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E-BRIEF

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MONETARY POLICY

The Impact of Monetary Policy on Financial Stability

by
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- The Bank of Canada's mandate is to target an inflation rate of 2 percent, but financial instability can have important effects on economic activity, which can influence the Bank's ability to hit that target.
- The concern is that monetary policy and financial stability might work at cross-purposes if, for example, stimulative monetary policy increases financial vulnerabilities.
- However, our results show that contractionary monetary policy shocks significantly reduce financial vulnerabilities, while expansionary shocks have little to no significant effect.
- These findings suggest that Canadian monetary policy does not, in fact, work at cross-purposes to financial stability.

Canada has a financial regulatory system that separates the responsibilities of monetary policy and financial stability.[1] On the one hand, this allows each institutional body to focus on its mandate; on the other hand, there is the potential for policies to work at cross-purposes. It is critical, then,

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1 Responsibility for oversight of financial stability is fragmented in Canada; see Kronick (2018) for details.

that different bodies have as much information and research as possible to understand how their policy actions affect variables outside their primary responsibility. This E-Brief focuses on one such interaction: the effect of monetary policy on financial stability. The situation today is one of interest rates at their effective lower bound and a massive expansion of the Bank of Canada's balance sheet. While necessary during the COVID-19 crisis, and certainly necessary to help the Bank hit its inflation target in the medium run, the concern is that this will also lead to significant growth in private debt and a reckoning down the line. In other words, necessary monetary policy stimulus might create the conditions for financial instability.

In order to study the impact of monetary policy on financial stability, we use a financial vulnerabilities barometer developed in previous work (Kronick and Ambler 2020a, 2020b). We then estimate the impact monetary policy has had on this barometer over the period from 1990–2019. To perform this test, we use the local projections methodology of Jorda (2005), but, critically, we adapt it to allow for the possibility of asymmetric effects from contractionary and expansionary monetary policy shocks.

We find that contractionary monetary policy causes the vulnerabilities barometer to fall, thereby reducing financial vulnerabilities, while expansionary monetary policy shocks have little to no significant impact. These results suggest that the Bank of Canada can conduct its monetary policy with some confidence that there will be few negative side effects on financial stability. If the Bank has to clamp down against high inflation by increasing its target overnight rate, it will reduce financial vulnerabilities simultaneously. If inflation is low and the Bank must look to boost aggregate demand to move inflation toward its target, it need not worry about the negative impact of its expansionary policy on financial vulnerabilities.

This is good news: it implies that Canadian monetary policy will not work at cross-purposes to financial stability.

Two potential questions arise. First, how does the low-interest rate, low-inflation environment we have lived in since the 2008–9 Great Recession affect our results? And, second, will the results still hold after the current pandemic is over? We test both these questions with the same robustness check – namely, estimating whether the results change if we stop the analysis pre-financial crisis. We find they do not, meaning that neither the low-interest rate, low-inflation environment nor the inclusion of a major crisis has any effect on the result.[2]

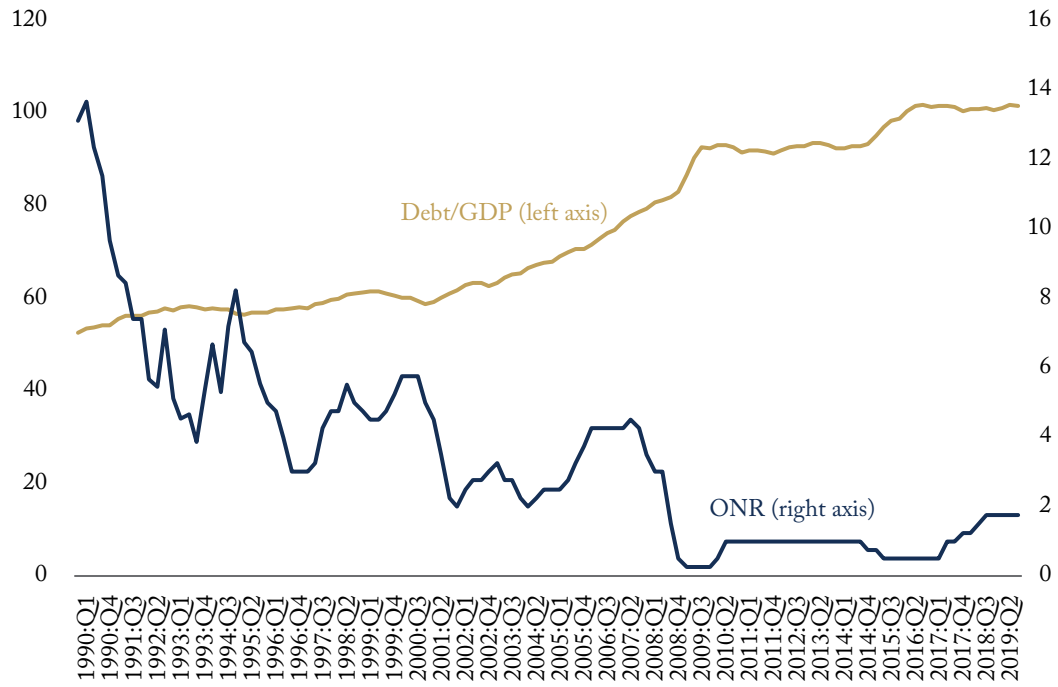
The following section reviews the concern over monetary policy working at cross-purposes to financial stability, and reviews the financial vulnerabilities barometer. The paper's third section describes our empirical methodology. The fourth section presents our results. The final section discusses the policy implications of our findings and presents our conclusion.

Monetary Policy and Financial Stability: The Link and How to Measure It

For much of the past decade, Canadians have been told that their household debt levels are unsustainable and that their day of reckoning is fast approaching. Low interest rates since the financial crisis, which might have been needed for the Bank of Canada to achieve its inflation target, simultaneously have led to large increases

2 We note that in this work we are asking whether monetary policy exacerbates vulnerabilities in the lead-up to a crisis. Once the crisis hits, however, the question itself changes; how then to respond is beyond the scope of this E-Brief.

Figure 1: The Overnight Rate and the Household Debt/GDP Ratio, Canada, 1990–2019



Source: Statistics Canada.

in household debt levels (see Figure 1).[3] Some might see this as similar to the scenario we saw in advance of the financial crisis in the United States, when the US Federal Reserve was accused of monetary policy that was too loose, leading to an asset price bubble in the housing market and the subsequent chaos this chain reaction sowed (see, for example, Taylor 2009). Loose monetary policy that is deemed necessary to hit the inflation target but that leads to undesirable credit growth is a classic case of monetary policy working at cross-purposes to financial stability.

Along with large increases in debt levels, however, the data also show that Canadians' net worth today has never been higher. Leading up to the 2008–9 financial crisis, household net worth was equal to a little over 7 times disposable income before bottoming out during the crisis at 6.25 times disposable income. Since then, it has been on a mostly continuous upward trend, approaching a ratio of 9 times disposable income at the end of

3 The figure shows the ratio of household debt to gross domestic product. The ratio of household debt to disposable income would show a qualitatively similar evolution. There are interesting regional differences in the evolution of this ratio, but exploring the details is far beyond the scope of this E-Brief. In any case, monetary policy is by its very nature national: there is one policy rate for the whole country.

2019.[4] If borrowing is used to acquire capital assets or consumer durables or to start new businesses, then debt levels or ratios of debt to income should not be a cause for worry.[5] The important point is that it is hard, when using debt levels or ratios of debt to income or to GDP, to distinguish good increases in debt from bad increases in debt. A better measure of financial vulnerabilities, as we show in Kronick and Ambler (2020a, 2020b), is one that incorporates debt servicing – that is, how much income is dedicated to debt repayment – into such a barometer. Our previous analysis shows that, when both household debt and household debt servicing are included as explanatory variables in regressions to predict GDP growth and financial crises, debt servicing is more robustly significant. New borrowing and debt servicing explain the highest amount of variation of the dependent variables (GDP growth and financial crises).[6] These results confirm those of Drehmann, Juselius, and Korinek (2017) – using a panel of OECD countries – concerning the importance of debt servicing versus debt. The implication of these findings is that debt servicing is a better predictor of the financial health of an economy than is the debt/GDP or other ratio measures that conflate stock variables, such as debt, and flow variables, such as GDP. This is critical when assessing the link between monetary policy and financial stability. Of course, debt itself must still be included, which we do by focusing primarily on deviations from trend.[7] Figure 2 shows the barometer updated to the fourth quarter of 2019. The barometer does a good job of tracking both major recessions (vertical light blue bars) and the other five periods of elevated financial stress (vertical light grey bars). Debt servicing also appears to have significant value added, especially in advance of recessionary periods.

Also interesting – and in contrast to the work of others, such as Duprey and Roberts (2017) – at no point between the financial crisis and the end of 2019, a period marked by no crises or recessions, did we reach the level of vulnerabilities seen before the financial crisis. The barometer seems to help capture the crisis periods while avoiding false positives.

Empirical Methodology

Our empirical methodology is the local projections method developed by Jorda (2005), which allows us to estimate the link between the financial vulnerabilities barometer and past monetary shocks and other control variables.[8] The methodology also allows us to distinguish between the impact of expansionary and contractionary monetary policy shocks on the vulnerabilities barometer. In other words, we allow for asymmetry.

4 Data from Statistics Canada, table 38-10-0235-01; for more information, see Ambler, Kronick, and Omran (2019).

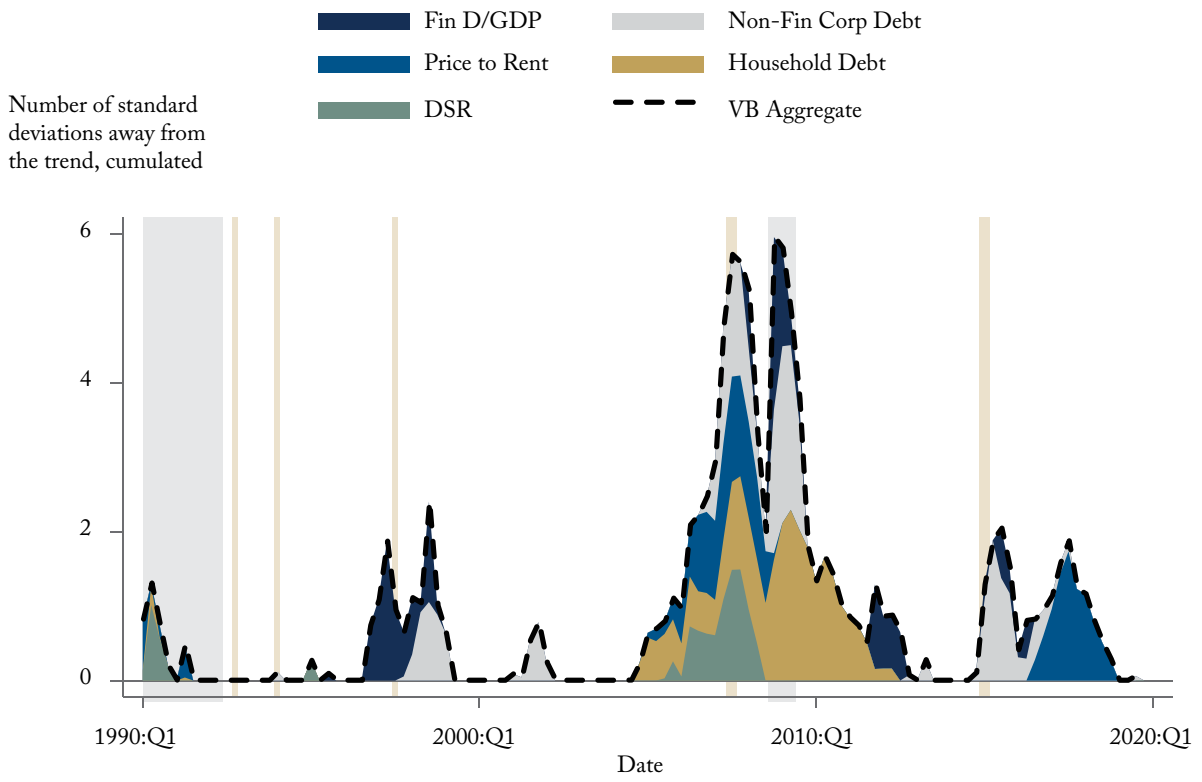
5 Congdon (2017) notes that the Organisation for Economic Co-operation and Development (OECD) and the Bank for International Settlements have been ringing similar alarm bells about debt levels around the world while net assets have been increasing: "The historical experience is that assets increase by amounts so much larger than debt that the net-wealth-to-income ratio and the debt-to-income ratio can and usually do rise together!"

6 As measured by the R^2, a statistical measure of how much variation in the dependent variable is captured and explained by the independent variables, typically expressed in percentage terms.

7 The construction of the financial vulnerabilities index is explained in online Appendix A.

8 See online Appendix B for details. Local projections are an alternative to vector autoregressions (VARs) for predicting economic time series. In VARs, each variable in a set of variables is regressed on several lags of itself (starting with the first lag) and of the other variables in the set. In local projections, to predict a variable at time $t + h$, it is regressed on itself and other variables observable at time t. For a comparison of the two approaches, see Brugnolini (2018). The vulnerabilities barometer itself can be related to the past dynamics of new borrowing and real growth. See Kronick and Ambler (2020a, 2020b), in which we show that it does a good job of predicting crises at both quarterly and annual frequencies, which allows for a longer build-up of risks.

Figure 2: Vulnerabilities Barometer



Note: Fin D/GDP is the sectoral component for the financial debt/GDP variables, Non-Fin Corp Debt is the sectoral component for the non-financial sector debt/GDP variables, Price to Rent is the sectoral component of the housing price to rent ratio variables, Household Debt is the sectoral component for the household debt/disposable income and household debt/GDP variables, DSR stands for debt-service ratio (deviation from trend), VB Aggregate stands for Vulnerabilities Barometer Aggregate, which is the sum of all the sectoral components. Grey bands indicate recessions as per the C.D. Howe Institute's Business Cycle Council. Yellow bars represent international crisis episodes as identified in Drehmann and Juselius (2014).

Source: Kronick and Ambler (2020b), updated to 2019:Q4.

We test two different versions of the monetary policy shock series, both of which deal with the critique that the current policy rate is a poor measure of the monetary policy stance because the policy rate change is often expected by households and businesses, so that when the change happens, its impact has already occurred. To pick up the true effects of monetary policy in the data, it is necessary to extract the unexpected component of policy changes (that is, the exogenous shocks).[9] Our first version comes from Champagne and Sekkel (2018),

9 We are following standard practice in the VAR and local projections literature. The impact of expected monetary policy changes is embedded in the joint dynamics of the variables included in the study.

who define a monetary policy shock as that part of a change in the overnight rate that cannot be predicted on the basis of an estimated Bank of Canada reaction function. This reaction function is an approximation of how the Bank changes its policy rate based on a series of economic indicators, including lags, nowcasts and forecasts of real GDP, unemployment and inflation (for details, see Kronick and Ambler 2018a, 2018b).

The second version is the Effective Monetary Stimulus (EMS) measure from Culling, Callaghan, and Richardson (2019). The measure is the cumulative difference, over a given time horizon, between the market outlook for interest rates (the forward or yield curve) and the neutral interest rate.[10] The EMS measure reflects the idea that households and firms consider both today's interest rates and likely future interest rates when making decisions about spending and saving, and that the difference between interest rates across the yield curve and the neutral rate is the degree to which monetary policy is contractionary or expansionary. A negative differential, with the neutral rate above the market outlook for interest rates, would be considered expansionary, and as this absolute difference widens (narrows), monetary policy becomes more stimulative (restrictive). A positive differential – where the neutral rate is below the market outlook for interest rates – that widens (narrows) would be more restrictive (stimulative). We take the real natural[11] rate estimate for Canada from Holston, Laubach, and Williams (2017), and generate the nominal neutral rate by adding back the Bank of Canada's 2 percent inflation target. In Kronick and Ambler (2021), we show that this EMS measure does better than the overnight rate in terms of generating the expected inflation response.[12]

Results and Robustness

The beginning point for our analysis is 1990:Q1, with the end date depending on which monetary policy shock series we use. For the Champagne and Sekkel (2018) monetary policy shock series, the data sample ends in 2015:Q4. For the EMS measure, we end the analysis in 2019:Q4, just before the outbreak of the pandemic. A complete list of the control variables is included in the online Appendix.

Figure 3 gives the impulse responses of the financial vulnerabilities barometer to contractionary and expansionary monetary policy shocks using the Champagne and Sekkel (2018) shock series. The dark-shaded areas are 90 percent confidence bands around the estimated responses, while the lighter-shaded areas are 95 percent confidence bands. Figure 4 repeats this exercise using the EMS monetary policy shock series.

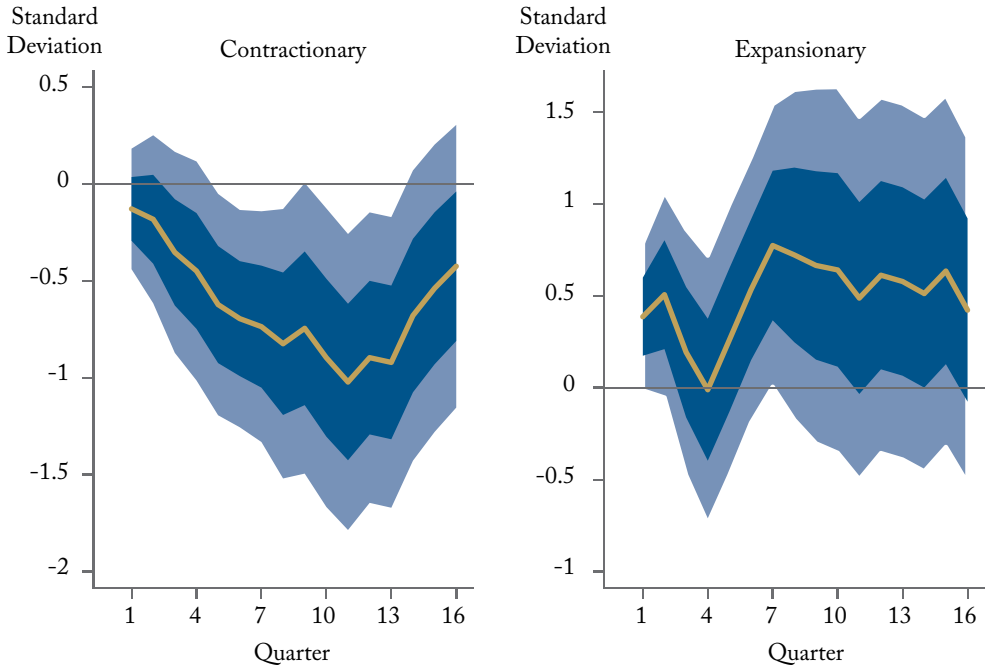
For the Champagne and Sekkel (2018) series, the results show that, in the contractionary case, the response of the vulnerabilities barometer is clearly significant, while, in the expansionary case, it is weakly significant. Contractionary monetary policy reduces financial vulnerabilities, while expansionary monetary policy increases it, but at a higher standard of significance in the case of a contractionary shock, and at a greater magnitude.

10 The neutral interest rate is the interest rate compatible with an economy that is operating at full capacity and with a stable inflation rate, after all cyclical shocks have dissipated – that is, where monetary policy is neither contractionary nor expansionary.

11 What these authors term the natural rate of interest is more consistent with what we define as the neutral rate, as the estimates are absent any business cycle shocks.

12 In fact, as we show in that paper, using the overnight rate produces the well-known price puzzle, where inflation increases (decreases) as a result of a contractionary (expansionary) monetary policy shock, contrary to economic theory. Using the EMS measure instead eliminates this puzzle.

Figure 3: Impulse Response Functions, Vulnerabilities Barometer, Champagne and Sekkel (2018) Series



Source: Authors' calculations.

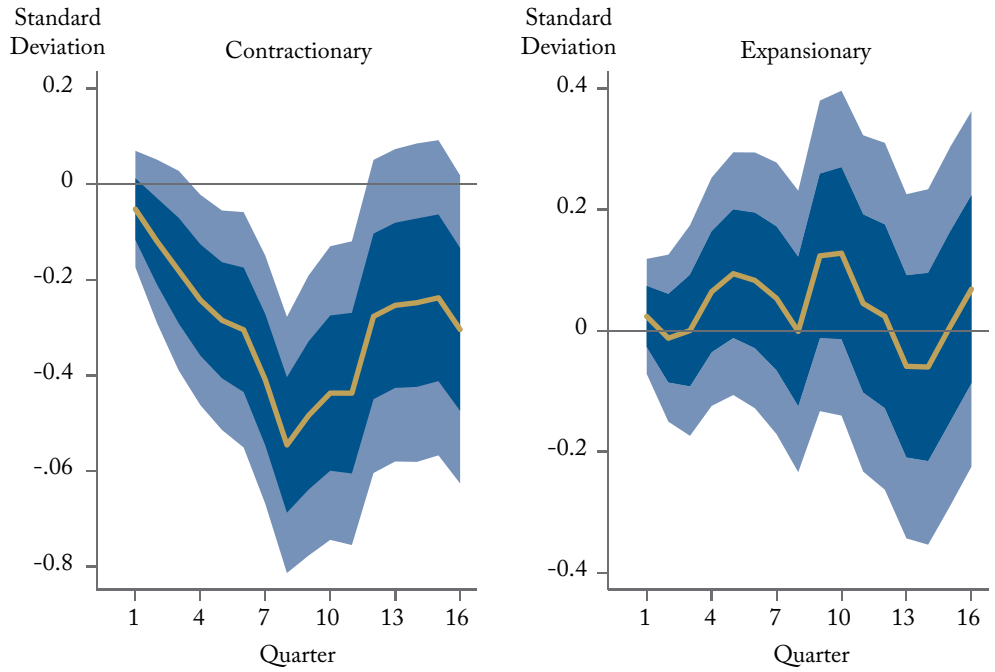
In the case of the EMS series, the contractionary shock continues to reduce financial vulnerabilities significantly, while the expansionary monetary policy shock has no significant effect whatsoever on financial vulnerabilities.

As inflation is a control variable, we can check that it responds symmetrically to contractionary and expansionary monetary policy shocks. We find that, with respect to both the Champagne and Sekkel and EMS shocks, inflation responds significantly and in the expected direction whether it is contractionary or expansionary (Figures 5 and 6).

Overall, these results tell us that contractionary monetary policy to bring inflation under control will reduce financial vulnerabilities, while expansionary monetary policy meant to stimulate inflation will not necessarily increase financial vulnerabilities. In other words, monetary policy does not appear to work at cross-purposes to macroprudential regulation.[13] The fact that the results differ when we are able to separate contractionary and

13 It is possible that macroprudential policies interacted with monetary policy to help bring about this result. However, given the fragmented nature of financial stability policy in Canada, there is no easy way to assess this possibility quantitatively. Furthermore, since the monetary policy shocks we use are intended to be exogenous, the most one can say is that macroprudential policy contributed to the state of the vulnerabilities barometer itself, which then affected how it interacted with monetary policy. Also, the data sample we use for our calculations covers a period when real interest rates were trending down. A reversal of this trend might alter the conclusions, but we judge this to be unlikely.

Figure 4: Impulse Response Functions, Vulnerabilities Barometer, EMS Series



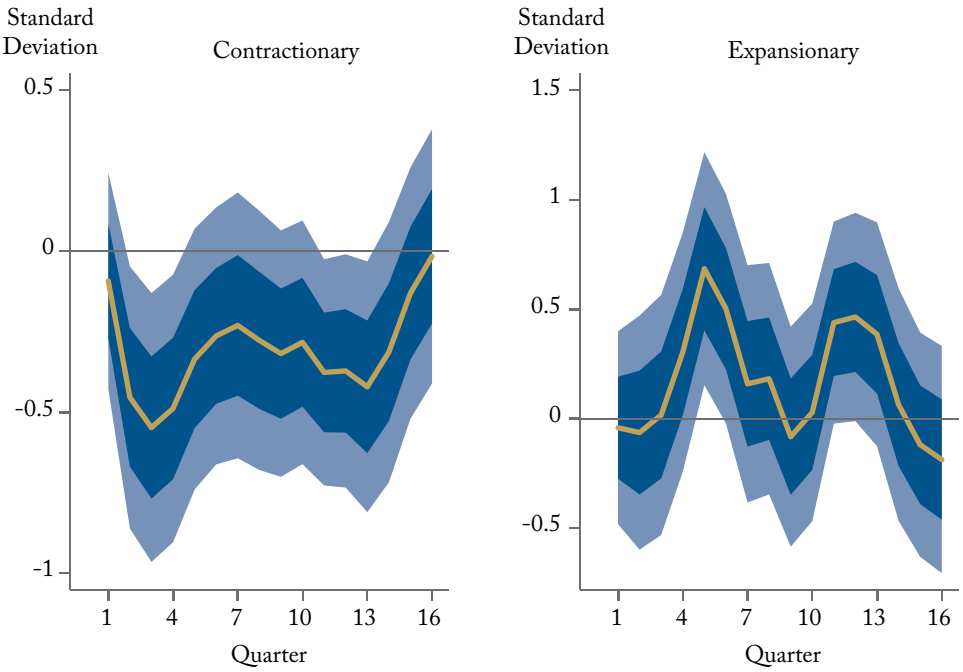
Source: Authors' calculations.

expansionary monetary policy shocks highlights how misleading it can be to assume symmetry in the reaction of key macroeconomic variables to different economic shocks.

One potential explanation for the asymmetric impact of monetary policy on the financial vulnerabilities barometer is the importance of credit constraints (see, among others, Florio 2004). Monetary tightening during an economic boom causes banks to reduce lending to firms or a deterioration in the balance sheet of borrowers (because of increasing interest rates). In both cases, there is a binding credit constraint, and thus a significant impact of monetary policy on credit. During an economic recession, expansionary monetary policy is unlikely to generate a rebound in borrowing of the same size. This is because, with credit falling during a recession, the constraint is not binding, and therefore a reduction in interest rates is less effective.[14]

14 One might then expect an asymmetric inflation response under this explanation. However, expansionary monetary policy might boost inflation through other transmission mechanisms, including, for example, a depreciated Canadian dollar, which would stimulate export demand.

Figure 5: Impulse Response Functions, Inflation, Champagne and Sekkel (2018) Series



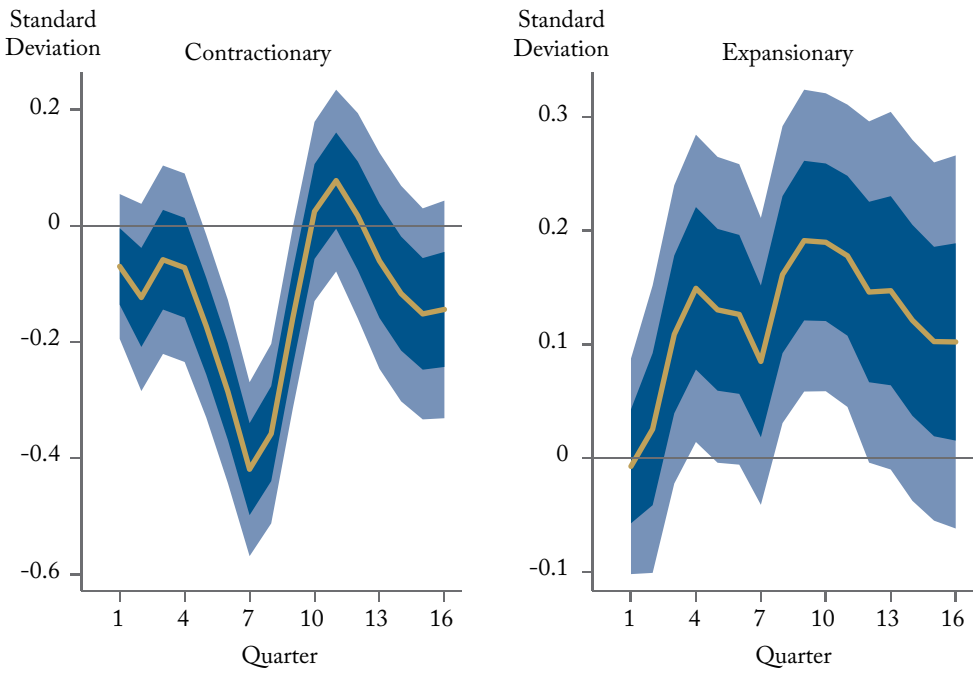
Source: Authors' calculations.

We undertook several robustness checks, but for simplicity, we present only one here: estimates restricted to the period before the 2008–9 financial crisis.[15] This seems a logical choice, for a variety of reasons. First, the post-crisis era has been characterized by low interest rates and inflation that has often undershot the Bank of Canada's 2 percent target. Excluding the period since the financial crisis from the sample period could change the results. Second, excluding this more recent period also allows us to see the impact of a crisis on the results – helpful as we assess whether these results might hold after the COVOD-19 pandemic. Finally, macroprudential regulation has often interacted with monetary policy in this post-financial crisis period, with former undergoing a series of tightenings to rein in debt levels exacerbated by persistent low interest rates during and after the crisis.

As Figures 7 and 8 indicate, the results remain essentially the same as where we use the full sample; if anything, the case for the insignificance of expansionary monetary policy shocks on financial vulnerabilities is even stronger.

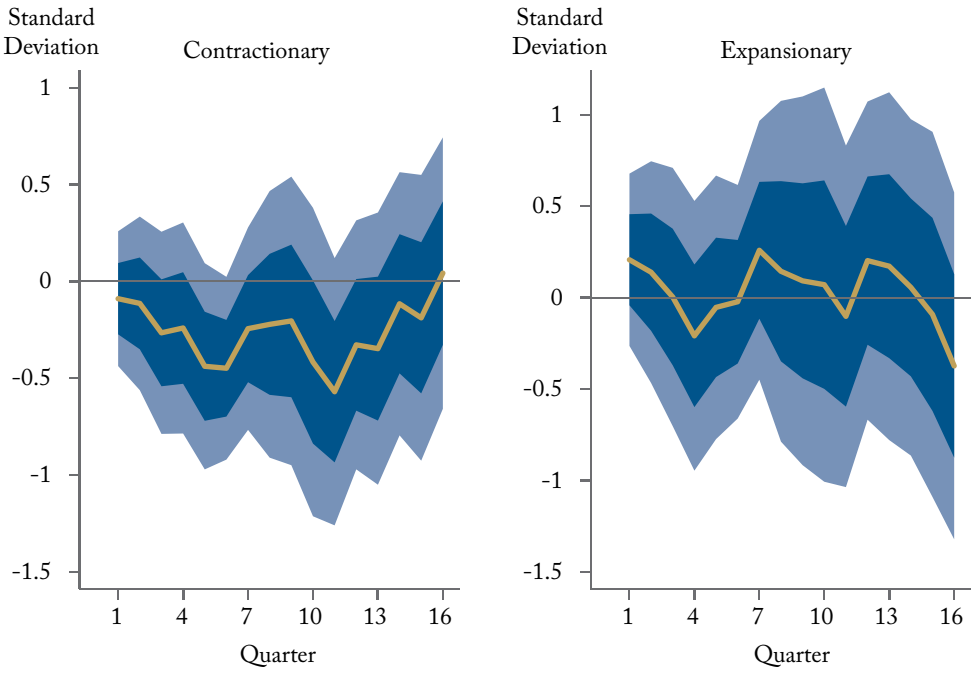
15 Other robustness tests include changes to the control variables, which also do not change the findings of the primary specifications. The details are available from the authors on request.

Figure 6: Impulse Response Functions, Inflation, EMS Series



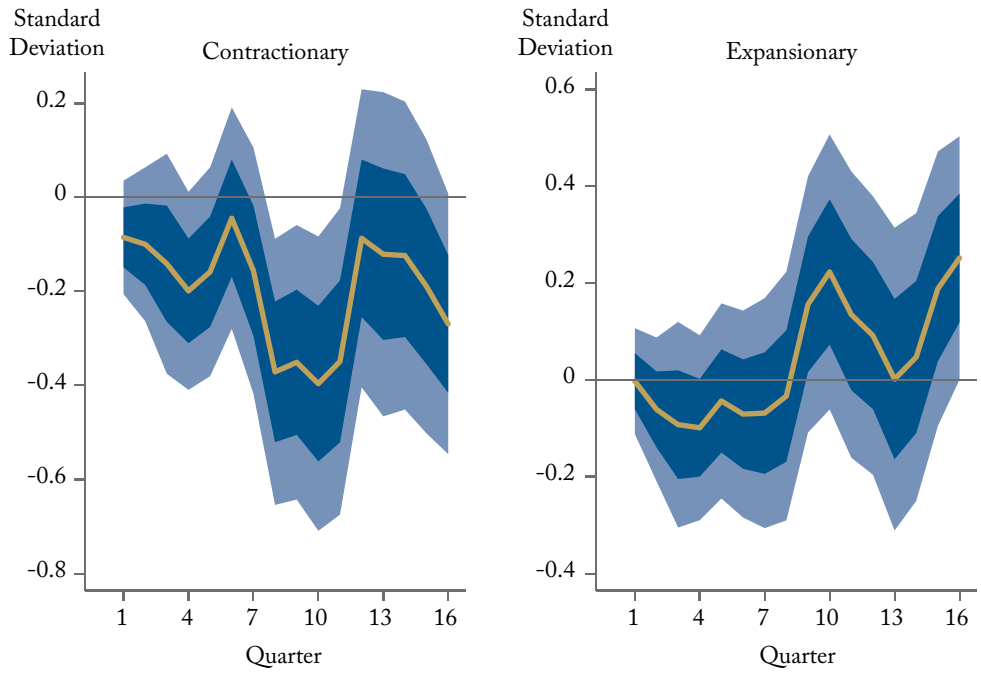
Source: Authors' calculations.

Figure 7: Pre-Financial Crisis Impulse Response Functions, Vulnerabilities Barometer, Champagne and Sekkel (2018) Series



Source: Authors' calculations.

Figure 8: Pre-Financial Crisis Impulse Response Functions, Vulnerabilities Barometer, EMS Series



Source: Authors' calculations.

Conclusion

We find that monetary policy innovations have significant effects on the financial vulnerabilities barometer we developed in Kronick and Ambler (2020a, 2020b). Contractionary monetary policy has strong and significant effects, reducing financial vulnerabilities, while the impact of expansionary policy on the barometer is only marginally significant.

This finding suggests that the Bank of Canada can conduct monetary policy with some confidence that it will have minimal or no negative side effects on financial vulnerabilities. If the Bank has to fight against high inflation by increasing the target overnight rate, it will simultaneously reduce financial vulnerabilities. If inflation is low, and the Bank needs to boost aggregate demand to move inflation toward its 2 percent target, it need not worry about the negative impact of expansionary policy on financial vulnerabilities.

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