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Abstract

We examine policy-related economic uncertainty effects on the availability of credit, non-performing loans and loan loss provisions using a panel of 18 countries. We provide significant evidence that uncertainty reduces the availability of credit while leading to increases in banks' non-performing loans and loan loss provisions, distorting sectoral stability. Our findings are economically meaningful.

Keywords: financial depth; financial institutions; economic policy uncertainty; non-performing loans; provisions.
JEL classification: C22, C23, D81, E51.

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1 Introduction

Financial institutions often face a significant amount of uncertainty related to the timing and content of policy changes. Uncertainty of this type has been attracting researchers' interest given the recent global financial crisis which led to recessions and crises in the US, UK and the Eurozone, and the negative effects that may arise from the Brexit and the policy changes induced by the Trump adminstration (e.g., IMF, 2017; and Baker et al., 2016). The key challenge in this line of research is the identification of an appropriate measure of policy uncertainty. Yet, several researchers have successfully examined the impact of policy uncertainty on firms' fixed investment expenditures (Gulen and Ion, 2016), bank loans (Bordo et al., 2016), or predicting recessions (Karnizova and Li, 2014) by employing a novel proxy proposed by Baker et al. (2016).

This paper examines the impact of economic policy uncertainty (EPU) on financial depth, banks' non-performing loans and provision for credit losses as we utilize the uncertainty proxy provided by Baker et al. (2016) for 18 countries. We show that aggregate credit to private sector would decline after economic policy shocks, making it difficult for bank-dependent borrowers to rely on external finance.[1] Also, given increases in EPU affects banks' non-performing loans and loan loss provisions adversely, we argue that the stability of the financial institutions will deteriorate in periods of increased economic policy uncertainty. We also argue that our findings are economically meaningful.

2 Data and Methodology

2.1 Data

We used several sources to construct our panel data. Country-specific news coverage about policy-related economic uncertainty index for 18 countries is extracted from the EPU website[2], where Baker et al. (2016) provided national EPU indices since 1985 for Australia, Brazil, Canada, Chile, China, France, Germany, India, Ireland, Italy, Japan, the Netherlands, Russia, South Korea, Spain, Sweden, the United Kingdom, and the United States. Furthermore, we obtained two financial depth (FD) measures from the World Bank Global Financial Development (GFD) database, covering the period 1985-2013. The first measure, $FD1$, domestic credit to private sector relative to gross domestic product (GDP), gauges the amount of financial resources provided to the private sector.

[1] Uncertainty may also lead to suboptimal allocation of resources. In the case of the banking sector one can claim that under increased policy uncertainty bank loans will not be allocated to their best possible use. See, for instance Beaudry et al. (2001), Baum et al. (2009) and Caglayan and Xu (2016a) along these lines.

[2] http://www.policyuncertainty.com/

The second measure, $FD2$, which we used to check the robustness of our findings, is the private credit to the real sector by deposit money banks and other financial institutions to GDP. We derived two additional series from the same database to gauge the asset quality and the stability of financial institutions: 1) non-performing loans ($NPLs$), and 2) loan loss provisions ($Provisions$), scaled by gross loans and span the period 1998-2013.

As control variables, we extracted variables that capture banking crisis, bank concentration, foreign bank concentration, international debt securities as a percentage of GDP from the GFD database, and regulatory quality from the World Governance Indicator database. We also obtained inflation, GDP per capita, total exports, and total imports from World Bank World Development Indicator database.

2.2 Empirical Models

We examine how availability of credit, non-performing loans and provisions for losses evolve as EPU varies over time using the following model:

$$\Delta Y_{jt} = \alpha + \beta_1 \hat{h}_{jt-1} + \boldsymbol{\gamma Z_{jt}} + i.time + \nu_j + \epsilon_{jt} \tag{1}$$

where Y_{jt} denotes financial depth, non-performing loans and loan loss provisions for country j at time t. The key explanatory variable, $\hat{h}$, is a measure of time-varying country-specific EPU. Because this variable is constructed based on events up to the end of each the year, it enters the model with a time lag. We start our investigation by examining the impact of uncertainty on changes in FD. We expect that an increase in uncertainty will lead to a decline in credit to the private sector as bank managers become more conservative in their lending. Hence, the coefficient associated with uncertainty, β_1, is expected to take a negative sign. Next, we examine the impact of EPU on changes in banks' asset quality. To do so, we estimate equation (1) by using $NPLs$ and $Provisions$ as dependent variables. In both cases, we expect to find that β_1 will take a positive sign, as businesses are more prone to bankruptcies during periods of volatility.

To overcome specification error, we introduced several control variables into the model. The vector ($\boldsymbol{Z}$) contains eight variables including the rate of inflation ($Inflation_{t-1}$) to capture the state of the economy, GDP growth rate (ΔGDP_{t-1}) and trade openness ($Openness_{t-1}$) to control for changes in domestic and foreign demand, respectively. The effects of banking crises is captured through a dummy variable ($dumBC$).[3] We also included variables that measure bank concentration ($Bank\_Concentration_t$), international indebtedness as a percentage of GDP ($Debt/GDP_t$), foreign bank concentration

[3]This variable is constructed following Laeven and Valencia (2013). Separately, we introduced a step dummy, set to 1 if the year is greater than 2007, to allow for post-2007 effects. Parameter estimates were not affected.

($Foregin\_Banks_t$), and regulatory quality ($Reg\_Quality_t$). The former two variables capture country-specific banking environment, and the latter two variables allow us to control for effects that emanate from foreign debt, and the soundness of the overall business environment. We also used time dummies in our wider models. The last two terms of the model capture the country-specific fixed effects, ν_j, and the idiosyncratic error associated with country j at time t, ϵ_{jt}.

In estimating the model, we employed an instrumental variables estimator based on the generalized method of moments approach (IV-GMM) to guard against the endogeneity problem. We carried out Hayashi C statistic (GMM distance test) to examine whether independent variables can be treated as exogenous.[4] We observed that Economic Policy Uncertainty could not be treated as exogenous but other variables could be. Hence, we used twice to thrice lag of EPU and inflation as instruments.[5] To test for the validity of the instruments, we computed Hansen's J-statistic and reported the associated p-value in the table.[6] In all models, we find that the instruments are orthogonal to the error term so that we do not raise this issue to avoid repetition. It should also be noted that all models employ a robust estimator to allow for arbitrary heteroscedasticity and autocorrelation in the idiosyncratic error term (Baum et al., 2007; and Schaffer, 2012).

3 Empirical Findings

Table 1 presents the estimation results and the economic impact of EPU for all models. Note that columns 1 and 3 span the 1985-2013 period, columns 5 and 7 span the 1998-2013 period, while even numbered columns span the 2005-2013 period as foreign bank concentration is available only after 2005. It is worth pointing out that both the sign and the magnitude of the coefficient estimates are similar between the relevant columns; i.e. the parameter estimates are not affected by the sample size.

The first two columns depict the effects of EPU on changes in $FD1$ which measures domestic credit to private sector relative to GDP. For robustness purposes, in columns 3-4 we report the results for $FD2$, which measures the private credit to the real sector to GDP. In both cases, we find that EPU has a negative and significant effect on changes in financial depth. This is sensible. Given that EPU is driven by expectations about the future policy-related economic uncertainty, the information embedded in this measure

[4]For more detail on the C (GMM distance) test, see Hayashi (2000), pp 233-34; and Baum et al. (2007).

[5]Inflation rate relates to price volatility, which ultimately affects EPU uncertainty.

[6]Note that we also carried out Kleibergen-Paap (KP) LM statistic of under-identification to observe whether the excluded instruments are relevant, and KP rk Wald F statistic of weak identification test to test whether instrument are weak.

would affect financial intermediaries' ability to accurately gauge the worthiness of the borrowers.[7] Therefore, under uncertainty managers will behave more conservatively in their lending decisions reducing the availability of credit to the private sector. As a consequent, businesses may face increased difficulties for securing funds to invest on projects with high capital cost, high return volatility and long payback period (e.g., strong infrastructure dependency alternative fuel production plants).

Consistent with the literature, we observe that inflation ($Inflation$) takes a negative coefficient, albeit significant only in column 1, suggesting that as financial intermediation becomes more difficult when the rate of inflation increases. For example, high inflation can repress financial intermediation by eroding the usefulness of money assets and by distorting the financial structure of institutions (e.g., Rousseau and Wachtel, 2002). Also, consistent with the literature, we find that GDP growth (ΔGDP) takes a positive significant effect indicating a strong link between economic growth and financial depth. In column 3, the coefficient associated with the banking crisis dummy ($dumBC$) is positive and significant. This may reflect the efforts of governments and central banks which pursue expansionary policies in such periods to help the recovery of the economy.[8]

Columns 5-6 and 7-8 present the results for changes in non-performing loans and provisions, respectively. The results provide evidence that uncertainty positively affects the changes in problem loans and provisions for NPLs. This finding is expected as businesses are more prone to bankruptcies during periods of policy-related economic uncertainty. To that end, in columns 5 and 6 the banking crisis dummy takes a positive and highly significant coefficient, indicating that risk of insolvency significantly increases during these periods. Interestingly, the same dummy takes a negative sign in columns 7 and 8 indicating that under uncertainty loss provisions are highly under-provisioned when the path of future NPLs differs from historical experience. In this context, our findings support Furlong and Knight (2010) who indicate that banks may delay the recognition of loan losses during the crisis periods.[9] In addition, we find that bank regulations, $Reg\_Quality$, has a negative and significant effect in columns 6 and 8. This implies that when a government formulates and implements policies that permit and promote private sector development through the use of regulations, the country will experience a lower level of problem loans and less provisions for NPLs.

The last row of the table presents the semi-elasticity with respect to EPU for each

[7] Caglayan and Xu (2016b) showed that the changes in economic agents' expectations on the state of the economy affect bank lending negatively.

[8] Recall that during the 2007-08 financial crisis the Federal Reserve Bank, the Bank of England and European Central Bank along with many other Central Banks throughout the world carried out expansionary polices to ease the adverse effects of the crisis on credit markets.

[9] Furlong and Knight (2010) argue that mortgage delinquencies and low recovery rates on repossessed houses from the 2007 house price fall in the US far exceeded any previous market downturns.

variable of interest to examine the economic significance of our findings. Columns 1-4 show that the change in credit contracts about .2% to .6% in response to a 10% change in EPU. From columns 5 and 6 we see the NPLs increases about 1% and from columns 7 and 8 loan loss provisions may increase up to 2.3%. These figures are substantial and point out that the financial intermediaries will be significantly affected due to bursts in policy-related uncertainty.[10]

4 Conclusion

Banks often face a significant amount of uncertainty related to the timing and content of various policy changes (e.g., monetary policy, taxes, fiscal policy, government spending, financial regulation, trade policy). These policy uncertainties could have notable impacts on both businesses and households and ultimately, banks' lending and risk taking behaviors.

In this paper, we examine the impact of economic policy uncertainty on the availability of credit and stability of financial institutions for a panel of 18 countries. We show that increases in economic policy uncertainty lead to a substantial reduction of availability of private credit and deterioration of the stability of financial institutions. As the evidence is gathered from a broad cross-country panel dataset, our findings demonstrate the importance of political stability in achieving proper functioning of financial intermediaries. This matter is of significant importance considering the substantial changes in public opinion that we have recently observed through referendums or general elections across many nations.

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[10]Note that EPU can increase much faster than 10%. For instance, EPU has doubled in the US from 2007 to 2008. In that sense, it would be good to know a one standard deviation in EPU would impact the change in financial depth for about 2%, NPL about 3.8% and the loan loss provisions up to 10%.

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Table 1: Economic Policy Uncertainty Effects on Financial Institutions

	$\Delta FD1$		$\Delta FD2$		$\Delta NPLs$		$\Delta Provisions$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\hat{h}$	-0.0606**	-0.117**	-0.166**	-0.133**	0.00827***	0.0101**	0.241**	0.351**
	(0.0274)	(0.0473)	(0.0777)	(0.0587)	(0.00286)	(0.00415)	(0.115)	(0.172)
$Inflation$	-0.0221***	-0.0224	-0.00451	0.0305	0.0238	-0.0353	0.463***	0.472***
	(0.00640)	(0.0534)	(0.00302)	(0.0584)	(0.0422)	(0.0471)	(0.140)	(0.175)
ΔGDP	0.000508**	0.000671***	0.000656***	0.000572**	-0.00000285	0.00000139	-0.00110*	-0.00106
	(0.000203)	(0.000242)	(0.000210)	(0.000244)	(0.0000211)	(0.0000224)	(0.000580)	(0.000684)
$Openness$	0.0279	-0.00661	0.00541	-0.106	0.0200*	-0.00484	-0.325	-0.00774
	(0.0532)	(0.133)	(0.0567)	(0.0978)	(0.0118)	(0.0168)	(0.228)	(0.283)
$dumBC$	-0.0364	-1.187	4.075**	2.997	1.120***	1.200***	-12.25**	-16.22*
	(1.611)	(2.499)	(1.719)	(1.863)	(0.283)	(0.374)	(6.082)	(9.819)
$Bank\_Concentration$		-0.00832		-0.0467		-0.00401		0.0542
		(0.0545)		(0.0404)		(0.00812)		(0.177)
$Debt/GDP$		0.0242		0.0280		0.0127*		-0.0701
		(0.0401)		(0.0358)		(0.00706)		(0.0786)
$Foreign\_Banks$		0.344		0.385**		-0.0449		-0.145
		(0.241)		(0.194)		(0.0455)		(0.708)
$Reg\_Quality$		3.161		-4.636		-1.979***		-38.10*
		(5.558)		(5.369)		(0.577)		(22.45)
$Time\_Dummies$	YES	YES	YES	YES	YES	YES	YES	YES
N	339	198	315	188	238	185	193	151
Hansen J (p_value)	0.853	0.681	0.506	0.439	0.458	0.515	0.685	0.442
Semi Elasticity	-0.0245	-0.0456	-0.0623	-0.0463	0.1095	0.0859	0.2153	0.2347

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$