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The timing of uncertainty shocks in a small open economy

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The timing of uncertainty shocks in a small open economy*

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Abstract

Foreign measures of uncertainty, such as the US EPU index, are often used as a proxies for domestic uncertainty in small open economies. We construct an EPU index for Sweden and demonstrate that shocks to the domestic index yield different impulse response functions for GDP growth than shocks to the US index. In particular, a one standard deviation shock to the Swedish index delivers its maximum impact in the same quarter, lowering GDP growth by 0.2 percentage points. In contrast, a shock to the US index delivers its maximum impact with a one-quarter delay. Other foreign proxies, such as the EU and German indices, also generate effects that peak with a one-quarter delay. (*JEL* D80, E66, F41, F42)

Keywords: economic uncertainty, policy uncertainty, business cycles, small open economy

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1 Introduction

Since the 2008 financial crisis, the world economy has been hit by a series of policy-related uncertainty shocks, such as the Eurozone debt crisis in 2011, the U.S. "fiscal cliff" episode in 2012, and the British referendum to leave the European Union ("Brexit") in 2016. Disagreement remains over the extent to which such shocks affect the macroeconomy. While an earlier literature and recent empirical work suggest that uncertainty significantly affects output growth and other macrovariables, DSGE model analyses typically find smaller effects (Leland, 1968; Hartman, 1972; Abel, 1983; Bernanke, 1983; Bloom, 2009; Bachmann et al., 2013). Another line of literature suggests that the magnitude of the impact may depend critically on interactions with financial frictions (Cesa-Bianchi and Fernandez-Corugedo, 2014; Bonciani and van Roye, 2015).

Much of the work on uncertainty shocks concentrates on large economies, such as the US and UK. Only a few studies (e.g. Stockhammar and Österholm, 2016a; Stockhammar and Österholm, 2016b; Colombo, 2013) analyze the international transmission of uncertainty shocks to small open economies (SOEs) or measure the impact of domestic uncertainty on SOEs. We contribute to the literature by developing a Swedish economic policy uncertainty index (EPU), following the methods outlined in Baker et al. (2013). We then demonstrate how this index differs from foreign proxies, which are often used by SOE researchers, forecasters, and policymakers. In particular, we compute impulse response functions (IRFs) for shocks to Swedish, US, EU, and German EPU indices, and show that Swedish GDP growth responds faster to domestic EPU shocks than to foreign proxies. This provides support for the following two claims: 1) foreign proxies for uncertainty do not capture an important component of domestic uncertainty in SOEs; and 2) the domestic component of uncertainty may impact GDP growth faster than uncertainty that originates elsewhere. These findings have implications for both policy and forecasting in SOEs.

2 Methods

Sweden is a small open economy and is therefore affected by uncertainty abroad (Stockhammar and Österholm, 2016a,b). Even though policymakers often refer to uncertainty as an important factor that affects the economy, such a quantitative index has been missing for most SOEs, including Sweden. Although the US series can be used as a proxy, it does not capture uncertainty that originates domestically in Sweden, but is given little to no foreign media coverage. A Swedish EPU index could therefore potentially be of great use for understanding and analyzing GDP growth, trade, investment, and other economic relationships in Sweden.

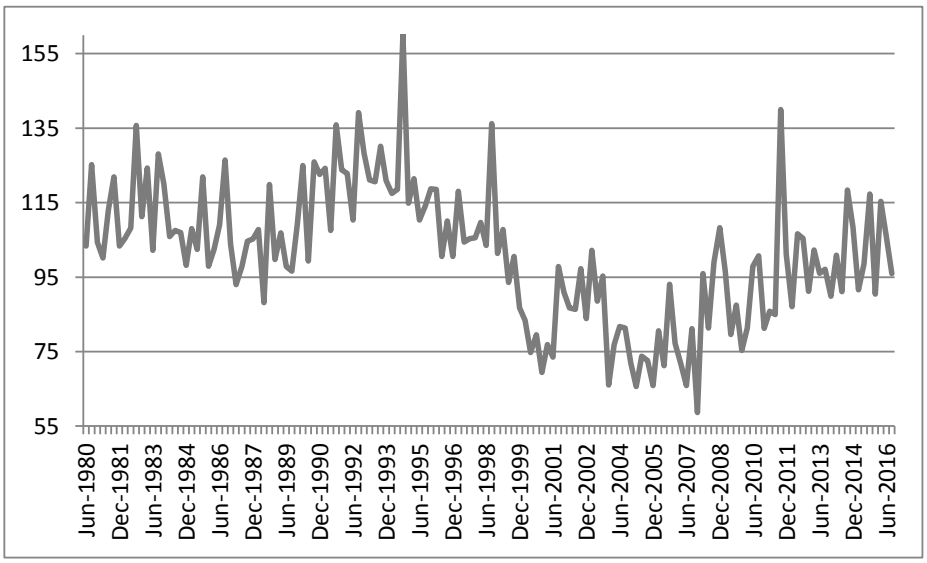
In this paper, we follow the methodology developed by Baker et al. (2013) and construct a monthly EPU index for Sweden that measures uncertainty related to economic policy. Baker et al. (2013) compiled the original index by searching for articles that contained "economic" (E), "policy" (P), and "uncertainty" (U) in major newspapers. They then normalized the index to account for trends in word usage and newspaper composition. The robustness of this approach is demonstrated in Baker et al. (2016).

We constructed a Swedish EPU index by scraping the National Library of Sweden's online newspaper archive. We queried the archive for Swedish keyphrases that correspond to their English equivalents of "economic," "policy," and "uncertainty."[1] The final index included articles from four of Sweden's largest newspapers: Aftonbladet, Expressen, Dagens Industri, and Svenska Dagbladet. We standardized the data and then normalized by the total number of articles that contained keywords for the "economic" component of the index.

Figure 1 shows the Swedish EPU index, starting in 1980. Notice that the

[1] We use the Swedish words "ekonomi" and "ekonomisk" for economic; "riksbank," "centralbank," "regering," "departement," and "reglering" for policy; and "osäker" and "oro" for uncertainty. We also included all keywords that contained the aforementioned words as roots.

Figure 1: Swedish EPU Index



index value increases during the Nordic Banking crisis in the early 1990s, and has a local peak in the fall of 1998 when the Stockholm stock exchange experienced its biggest fall since 1900, coinciding with the Russian financial crisis. It also increases around the IT bubble crash and 9/11 terrorist attacks in the early 2000s; and around the global financial crisis in 2008. It had another local peak during the European sovereign debt crisis in 2011 and has remained elevated since then, as has the EU index.

3 Results

We first analyze the relationship between the Swedish EPU index and Swedish GDP growth using a bivariate VAR. We later add more variables in a subsequent exercise to demonstrate the validity of the index. Since the domestic index also contains uncertainty originating in the US, EU, and Germany,

we use a specification that includes only one EPU index per VAR to avoid building in a high degree of multicollinearity.

The system is identified following the standard recursive ordering procedure with the EPU index ordered first.[2] The appropriate lag-length for the VAR is chosen to be four lags, using the Akaike information criterion. The data spans the period from 1981:Q2 to 2016:Q2. GDP enters as a growth rate, while the EPU index is included in levels. In Figure 2, the Swedish EPU is shown together with Swedish GDP growth. Casual observation suggests a negative relationship between the two variables.

Figure 2: Swedish GDP Growth (Q/Q%) and Swedish EPU Index

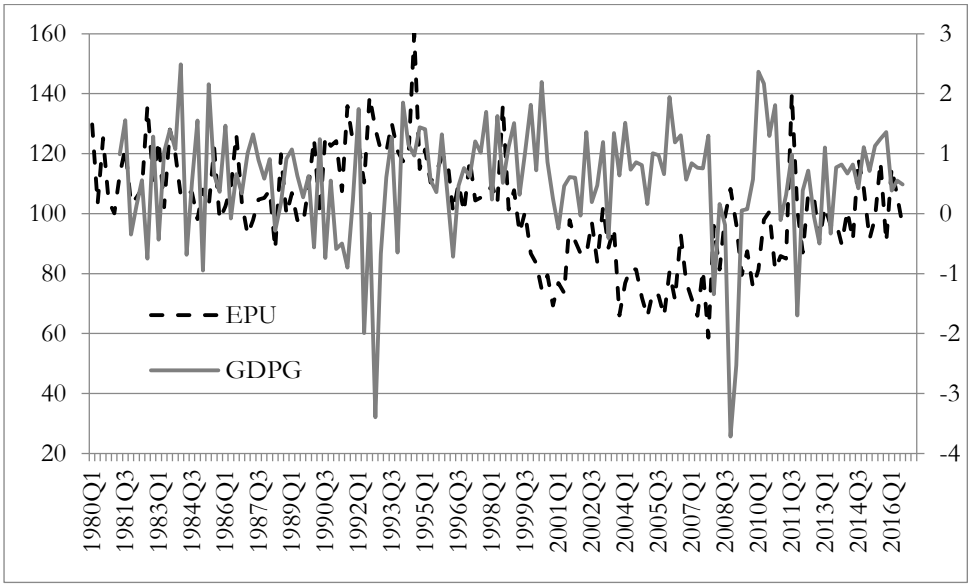
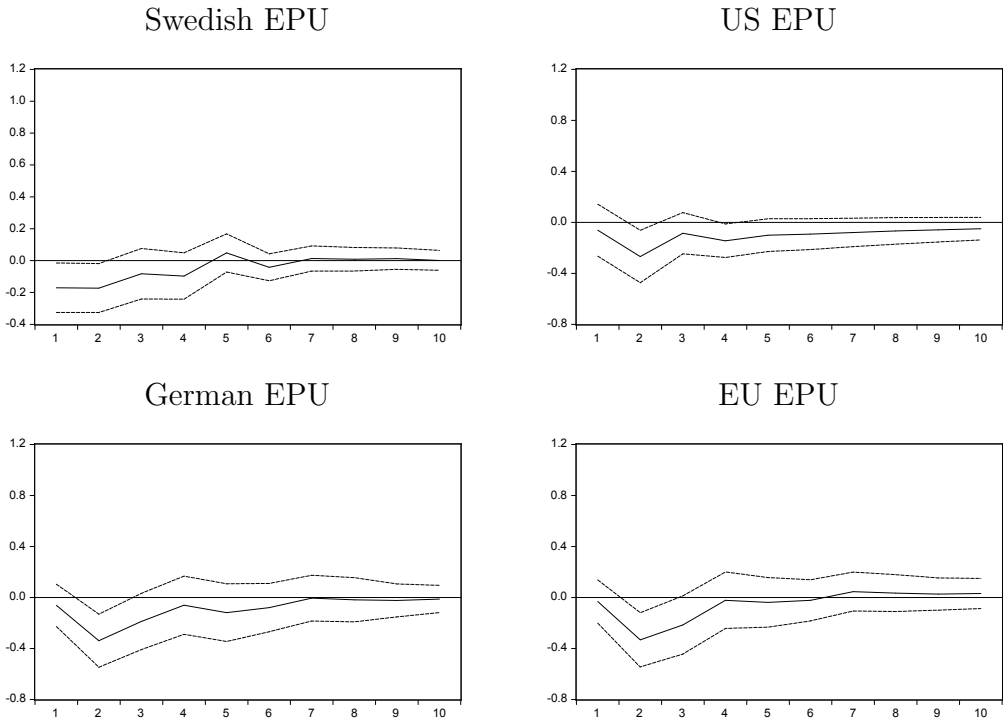


Figure 3 shows how Swedish GDP growth responds to a one standard deviation EPU index shock, along with the associated 95% confidence interval. The impulse response functions were calculated using a Cholesky decomposition.

[2]We have also tried ordering the EPU second in the VAR, which generates similar but not identical results.

Figure 3: Impulse Response Functions for Swedish GDP Growth



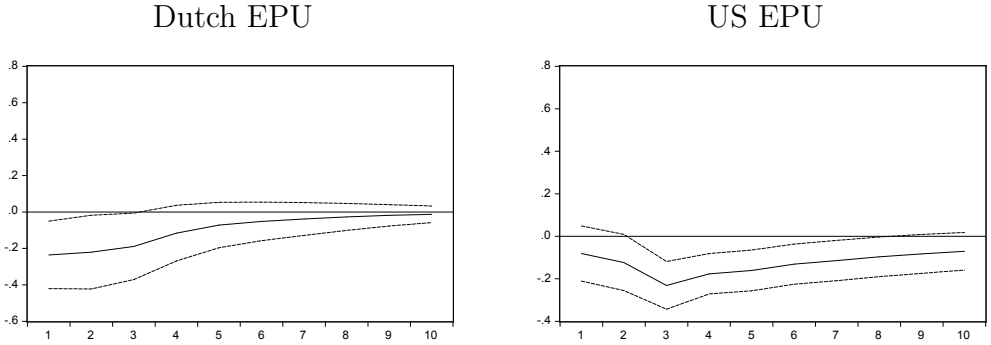
Notes. Each IRF is computed for a separate bivariate VAR that includes Swedish GDP growth and the EPU index referenced in the plot's title. We use quarterly data and a sample period of 1981:Q2 to 2016:Q2. Quarters are shown on the horizontal axis. Percentage points are shown on the vertical axis.

Notice that GDP growth in Sweden drops by 0.2 percentage points in the same quarter as the one standard deviation shock to the Swedish EPU. The effect then dissipates over the following four quarters. We also find a significant response to a US index shock, but it arrives with a one-quarter delay. EU and German EPU shocks also have a maximum impact after two quarters.

We also repeat the same exercise for the Netherlands, which is the other non-Anglosphere SOE in Europe with an EPU index. The results, shown in Figure 4, are nearly identical: a one standard deviation shock to the Dutch

EPU index has its largest impact on Dutch GDP growth in the same quarter; however, a shock to the US index takes two additional quarters to have its maximum impact on Dutch GDP.

Figure 4: Impulse Response Functions for Dutch GDP Growth

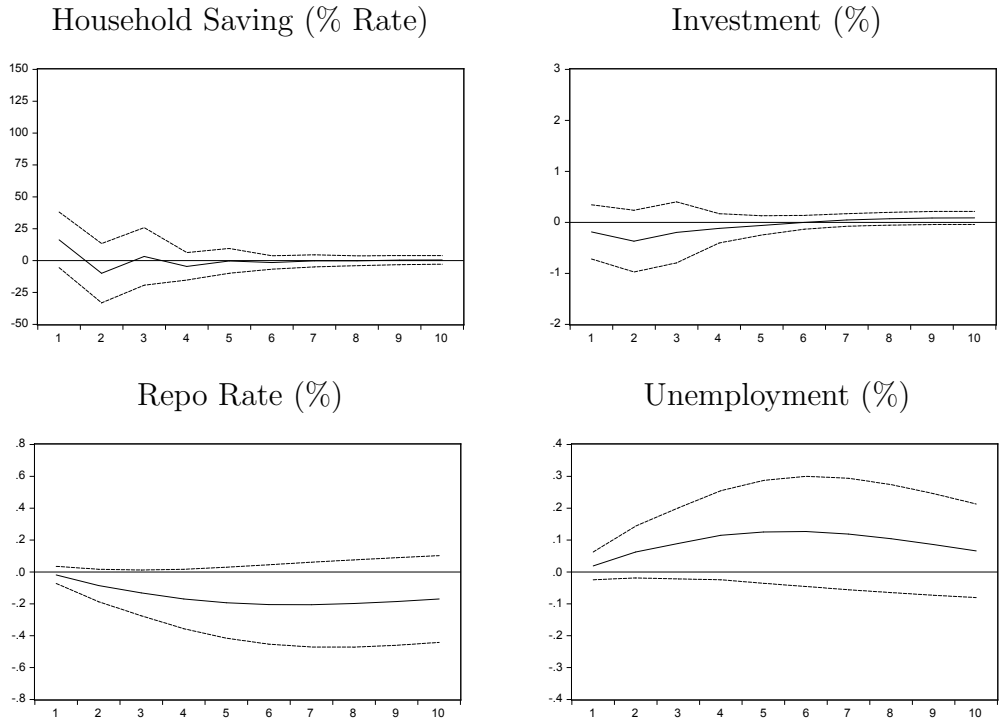


Notes. Each IRF is computed for a separate bivariate VAR that includes Dutch GDP growth and the EPU index referenced in the plot's title. We use quarterly data and a sample period of 2003:Q1-2016:Q1. Quarters are shown on the horizontal axis. Percentage points are shown on the vertical axis.

We next consider a larger VAR to verify that shocks to the Swedish EPU index generate the expected IRFs. Since Swedish newspapers provide a substantial amount of coverage for the US, EU, and Germany, we expect the Swedish EPU index to contain much of the information embodied in the other indices. For that reason, we abstain from including foreign EPU indices in the VAR. We add household saving, investment, the repo rate, and unemployment. Finally, we order the EPU first in the VAR.

Figure 5 shows the impulse responses generated from a one standard deviation shock to the Swedish EPU. In line with the existing literature, we find that an increase in uncertainty tends to 1) increase household saving; 2) decrease the repo rate; and 3) increase unemployment. We also find a statistically insignificant, but persistently negative investment response, which provides support for the hypothesis advanced in Bloom (2009). Overall, these

Figure 5: Impulse Response Functions for Augmented VAR



Notes. Each IRF is computed for the same VAR, which includes household saving, investment, the repo rate, unemployment, and the Swedish EPU. We use quarterly data and a sample period of 1993:Q1-2016:Q1. Quarters are shown on the horizontal axis.

results suggest that the index developed in this paper captures economic policy uncertainty well in Sweden.

4 Conclusion

Following the approach in Baker et al. (2013), we construct a Swedish EPU index. Such indices remain rare for SOEs in Europe. Employing a series of VARs, we find that a one standard deviation shock to the Swedish EPU index reduces Swedish GDP growth by 0.2 percentage points in the same quarter. Shocks to the US, EU, and German indices all arrive slower, achieving a

maximum impact on Swedish GDP growth with a one-quarter delay. We demonstrate external validity by showing that the same result holds for the Netherlands. Our results indicate that researchers, forecasters, and policymakers in SOEs may benefit from constructing domestic EPU indices, rather than relying on foreign proxies.

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