparties compared with the growth rate of Canadian banks' claims on other foreign counterparties. We plot the coefficients β_N from $N = 0$ to $N = 7$, with the coefficient on the pre-Brexit period normalized to zero.

5.3.3. Results

First, we examine the responses of total foreign claims to the Brexit shock by summing cross-border, inter-office, and foreign-affiliate claims. We present the results in **Chart 10**. The blue dots in the chart represent the estimated coefficients ($\beta_{-1}, \beta_0, \dots, \beta_7$) from the event-study regression, with the vertical lines highlighting their 95% confidence intervals. We normalize β_{-1} to zero, so the estimated effects are relative to the pre-Brexit level.

Chart 10: Total foreign claims on the United Kingdom by Canadian banks



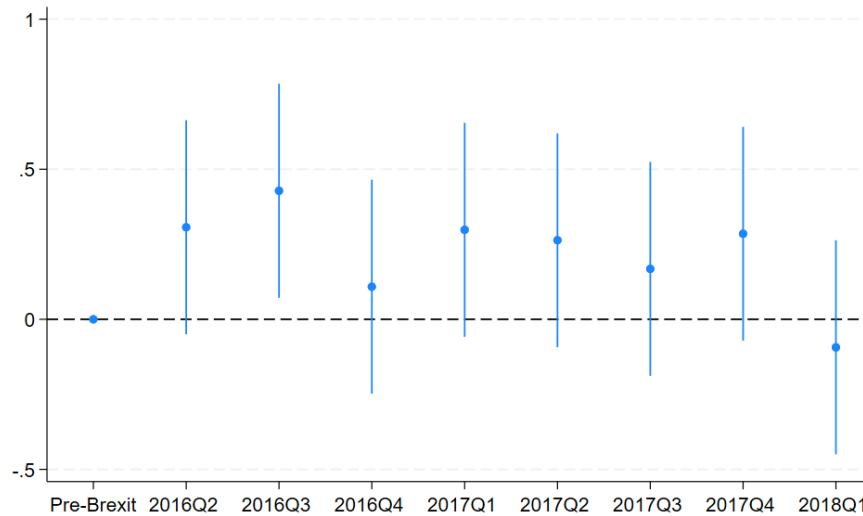
Note: The dependent variable is total foreign claims on the United Kingdom by Canadian banks. Sample range is from 2014Q4 to 2019Q4, with the Brexit shock in 2016Q2. Controls include quarterly time-fixed effects and bank-country fixed effects. Vertical lines show the 95% confidence intervals; blue dots are the estimated coefficients from the event-study regression. Source: Banks' regulatory filings (GRGQ).

The coefficient β_2 is positive and significant, with an estimated value of 0.28. This suggests that the growth rate of Canadian banks' total foreign claims on the United Kingdom increased by 28% (relative to Canadian banks' claims on other countries) in 2016Q4, which is two quarters after the Brexit shock. This increase is equivalent to about Can\$50 billion. The growth effect, however, appears to be mostly temporary because the growth rate of total foreign claims returns to its pre-Brexit-shock value over time (the Canadian banks nevertheless have a higher level of total foreign claims on the United Kingdom than they did before the Brexit shock).

We then break down total foreign claims into its three components. **Chart 11** displays the results when the dependent variable is cross-border claims on the United Kingdom (which make up about 10% of Canadian banks' total foreign claims on the United Kingdom). Cross-border claims appear to respond faster to the Brexit shock than total foreign claims, with the

peak response already occurring one quarter after the shock. The increase in the growth rate of cross-border claims is highly significant and amounts to nearly 50% at the peak, which is equivalent to Can\$4.3 billion. This finding seems intuitive because cross-border claims possibly require the least amount of banking infrastructure in the destination country and can therefore be adjusted relatively quickly.

Chart 11: Cross-border claims on the United Kingdom by Canadian banks

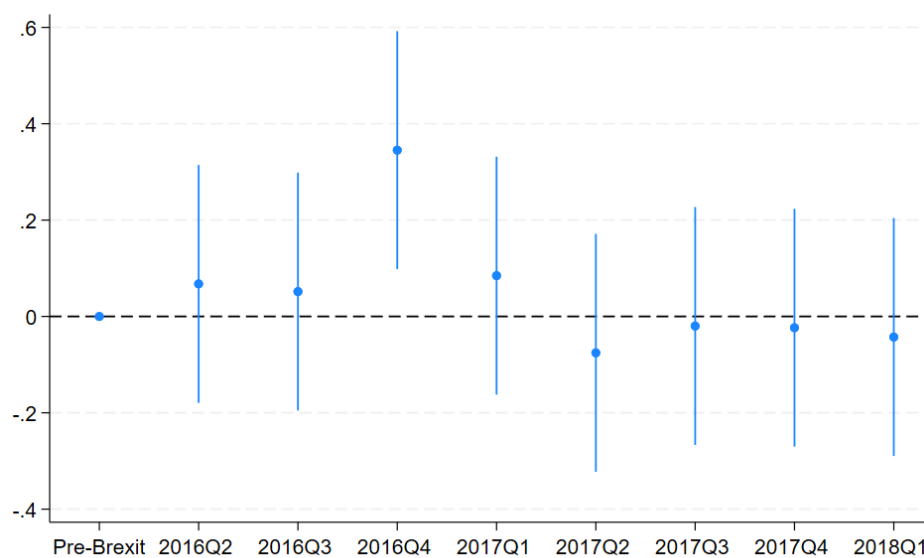


Note: The dependent variable is cross-border claims on the United Kingdom by Canadian banks. Sample range is from 2014Q4 to 2019Q4, with the Brexit shock in 2016Q2. Controls include quarterly time-fixed effects and bank-country fixed effects. Vertical lines show the 95% confidence intervals; blue dots are the estimated coefficients from the event-study regression. Source: Banks' regulatory filings (GRGQ).

We also assess the impact on total foreign-affiliate claims, which account for about two-thirds of Canadian banks' total foreign claims on the United Kingdom and are therefore the largest component of total foreign claims on the United Kingdom (**Chart 12**). Total foreign-affiliate claims exhibit similar dynamics as total foreign claims, with a peak response occurring in 2016Q4 (two quarters after the Brexit shock) and amounting to an increase in the growth rate of total foreign-affiliate claims of 33% (equivalent to Can\$39 billion and occurring in 2016Q4, two quarters after the Brexit shock).

Next, we break down total foreign-affiliate claims further. Total foreign-affiliate claims on the United Kingdom refer to Canadian banks' claims on UK counterparties regardless of whether Canadian banks' foreign affiliates are located in or outside the United Kingdom. To better understand the effect of the Brexit on Canadian banks' UK affiliates, we focus on the UK claims by Canadian banks' UK affiliates. We refer to these claims as "UK affiliate claims."

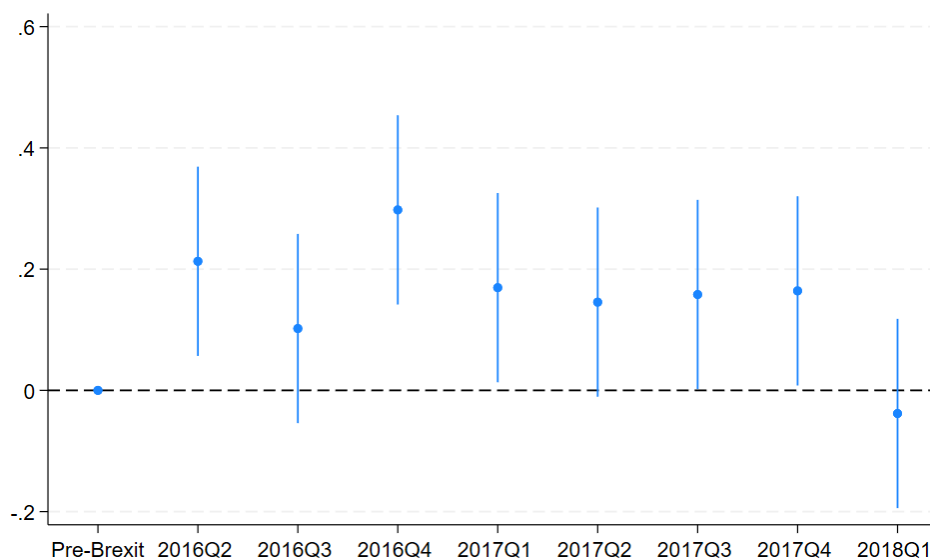
Chart 12: Total foreign-affiliate claims on the United Kingdom by Canadian banks



Note: The dependent variable is total foreign-affiliate claims on the United Kingdom by Canadian banks. Sample range is from 2014Q4 to 2019Q4, with the Brexit shock in 2016Q2. Controls include quarterly time-fixed effects and bank-country fixed effects. Vertical lines show the 95% confidence intervals. Source: Banks' regulatory filings (GRGQ).

Chart 13 plots the event-study results for UK affiliate claims in response to the Brexit shock. The immediate response in 2016Q2 is an 21% increase in the growth rate, with a peak response in 2016Q4 at 29%. The increase amounts to around 18% and persists until the end of 2017, which makes the response of this type of claim the most pronounced one.

Chart 13: UK affiliate claims on the United Kingdom by Canadian banks



Note: Dependent variable: UK affiliate claims on the United Kingdom by Canadian banks. Sample range is from 2014Q4 to 2019Q4, with the Brexit shock in 2016Q2. Controls include quarterly time-fixed effects and bank-country fixed effects. Vertical lines show the 95% confidence intervals; blue dots are the estimated coefficients from the event-study regression. Source: Banks' regulatory filings (GRGQ).

Our analysis suggests that the aggregate response of Canadian banks to the Brexit shock is expansionary, especially through an increase in their UK affiliate lending. However, it should be noted that considerable heterogeneity exists in Canadian banks' individual responses (not shown). Some banks did not expand their UK lending activities in response to the Brexit shock, whereas others expanded them significantly. This might be due to differences in Canadian banks' international expansion strategies, such as focusing on different geographic priorities or different business models (e.g., placing an emphasis on foreign retail banking versus capital market operations).

Our last exercise examines the effects of the Brexit shock on Canadian banks' balance sheets more broadly. We focus on the balance sheets for all foreign activities (equivalent to the total foreign claims measure on the asset side) and break it down along the following dimensions: (i) side of the balance sheet (claims, liabilities); (ii) sector of the counterparty (household, non-financial corporations, other banks, non-bank financial institutions [NBFI], government); (iii) currency (Canadian dollar, British pound, US dollar, euro, Swiss franc, Japanese yen, other).

For each balance sheet item, we analyze the Canadian banks' response to the Brexit shock by running a simplified regression of the growth rate of the item on an interacted before-after dummy, $post_t \times UK_c$, with time fixed effects, bank-country fixed effects and additional controls.

Table 4 shows the balance sheet items with significant coefficients on the interaction term. The first column shows the labels of the investigated balance sheet items that are disaggregated by claims and liabilities, category and currency. The second column shows the estimated coefficient on the interaction term $post_t \times UK_c$ with the disaggregated balance sheet item as the dependent variable.³⁷ The last column highlights the economic significance of the balance sheet item by calculating the percentage of each item that is booked to the United Kingdom compared with all countries in 2018Q1. For example, for loans in US dollars, we display the share of US dollar loans booked to the United Kingdom relative to US dollar loans booked to all countries. This share reflects the importance of the UK exposure for each balance sheet item in the portfolio of Canadian banks.

³⁷ The asterisks indicate the level of statistical significance (***) indicates a p -value less than 0.1%; ** indicates a p -value less than 1%).

Table 4: The response of disaggregated balance sheet items

Balance sheet item	Beta	UK share of component (%)
<u>Claims</u>		
<u>By category:</u>		
Loans	0.284**	2.91
in Canadian dollars	0.429**	0.11
in US dollars	0.232*	3.25
Securities	0.241**	2.60
<u>By sector:</u>		
To governments	0.358**	1.13
To non-bank financial institutions	0.280*	7.66
in US dollars	0.352**	4.12
<u>Liabilities</u>		
Deposits from households	-0.242***	0.39
in US dollars	-0.204*	0.47

Note: The dependent variable is total foreign activities in the United Kingdom by Canadian banks. Before-after analysis is around the Brexit shock in 2016Q2. The table contains results from a regression of disaggregated balance sheet items on the interaction term *Post*UK*. The first column shows the name of each item, and the second column shows the coefficient estimate on *Post*UK*, with (*) indicating significance level < 0.1, (**) < 0.05 and (***) < 0.01. The last column shows the United Kingdom's share of this item compared with all countries in 2018Q1.

Consistent with our analysis above, the results in **Table 4** highlight three sources of potential vulnerabilities for Canadian banks due to their UK expansion after the Brexit shock. First, the growth rate of loans in US dollars increased significantly by 23%. This finding points to the emergence of potentially complex financial transactions because the US dollar is neither the native currency of the United Kingdom nor of Canada. Second, the growth rate of claims on the NBFi sector increased by 28% after the Brexit shock. Canadian banks' claims on the NBFi sector in the United Kingdom make up 7.7% of all their NBFi claims, which itself is a notable share of Canadian banks' portfolios. Because it is a less-regulated sector, financial transactions involving NBFi counterparties tend to potentially involve higher risk. It is also noteworthy that transactions denominated in US dollars show the most prominent response among all NBFi activities. And third, on the liability side, Canadian banks appear to fund themselves less using household deposits after the Brexit shock, as indicated by a negative growth rate of 24%. This may constitute a less favourable development because household deposits are typically considered a highly stable funding source.

In summary, we find that Canadian banks significantly expanded their claims on UK counterparties after the Brexit shock. The key drivers of this expansion are Canadian banks' foreign-affiliate claims, especially claims from their UK affiliates. Cross-border claims on the

United Kingdom increased as well, while inter-office claims showed no significant response (and thus are not discussed here). While Canadian banks expanded their foreign activities considerably in response to the Brexit shock, it should be noted that a certain degree of heterogeneity remains across banks, potentially driven by their divergent international strategies. Overall, the Brexit shock may have presented a potential opportunity for Canadian banks to diversify their business models and to increase their revenues by conducting more business in the United Kingdom.

However, we also identify a possible increase in potential vulnerabilities associated with significant changes of certain balance sheet items after the Brexit shock. On the asset side, we find evidence of more exposure to the NBFIs sector. Moreover, transactions denominated in US dollars increase as well, even though the US dollar is not native to either Canada or the United Kingdom. On the liability side, we find a declining reliance on household deposit funding, which is generally considered a stable funding source. Hence, while Canadian banks seem to have taken advantage of the Brexit shock by expanding their business in the United Kingdom, the emergence of some potential vulnerabilities may require these vulnerabilities to be actively managed.

6. Conclusion

In this paper, we document the growing international exposure of the Canadian banking system and highlight potential vulnerabilities that could emerge as a result. In 2023Q4, the share of Canadian banks' foreign assets and liabilities amounted to around 50%, with foreign exposures even surpassing domestic ones in some cases. We mainly focus on four potential vulnerabilities that are associated with the international expansion: foreign currency exposure, foreign country exposure, exposure to less-familiar entities, and exposure to borrowers with foreign ties.

We use a combination of regulatory and commercial data sources to identify the following facts. First, Canadian banks' foreign activities differ considerably from their domestic ones. While Canadian banks engage domestically mostly with real sector entities, such as households and non-financial corporations, their most common counterparties abroad are NBFIs. To the extent that NBFIs or their behaviours might be less known to Canadian banks, a considerable exposure to such entities could constitute a potential vulnerability. Second, Canadian banks have sizable foreign currency and foreign country exposure to the US dollar and the United States but also notable exposures to other countries and currencies. And third, we document the presence of an indirect foreign exposure channel for Canadian banks through lending to internationally exposed firms, even if these firms are domiciled in Canada and borrow in Canadian dollars. Lastly, as an example of how this international expansion has played out, we also include a case study that illustrates how Canadian banks significantly expanded their market share in the United Kingdom due to the Brexit shock.

While our work serves as a first step toward documenting Canadian banks' foreign activities, several caveats remain, and more work is needed to address them.

First, the list of potential vulnerabilities in the international context discussed in this paper is not exhaustive. For example, by holding foreign securities, Canadian banks could be exposed not only to foreign exchange risks but also to foreign interest rate risks. In such a scenario, a change in US monetary policy could have a direct impact on Canadian banks. Moreover, even if Canadian banks do not hold foreign securities directly, a change in US monetary policy could have an impact through the portfolio rebalancing channel, the term premium, or could be seen as foreshadowing a change in Canadian monetary policy. A similar link can be made for foreign market risks. If Canadian banks hold securities directly, their valuation would depend on the price dynamics for foreign assets, and significant asset price changes could spill over into Canadian markets. In addition, we did not explore third-country effects in this paper. Such effects could emerge when a major trading or financial partner of Canada, most notably the United States, would be affected by a sizable external shock.

Second, as discussed above, our analysis did not consider any risk mitigation strategies that Canadian banks can employ to reduce their exposure to the vulnerabilities highlighted above. For example, to address foreign exchange exposures, banks could use financial hedges, such as foreign currency derivatives, or natural hedges, such as creating matching revenue flows or exploiting funding sources that can neutralize the original exposures to foreign exchange risks. To address foreign country exposures, banks could match assets and liability exposure for each country so that country-specific shocks are buffered or banks could diversify exposures across a larger number of countries so that shocks from individual countries matter less. The optimal responses to the two other vulnerabilities will greatly depend on the context, however, and more work may be required to fully understand these vulnerabilities. Most likely, strategies to obtain more information about the business models and financial health of Canadian banks' counterparties as well as their behaviour in times of financial stress could close the information gap to some degree.

Third, Canadian banks operate in a well-regulated environment. Two Canadian banks—the Royal Bank of Canada and the Toronto-Dominion Bank—have been designated as global systemically important banks (G-SIBs), which comes with higher requirements for capital absorbency, disclosure and supervisory expectations. To assign such a designation, the Basel Committee on Banking Supervision uses a range of indicators from the categories such as size, substitutability, interconnectedness, complexity and cross-jurisdictional activity.³⁸ In addition, the Canadian banking regulator, OSFI, implemented a series of liquidity adequacy requirements (LAR) for Canadian banks that include a liquidity coverage ratio (LCR) and a net stable funding ratio (NSFR). Moreover, some of the metrics associated with the LAR framework explicitly cover the exposure to foreign exchange risks, such as the "LCR by significant currency" metric, which allows both the banks and OSFI to track potential currency mismatches (for details, see OSFI 2024h). OSFI has also introduced a parental stand-alone (Solo) total loss-absorbing capacity (TLAC) framework that assesses the sufficiency of loss-absorbing capacity readily available to Canadian parent banks on a stand-alone legal entity basis as well as the parents' abilities to act

³⁸ See OSFI (2024f). Moreover, all Big Six Canadian banks have been designated as domestic systemically important banks (D-SIBs), which also comes with higher capital absorbency, disclosure, and supervisory expectations (see OSFI, 2024g).

as source of strength for their subsidiaries or other affiliates. These regulatory initiatives complement existing banking regulations by taking international exposures more explicitly into account.

Fourth, after the assessment of the vulnerabilities has been concluded, a similar approach could be followed to highlight the benefits of an international expansion. Especially if Canadian banks' exposures are well spread along the geographical dimension, across currencies and across business models, instruments and counterparties, there should be a considerable diversification benefit for Canadian banks to expand internationally. Once these benefits have been sufficiently identified, one could compare them with a possible increase in potential vulnerabilities to obtain more clarity about the net effect. It would certainly be concerning if the costs would outweigh the gains by exposing the country to large foreign shocks for only small diversification gains or increases in revenues. However, as is the nature of diversification, the emergence of (small) negative shocks from abroad due to foreign expansion should rather be considered as a defining characteristic than a concern.

Lastly, it is worth pointing out that the availability of high-quality granular data can sharpen the conclusions of any empirical analysis. While the Canadian regulatory returns provide a good picture of Canadian banks' overall exposures, information about their risk mitigation techniques is rather scarce. More information on derivatives (and here, most notably, foreign exchange derivatives) and the way they are used to manage potential vulnerabilities could enrich the findings of such work. Moreover, gaining a better understanding of the foreign counterparties of Canadian banks, especially in the non-financial sector, might not only be helpful from an analytical standpoint but could also directly contribute to the reduction of potential vulnerabilities associated with an exposure to lesser-known foreign entities.

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Appendix

Chart A-1: GQ, GR and M4 Lending Comparison

