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MONETARY POLICY

Reversal of Fortunes: Rising Interest Rates and Losses at the Bank of Canada

by Trevor Tombe and Yu (Sonja) Chen

- The Bank of Canada is responding to high inflation by increasing its policy interest rate. With the Bank having recently expanded its balance sheet by buying government bonds and increasing its liabilities to financial institutions, higher policy rates have immediate implications for the Bank of Canada's own finances.
- The bonds were largely purchased from financial institutions, and the proceeds from the sales were overwhelmingly added to the institutions' deposits, or settlement balances, at the Bank of Canada. This dramatically increased the size of interest-earning deposits at the Bank.
- Financial institutions' deposits at the Bank of Canada earn interest at the deposit rate, which means that rising interest rates increase the Bank's interest expenses. These expenses now exceed Bank of Canada revenues, and a large financial loss will result – a first in Canadian history. The Bank has always earned a profit since its founding in 1935.
- We estimate cumulative losses of between \$3.6 billion and \$8.8 billion over the next two to three years, depending on the projection scenario. While this does not undermine the Bank's ability to conduct monetary policy, it does create novel reputational and communications challenges for the Bank at a time of elevated public attention on its activities. It also creates a direct financial cost for the federal government.
- Though details of how such losses will be treated are under development, we propose they be (i) subtracted from Bank reserves, or (ii) accumulated within a deferred account; either way, future profits should be used to eventually cover today's losses. Whichever course is chosen, future amendments to the *Bank of Canada Act* are almost surely in store.

Canada's inflation rate rose from 3.1 percent in June 2021 to 8.1 percent one year later – the highest since the early 1980s and the fastest acceleration since the early 1950s. Monetary policy is consequently tightening. The Bank of Canada's key policy rate, which affects interest rates

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throughout the economy, increased from 0.25 percent in January 2022 to 4.25 percent by December. These rapid rate increases aim to bring inflation down to the Bank's 2 percent target.

While the full effects of these moves are not yet known, there is an immediate impact on the Bank of Canada's own finances: growing interest expenses and potentially multi-billion-dollar financial losses. For the Bank, this creates new reputational and communications challenges – especially at a time of heightened political attention on monetary policy issues. This development also reveals an important connection between monetary and fiscal policy. The Bank of Canada, after all, is wholly owned by the federal government, and Bank surpluses add to government revenues. Financial losses at the Bank mean its remittances to the federal government are likely to cease for some time, and losses will be directly reflected on the government's financial statements as lower federal revenues.

In this E-Brief, using publicly available data, we project cumulative losses from 2022/23 to 2024/25 ranging from \$3.6 billion to \$8.8 billion, depending on the scenario. The net loss of \$511 million in the third quarter of 2022 is, therefore, just the beginning. In response, we propose a simple approach to handle these losses that is consistent with the *Bank of Canada Act* and contrast it with some other available options.

Before proceeding with our analysis and discussion, it is important to note that the financial implications of recent rate increases are only one of countless considerations when evaluating Canada's monetary policy experience. Whether quantitative easing was too large or too small, or ended too soon or too late, are critical questions that researchers will examine for years to come. The same is true of whether recent interest rate increases were too fast or too slow. We do not offer a broad assessment of the costs and benefits of such decisions, only a careful accounting and projection of Bank of Canada finances.

In terms of the fiscal implications for the Government of Canada, we also do not offer an assessment of how monetary policy affected economic growth, employment, past borrowing costs and so on. Ours is a mechanical exercise to shed more light on a previously underappreciated aspect of Canadian economic policy: the Bank of Canada's finances. And, importantly, since the Bank is a fully consolidated entity within the federal government's financial accounts, the interest expenses that we quantify are, in many important respects, like government debt-service costs more generally. Viewed in this way, some may question the utility of examining the Bank of Canada finances. But for reasons that we explore later, a clear understanding of central bank finances will be increasingly important for policy analysts and the public alike. To that end, we begin with some important background.

Background

The Bank of Canada is a large and complex institution, but the broad strokes of its finances are simple. Bank revenues derive largely from its asset holdings. Prior to March 2020, when the pandemic started to heavily disrupt Canada's economy, these holdings mainly included Government of Canada bonds (\$80 billion) and treasury bills (\$25 billion). The overwhelming majority of these assets were balanced by liabilities in the form of currency in circulation, which the Bank of Canada issues and does not have to pay people to hold. The returns on bond holdings, funded by liabilities that cost the Bank very little beyond physical production costs, is called "seigniorage." And it is normally large. Prior to the pandemic, revenue from the Bank's bond holdings generated roughly \$2 billion annually. This more than offset the less than \$1 billion in expenses. Those expenses included staff compensation, technology and telecommunications costs, the cost of producing, researching and processing bank notes, as well as maintenance on buildings and so on. The excess of revenue over expenses is then remitted to the federal government, less any amounts required to maintain certain reserves.

To be clear, not all bank liabilities are interest free like currency in circulation. Deposits by financial institutions that are held at the Bank of Canada (called “settlement balances”) as well as, until recently, deposits by the Government of Canada, earn interest. These interest payments, however, were relatively modest as settlement balances were negligible and only government deposits were material. We estimate that over two decades between 1999 and 2019, the average annual interest paid by the Bank to all depositors was approximately \$100 million per year – roughly 90 percent of which went to the Government of Canada.

In recent years, however, the Bank’s interest-bearing liabilities have increased, leading to a rapid growth of interest expenses. To see how this affects the Bank of Canada’s annual financial situation, we display the inflows and outflows for 2021 in Figure 1. That year, the Bank paid nearly \$1 billion in interest, mainly to financial institutions. Paying interest on deposits is a modern development. Indeed, the original 1934 *Bank of Canada Act* stated in Section 21 that, “The Bank shall not ... pay interest on any moneys deposited with the Bank.” It even restricted the Bank from paying interest on government deposits. But as the role of the Bank evolved, so too did its powers. A major reform enacted through the *Payment Clearing and Settlement Act* in 1996 gave the Bank authority over the payments system in Canada; it also allowed for interest payments on deposits.¹ And in early 1999, when the electronic wire payment system known as the Large Value Transfer System started, the Bank began to do just that (Bank of Canada 1999).

Today, interest expenses are growing and are a large item for the Bank. Why? Prior to the pandemic, monetary policy typically involved the Bank of Canada influencing the overnight rate at which financial institutions borrow and lend to each other overnight. The Bank aimed to keep that rate within a narrow corridor around its target overnight rate. To do that, it would pay interest on deposits at the deposit rate, 25 basis points below its target, and charge interest on lending at the bank rate 25 basis points above its target. As a result, settlement balances remained very low (near zero) as financial institutions largely borrowed and lent directly to each other.

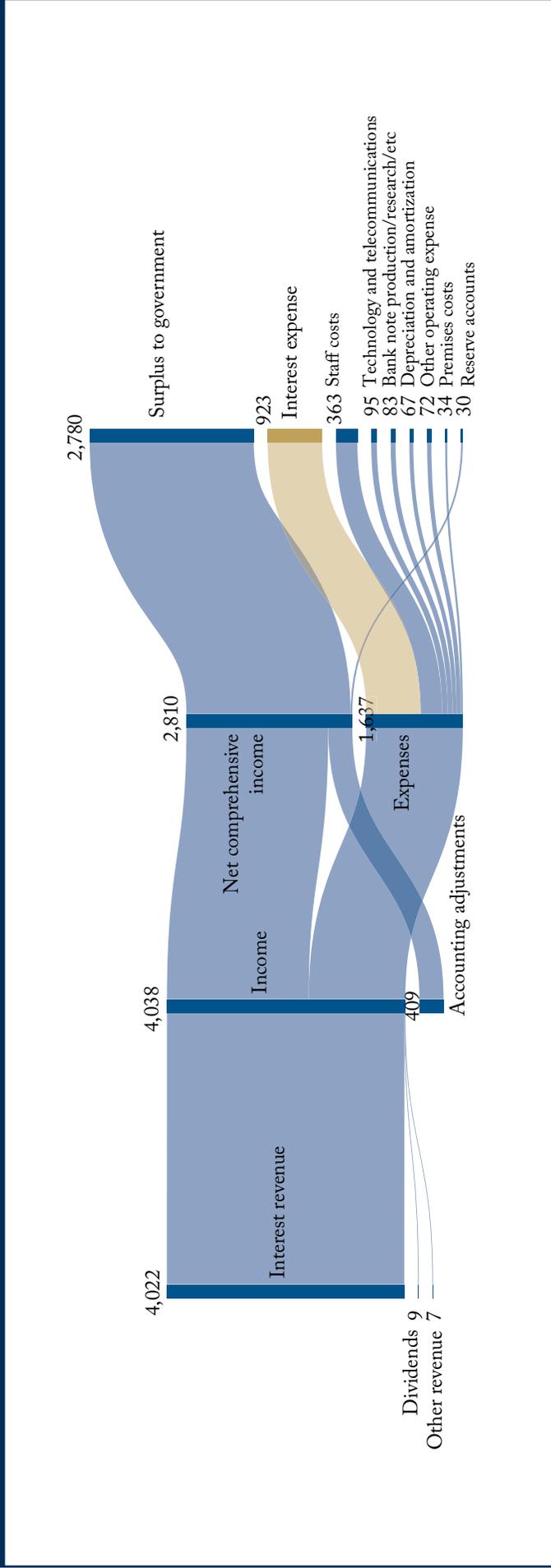
With the target for the overnight rate cut to near zero by late March 2020, however, additional monetary policy action to ease financial conditions and lower longer-term interest rates required the Bank to engage in large-scale asset purchases. There were many specific programs, but the largest – the Government of Canada Bond Purchase Program – was announced in March 2020. At its peak, this and other purchase programs increased the Bank’s balance sheet by well over \$400 billion. Not since the Second World War has the Bank of Canada expanded its holdings by so much so quickly.²

The Bank of Canada purchased these bonds largely from financial institutions, and the proceeds from the sales were overwhelmingly held as settlement balances at the Bank of Canada. And this dramatically increased the Bank’s interest-earning deposits. To illustrate, we display the total value of Canadian dollar deposits at the Bank of Canada in Figure 2a. These deposits (with the recent exception of government deposits) earn interest at

1 Enacted through Schedule 162 of *An Act to Amend, Enact and Repeal Certain Laws Relating to Financial Institutions*, 1996, Canada 44-45 Elizabeth II, c.6. The ability to pay interest on government deposits was added separately through *An Act to Amend Certain Laws Relating to Financial Institutions*, 1997, Canada 45-46 Elizabeth II, c.15. Interest expenses did exist prior to these reforms – interest was paid on unclaimed deposits, for example – but these expenses were negligible.

2 Between 1939 and 1947, Bank of Canada asset holdings as a share of GDP increased by approximately 12 percentage points. Between 2019 and 2022, asset holdings increased by approximately the same 12 percentage points.

Figure 1: Bank of Canada Financial Flows, \$millions, 2021



Note: Financial inflows are displayed from the left and outflows to the right, to and from the Bank of Canada.
 Source: Authors' calculations from the Bank of Canada Annual Report 2021, Statement of Net Income.

the deposit rate. The supply of settlement balances is now so large that the overnight rate is bound by the Bank's deposit rate. That is, the overnight target rate and the deposit rate are one and the same – the corridor, described above, became a floor. As a result, the market for overnight funds is largely non-existent between financial institutions that hold deposits at the Bank of Canada. With the Bank now holding more than \$200 billion in those interest-earning deposits, higher interest rates are driving up the Bank's interest expenses. We estimate the total value of interest payments made by the Bank on those deposits in Figure 2b. They are now at orders of magnitude larger than in the past. Without corresponding revenue increases, the rise in interest expenses will create large financial losses.

Projecting Bank of Canada Income

To illustrate the potential paths of Bank income and expenses, we construct a simple scenario projection. Starting with Q3 2022 financial statements, we project Bank of Canada assets, liabilities and policy rates that together imply the paths of revenue and expenses. Intuitively, changes in the Bank's bond holdings must be balanced against offsetting changes in other assets or (much more importantly) changes in liabilities or capital. Assuming other assets, capital and minor liabilities do not change, then one need consider only changes in the Bank's major liabilities: interest-bearing deposits, non-interest-bearing deposits (that is, Government of Canada deposits) and currency in circulation. We use the following formula to express the growth in the Bank's liabilities:

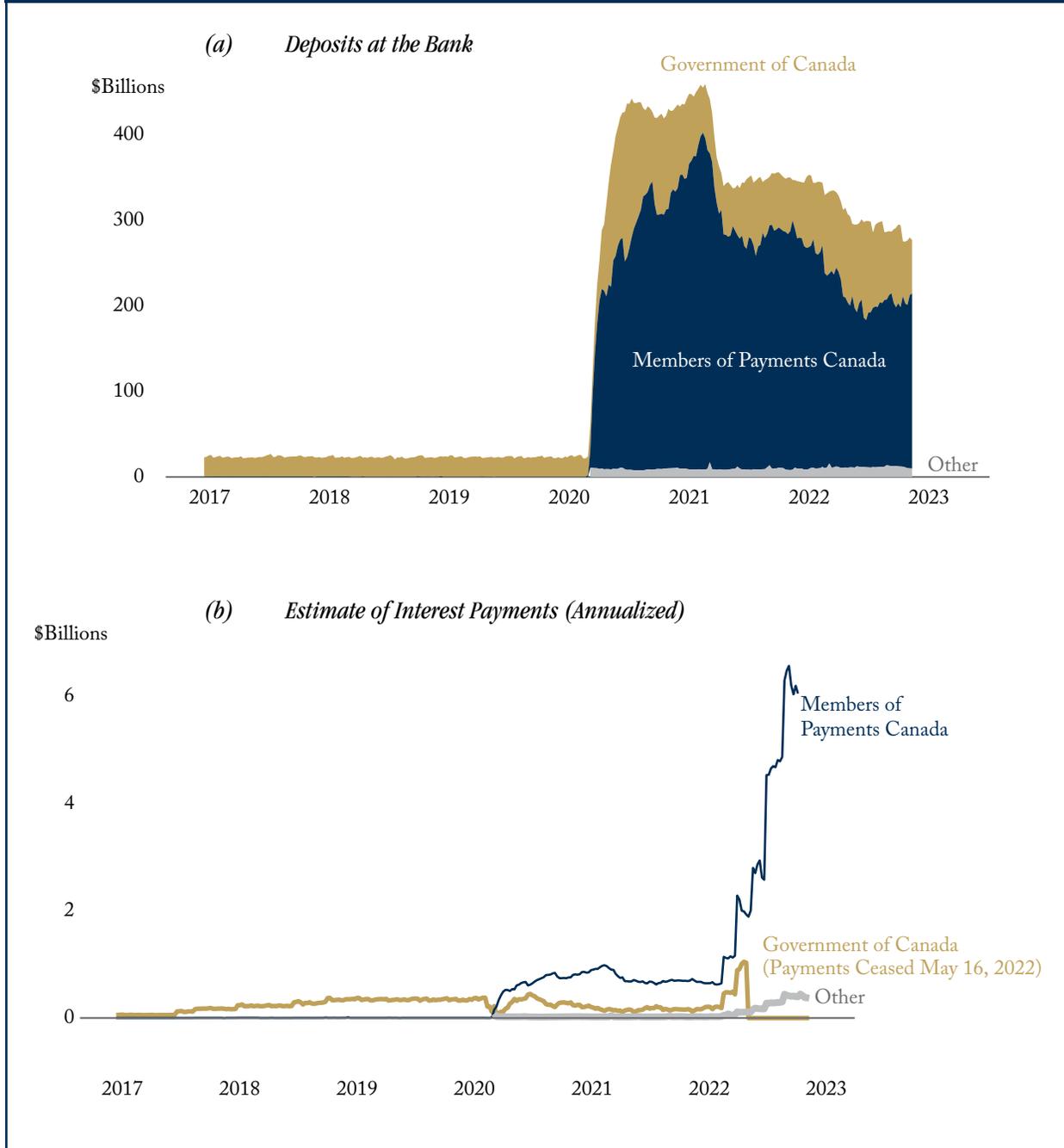
$$\Delta Bonds = \Delta D^i + \Delta D^n + \Delta C,^3$$

Given current policy, the Bank's bond holdings will gradually mature and roll off its balance sheet at a known schedule (Bank of Canada 2022). The liabilities side is less certain. We assume currency in circulation increases at a constant annualized rate of 5.4 percent – equal to the average of the 10 years prior to the pandemic. For deposits, we explore the full range of scenarios for non-interest-bearing deposits, changing dollar-for-dollar with bond maturities or not changing at all. Changes in interest-bearing deposits (settlement balances) is then a residual. Finally, we impose a floor on government deposits of \$20 billion (roughly the pre-pandemic level) and of \$250 million for interest-bearing deposits (the level of settlement balances in the pre-pandemic monetary policy framework). In any scenario where interest-bearing deposits hit this floor, we assume the Bank purchases new bonds to balance the above equation.

Changes in interest rates also matter for Bank finances. For our main set of results, we adopt the interest-rate path consistent with market expectations as of mid-November 2022 (Hertzberg and Duarte 2022). Specifically, we assume the Bank of Canada's target rate peaks at 4.5 percent in January 2023 and remains there before gradually starting a decline in one year. We assume the target rate lowers to a constant 3 percent within three years. These rates would affect both Bank revenues and expenditures. In terms of revenues, we assume interest revenues evolve proportionally to current bond holdings and the remaining weighted-average coupon rate. If new bonds are purchased, we assume they yield one-percentage-point above the target rate at the time they were bought.

3 Where D^i and D^n are interest and non-interest-bearing deposits, respectively, and C is currency in circulation.

Figure 2: Deposits at and Interest Payments from the Bank of Canada



Notes: Total value of deposits at the Bank of Canada is displayed along with our estimates of interest earned on those deposits. Interest payment estimates are weekly and presented on an annualized basis. Effective May 16, 2022, the deposit rate on government deposits is zero. Members of Payments Canada include the Bank of Canada, domestic banks and authorized foreign banks and other deposit-taking institutions. The amendments to the *Canadian Payments Act* in 2001 opened membership to life insurance companies, securities dealers, and money market mutual funds, among others. Payments Canada is funded by its membership, which stood at 111 at the end of 2021. See: <https://payments.ca/about/our-members-stakeholders/members>

Source: Authors' calculations from Statistics Canada data tables 10-10-0108-01, 10-10-0136-01 and 10-10-0139-01.

In terms of expenditures, we assume interest expenses evolve proportionally to interest-earning deposits and the prevailing deposit rate. In the special case where settlement balances return to pre-pandemic levels, the deposit rate will then be 0.25-percentage-points below the Bank's target rate. Finally, we assume non-interest expenses, such as normal operating costs, rise at an annualized rate of 2 percent.

Although there are several components of this projection model, its results are intuitive. We illustrate these results across a range of scenarios in Figure 3. Our projection suggests Bank losses are likely to continue until late 2024 or 2025, with peak losses in Q1 2023. In this scenario, cumulative losses will total between \$3.6 billion to \$8.8 billion by the end of 2025. Our preferred estimate of \$5.7 billion in total losses reflects the scenario where non-interest deposits absorb one-third of the bond maturities.

The faster that settlement balances decline, the smaller the Bank's financial losses will be. This projection is, of course, contingent on our scenario assumptions. The actual path will change with market conditions and monetary-policy decisions, such as the size and composition of asset purchases or target-rate changes. For perspective, if the peak target rate is 5 percent rather than the 4.5 percent assumed here, then cumulative losses rise from \$5.7 billion to \$7 billion over the next three years. Importantly, the decision to cease interest payments on Government of Canada deposits as of May 2022 was significant. We estimate losses would otherwise be approximately \$13 billion by 2025.

Despite these short-term losses, the long-run financial position of the Bank remains sound. Our projections show a return to positive net income within two-to-three years in all scenarios, though various policy choices or economic developments may affect that timeline. Over the longer term beyond these projections, financial losses by the Bank are unlikely since the yield on government bonds will normally exceed the deposit rate. As well, a substantial portion of Bank asset holdings is funded with currency in circulation, which pays no interest.

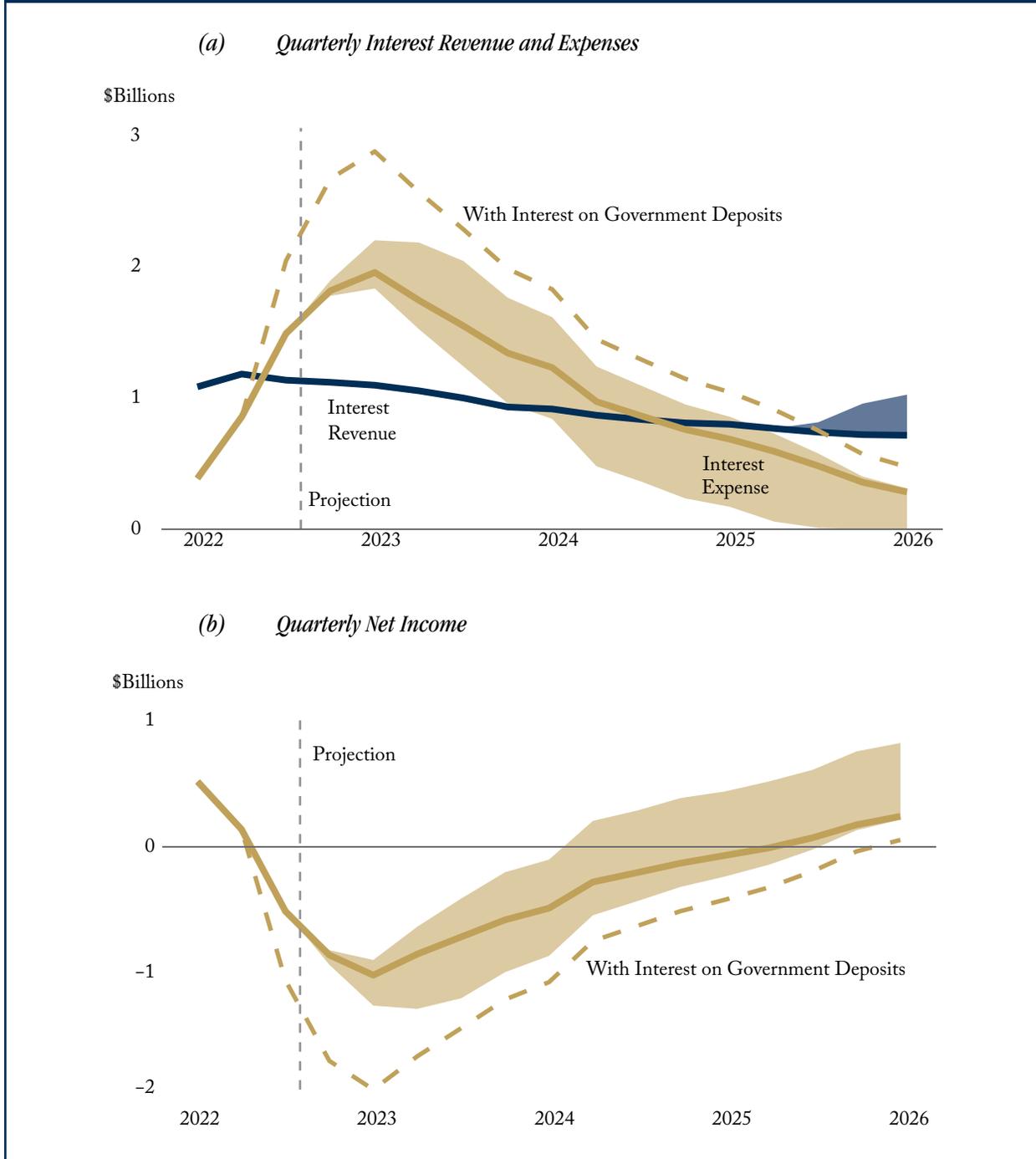
Reputational and Communications Challenges

Financial losses or even negative central bank equity do not mechanically undermine monetary policy. Unlike a commercial bank, the Bank of Canada has a monopoly on the issue of currency and, therefore, can create liquidity to achieve its objectives, regardless of the accounting value of its equity. The Bank of Canada can also issue, at will, settlement balances that may be used to purchase assets – as it did during the pandemic. Not only that, but paying interest on deposits – regardless of the financial losses – may be a key part of the conduct of monetary policy today. If such payments ceased, for example, then financial institutions would have a strong incentive to pull out settlement balances and loan more funds to individuals and businesses, which may be inflationary.

The Bank of Canada, however, has always earned annual profits since its founding in 1935. Indeed, the Bank normally remits significant amounts to the federal government. To demonstrate, we construct a full series of Bank of Canada remittances, using several data sources including the Public Accounts of Canada and various Bank of Canada annual reports and financial statements. We display these results in Figure 4. Over the Bank's entire history, remittances totalled nearly \$160 billion (in 2021 dollars) and peaked at more than \$5 billion in 1982. And in the past two years, annual remittances well exceeded \$2 billion per year.

Given this history, financial losses at the Bank will negatively affect government finances, likely causing adverse political and public attention. The losses will push the federal deficit modestly higher, requiring the public debt to expand (*ceteris paribus*), and resulting in marginally higher debt-service costs. In fiscal 2021/22, for example, profits remitted to the government from the Bank plus interest on Government of Canada deposits

Figure 3: Projection of Bank of Canada Interest Revenue and Expenses



Note: Panel (a) displays a projection of Bank of Canada interest revenue and expenses. Shaded regions reflect a range between scenarios where non-interest-bearing deposits decline dollar-for-dollar with bond maturities and where non-interest deposits remain constant. Panel (b) displays quarterly net income, including an estimate of core non-interest expenses. See text for additional details.

Source: Authors' calculations. Bank holdings of Government of Canada bonds mature as reported in Bank of Canada (2022). All projected changes are relative to the Q3 2022 interim financial statements.

totalled \$2.7 billion. At a federal borrowing rate of 3.5 percent, the loss of this amount alone increases annual debt-service costs on the larger federal debt going forward by more than \$90 million. Still, these losses are modest relative to Gross Domestic Product (GDP) – just over 0.1 percent at peak – and relative to recent remittances. Profits between 2019/20 and 2021/22, for example, were larger than the losses projected here. Most importantly, to the extent that large-scale asset purchases through the pandemic helped support the economy and accelerate recovery (Ambler and Kronick 2020), the resulting financial losses occurring today must be weighed against those benefits.

Canada will also be in good company. The US Federal Reserve, for example, faces a similar challenge, though accounting approaches may differ. This issue has received increasing attention in recent months as analysis previously predicted US Fed net income would turn negative (Anderson et al. 2022). Indeed, this occurred in September 2022, and remittances to the US Treasury ceased. To account for this, a special deferral account (recorded as a negative liability to the Treasury) will accumulate the losses, and future positive net income will deplete that account before remittances resume. This practice ensures Fed capital remains positive despite potentially large net losses, which Anderson et al. (2022) estimate may peak at more than \$75 billion (CAD), although the margin of error around this estimate is large.⁴ Albeit a new development for the Federal Reserve, it has been recognized as a potential outcome since the 2008 financial crisis (Carpenter et al. 2015).

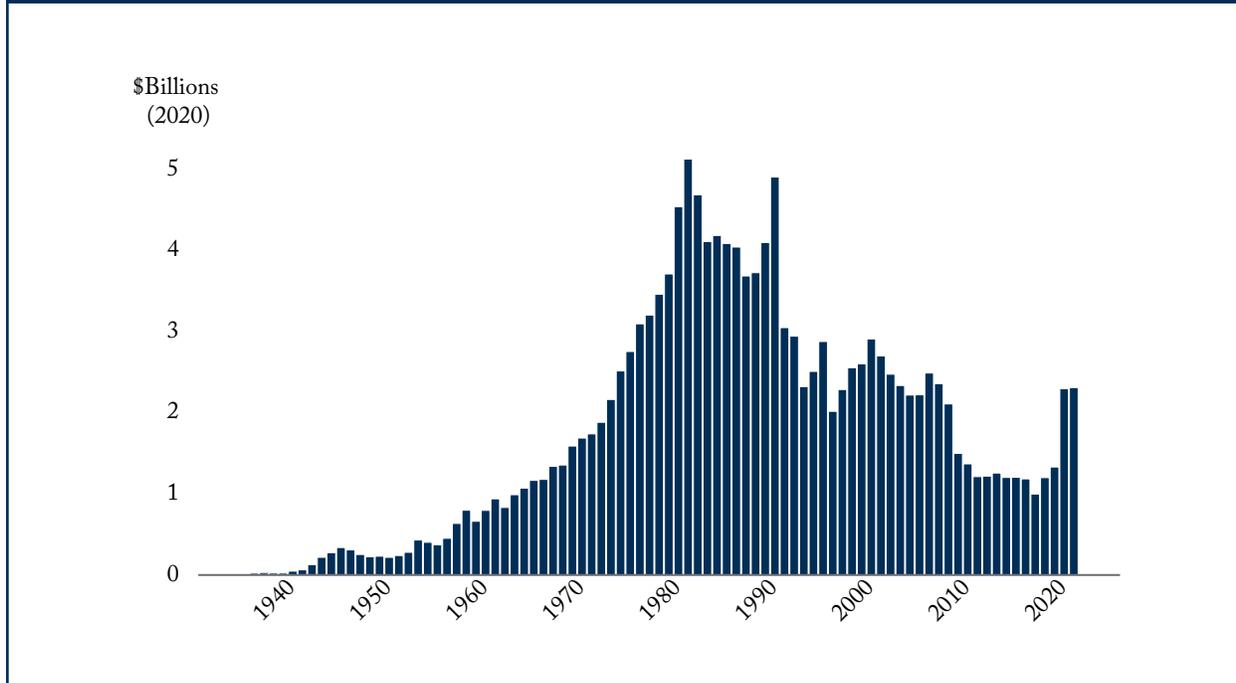
Canada's approach to cash losses at the Bank of Canada is still in development. As of late October 2022, for example, the remittance agreement between the Bank and the government contains no provisions for cash losses. Simple options are available, however. The Bank could sell some of its current bond holdings to cover the financial losses. As these bonds are generally worth less now than what they were when purchased, losses would result. But unlike the financial losses described so far, losses on bond sales are fully indemnified by the Government of Canada, so selling bonds is a potential mechanism to avoid booking losses on the Bank's own financial statements. To be clear, though, this would have broader monetary policy implications, including on financial markets, so it should not be pursued except to help achieve the Bank's policy objectives.

How else could financial losses be accounted for? The *Bank of Canada Act*, for example, has always implicitly contained provisions that could govern losses. In the absence of a surplus from operations, the Bank would simply not remit anything to the government. And if losses are booked against the Bank's reserve fund, quickly turning it negative, then Section 27 of the *Act* would be relevant. With reserve funds below paid-up capital (the \$5 million in shares owned by the Government of Canada), one-third of any future Bank profit would be retained and allocated to the reserve. The reserve fund's large negative balance would gradually shrink toward zero, and this would continue until reserves return to a certain positive threshold when only one-fifth is retained.⁵ Eventually, once reserve funds return to the desired level of \$25 million, all profits would once again be remitted.

4 Negative liabilities on the Fed balance sheet are found under "Earnings remittances due to U.S. Treasury." The Federal Reserve system has reported losses and the use of deferral accounts at certain individual reserve banks, such as the Federal Reserve Bank of New York in November 2011, so this practice is not unprecedented.

5 Today, this threshold is defined in Section 27(b) of the *Act*. If reserves are at least paid-up capital, then one-fifth of profits are retained; and if reserves are at least five times paid-up capital, then no profits are. This definition was added in 1954. Originally, if reserves were at least equal to paid-up capital, but less than twice paid-up capital, then one-tenth of profits were retained. For clarity, prior to 2007 the reserve fund was called a rest fund. Today, the Bank has multiple reserve funds.

Figure 4: Bank of Canada Profits Remitted to the Federal Government, 1935/36 to 2021/22



Note: We exclude early remittances to private shareholders, which ceased in August 1938, and include dividend payments on government-owned shares, which ceased in July 1954.

Source: Authors' calculations from several sources, including Government of Canada Public Accounts and Bank of Canada annual reports and financial statements. We convert to real dollars using the Finances of the Nation Macroeconomic Database.

This is merely one potential option, and one that some – including the Bank of Canada – do not see as permitted by the *Bank of Canada Act*.⁶ There are alternatives. Current practice is for losses to accumulate within a retained earnings (losses) line in the financial statements. This is shrinking Bank capital and will soon turn it negative. Indeed, by November 2022 the Bank had recorded a \$596 million loss within such an account. And this follows a move in October 2022 to deplete its \$25 million reserve fund to zero. This approach may be problematic for two reasons. First, a situation where Bank equity turns negative (that is, where liabilities exceed assets) may lead some to (inappropriately) conclude the Bank is insolvent. This is a communications challenge. Second, using future surpluses to reduce accumulated losses within the retained earnings fund may require an amendment to the *Bank of Canada Act*.

If amendments to the *Act* are under consideration, then there are potentially superior options. In particular, the Bank of Canada could book its losses in a deferred account in the same way as the US Federal Reserve is doing. This is effectively an asset that represents forgone future remittances to the Treasury to cover the accumulated losses. This avoids negative Bank of Canada capital and has recently been proposed as the best way forward by Ambler, Koepl and Kronick (2022). In any case, however the losses are accounted for, they will be borne by the federal government. This matters for several reasons.

⁶ We thank the Bank of Canada for confirming this with us in email correspondence.

First, financial losses risk a political response that may erode confidence in the central bank. Although there is some evidence that central bank financial strength may matter for policy outcomes (Stella 2005, 2010), this is mainly a concern for developing and emerging market economies. For Canada, losses primarily create a reputational risk rather than an economic one. Indeed, there is some evidence that central banks do indeed care about their profits, at least at the margin, for potentially this very reason (Goncharov, Ioannidou and Schmalz 2021). And the prospect of losses undermining the Federal Reserve's reputation has been publicly recognized by its own leaders following the financial crisis (Dudley 2013) and reiterated more recently (Miller 2022). For these reasons, various measures of central bank independence incorporate measures of financial independence (Amttenbrink 2010, Ivanovic 2014, Jasmine, Mona and Talla 2019). Furthermore, careful consideration of how profits and losses are treated, ideally separately from fiscal authorities, is an important aspect of central bank design (Reis 2013). This is not just an abstract concern. Confidence in a country's central bank matters for its ability to conduct monetary policy and achieve low and stable inflation. If confidence is high, then individuals and businesses will more strongly align their inflation expectations with the central bank's target, which makes it easier to achieve.

Second, policymakers may reform Bank policy because of financial losses. This would not be unprecedented. From the 1950s through to 2007, the Bank of Canada's capital included only the \$5 million in outstanding shares (owned by the federal government) and \$25 million in statutory reserves. But in April 2007, the *Bank of Canada Act* was amended to create a special reserve of up to \$400 million. This was in response to new accounting standards adopted by the Canadian Institute for Chartered Accountants to better account for changes in the value of financial instruments that organizations own (Johnson and Zelmer 2007). Today, the excess supply of settlement balances, and the increased interest rate risk this creates, may motivate further increases in reserves to ensure the Bank has sufficient capital to absorb financial losses as it strives to achieve monetary policy objectives.

Meanwhile, some observers argue there is little risk of over-capitalization (Ernhagen, Vesterlund and Viotti 2002). Absent such capital reserves, allowing for future reductions in remittances to the fiscal authority to make up for past losses is a key component of central bank solvency (Hall and Reis 2015). Ensuring Canada's approach to financial losses at its central bank is formula-driven and transparent will be critical.

Finally, accessible communications by the Bank to ensure a broad public understanding of its actions and objectives may help (Bernanke 2022). Recent op-eds by Bank of Canada Governor Tiff Macklem are examples of such efforts (Macklem 2022). Ultimately, future seigniorage (profits from issuing currency) will offset modest short-term losses. The challenge is to smooth these losses in a way that minimizes adverse political responses that may limit the Bank's future independence. Such losses are a risk of having a large supply of settlement balances that earn interest. And since a large supply of settlement balances may be an efficient approach to conducting monetary policy (Cúrdia and Woodford 2011), ensuring the Bank has all monetary policy tools at its disposal is vital. Clear communications will not be easy, though, especially since the interconnections among monetary policy, central bank balance sheets and resources available to fiscal authorities is a novel issue in Canadian public policy discussions. The pandemic changed that conversation dramatically.

Conclusion

While future inflation and monetary policy remain uncertain, the existence of financial institutions' large interest-earning deposits at the Bank of Canada means rising interest rates causes large losses for the Bank – a first in Canadian history. While this does not undermine the Bank's ability to conduct monetary policy, it may pose a

reputational and communications challenge. This is especially so during a period of heightened political interest in monetary policy, in general, and in the Bank, in particular. There are also important fiscal implications for the Government of Canada. We estimate Bank of Canada cumulative financial losses of between \$3.6 billion and \$8.8 billion, depending on the projection scenarios, with a preferred estimate of \$5.7 billion. Though details of how such losses will be treated are under development, we discuss several options. And since it appears amendments to the *Bank of Canada Act* are likely, opting to use a deferred account – as the US Federal Reserve is doing for its losses – may be the best option for Canada. Whatever the eventual details, a better understanding and appreciation of central bank finances in Canada among policymakers, researchers and the public is necessary.

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Trevor Tombe is a professor of economics at the University of Calgary and research fellow at the School of Public Policy. He is also co-director of Finances of the Nation.

Yu (Sonja) Chen is an assistant professor in the Department of Economics at the University of Calgary. Her research focuses on macroeconomics and labour economics, especially the efficiency of markets and productivity mismatch. She received her Ph.D. from the University of Waterloo and her M.A. from the University of Paris 1 Panthéon-Sorbonne.

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