Exchange rate uncertainty and firm investment plans evidence from Swiss survey data

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A R T I C L E   I N F O

Article history:
Received 19 April 2016
Revised 15 September 2016
Accepted 22 November 2016
Available online 23 November 2016

JEL Classification:
D81
D84
E22

Keywords:
Investment
Uncertainty
Irreversibility
Switzerland

A B S T R A C T

A sudden change in monetary policy happened in Switzerland on January 15th, 2015. The Swiss National Bank removed the lower exchange rate bound vis-à-vis the Euro. We believe that uncertainty concerning a vital economic indicator as the exchange rate should influence economic activities. We argue that the unexpected removal of the lower bound induced a temporary uncertainty about future prices in foreign markets and believe that this influenced firm investment in the short term. We exploit the unexpected change in monetary policy as a natural experiment and use the continuous nature of business tendency surveys to determine the role of uncertainty in the immediate aftermath of the event. Changes in firm-level expectations are measured by specially designed survey questions. We use this information to disentangle first and second moment effects. We find that uncertainty negatively affects investment in equipment and machinery through real-option effects and believe that uncertainty positively influences expenditures in research and development through growth-option effects. Finally, we argue that focusing on aggregate gross fixed capital formation masks important insights and suggest the use of disaggregated investment data in future research on the relationship between uncertainty and investment.

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1. Introduction

On January 15th, 2015 the Swiss National Bank (SNB) removed a lower exchange rate floor of the Swiss Franc vis-a-vis the Euro and introduced a floating exchange rate regime immediately. This change of exchange rate regime came as a surprise. The Swiss Franc appreciated by around 15% against the Euro in the immediate aftermath of the announcement. We argue that this sudden appreciation did not only represent a first moment shift of the CHF/EUR exchange rate, but that it also increased uncertainty about the future exchange rate. Aggregate uncertainty indicators reacted strongly as a consequence of this policy change, which supports our claim.

The economic literature has discussed the importance of uncertainty for economic activities extensively in the past forty years. Arguments have been made for various channels of influence between uncertainty and economic indicators. We will limit our analysis to the effect of uncertainty on investment and focus on the theoretical channels known as real-option and

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* We thank Jan-Egbert Sturm, Klaus Abberger, and Matthias Bannert for taking their time and providing us with helpful comments and suggestions. Additionally, we thank the participants of CIRET Workshop 2015 and the participants of the Young Swiss Economists Meeting 2016 for useful remarks.

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http://dx.doi.org/10.1016/j.jmacro.2016.11.004
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growth-option effects. While real-option theory argues that uncertainty should lower irreversible investment temporarily if markets are not perfectly competitive, growth-option effects imply an increase in investment in uncertain times. This counterintuitive prediction deduces from the idea that the potential losses of an investment project are confined at a project’s initial costs while possible revenues from the same project are unbounded.

We study the monetary policy shock in Switzerland and its effect on investment plans of Swiss firms. We assume that the policy shock introduced exchange rate uncertainty that is equivalent to uncertainty about foreign market prices. This should directly affect firms’ decisions. We exploit the exogenous nature of the exchange rate shock and estimate its effect on firm-level investment. The firm-level data stem from the KOF investment survey. The biannual survey provides data on firms’ investment plans for the year 2015 at two time points, once in Autumn 2014 and once in Spring 2015. Therefore, we obtain firm-level investment projections for 2015 at a time when the lower bound was still effective (in Autumn 2014) and at a time when the lower bound had been abandoned (in Spring 2015). We can measure the change in firms’ investment plans for 2015 between the two survey waves, so that we can estimate whether a firm increased or decreased its investment plans for 2015 between Autumn 2014 and Spring 2015. Finally, we connect these investment plan changes to the exchange rate shock.

Within the data, we can distinguish between the areas where each firm chose to invest: investment plans in equipment and machinery, in construction, and in research and development. Additionally, the dataset allows the identification of the subjective first and second moment impacts of the sudden appreciation of the Swiss Franc on exchange rate expectations. Furthermore, the dataset contains information on further firm-specific characteristics, such as the sector in which a firm operates, a firm’s number of employees, different degrees of irreversibility of investment, or a firm’s export share. We will use this set of variables to explain firms’ investment plan revisions for 2015 across the different types of investment categories distinguished above.

Our firm-level proxy for uncertainty can explain firm investment plan revisions to a certain extent. We find a negative effect of uncertainty on investment plans in equipment and machinery and find that the effect of uncertainty is stronger for irreversible investment than reversible investment. The difference in investment plans for equipment between firms indicating uncertainty and irreversible investment and other firms is a decrease of almost 10 percentage points. This finding is in line with real-option theory. Furthermore, we find a positive effect of uncertainty on expenditures in research and development through growth-option effects, indicating that firms experiencing uncertainty planned to increase their investments in research and development after the shock. Here, the difference between firms indicating uncertainty and other firms is roughly 13 percentage points.

This paper adds to the ongoing debate on wait-and-see business cycles. While Bloom (2009) and Baker and Bloom (2013) provide evidence that macroeconomic uncertainty shocks are strong enough to lead to wait-and-see fluctuations in aggregate investment, Bachmann and Bayer (2013) find that macroeconomic uncertainty shocks can only explain a small percentage of the variation in aggregate investment. These contradictory results are a consequence of the samples of firms used in these articles, as Bachmann and Bayer (2013) demonstrate that limiting analysis to publicly listed firms overemphasizes the effect of uncertainty.

We provide evidence that the effect of uncertainty increases with firm size and add another dimension to the discussion. When studying the effect of uncertainty on aggregate investment, researchers usually focus on gross fixed capital formation (GFCF) which represents an aggregate of various investment categories, such as investment in machinery and equipment, investment in construction or investment in research and development. Yet the effect of uncertainty on investment in these distinct categories is not coordinate. We show that focusing on gross fixed capital formation masks the effects of uncertainty, as the effects within the distinct investment categories are of opposite signs.

Furthermore, this paper uses the combination of an exogenous event and firm-level uncertainty measures to circumvent identification issues. Generally, identification appears to be a constant struggle when studying uncertainty shocks. We solve this problem by exploiting an exogenous policy shock. The removal of the currency peg allows us to determine the source of uncertainty and study its effects on firm investment plans. To fully identify the effects of uncertainty, we need to separate how much of the investment plan revisions are due to first moment changes and how much of the revisions are due to second moment changes. We observe first moment changes and can derive changes in firm-level uncertainty from a survey question designed to measure perceived uncertainty.

The remainder of the paper is structured as follows. First, we reflect on the theoretical relationship of uncertainty and investment and elaborate on recent developments in measuring uncertainty. Then, we focus on the change in exchange rate regimes and the appreciation of the Swiss Franc before describing our hypotheses. Section 3 presents our dataset and the variables used in estimation. We present our identification strategy of uncertainty as well as our empirical model in Section 4, before Section 5 concludes. We provide robustness analysis and diagnostics in the Appendix.

2. Uncertainty and investment

Recently, studies on uncertainty have received increased attention. Several factors have led to this surge in the literature. According to Bloom (2014), the sudden increase in economic uncertainty with the beginning of the Great Recession in 2008 and uncertainty’s role in the recession’s trajectory led to heightened academic interest. Additionally, technical progress such
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