

Analyzing supply and demand for business loans using microdata from the Senior Loan Officer Survey

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Disentangling supply and demand effects on business loans

Bank lending to businesses is driven by both supply and demand factors. Disentangling the relative importance of these factors in business credit dynamics can help determine their economic effects and policy implications. However, traditional hard data, such as credit aggregates or interest rates, show only the result of the combined effects of supply and demand factors on prices and quantities. In contrast, the Bank of Canada's Senior Loan Officer Survey (SLOS) gathers information from financial institutions on their lending (supply) conditions as well as on customer demand for loans. In this way, the SLOS can help separate supply effects from demand effects on the growth of business loans.

We use microdata from the SLOS to study how well the supply and demand information it gathers can explain changes in lending from banks to businesses.¹ We then use our empirical estimates to conduct a counterfactual exercise where we isolate, quantify and compare the supply and demand effects on the growth of business loans during the 2008–09 financial crisis.

Overview of the SLOS

The SLOS gathers information quarterly on price and non-price lending conditions (and demand conditions) for loans to small, commercial and corporate businesses. The survey, which has been conducted since the second quarter of 1999, asks a sample of lenders whether their standards and terms for approving credit have eased, tightened or remained unchanged over the past three months.² Similarly, it asks respondents whether demand for credit from their clients has increased, decreased or stayed the same.³ Lending conditions tend to remain fairly stable unless the economy is in a period of economic or financial stress. Indeed, analyzing SLOS responses over the entire sample, we find that respondents most often report that lending conditions are “unchanged.” This includes 85 to 90 percent of responses regarding lending to small and commercial businesses. Responses regarding corporate lending conditions are slightly more varied, with about 63 percent recorded as “unchanged” and the rest evenly split between “eased” and “tightened.” During periods of economic stress, however, financial institutions more actively adjust their lending conditions.

¹ This note uses the empirical approach followed by Del Giovane, Eramo and Nobili (2011), who use data for the Italian banking system.

² The current SLOS business sample consists of eight Canadian banks, one foreign bank, five credit unions and three other types of lenders.

³ See Faruqui, Gilbert and Kei (2008) for a more complete description of the survey.

During the 2008–09 financial crisis, for example, there was a marked shift toward more tightening for all borrowers (**Table 1**).

Table 1: Lending conditions in normal and crisis times as reported in the SLOS*						
	Small (average across five regions for both price and non-price conditions)		Commercial (average across five regions for both price and non-price conditions)		Corporate (asked only for Canada as a whole, average of price and non-price conditions)	
	Total sample (%)	Financial crisis (%)	Total sample (%)	Financial crisis (%)	Total sample (%)	Financial crisis (%)
Eased	3	0	5	0	18	5
Unchanged	90	75	85	69	63	44
Tightened	7	25	9	31	19	50

* Numbers may not add to 100 due to rounding.

Information content of the SLOS

To empirically investigate the relationship between SLOS indicators and future loan growth, we run a panel regression. More specifically, we regress each institution’s loan growth on its demand and supply indicators from the SLOS, as well as on a set of control variables. We run regressions for a series of different horizons of loan growth since credit conditions may influence lending over several quarters.

We construct our SLOS supply indicator by calculating the share of an institution’s business lending portfolio that is subject to a tightening of lending conditions. Similarly, we compute the demand indicator as the share of an institution’s business lending portfolio that is subject to increased demand for funds from clients.⁴

As we can see from **Chart 1, SLOS supply and demand indicators appear to have some predictive power for future business loan growth**. Furthermore, changes in supply conditions have statistically significant impacts across multiple quarters, while the statistically significant impacts of demand are shorter.⁵ A tightening in supply conditions leads to a fall in future business loan growth with the coefficient remaining significant (at a 5 percent

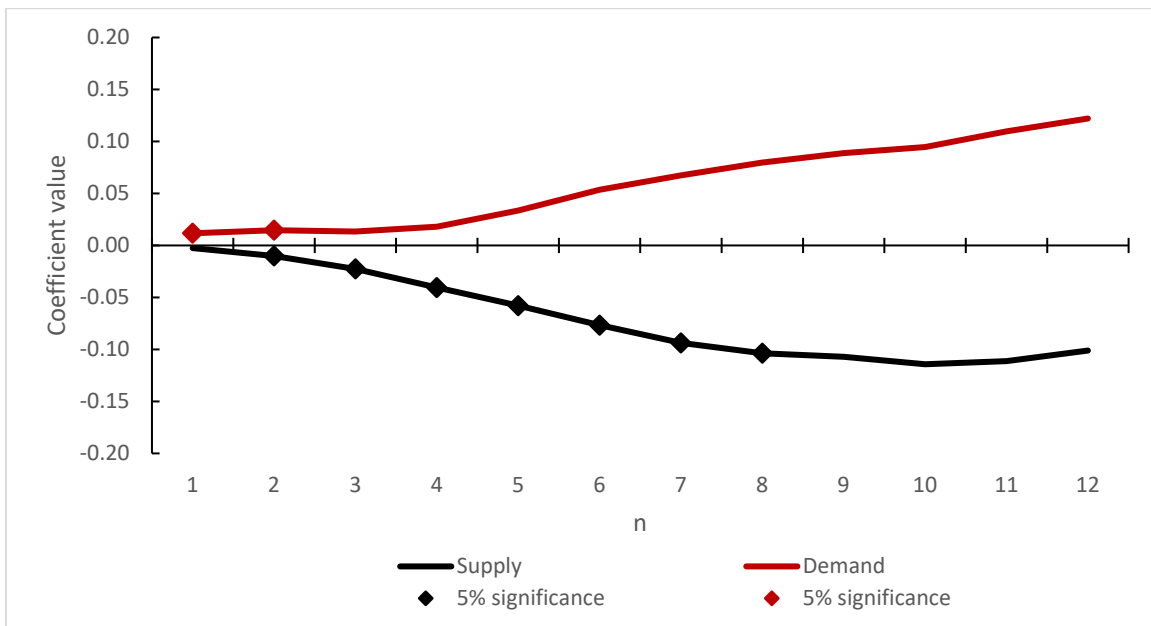
⁴ To control for seasonality effects in our demand indicator, we use a four-quarter moving average in our regressions. For our control variables, we use the quarterly change in the overnight rate, quarterly real GDP growth, a financial crisis dummy, quarterly dummies and a SLOS indicator of capital market access for corporate clients.

⁵ In terms of magnitude, a 1 percentage point tightening in the supply indicator leads to a fall in future business loan growth of between 0.01 percentage point in the following quarter (non-annualized) and 0.1 percentage point over eight quarters for the average bank. In dollar terms it averages roughly \$0.3 million to \$3 million for the typical bank’s business loan book during the sample period.

significance level) for up to nine quarters. Our demand indicator also has the expected relationship, with an increase in demand associated with an increase in future business loan growth. However, the effect of demand is shorter, with the coefficient insignificant beyond the first two quarters.

Chart 1: SLOS supply and demand indicators appear to contain predictive power above and beyond control variables for future business loan growth

Change in business loan growth per unit change in SLOS supply and demand indicators

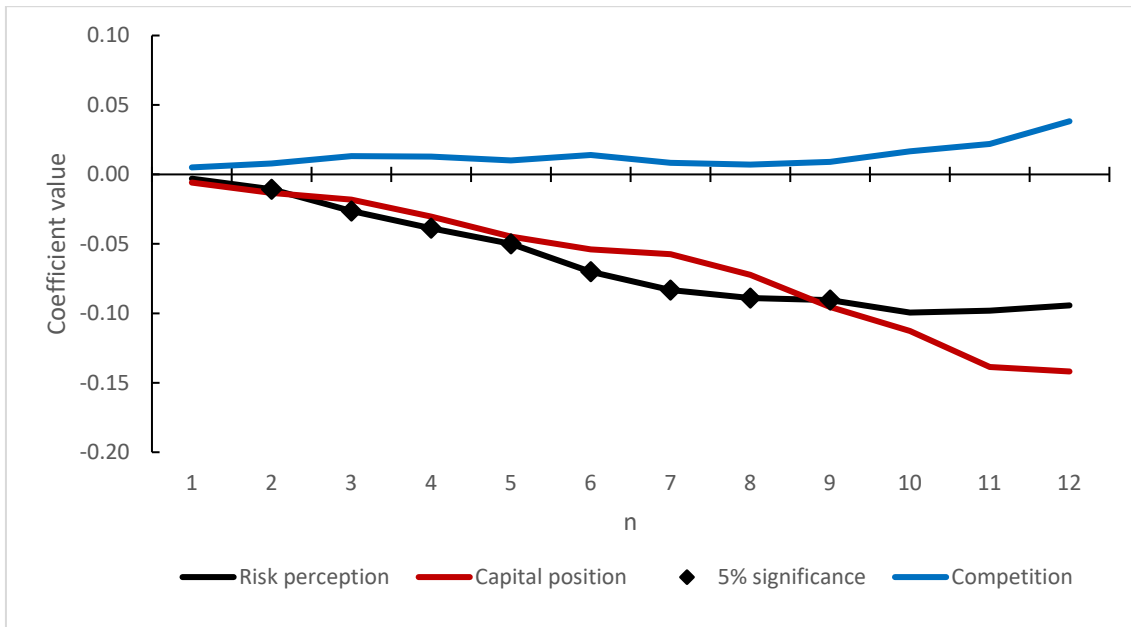


The reasons behind changing lending conditions matter for future business loan growth

The SLOS also asks follow-up questions on the reasons behind changes in lending conditions. With this information we can dig deeper to also examine the predictive power of the factors behind these changes. Respondents are asked to select from a list of reasons for easing or tightening their lending conditions. These reasons include the economic outlook and industry-specific problems (which we combined into one group called risk perception), competition and change in their capital position. We created the indicators in the same manner as those for overall supply conditions, calculating the share of an institution’s business lending portfolio that is subject to tightening for each reason. **Chart 2** shows the results.

Chart 2: Factors behind changes in lending conditions (particularly those associated with risk perception) also appear to contain predictive power for future business loan growth

Change in business loan growth per unit change in SLOS reasons indicators



“Risk perception” factors appear to have the strongest relationship with future business loan growth. An increased perception of risk is associated with a fall in future business loan growth, significant (at a 5 percent significance level) for up to nine quarters. Reasons related to an institution’s capital position have coefficients of roughly the same magnitude, though they are statistically insignificant. As for the competition indicator, it appears to have a slightly positive relationship. This implies that a tightening of lending conditions due to competitive pressure slightly increases business loan growth (although the coefficients are statistically insignificant in all regressions). This may be because competition is with capital markets as opposed to with other banks. Tighter lending conditions in capital markets may allow banks to tighten their own lending conditions to a degree. At the same time, some firms might then increase their borrowing from banks to replace lost (or more expensive) market funding.

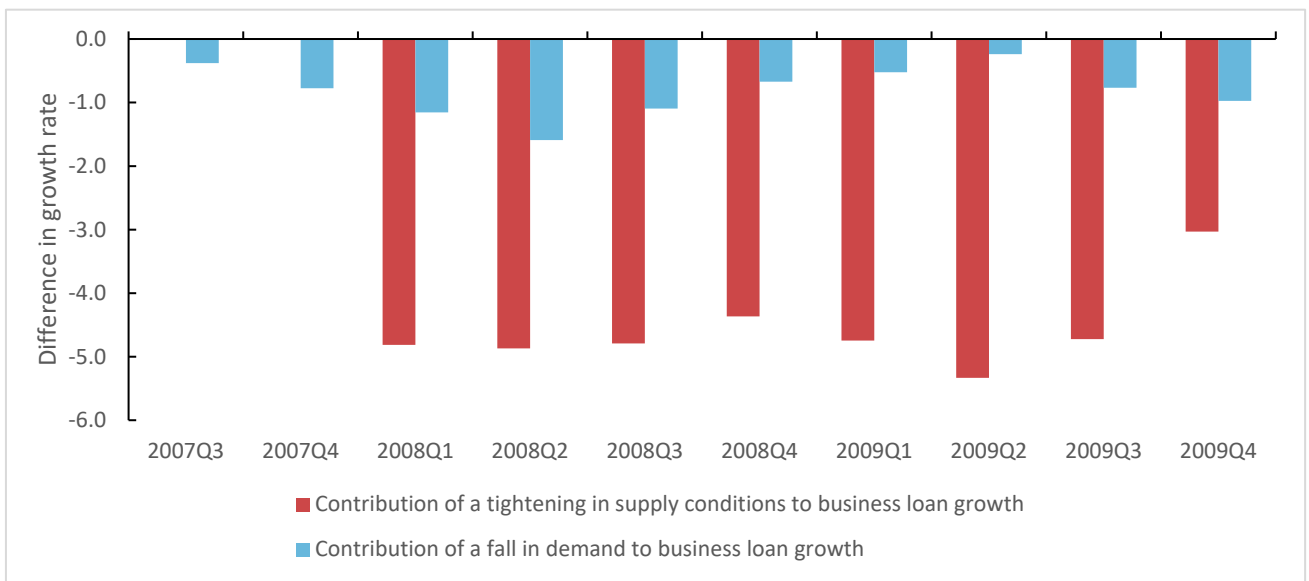
Counterfactual—using SLOS data to examine the role of supply and demand during the financial crisis

Having shown that SLOS supply and demand indicators both help to explain business loan growth, we turn to another interesting avenue to explore: how much each contributes to this

growth during a period of economic stress. We perform a counterfactual exercise to assess the roles each played during the 2008–09 financial crisis. Following the approach of Del Giovane, Eramo and Nobili (2011), we first use the actual historical values of the SLOS variables to estimate quarterly loan growth during the crisis.⁶ We then gauge what the quarterly business loan growth would have been had lending conditions not tightened. To do this, we fix the value of the SLOS supply indicator at pre-crisis levels and re-estimate loan growth. The difference is the contribution of supply tightening to the decline in business loan growth. We then repeat the same process for demand. **Chart 3** shows the results of this exercise.

Chart 3: Supply appears to have been the main contributor to the fall in business loan growth during the financial crisis

Contribution of supply and demand to the decrease in business loan growth during the 2008–09 financial crisis



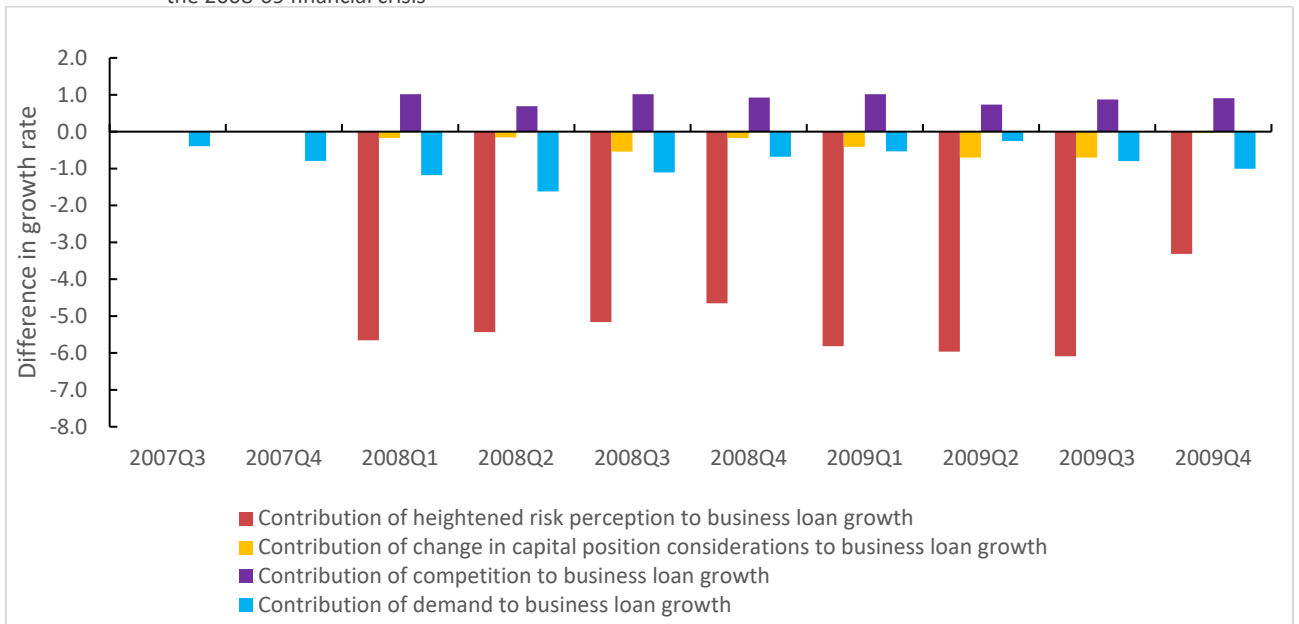
As we can see, the negative effect of tighter supply conditions clearly dominates the negative effect of lower demand on business loan growth throughout this period. Indeed, tighter supply conditions contributed about -5.0 percentage points to loan growth for much of the crisis period. In contrast, weaker demand contributed about -1.5 percentage points at its peak.

⁶ Following Del Giovane, Eramo and Nobili (2011), we choose the lag structure for SLOS supply and demand based on the fit of the regression and the significance of coefficients. For our counterfactual, the regression specification uses SLOS supply lagged two quarters and contemporaneous demand. We also do not include control variables in the counterfactual. This allows us to more clearly isolate supply and demand effects (the demand indicator in particular is likely associated with macroeconomic conditions such as interest rates and GDP).

Chart 4 shows the results of this same exercise, except using the SLOS factors behind changes in lending conditions as the supply indicators. Here we see clearly that heightened risk perception was the driving force behind the supply tightening that drove down business loan growth during this period. Factors related to an institution’s capital position contributed more in the latter period, though that factor’s contribution never exceeded taking 0.7 percentage points off business loan growth. Finally, more or less competition appeared to be a countervailing force.

Chart 4: Heightened risk perception was the largest supply-side factor contributing to lower business loan growth during the financial crisis

Contribution of supply-side factors and demand to the decrease in business loan growth during the 2008-09 financial crisis



Conclusion

This note examines the information content of the SLOS using institution-level microdata to construct a panel regression. We find both supply and demand indicators have leading-indicator properties for future business loan growth. Looking at the reasons behind changes in lending conditions instead of only at the changes themselves gives us more insight into the factors driving the supply of credit. In terms of being leading indicators, the reasons behind the changes in lending conditions perform just as well as overall conditions. Using first the overall supply indicator and, next, the factors behind changes in supply, we are able to use the SLOS to isolate the supply and demand effects on business credit growth during a credit downturn. We find that during the 2008–09 financial crisis, supply and, more specifically, heightened risk perception were the key contributors to the contraction of business credit

witnessed in that period. As we gather more data throughout the COVID-19 pandemic, we plan to conduct a similar exercise to better understand the drivers of business credit growth during this episode.

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