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The impact of the global business cycle on small open economies: A FAVAR approach for Canada

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ABSTRACT

Building on the growing evidence on the importance of large data sets for empirical macroeconomic modeling, we use a large factor-augmented VAR (FAVAR) model to analyze how global developments affect the Canadian economy. We focus on several sources of shocks, including commodity prices, foreign economic activity, and foreign interest rates, and evaluate the impact of each shock on key Canadian macroeconomic variables. Results indicate that Canada is primarily exposed to shocks to foreign activity and to commodity prices. In contrast, the impact of shocks to global interest rates and global inflation is substantially lower.

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1. Introduction

As the global economy becomes more integrated, foreign developments and their impact on the domestic economy are becoming increasingly important for policymakers. The macroeconomic outlook for small open economies, in particular, can be strongly influenced by international developments. Canada – a textbook example of a small-open economy – is a case in point. The Canadian economy has become increasingly integrated with the rest of the world during the last decades as international trade has expanded and financial integration with the rest of the world has deepened. There is evidence that existing links, for example, through commodity prices, may have become more important in the last few years (Maier & DePratto, 2008).

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As a highly open economy, Canada is exposed to the global business cycle, and understanding how these developments impact the domestic economy is important for identifying the best policy response to these developments. However, relatively little work has been done on how global developments affect the Canadian economy. Previous studies have evaluated the transmission of foreign shocks, mainly from the U.S., using small scale econometric models, such as vector autoregression models (VARs) or structural VARs (for instance, [Burbidge & Harrison, 1985](#); [Johnson & Schembri, 1990](#); [Kuszzak & Murray, 1987](#); [Souki, 2008](#)). [Klyuev \(2008\)](#) focuses on the impact of U.S. financial conditions on financial conditions and real economic activity in Canada. Using a structural VAR (or SVAR) that includes the inflation rate, real GDP growth rate, and the short-term interest rate, the paper finds that a tightening in U.S. financial conditions has significant implications for real activity in Canada. [Souki \(2008\)](#), using a SVAR including U.S. and Canadian real output growth and inflation changes analyzes the importance of U.S. supply and demand shocks in Canadian real GDP and inflation fluctuations. The paper finds that U.S. shocks tend to intensify both Canadian booms and recessions, while they have an overall stabilizing effect on Canadian prices over 1974–2004.

The recent global financial crisis has made abundantly clear that economic shocks are increasingly globally synchronized, thus motivating a global consideration of the economic outlook. This is the first study, to the best of our knowledge, to provide a detailed assessment of the dynamic effects of developments originating outside Canada on a wide variety of Canadian macroeconomic variables. We build an open-economy factor-augmented vector autoregressive model (FAVAR) to investigate the importance of global business cycle movements for Canada. FAVAR models were first developed by [Bernanke, Boivin, and Eliasziw \(2005\)](#), and implemented by [Mumtaz and Surico \(2009\)](#) and [Boivin and Giannoni \(2008\)](#), among others. The FAVAR approach is appealing as these models have the ability to process a vast amount of information while reducing the dimensionality of the data such that traditional VAR estimation techniques can still be applied.

Our paper is most closely related to [Mumtaz and Surico \(2009\)](#) who extend the [Bernanke et al. \(2005\)](#) FAVAR model to an open-economy framework in order to examine how foreign developments impact the U.K. economy. They find that shocks to foreign economic activity have relatively little impact on the U.K. economy, whereas shocks to foreign short-term interest rates can have substantial effects. This result is not surprising given the country's importance as a global financial center. We expect global developments to have very different effects on Canada, given the substantial differences in terms of economic structure between the Canadian and the U.K. economy. First, the U.K. is a net importer of commodities, while Canada is a net exporter of commodities. If commodity prices increase in response to an increase in global economic activity, it is likely to be beneficial for the Canadian economy, but is likely to act as a drag on the U.K. economy. Second, among the G7 countries, Canada is the most open to trade, and thus more likely to be affected by global economic developments through changes in imports and exports. Lastly, the importance of the financial sector is considerably higher in the U.K. than it is in Canada.

We use the FAVAR approach to model the interaction between the Canadian economy and the rest of the world, which we treat as the "foreign" block. We extract international and Canada-specific common components from a large panel of data covering 20 OECD countries and more than 260 series. Given the importance of commodity price movements for the Canadian economy, we extend the open-economy FAVAR model in [Mumtaz and Surico \(2009\)](#) to include commodity prices as additional observable variables. Then, we analyze the impact of several types of foreign developments, including changes in foreign economic activity, changes in commodity prices, and changes in foreign interest rates, and rank these developments in terms of their impact on the Canadian economy.

To preview the conclusions, our results show that unlike the findings of [Mumtaz and Surico \(2009\)](#) for the U.K., changes in foreign interest rates have relatively small impact on the Canadian economy. Canada is primarily exposed to shocks to global economic activity and, in particular, to commodity prices. As a commodity exporter, Canada benefits from higher commodity prices through a positive term of trade shock, but at the same time, higher commodity prices tend to lower global economic activity, hurting Canadian non-commodity exports. Put simply, Canada benefits from higher commodity prices, but only to the extent that they do not choke off global economic activity.

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