Macroeconomic Effects of Political Risk Shocks ☇

Sinem Hacıoğlu Hoke*
Bank of England and DAFM

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Abstract

We investigate the macroeconomic effects of political risk in an information-rich SVAR. Using an external instrument based on an index of US partisan conflict for identification, we find that reduced political risk has an expansionary impact: it is immediately priced into stock prices; increases firms' credit availability, employment and investments while households invest and consume more – ultimately output rises. As an important driver of economic dynamics in medium to long term, the shock creates an aggregate supply effect where output and inflation move in opposite directions and generates a trade-off between inflation stabilization and output growth during turbulent periods.

Keywords: Political risk shocks, Partisan conflict, Identification with external instruments

JEL Classification: C36, E2, E3, E6

*Bank of England, London. Data Analytics for Finance and Macro (King's College, London). E-mail: sinem.hacioglu@bankofengland.co.uk Web: http://www.sinemhaciogluhoke.com

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1 Introduction

Events that cause disagreements among politicians increase the uncertainty around policies to be implemented. This uncertainty and following potential instability in the political system affect the actions taken by various economic agents and therefore affect the economy. For instance, firms[1] might be more inclined to keep track of discussions about private-sector regulations, trade wars or national defence issues for business continuity or with profit maximization in mind. On the other hand, households are more likely to hear about discussions around social issues such as health care, immigration reforms, marital rights or gun controls, and assess their potential impact on their budget constraints and portfolios. While the discussion among scholars about the implications of political risk has a long history, there is a reignited debate about their macroeconomic impact.

This paper provides an empirical investigation to the macroeconomic impact of political risk and the channels through which political risk shocks transmit. As Hassan et al. (2019) show, one of the economic agents which act upon the changes in the political environment is indeed firms. The time firms spent to discuss political risk and their perception of the political environment change their hiring and investment strategies. Relatedly, Altig et al. (2019) conclude from their firm-level survey that firms' future employment decisions and sales growth are shaped by the perceived uncertainty in the economy, which also includes firms' perceptions of the political environment. Therefore, political risk can in part be linked to movements in some macroeconomic aggregates. However, less is known about the exact transmission of political risk shocks and how other agents, for instance, households, and also the broader economy, react to changes in the political environment.

To explore how political risk shocks transmit, we use an external instrument to identify these shocks in a 20-variable Bayesian structural vector autoregression (SVAR). The instrument relies on the US Partisan Conflict Index (PCI) proposed by Azzimonti (2014, 2018). This monthly index is constructed by textual analysis on newspaper articles starting from 1981 and aims to measure the conflict that arises between politicians, e.g. the Senate, the Congress and the President. It simply is a way of quantifying the

[1]Throughout the paper, we do not explicitly distinguish financial and non-financial firms.

uncertainty about the policies that are yet to be implemented – e.g. which health care bill will be approved – rather than the uncertainty about what consequences these policies would lead to – e.g. what the implications of the approved health care bill will be. This is one of the key features of the PCI that distinguishes it from the Economic Policy Uncertainty Index (Baker et al., 2016) that measures economic uncertainty. Therefore the PCI mostly distinguishes political risk from business cycles. We construct our instrument as the exogenous component of the PCI to the current and expected economic conditions. Identification of SVARs using an external instrument allows us to explore the different channels through which these shocks transmit without imposing any ex-ante restrictions on the timing and the direction of the responses. The broad coverage of the SVAR ensures to capture the different channels through which political risk affects various parts of the economy, e.g. financial markets, the real economy, firms and households.

A positive shock – a reduction in political risk by taking an optimistic stance – has an expansionary effect on the economy: stock market prices in the shock immediately which affects credit availability and leads firms to make decisions regarding their dividends and debt issuances in line with the direction of which stock prices and credit availability move. Firms benefit from the increase in credit availability, the drop in capital and unit labour costs which increase the aggregate supply as the cost of external finance channel implies (Gilchrist et al., 2014). Consumer expectations for the economic environment, business conditions and more importantly, inflation change favourably. Households' demand for consumption goods increases. Eventually output, consumption and investment all rise.

Our results suggest that political risk shocks generate an aggregate supply effect which causes inflation and output to move in opposite directions. The changes in supply dominate the demand effect due to the household portfolio channel (Bayer et al., 2019): households make adjustments between their consumption and investment choices as the perceived income risk decreases and they increase their investments more than their consumption. As the change in aggregate demand by households does not match the change in aggregate supply, the improvements in the economy are accompanied by a steady drop in inflation following favourable political risk shocks. These results hold when the Great Financial Crisis (GFC) is excluded from our sample. Moreover, our results and interpretations are very similar when we instead use the aggregated version of Hassan et al. (2019)'s firm-specific political risk indices as an external instrument.

To explore the role of these shocks in driving economic activity in more detail, we use a frequency-domain variance decomposition as in Altig et al. (2011) and Miranda-Agrippino et al. (2018). We show that these shocks are important drivers of economic activity in the medium to long term, i.e. output growth, inflation, investment, consumption and labour supply. We also investigate if political risk shocks provide insights for the 'missing disinflation puzzle'. Missing disinflation debate has gained attention after the GFC, Hall (2011). Although the economy shrank substantially, the inflation rate did not reflect the sharp drop in aggregate demand (Christiano et al. (2015), Coibion and Gorodnichenko (2015), Gilchrist et al. (2017)). According to our results, inflation rises as output declines during the turbulent period when a negative political risk shock materializes. Elevated levels of partisan conflict after the GFC can be thought of one of the reasons why inflation stayed higher than expected during the crisis and the recovery period. In the variance decomposition, we show that a quarter of the variance of the inflation dynamics is accounted for by the political risk shock in the long term.

We investigate the features of political risk shocks using a broader set of variables. We first discuss our results based on uncertainty as it is only natural to think that political risk shocks might be closely related to uncertainty shocks. Using various uncertainty measures in our SVAR, we show that only some uncertainty measures react to the shock significantly but even then their response is somewhat delayed while some are mostly unresponsive to the shock. Moreover, the variances of each of the uncertainty measures explained by our shock are negligible at all frequencies. Therefore, the shock does not carry the features of pure economic uncertainty but leads to macro and financial uncertainty afterwards. Second, we explore the impact of political risk shocks on house prices and bank mortgages, and banks' capital and non-performing loans (Cúrdia and Woodford (2010), Gerali et al. (2010), Meh and Moran (2010), Abbate et al. (2016)). Finally, to show that this shock does not carry the features of other shocks, we present the pairwise correlations between the political risk shock and some other shocks widely studied in the literature, e.g. monetary policy, TFP, tax and military news, investment, oil supply, income risk and financial shocks.

Related Literature

This paper relates to the studies that investigate the effects of political risk on financial markets and the macroeconomy. This paper is most related to Hassan et al. (2019) where they construct a firm-level political risk index via analysing the time spent on discussing political risk during firms' quarterly earnings calls. They show that firms act on their perception of political risk by changing their hiring and investment strategies. Using Hassan et al. (2019)'s political risk indices for firms, Gad et al. (2019) explore the credit market implications of political risk shocks. They find that lenders take into account the political risk exposure of the borrowers and that political risk transmits via financial institutions' linkages to others. In a similar spirit, Altig et al. (2019)'s monthly business survey aims to understand how firms' perceive the uncertainty in the economy some of which might be caused by government actions and how their future sales growth, employment, and capital expenditures will be affected by it. In aggregate level, Fernàndez-Villaverde et al. (2015) conclude that unexpected shocks to fiscal policy and fiscal policy volatility have important and sizable effects on the economy.

Although these papers take a broader approach to explore the effects of political risk, some studies exclusively focus on the impact of political risk on investment. For instance, Azzimonti (2011) argues the impact of political polarization on creating barriers to private investment. She finds that highly polarized societies – societies with high political instability – grow at a slower pace and reach to lower levels of per capita income which is a discussion that goes back to Barro (1991). Azzimonti (2014) which introduces the features of the PCI, shows that political conflict is directly related to changes in output, investment and employment. Azzimonti (2018), on the other hand, discusses how high levels of partisan conflict depresses private investment. Gulen and Ion (2015) provide evidence on the negative relationship between political uncertainty and firm-level capital investment. Therefore the actions taken by agents, especially firms, against political risk are associated with changes in the macroeconomic aggregates such as investment, employment and hence productivity.

There is also more focussed literature exploring the impact of presidential elections and the elected party on the macroeconomy. The macroeconomic impact of which party occupies the White House goes back to Hibbs (1977); Alesina (1987); Alesina and Rosenthal (1989). These papers document a relationship between election outcomes and the state of the economy on the basis of unemployment and growth. Investment decisions of firms around elections are also explored by Jens (2017) who finds evidence that investment declines around elections and firms delay their equity and debt issuances linked to investments before elections. Relatedly, Akey and Lewellen (2017) document that firms which are more prone to be affected by the political environment have different risk-taking, firm value and investment characteristics compared to firms which are policy-neutral around elections. For the impact of national elections on investment see Julio and Yook (2012) and on commodity prices see Hou et al. (2017). Our paper aims to look at the political risk through the lens of the macroeconomy, rather than focusing exclusively on individual firm behaviour. Moreover, our focus is beyond elections but also other periods when political risk might be elevated due to other reasons. That said, some of our results provide aggregate support to the existing studies on how firms react to political risk.

A related branch of the literature focuses on the impact of political uncertainty around elections on stock prices. Analysing high-frequency market data around the 2004 US presidential election, Snowberg et al. (2007) argue that George Bush's re-election leads to higher stock prices which resembles a similar pattern for elections going back to late 1880s. Relatedly, although not exclusively on elections, Santa-Clara and Valkanov (2003) document a difference in the excess return in the stock market between the periods of Democratic or Republican presidencies. The difference is not explained by business cycle fluctuations, the riskiness of the stock market associated with particular presidents or the economic policies of different presidents. Goodell and Vähämaa (2013) focus on the impact of political uncertainty around elections on implied stock market volatility. Similarly, Goodell and Bodey (2012) argue that stock market volatility around presidential elections partly originates from the actions firms take around elections which ultimately affect their price-to-earnings ratio, rather than originating purely from investor sentiment. Girardi (2018) explore the impact of partisan electoral victories on share prices; see also Durnev (2010); Boutchkova et al. (2012). An intersection of asset pricing and corporate finance literature has also explored the heterogeneous cross-sectional effects of political risk, e.g. Belo et al. (2013); Brogaard and Detzel (2015). We contribute to this part of the literature by showing that political conflict can induce a significant reaction of stock prices.

The empirical model used in the paper builds on the recent literature of shock identification in SVAR models using external instruments. These work include instruments for monetary policy shocks (Romer and Romer (2004), Romer and Romer (2010), Stock and Watson (2012), Stock and Watson (2018), Miranda-Agrippino and Ricco (2018)), fiscal shocks (Ramey, 2011), tax shocks (Mertens and Ravn, 2013), shocks to sovereign spreads (Bahaj, 2019) and technology news shocks (Miranda-Agrippino et al., 2018). Ramey (2016) provides a detailed survey of available shocks.

The findings related to missing disinflation is distantly related to the recent literature which aims to shed light on the missing disinflation phenomenon mostly focusing on the post-crisis period. The most prominent evidence that liquidity constrained firms had to increase prices despite the fall in demand during the GFC was provided by Gilchrist et al. (2017). As a result, these financial shocks shatter the 'divine coincidence of output and inflation' which New Keynesian or financial accelerator models highlight, see e.g. Blanchard and Gali (2007). Since output and inflation do not co-move in the same direction, this leads to a monetary policy trade-off: lowering interest rates during turbulent periods cannot stabilise both inflation and output at the same time. In addition, Coibion and Gorodnichenko (2015) find that the missing disinflation during the GFC was mainly due to households' expectations of high inflation, due to their observation of rising oil prices, by using a model with expectation-augmented Phillips Curve. Many others provided evidence of the existence of the missing disinflation period and potential reasons, see e.g. Christiano et al. (2015); Abbate et al. (2016).

The rest of the paper is organized as follows. Section 2 outlines the construction of the partisan conflict based instrument and provides the details of how we identify the political risk shocks in the SVAR. We present the impulse response functions of all variables to a positive shock in Section 3. Section 4 discusses the medium and long term effects of political risk shocks in driving economic activity and provides insights related to the missing disinflation debate. We provide additional empirical analysis by considering a broader set of variables in Section 5, while Section 6 concludes. Additional results and details are outlined in Appendix A. Data sources and additional information on data are provided in Appendix B.

2 Instrument and Shock Identification

This section first introduces the Partisan Conflict Index. We then provide the details of constructing our instrument and lastly, we explain the details of identification using the instrument in VARs and the conditions the instrument has to fulfil.

2.1 Details on the Partisan Conflict Index

Conflict among politicians can be sparked by a wide range of topics that are frequently discussed: environmental discussions, debates around health care, security and defence issues, technology, social issues such as same-sex marriage, gun control and rights, immigration, care for families and children, and social security, among many. Azzimonti (2018)'s Partisan Conflict Index is a monthly measure, shown Figure I starting in 1981, that captures the overall political conflict between US politicians using newspaper coverage of political disagreements.

The PCI tends to increase around government shut-downs, elections, debt ceilings and fiscal bill discussions. Also, it has been higher than the past levels in the period that coincides with the recovery period of the GFC. By construction, the PCI is about the uncertainty about policies yet to be implemented, not the uncertainty about the consequences of implemented policies. The latter has been explored by the Economic Policy Uncertainty (EPU) index proposed by Baker et al. (2016). Both the PCI and the EPU tend to rise around elections. However, the EPU index spikes around wars, or 9/11 whereas partisan conflict around these events is quite subdued as politicians agree on the steps to be taken without leaving any room for conflict. There are also situations in which partisan conflict have not caused economic policy uncertainty, see Azzimonti (2014, 2018) for more detail.

The EPU is affected by financial shocks such as Lehman's collapse while these type of shocks do not cause any movement in the PCI. Similarly, It is not straightforward to distinguish the macroeconomic uncertainty from political uncertainty in the EPU. The EPU tends to rise during recessions while Azzimonti (2014) finds no evidence of PCI's relation to recessions. Moreover, Hassan et al. (2019) discuss that some of the uncertainty captured by the EPU might be originating from political risk however, it is hard to strip out the political risk component of the EPU.

On a separate note, the PCI captures different dynamics than how the political uncertainty defined in Pastor and Veronesi (2013). The PCI is about conflicts between politicians that can be purely temporary and might ease off after a while. Pastor and Veronesi (2013)'s political uncertainty is about the implementation of policies and the uncertainty around their consequences. Similarly, the Policy Related Equity Market Volatility Index (Baker et al., 2019) aims at measuring the implied volatility of stock prices due to the policy uncertainty around the consequences of government policies. In that sense, the policy uncertainty in Pastor and Veronesi (2013) and in Baker et al. (2019) resemble similarities to the EPU rather than to the PCI.

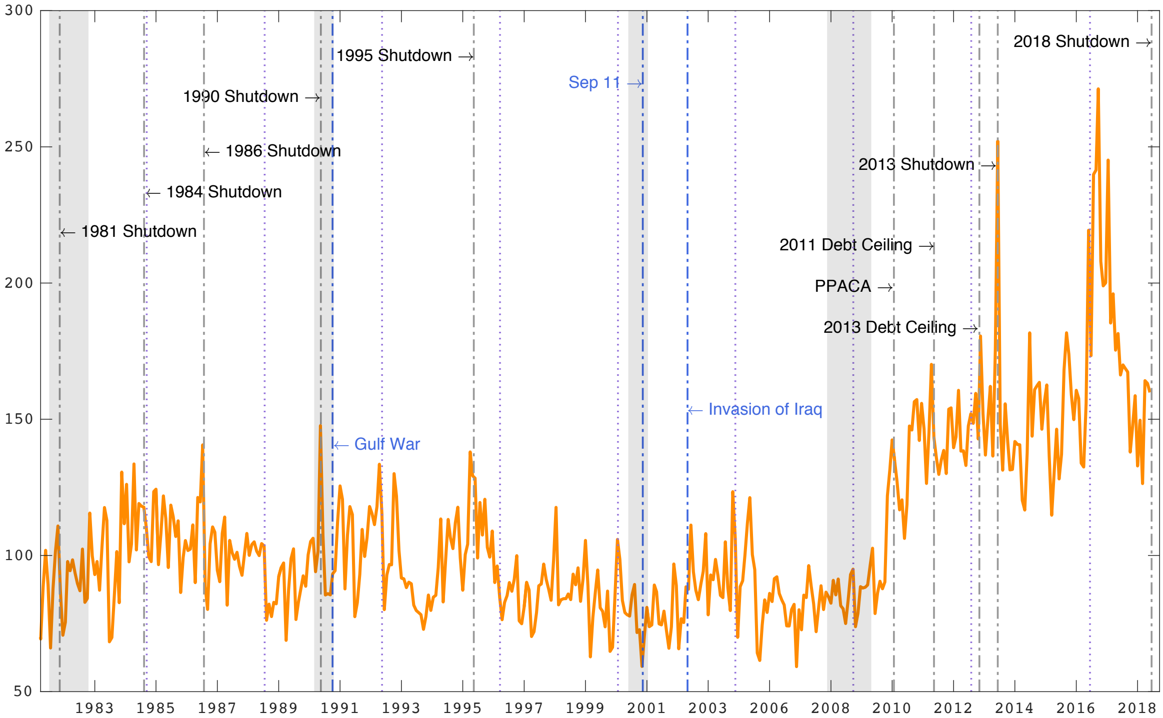
Partisan conflict is, in part, associated with political polarization, see e.g. Jensen et al. (2012) for a discussion on polarization. However, polarization is a necessary condition for conflict to arise, although not a sufficient one. Even in an evenly distributed political system, the conflict between politicians might arise or when a divided government enters a deadlock, although the economic policy is highly uncertain, conflict among politicians can be subdued. Therefore, the PCI should not be referred to as a pure political polarization index but an index that is related to it.

An aggregate index of political conflict provides a viable proxy of how political conflict might change different agents' behaviour against changes in political risk originating from political conflict. Ideally, an index such as Hassan et al. (2019)'s political risk indices for firms, aiming to quantify political risk from each firm's perspective, might be a more targeted measure to use in empirical analyses. However, the time span of such series is a limiting factor to use them as a measure or an external instruments in SVAR models that aim to shed light on the business cycle movements political risk shocks might induce. On the other hand, when we repeat our analysis with the aggregated version of Hassan et al. (2019)'s political risk indices within firms[2], we obtain very similar results, see Figure A.5. These points, as we summarized above, are our primary motivation to use the PCI to construct our instrument.

Stock markets have been known to be quite responsive to political conflict. Sharp

[2]The aggregate index we use is the average of the firm-specific indices provided by the authors, downloaded from `https://sites.google.com/view/firmrisk/data-explorer`.

Figure I: Partisan Conflict Index



Note: Partisan Conflict Index in monthly frequency between 1981-2018, Azzimonti (2018). Historical events marked. Government shut-downs, the Patient Protection and Affordable Care Act (PPACA), Debt Ceilings in grey; Gulf War, September 11 and Iraq's invasion in blue; presidential elections in purple-dotted lines. The shaded areas denote the NBER recessions.

changes in stock markets which are not necessarily caused by economic fundamentals or are purely speculative still affect firms' worth and their investment decisions among others. For instance, between 17 and 24 December, 2018 the S&P 500 index fell approximately by 7.5%. Sharp moves similar to this in the stock market were mostly due to speculation and the event of a government shut-down due to the disagreements on the budget allocation to the proposed southern border wall, which was resolved in the first few weeks of 2019. Similarly, compared to the previous day, the S&P 500 changed in the range of −0.85% to 2.2% between 1 and 17 October 2013 when the US government shut down due to the disagreements about the 2014 fiscal bills. The index jumped up by 2.2% on November 7, 2016, compared to a day before, which marks the day before the latest US presidential election.[3] Although political uncertainty is not the only reason why stock

[3]The stock market volatility around the latest presidential election was widely covered by scholars. See https://www.nytimes.com/2018/03/23/business/trump-recession-forecast.html and

markets move, it certainly is an important reason.[4] As stock prices move, improvements or deteriorations in firms' conditions change their ability to borrow, invest, produce and hire. We build on this intuition for the construction of our instrument in the next section.

2.2 Political Risk Shock Instrument

Political conflict can be purely speculative and therefore exogenous to the current and the expected state of the economy. However, some disagreements can originate from policies that will be put in place related to the current and expected future state of the economy, or current policy shocks. As we will discuss in Section 2.3, the instrument should be uncorrelated with the other shocks captured in our SVAR. To test this, we test the forecastability of the quarterly growth rate of the PCI, i.e. we regress it on its lags and the expected conditions of the economy in the current quarter, in the next quarter and in the next year, and perform Granger causality tests. The expected conditions are the forecasts of Survey of Professional Forecasters (SPF) on real output growth, unemployment rate, inflation, real federal government spending, real non-residential investments and real corporate profits net of taxes. The results in Table A1, in Appendix A, present the autocorrelated nature of the PCI, along with its forecastability with the expected economic conditions for the next quarter.

Given the finding regarding the potential forecastability of the PCI, we need to first isolate the orthogonal component of the PCI to the current and expected macroeconomic aggregates, and policy shocks. We construct the external instrument, m_t, to identify political risk shocks by the following regression estimated via OLS, in quarterly frequency:

$$pci_t = c + \sum_{i=1}^{4} \alpha_i pci_{t-i} + \sum_{j=0}^{1} \psi_j \pi_{t-j} + \sum_{k=0}^{4} \phi_k g_{t-k} + \sum_{h=1,4} \beta_h \mathbb{E}_t[X_{t+h}] + \boldsymbol{\delta w_t} + m_t \tag{1}$$

where pci_t is the quarterly growth rate of the PCI. We use the first four lags of the

https://krugman.blogs.nytimes.com/2017/02/07/is-there-a-trump-bubble/

[4]In a similar context Pastor and Veronesi (2013) show that three shocks drive stock prices: capital shocks, impact shocks, and political shocks. They discuss that political shocks are orthogonal to economic shocks. Political uncertainty urges investors to hedge against potential shocks that might originate from the political agenda that will follow. Therefore investors require compensation against the risk that the adapted policy might not be in their favour. Moreover, Kelly et al. (2016) discuss in detail that equity option markets price political uncertainty.

dependent variable along with other variables to recover the instrument m_t. First, we use the current and the last quarter's inflation rate, π, and the current and the four lags of the quarterly growth rate of real GDP growth, g. These two variables filter the political conflict that might be related to the current stance of the real economy. The partisan conflict should also be orthogonal to the expectations of some economic indicators. Therefore, $\mathbb{E}_t[X_{t+h}]$ includes the one-quarter and four-quarter-ahead SPF forecasts of the unemployment rate, inflation, the growth rates of real non-residential fixed investments and of real corporate profits after tax in the current quarter. The last set of variables we include, $\boldsymbol{w_t}$, are the well-known proxies for tax and interest rate changes: the current and the two lags of the unexpected and anticipated exogenous tax changes for the current quarter (Romer and Romer (2010) and Mertens and Ravn (2012)) and unanticipated changes to the intended Fed funds rate target (Romer and Romer (2004)). The start and end dates of the sample used in Eq. (1) is restricted by the start date of the PCI and the availability of the policy change proxies, respectively.[5] Therefore, the sample runs from 1981-Q1 to 2006-Q4.[6]

The instrument is shown in Figure II. Appendix A.4 provides a sensitivity analysis of our results to the construction of the instrument. We present alternative univariate regressions for the construction of the instrument and our benchmark results using other variants of the main instrument.[7]

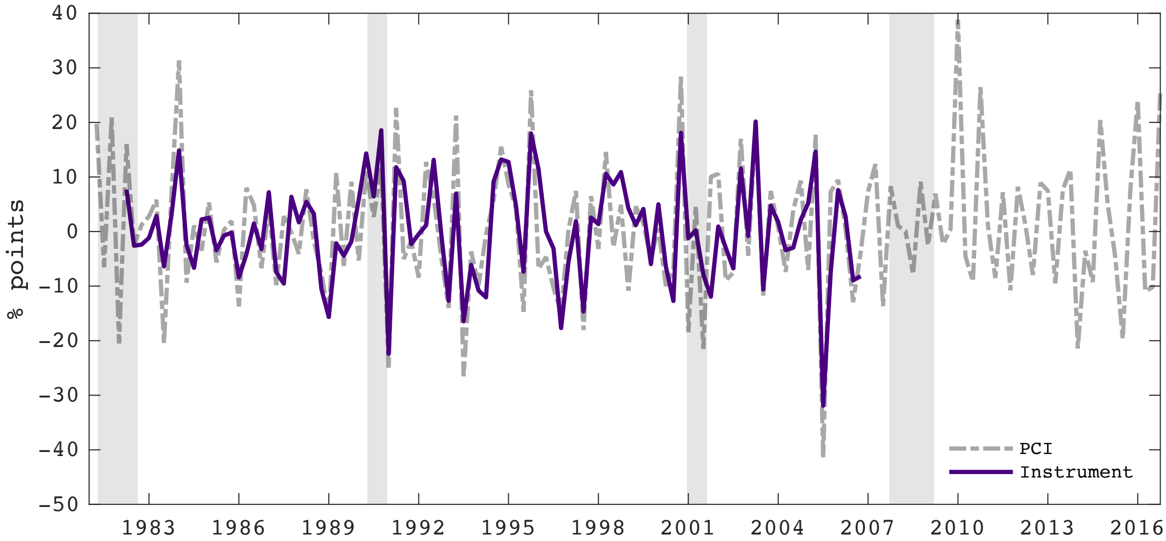
To provide supportive analysis to the exogeneity assumption for the instrument, Table A2 in Appendix A repeats the earlier exercise by performing Granger Causality tests. The results indicate that the instrument is exogenous to the current and the expected stance of the economy. In addition, we show in Table A3 that the PCI is correlated with the fourth

[5] These series have been extended until 2007 by Miranda-Agrippino and Rey (2015).

[6] Given our instrument does not capture the GFC, we run a specification where we use a slightly different approach to recover the instrument, i.e. we do not use the tax and monetary policy changes to recover the instrument as these are the variables that restrict the time span of the instrument; instead we use the one-quarter and one-year SPF forecasts of the federal government spending. Although this approach provides us with a sample that is longer than the current one, from 1981 to 2016, our results are virtually very similar under this approach. Hence we prefer to use policy changes in recovering the instrument to ensure its exogeneity.

[7] To preserve space, the coefficient estimates of Eq.(1) are not provided but are available upon request. The regression has the R^2 of 0.41. The sensitivity analysis in Appendix A.4 serves an important purpose for the construction of the instrument. One can think that inflation and output could generate endogeneity issues in the regression. Therefore we provide evidence that excluding some of the variables, such as inflation and output, does not change our results. Moreover, although unreported, using dummies for presidential and mid-term elections in Eq. (1) leaves results unchanged.

Figure II: Political Risk Shock Instrument



Note: PCI is the quarterly growth rate of the Partisan Conflict Index from 1981-Q1 to 2016-Q2. The instrument is the residual of Eq. (1) from 1982-Q1 to 2006-Q4. The shaded areas denote the NBER recessions.

factor in the large macroeconomic data set as in McCracken and Ng (2016), whereas the instrument does not demonstrate such a relationship.[8]

2.3 Shock Identification

We use the instrument, m_t, we recovered in Eq. (1) in a structural VAR model, Mertens and Ravn (2013); Stock and Watson (2012, 2018). Define the following structural VAR for endogenous variables y_t,

$$A(L)y_t = A_0 e_t, \qquad e_t \sim \mathcal{WN}(0, \mathbb{I}_n), \tag{2}$$

where $\mathcal{WN}$ denotes a white noise process with the respective mean and variance, A_0 denotes the contemporaneous transmission coefficients that characterize the effects of e_t on y_t, $A(L) \equiv \mathbb{I}_n - \sum_{j=1}^{p} AjL^j$, p is the lag order, e_t is a vector of n structural shocks with economic interpretation, such that $u_t = A_0 e_t$ where u_t is the innovations of the VAR in

[8]These tests also provide the support that the instrument, as the residual of Eq. (1), need not be treated as a generated regressor in the analysis. Residuals which are unanticipated variables conditional on the information used in the second stage estimation are efficient estimators when used as regressors; see Pagan (1984) Theorem 7.

Eq (3).

$$A(L)y_t = u_t, \qquad u_t \sim \mathcal{WN}(0, \Sigma), \tag{3}$$

The challenge of the identification is to map the MA representation of the innovations, $y_t = A(L)^{-1}u_t$ to the MA representation of structural shocks $y_t = A(L)^{-1}A_0 e_t$ (Stock and Watson, 2012). This is basically done by assuming that innovations are the linear combinations of structural shocks. Economic theory and experience provide practitioners with the restrictions they need to identify the shocks of interest.

In our framework, let us assume that we concentrate on only one structural shock which is the first one for notational simplicity, $e_{1,t}$. For the SVAR, we assume that there exists a $1 \times n$ vector δ such that $e_{1,t} = \delta u_t$, which means that we can recover the structural shock of interest, $e_{1,t}$ from the VAR innovations subject to the suitable rotation we impose with the help of the instrument.

Let m_t denote the external instrument used for the identification of $e_{1,t}$. According to Miranda-Agrippino and Ricco (2018), the required conditions for the validity of this instrument are: i) Relevance, $\mathbb{E}[e_{1,t}m_t'] = \rho, \;\; \rho \neq 0$; ii) Contemporaneous Exogeneity, $\mathbb{E}[e_{i,t}m_t'] = 0, \;\; \forall i \neq 1$; iii) Lead/Lag Exogeneity, $\mathbb{E}[e_{i,t+\tau}m_t'] = 0, \;\; \forall i \neq 1, \tau \neq 0 : \mathbb{E}[e_{i,t+\tau}u_t'] = 0$. As long as these conditions hold, we can estimate the impulse responses of all the variables in the VAR, y_t, to the structural shock $e_{1,t}$. The first two conditions on the instrument are the standard conditions for instrument validity in instrumental variable identification. According to the first two conditions, the instrument is supposed to be relevant to the shock of interest and not relevant to other structural shocks. Relevance can be assessed with correlations: the instrument should be correlated with the shock we identify. The third condition allows the instrument to include information on the leads and lags of other shocks but requires these to be filtered out by the VAR. This condition, as a result, requires the VAR innovations and the instrument to be related only via the structural shock of interest. The last two conditions are shown to hold with the Granger Causality tests results provided in Appendix A. We provide the support to the first condition in the next section.

The identification works through projecting $\hat{u}_t$ onto the instrument m_t. Our main interest is to estimate the column of A_0 that corresponds to the shock of interest, a_0.

First, we estimate the innovations of the VAR(p) defined in Eq. (3), $\hat{u}_t$. Estimating the relevant column of A_0 boils down to a regression of $\hat{u}_t$ on the instrument m_t. The regression coefficients provide us $\hat{a}_0$ once they are normalized by following Mertens and Ravn (2013). The resulting impulse responses are consistent up to scale and sign.[9]

3 Results

The previous section provided the details of how we construct our instrument and how it is used to identify the political risk shock. In this section, we present the impulse response functions (IRF) of various variables to political risk shocks identified via the instrument.

To explore the transmission of political risk shocks, we employ a 20-variable SVAR in which we include various variables to represent different parts of the economy, e.g. financial variables, prices and quantities in the real economy, firms and labour market and households. All of the variables are listed in Table I, and are in log-levels. They are in per-capita terms and deflated using the GDP deflator where applicable. Appendix B provides detailed information of their sources and transformations.

Table I: Variables Used in Estimation of the SVAR

Financial	**Prices and Quantities**	**Firms and Labour Market**	**Households**
S&P 500	Real GDP	Business Conditions E5Y	Consumer Confidence
Excess Bond Premium	PCE Deflator	Business Loans	Real Wages
Equity Payout	Inflation Expectations	Real Investment	Consumer Loans
Debt Repurchase	Producer Price Index	Corporate Profits	Real Consumption
	Short Rate	Unit Labour Cost	
	Term Spread	Labour Force Participation Rate	

Notes: Variables used in the VAR. Sample period 1978-Q1:2016-Q2. All variables are in log levels and, where applicable, they are in per-capita terms and deflated using the GDP deflator. Details are given in Table A1.

The estimation sample is between 1978-Q1 and 2016-Q2 where the start and the end dates are constrained by the availability of inflation expectations and excess bond

[9]The ambiguity in the sign stems from the relevance assumption, $\mathbb{E}[e_{1,t}m_t'] = \rho,\ \rho \neq 0$. The term ρ is the covariance between the instrument and the structural shock we are interested in identifying. As ρ the square root of the correlation between m_t and $e_{1,t}$, it is at practitioners discretion to decide if the instrument is negatively or positively correlated with the structural shock, see Lundsford (2015) for more detail.

premium series, respectively. We estimate the VAR with Normal-Inverse Wishart prior as in Doan et al. (1983); Kadiyala and Karlsson (1997); Litterman (1986).[10] The optimal hyperparameters are estimated by following Giannone et al. (2015). We estimate the VAR with four lags. However, changes in lag-length do not change our qualitative assessment.

Before we present the impulse response functions, we provide evidence related to the relevance of the instrument, i.e. $\mathbb{E}[e_{1,t}m_t'] = \rho,\ \ \rho \neq 0$, as we discussed in the previous section. The rule-of-thumb for assessing instrument relevance in the instrumental variable (IV) literature is to obtain an F-statistic of 10 or above when the endogenous variable – in our case, VAR residuals – are projected on the instrument, as in e.g. Stock and Watson (2012, 2018). However Lundsford (2015) shows that the F-statistic as in the weak IV literature should not be used in assessing instrument in VARs. First, he argues that the F-statistic in VARs is a function of the estimated VAR parameters which is not accounted for by the traditional IV test. Second, when the instrument is weak, VAR parameters are inconsistent. Both of these issues lead to unreliable critical values.

Following Lundsford (2015), we project the instrument on the residual of stock prices and obtain an F-statistic of 8.56 (p-value: 0.004). The critical values of the F-statistic for a 20-variable VAR are 6.78 and 7.56 for 5% and 1% significance levels respectively where the asymptotic bias is 10% to reject the null hypothesis of a weak instrument. We refer the reader to Lundsford (2015) for technical details but suffice to say, we reject the null hypothesis of a weak instrument.

Note that the impact of the shock is identified up to a sign and magnitude as we discuss in Section 2. Below, we discuss the implications of a *positive political risk shock* that has an expansionary impact on the different parts of the economy. For interpreting the impact of adverse political risk shocks, all the IRFs below should be inverted, i.e. multiplied by -1. The IRFs of all the variables to the political risk shock are presented in Figures III to VII. The results for the pre-crisis sample is presented in Figure A.4 and all the results are qualitatively similar but the impact of the political risk shock on some of the variables is slightly less strong.[11] We provide the IRFs of the estimation in which the

[10] Arias et al. (2018), Bahaj (2019) and Caldara and Herbst (2019) are some of the recent papers using Bayesian SVARs with external instrument identification for different empirical questions.

[11] Parameter instability in VARs after the GFC has become an important point to explore, see Aastveit et al. (2017). Our VAR is a fairly large one which improves stability. By also exploring the results for the pre-crisis period, we conclude that the results do not suffer from parameter instability.

shock identification is ensured via Hassan et al. (2019)'s aggregated political risk index in Figure A.5. The slight differences in the results are due to the significant mismatch in the time span of our instrument and the aggregated political risk index while our qualitative assessment of the results still holds.

Financial Variables

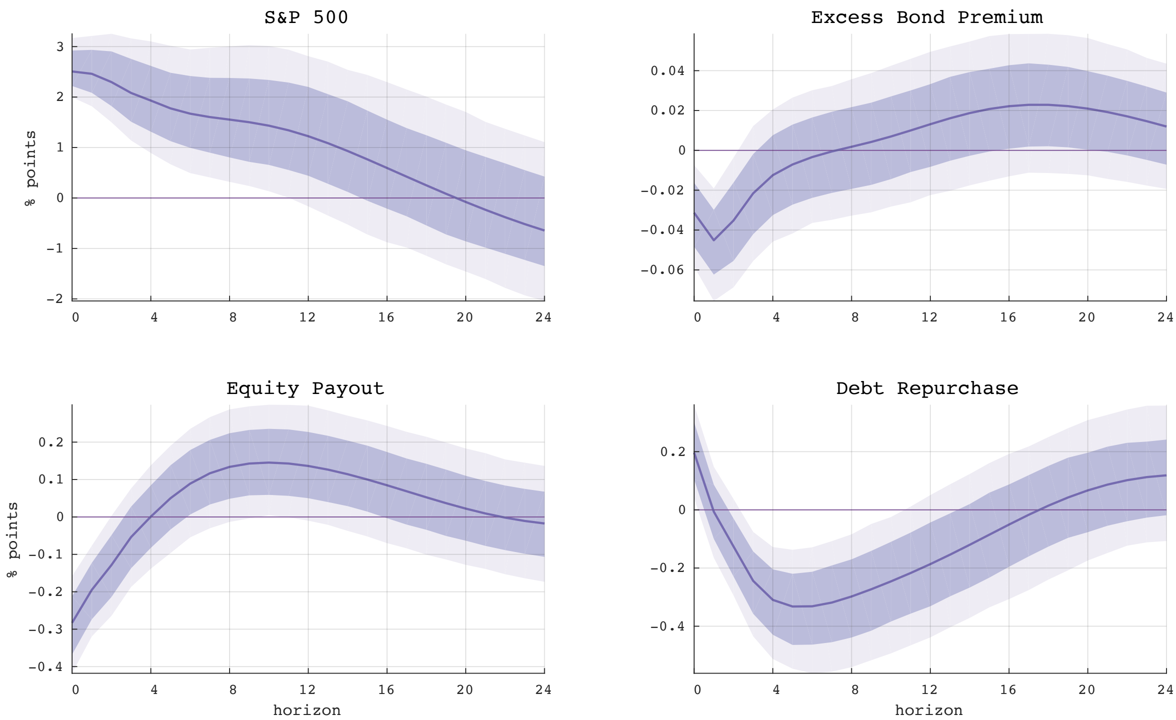
We start by discussing the responses of the key financial variables for our analysis. Figure III presents the responses of the financial variables: S&P500, Excess Bond Premium, Equity Payout and Debt Repurchase. While the first one is a common variable in empirical models, others warrant a discussion. Excess Bond Premium (EBP) is the risk premium on corporate bonds which increases as the issuing party becomes riskier or vice versa. Therefore it is a proxy of credit availability to firms. The last two variables are taken from Jermann and Quadrini (2012) in which they investigate the macroeconomic effects of financial shocks. These variables reflect firms' ability to borrow, drawing attention to the decision firms have to make between debt and equity during booms and busts. There is some degree of substitution between debt repurchases and equity payouts. During booms, firms increase both their equity payouts (dividends) and their debt reliance, i.e. debt repurchases decline and vice versa during busts. Moreover, Jens (2017) explores how equity and debt issuances related to firms' investments are affected by the periods before elections when the political uncertainty is elevated. The changes in firms' financing decisions reflect their aggregate investment behaviour up to some extent so we use these variables as a measure of firms financing and investment decisions. Appendix B provides details about how these variables are constructed and updated.

The shock is priced in immediately in the stock market and increases the stock prices substantially, i.e. favourable political environment creates a stock market boom. Hence this shock we identify can be interpreted as a positive shock that increases firms' worth.

As a response to a positive political risk shock, the EBP declines on impact. The drop in the EBP suggests a positive impact of political risk shock on credit availability and credit growth[12]. The value of external funds, where credit is a substitute for internal

[12]In unreported results, we find that credit spreads significantly tighten if we estimate our SVAR using credit spread series of Gilchrist and Zakrajšek (2012) instead of their EBP series.

Figure III: Financial Variables



Note: Modal responses to a political risk shock identified with the exogenous component of the Partisan Conflict Index. VAR(4). Estimation sample 1978-Q1:2016-Q2. Identification sample 1982-Q1:2006-Q4. Shaded areas denote 68% and 90% posterior coverage bands.

funds, increase sharply. Overall, as the credit market receives the signals that firms get less risky with improvements in their creditworthiness, credit availability increases while the cost of credit decreases. The tightening in the credit spreads reduces the cost of working capital and firms' marginal costs, as we also discuss below while discussing firms' responses. Although the EBP response is small in magnitude and becomes insignificant after a short while, we show in the next section that a non-negligible amount of EBP's variance can be accounted for by the political risk shock in the long term.

Consistent with the findings of the Jens (2017), we observe changes in debt repurchases and equity payouts when a political risk shock hits. We find that the debt repurchases first increase which essentially implies a drop in outstanding debt. Equity moves in the opposite direction at first, indicating that firms cut back their dividend payments. Both of these variables, however, switch signs after a short while. Although there is an initial drop in debt and equity payouts, a positive political risk shock eventually leads firms to invest more. The initial responses of debt repurchases and equity payouts are consistent with the initial drop in business loans as we discuss below in firms' responses and can be explained by the finding of Covas and Den Haan (2011). They show that firms' lagged cash flows and Tobin's Q have a positive effect on investment, with some degree of heterogeneity within small and large firms. In terms of financing investments, firms tend to finance themselves with internal funds first, i.e. retained earnings. Based on our results, corporate profits increase as a response to a positive shock which motivates firms to finance their operations with their earnings in the first instance and investment already starts rising. In time, firms start raising debt – reducing their debt repurchases – and distributing dividends. Until then, we observe an initial drop in their loans, debt levels and equity payouts.

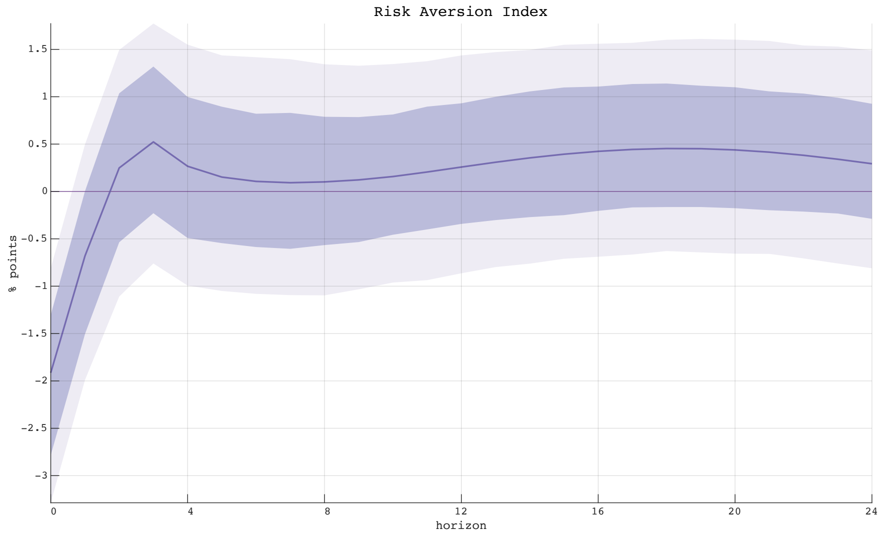
In addition to these financial variables, it is useful to discuss how firms' risk appetites change. Bekaert et al. (2019) document the time-varying feature of the risk appetite of economic agents. Risk-aversion, which is the price of risk, can be inferred by their the risk-aversion index informed by analyzing of high-frequency financial data. Although the significant impact of the shock is short-lived, risk aversion declines on impact when the political environment is favourable as documented in Figure IV. A decline in risk aversion (higher appetite for taking risk) leads to increases in firms' investments and affects hiring decisions which are consistent with the rest of our results as we discuss below.

Prices and Quantities

Figure V shows the responses of prices and quantities in the real economy. In the case of a monetary policy shock, if stock prices increase as a response to monetary easing, the improvement in firms' worth decreases their external finance premium, i.e. 'credit view' (Bernanke and Gertler, 1995). As a result, these types of shocks are expected to increase lending, therefore investment and eventually output growth. Via its effect on stock prices, the political risk shock generates similar responses in prices and quantities.

In our results, real GDP does not react on impact. Three years after the shock, it reaches its peak at 0.3 percentage points and stays significant for over five years. The muted response of real GDP on impact distinguishes political risk shocks from other shocks, e.g. demand or supply shocks which would affect GDP on impact. We elaborate

Figure IV: Risk Aversion



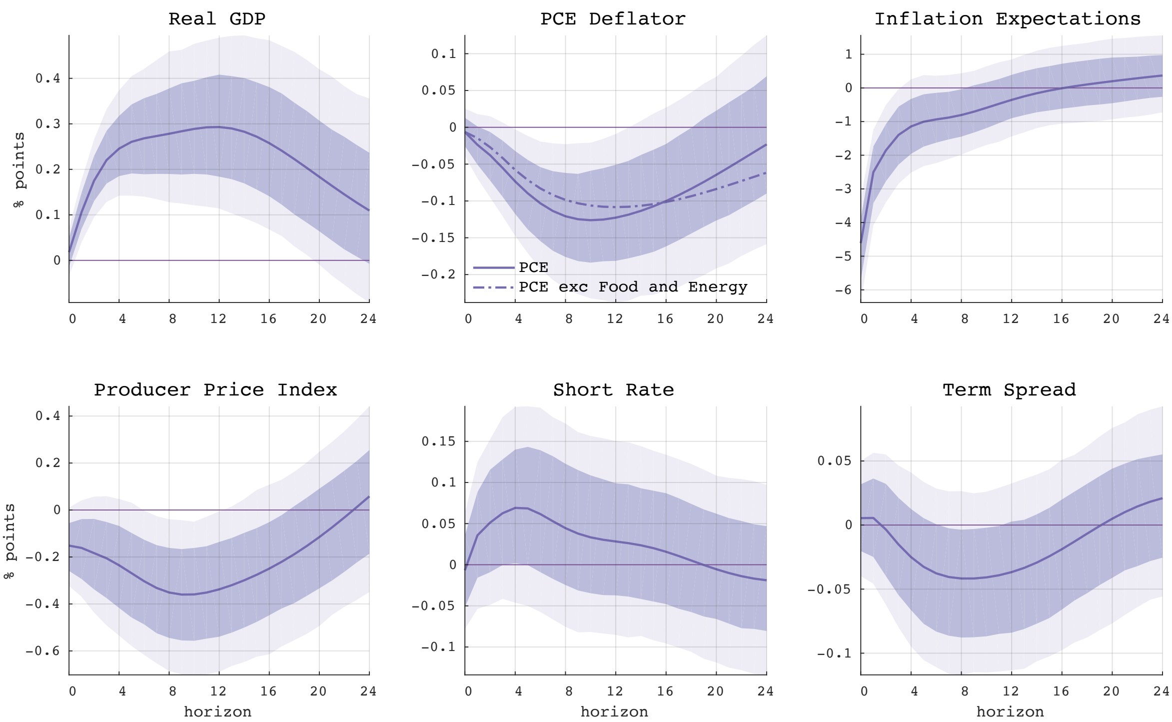
Note: Modal responses to a political risk shock identified with the exogenous component of the Partisan Conflict Index. VAR(4). Estimation sample 1986-Q1:2014-Q4. Identification sample 1986-Q1:2006-Q4. Shaded areas denote 68% and 90% posterior coverage bands. The Risk Aversion Index is added to the benchmark SVAR as an additional variable.

on the features of the shock further in Section 5.

As a response to a positive shock, inflation expectations of households over the next year decline substantially on impact. This is consistent with the evidence Gillitzer et al. (2017) provides on how political environment – which party holds the office – plays a role in forming consumers' inflation expectations. The PCE deflator decreases steadily until it reaches its trough after about ten quarters. In conclusion, output and inflation move in opposite directions. Using personal consumption expenditures excluding food and energy prices does not change the results. Producers Price Index (PPI) responds similarly. We elaborate more on the impact of political risk shocks on inflation dynamics in Section 4 on the basis of the missing disinflation debate.

Term spread, which is the difference between 10-year and 1-year Treasury rates, does not significantly react on impact. However, it contracts following the gradual increase in the short rate, although neither is quite significant. So it is not clear that the political risk shock implies any response from the monetary policy authority regarding the short term interest rate. Monetary authority's lack of action might be driven by the inflation and output moving in the opposite direction and generating a trade-off between inflation and output stabilization while inflation expectations offsetting any potential interest rate changes from monetary policy authority's perspective.

Figure V: Prices and Quantities in the Real Economy



Note: Modal responses to a political risk shock identified with the exogenous component of the Partisan Conflict Index. VAR(4). Estimation sample 1978-Q1:2016-Q2. Identification sample 1982-Q1:2006-Q4. Shaded areas denote 68% and 90% posterior coverage bands. Personal Consumption Expenditures Excluding Food and Energy modal responses are in dashed-dotted lines.

Firms and Labour Market

Figure VI presents the responses of variables associated with firms. A positive political risk shock improves business conditions which are the consumers' expectations about economic conditions over the next five years, taken from the University of Michigan Survey of Consumers. The response takes effect on impact and stays significant for more than two years after the shock.

As stock prices go up, equities become more attractive than bonds. The increase in Tobin's Q reduces the cost of capital, see e.g. Mishkin (1995). Moreover, as labour participation rate goes up, the average cost of labour per unit of output produced (unit labour cost) for firms goes down, as a consequence of the increasing labour participation rate (labour supply). The reduction in the cost of labour and capital are the main reasons behind the drop in the PPI, i.e. firms produce the same products at a cheaper cost.

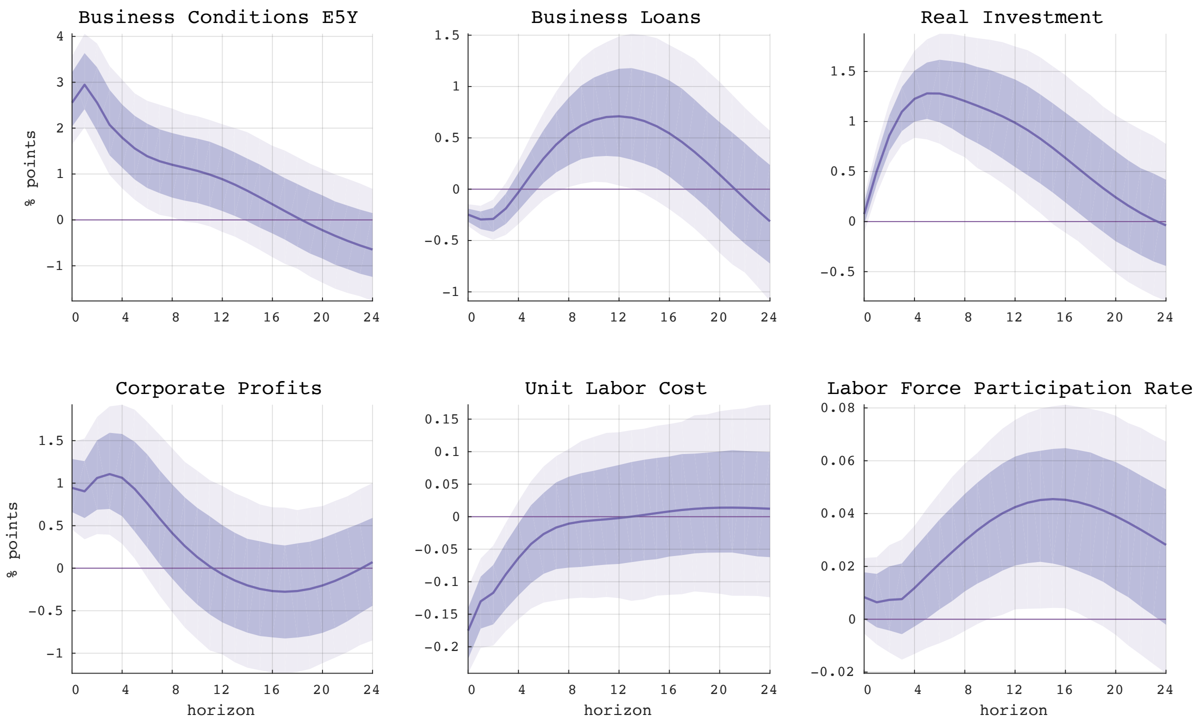
All these improvements in firms' operations encourage investment to pick up through the increasing business loans – which are the commercial and industrial loans – which peak three years after the shock, in part also as a response to the decline in the term spread. Real investment reaches its peak at around 1.25pp in the sixth quarter. This result regarding the impact of political risk on investment is consistent with the existing studies, e.g. Julio and Yook (2012); Azzimonti (2018). The increase in stock prices, and the drop in PPI and unit labour costs explain the significant increase in corporate profits on impact and the two years after the shock. As we discussed above for the equity and debt, the initial drop in business loans are explained by a particular firm behaviour, Covas and Den Haan (2011): firms finance themselves by retaining earnings, through rising profits, before they turn to external funds. Therefore they reduce their reliance on loans until they need external funds to finance their investments. This also explains why investment reaches its peak earlier than business loans.

Households

The impulse response functions of household variables are shown in Figure VII. Similar to the business conditions, consumers treat positive political risk shocks as improvements in the current stance of the economy. The consumer confidence, which is the Consumer Sentiment Index by the University of Michigan Survey of Consumers, is indicative of the near-term consumption behaviour of households and therefore an important determinant of real activity as well as households' sentiment about interest rates and stock markets in the near term. As a response to a positive political risk shock, consumer confidence goes up on impact and stays significant for almost three years.

The shock has important effects in the labour market. We show in Figure VI that unit labour cost goes down on impact while the labour force participation rate steadily increases for three years as a response to the improving labour market conditions. As the shock transmits into the various parts of the economy, real wages go up eventually and stay positive thereafter. Households increase labour supply following due to the eventual

Figure VI: Firms and Labour Market



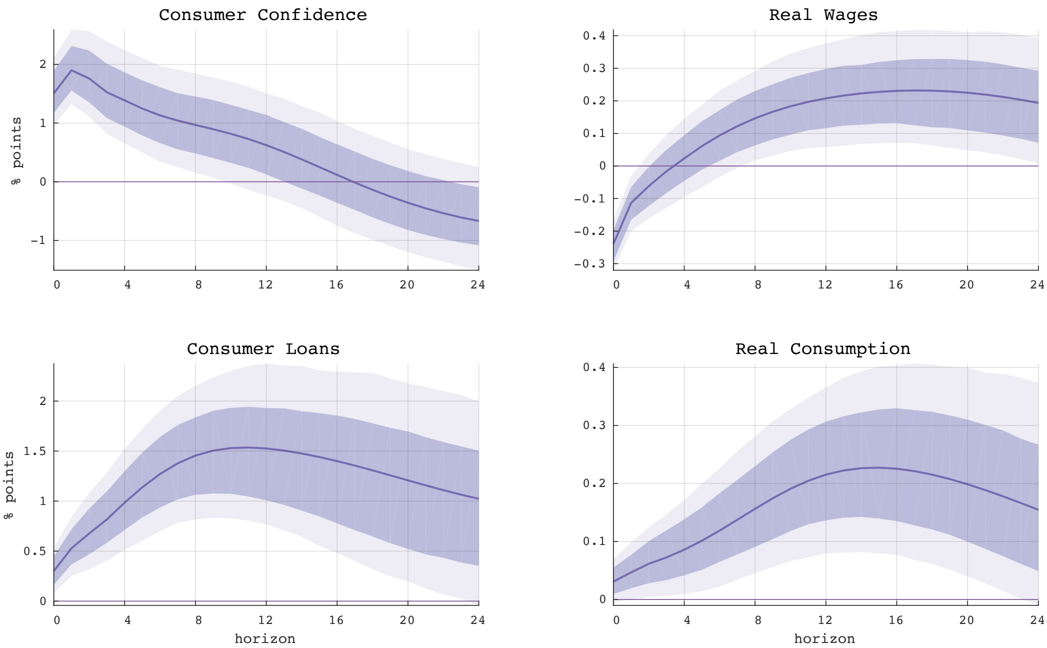
Note: Modal responses to a political risk shock identified with the exogenous component of the Partisan Conflict Index. VAR(4). Estimation sample 1978-Q1:2016-Q2. Identification sample 1982-Q1:2006-Q4. Shaded areas denote 68% and 90% posterior coverage bands.

increase in real wages.

The positive economic environment encourages households to consume. Households start smoothing their consumption as a response to the shock, despite the initial drop in real wages due to the nominal rigidities (Woodford, 2003).[13] Consumption reaches its peak over 0.2 percentage points shortly after 3.5 years. As long term interest rates are favourable, consumer loans go up on impact and increase for the first three years after the shock by reaching a maximum of 1.55 percentage points. Although labour demand also increases, as evident by the ultimate increase in real wages of households, due to wage rigidities there is a time mismatch between the increase in labour supply and demand. Eventually, the increase in both labour supply and demand normalise the unit labour cost, along with a fairly persistent increase in real wages thereafter.

[13] Another reason why consumption might also rise is the increase in stock prices, i.e. wealth effect. This has a positive impact on the value of households' financial assets which also indicates a favourable economic environment where the likelihood of financial distress is low.

Figure VII: Households



Note: Modal responses to a political risk shock identified with the exogenous component of the Partisan Conflict Index. VAR(4). Estimation sample 1978-Q1:2016-Q2. Identification sample 1982-Q1:2006-Q4. Shaded areas denote 68% and 90% posterior coverage bands.

Having observed improving economic conditions and household portfolios, households invest more than they consume, i.e. see the top-left panel in Figure VIII for the response of 'real gross private domestic investment' which we replace real investment by in the benchmark SVAR. The theoretical support for the households' behaviour of increasing their investment more than their consumption follows Bayer et al. (2019). They show that households' saving decisions and portfolio allocation between liquid and illiquid assets depend on their perceived income risk. Households evaluate the effects of a positive political risk shock as an improvement in the economy, therefore, a reduction in their income risk.[14] They rebalance their portfolios and reduce their savings and liquid assets – which they use to smooth their consumption during turbulent periods – as income risk declines. They invest in illiquid assets which improves the share of wealth in their income. As a result, the increase in household investment is amplified: households increase

[14]We do not explicitly assume and show that political risk shocks imply a change in income risk. We make the connection between income risk and political risk shocks only through our results on household expectations.

investment (i) as a response to the favourable economic outlook, via improving wages and prices; (ii) by converting liquid assets to illiquid assets and saving less. In the end, the increase in aggregate demand through the wealth effect and ultimate rise in wages does not match the increase in aggregate supply. Hence prices go down creating a disinflationary pressure as the political risk shock causes aggregate supply effect to dominate the increase in aggregate demand.

Figure VIII offers the empirical support for the change in household investment, portfolios, wealth and savings. We add these variables into the benchmark VAR to assess their responses. Investment rises substantially and at its peak, it is approximately five times the peak response of consumption. Households decrease the share of liquid assets in their portfolios alongside their precautionary savings by shifting them towards illiquid assets. Their welfare as a share of their income improves in the short term.[15]

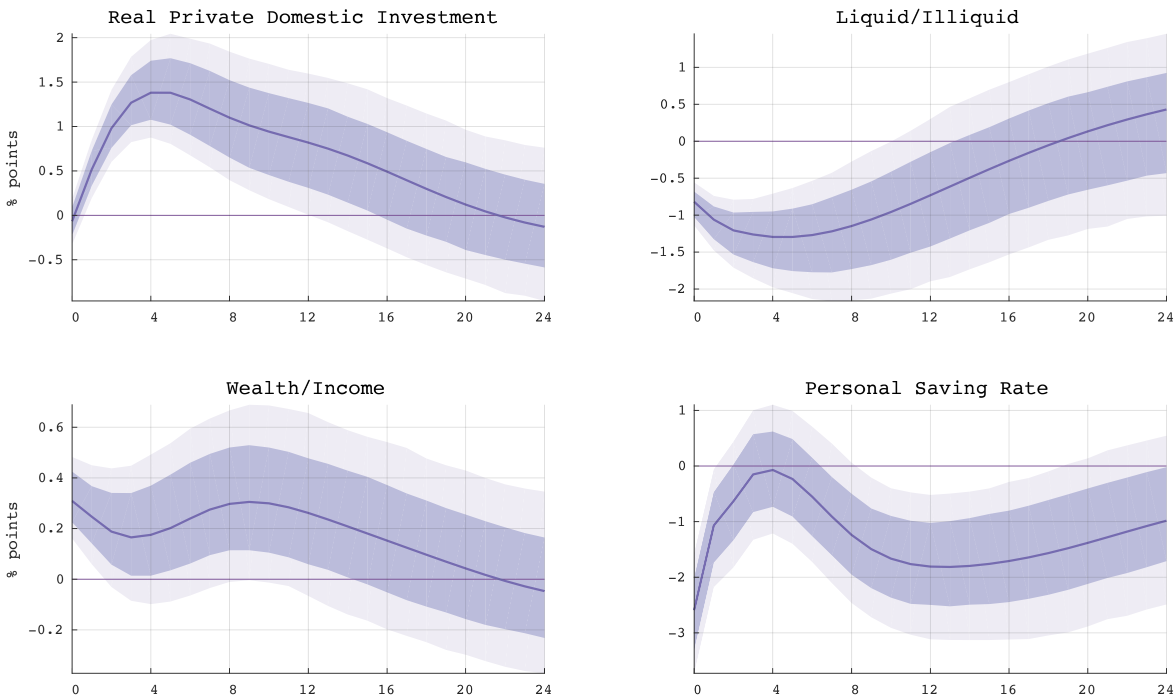
4 Short and Long Run Effects of Political Risk Shocks and Missing Disinflation

In the previous section, we explained the demand and supply dynamics through which political risk shocks transmit. Although the responses of the economic and financial indicators to the shock we identify imply that political risk shocks have significant effects on the economy, we need a more systematic approach to assess if they are important drivers of macroeconomic fluctuations in general. To explore that, we report the share of variance that the identified political risk shock accounts for at all frequencies between 1 (highest frequency) and 100 (lowest frequency) years in Table II. We use the algorithm used in Altig et al. (2011) and Miranda-Agrippino et al. (2018), and refer the reader to these papers for the detailed explanation of the algorithm.[16] Appendix A.3 reports the

[15] Bayer et al. (2019) use Flow of Funds data by the Federal Reserve Board to define the liquid and illiquid assets. Net liquid assets are composed of money market, checking, savings accounts, and call accounts, as well as corporate and government bonds and Treasury bills (T-bills) net of credit card debt. All other assets net of all other debt makes up net illiquid wealth. Total wealth is the sum of liquid and illiquid assets as a share of total income. See their Appendix for more details https://www.econometricsociety.org/sites/default/files/ecta12425-sup-0001-Supplement.pdf.

[16] For our VAR, we prefer to report the frequency domain based variance decomposition results. That said, the forecast error variance decomposition in time domain provides similar results and is available

Figure VIII: Households' Portfolio Balancing Responses



Note: Modal responses to a political risk shock identified with the exogenous component of the Partisan Conflict Index. VAR(4). Estimation sample 1978-Q1:2016-Q2. Identification sample 1982-Q1:2006-Q4. Shaded areas denote 68% and 90% posterior coverage bands. These variables are added to the benchmark VAR separately as additional variables.

full results for various horizons.

Our results suggest that, in the long-term, 25% of the inflation dynamics can be explained by political risk shocks. On the firms' side, the shock explains 35% of the variation in the PPI. Although their impact is substantial in the long term, political risk shocks do not explain the variation in inflation in the short term, which is up to two years. At business cycle frequencies, between 2 to 8 years, only 5% of inflation is accounted for by political risk shocks. On the other hand, these shocks explain a larger fraction inflation expectations at all frequencies, especially in the short term. The variance of the EBP that the political shock accounts for is mostly in the long term.

In the short-term and at business cycle frequencies, the political risk shock explains a

upon request. However, each horizon is a mixture of short, medium and long term components in the time domain approach. Making a fair judgement of short versus long term drivers of variables is, therefore, problematic.

TABLE II: ERROR VARIANCE DECOMPOSITION IN FREQUENCY DOMAIN

	Short Term (4-8quarters)	Medium Term (Business Cycle) (8-32quarters)	Long Term (32-100quarters)
S&P 500	0.23	0.13	0.30
Excess Bond Premium	0.03	0.03	0.10
Equity Payout	0.07	0.12	0.08
Debt Repurchase	0.06	0.09	0.16
Real GDP	0.04	0.07	0.28
PCE Deflator	0.00	0.05	0.25
Inflation Expectations	0.11	0.10	0.25
Producer Price Index	0.01	0.01	0.35
Short Rate	0.00	0.01	0.04
Term Spread	0.00	0.02	0.05
Business Conditions E5Y	0.11	0.15	0.31
Business Loans	0.10	0.09	0.16
Real Investment	0.06	0.14	0.29
Corporate Profits	0.03	0.10	0.12
Unit Labor Cost	0.08	0.07	0.05
Labor Force Participation Rate	0.01	0.03	0.19
Consumer Confidence	0.11	0.13	0.33
Real Wages	0.12	0.11	0.22
Consumer Loans	0.02	0.12	0.20
Real Consumption	0.01	0.03	0.28

Notes: Share of error variance accounted for by the identified political risk shock over different frequencies. Numbers are percentage points. The algorithm used builds on Altig et al. (2011) and Miranda-Agrippino et al. (2018).

fair amount of variation in the stock market, consumer confidence and business conditions, and real wages. Moreover, the contribution of the shock to real investment is significant at business cycle frequencies. The political risk shock has a fair contribution to the long-term dynamics of most of the variables. It explains 28% of the variation in real GDP and consumption, and 29% of the variation in real investment. In addition to those which are significantly explained by the shock at business cycle frequencies, consumer confidence and business conditions are influenced by the shock in the long-term as well as PPI, business loans, labour force participation rate, corporate profits and real consumption. Note that although the political risk shock is important for credit availability through the EBP, it has a negligible role in the interest rate dynamics. It is responsible for 12%

of equity payout variation at business cycle frequencies.

As reported in Figure I, the PCI remains quite elevated in the post-crisis period which might be the reason why the economy recovered slowly after the turbulent periods. Moreover, inflation stayed higher than expected given the scale of the downturn in the post-crisis era. When political risk shocks hit the economy, output and inflation do not co-move in the same direction. This contradicts with the classical New Keynesian view of the 'divine coincidence' of output and inflation. Therefore, this dynamic causes a trade-off between output and inflation stabilization. That makes political risk shocks a potential reason which leads inflation to stay elevated during the GFC.

Although we do not include liquid assets as a share of illiquid assets and welfare share of income in the benchmark specification, they provide an important channel as to how inflation dynamics evolve. In the long term, 21% and 7% of the variances of liquid to illiquid assets and welfare are explained by the political risk shock, respectively. In the short term and at business cycle frequencies, the variances explained are in the range of 5% to 14%.

In the light of the empirical support we gather from the IRFs and the variance decomposition, we conclude that the political risk shocks we identify are important drivers of inflation dynamics as well as economic activity. Collectively, these findings point out to the medium to long term impact of political risk shocks. Expectations and confidence to the economic environment react in the short term however, the material impact of these shocks on economic dynamics comes with a delay.

5 Political Risk and a Broader Set of Variables

Below we discuss the results of the empirical model when we consider a broader set of variables in our analysis. The variables we explore below by no means provide a comprehensive list of potential indicators that can be included in the analysis. However, they draw attention to those variables which some of the recent studies have explored.

In identifying political risk shocks, one concern is distinguishing them from uncertainty shocks. It is quite natural to think that economic uncertainty and political risk co-move. Whether or not our shock captures traces of uncertainty shocks is a fair question. We mention in Section 3 that the muted response of real GDP is a way to ensure that our shock does not capture macroeconomic shocks such as aggregate demand and supply shocks. Moreover, both output and stock prices rise following the shock, which is a way to distinguish political risk shocks from investment-specific demand shocks.

In this section, we first present an analysis of the relationship between our political risk shock and various uncertainty measures. Then we provide the support that the responses it triggers from different parts of the economy are in line with what one might expect these shocks to do. Finally, we show that the shock does not depict any correlation with the shocks that are widely used in the literature.

Uncertainty

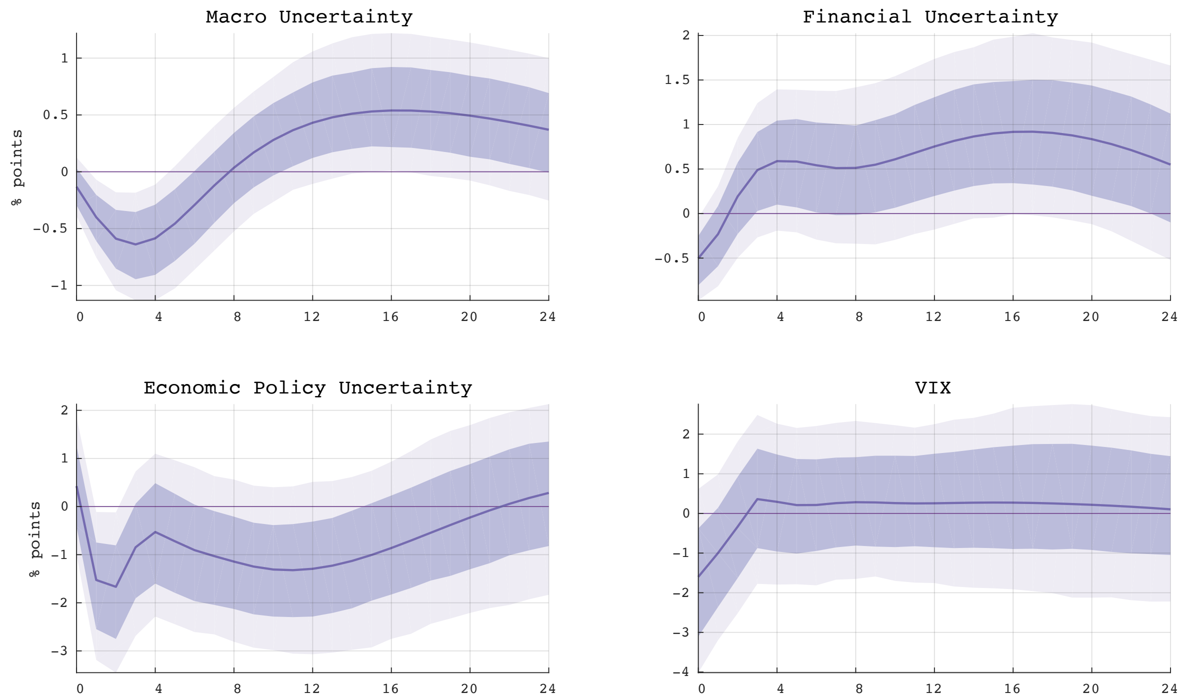
To explore if the political risk shock has the features of an uncertainty shock, we run our benchmark VAR by adding various uncertainty measures as additional variables. The first two of the uncertainty indicators are Jurado et al. (2015)'s macro and financial uncertainty measures[17]. We also explore the responses of Baker et al. (2016)'s Economic Policy Uncertainty Index (EPU) and stock market volatility (VIX). We report the responses to a positive financial shock in Figure IX.

While other, unreported, variables respond qualitatively similar to the benchmark results, macro and financial uncertainty, and VIX decline on impact while EPU increases. The most important evidence we gather from this exercise is the responses of the uncertainty measures *on impact and shortly after the shock*. According to our results, the impact response of macro uncertainty is around zero and insignificant. Financial uncertainty measure is borderline significant on impact however becomes insignificant in the second quarter and stays as such for the next two quarters. For both the EPU and the VIX, the effect of the shock leads to mostly insignificant responses on impact and for almost all horizons.

It is no surprise that political risk shocks can induce uncertainty or vice versa. In our results, the lagged significant reaction of both uncertainty measures ensures that our instrument captures a political risk shock which might drives uncertainty later on if at

[17] We pick their specification where the forecast horizon is three months. We convert their monthly series to quarterly by averaging within quarter.

Figure IX: Responses of the Uncertainty Measures



Note: Modal responses to a positive political risk shock identified with the exogenous component of the Partisan Conflict Index. The series are added to the benchmark VAR(4) presented in Section 3 one by one .Due to the availability, VARs have different time spans. Macro and financial uncertainty: 1978-Q1 to 2015-Q1; EPU: 1985-Q1 to 2016-Q2; VIX: 1990-Q1 to 2016-Q2. Identification sample 1982-Q1:2006-Q4. Shaded areas denote 68% and 90% posterior coverage bands.

all. Moreover, the variance of these measures accounted for by the political risk shock is quite small, especially in the short term and at business cycle frequencies, as presented in Table III.

An interesting observation is that macro uncertainty starts rising significantly two years after the shock. There might be several explanations for this. For instance, as output persistently increases following a positive shock, the overheating of the economy might cause concerns about approaching turbulent periods while inflation persistently declines. The increase in macro uncertainty after a while could be the expectation of a central bank intervention to output and inflation moving in opposite directions.

On a separate note, Leduc and Liu (2016) discuss that uncertainty shocks feed into the economy as aggregate demand shocks which move employment and inflation in the same direction. In our main results, employment increases while inflation declines steadily as a response to political risk shocks. The shock we identify generates an aggregate supply effect when the cost of external finance channel is in place and dominates the increase in demand. This is an additional piece of evidence that the shock does not inherit the characteristics of uncertainty shocks.

House Prices and Mortgages

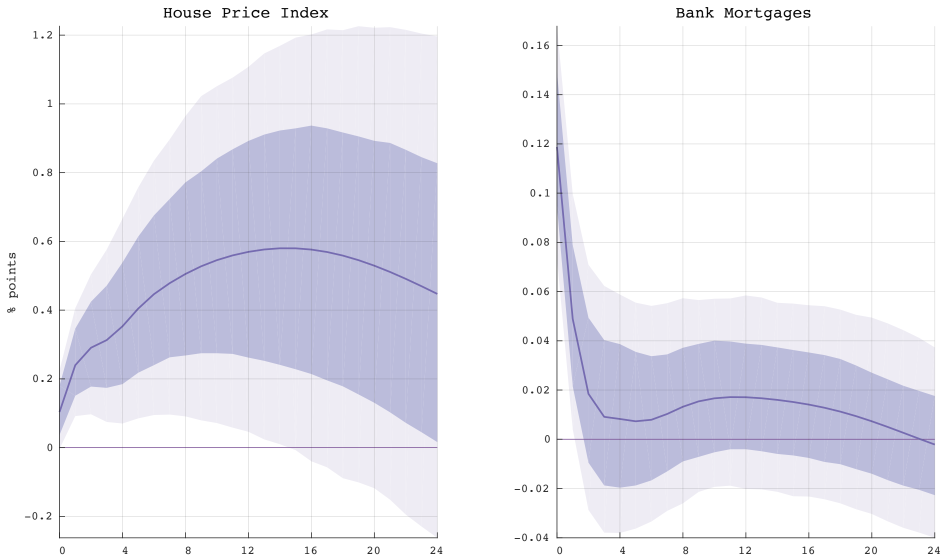
While exploring the impact of political risk shocks on a broader set of economic aggregates, we add the house price index in our benchmark VAR and explore its response to our shock. Second, we use bank-level data for US banks to extract the first principal component of household mortgages which we define as the share of real estate loans in total loans.[18] These two variables are important for understanding households' investment choices, i.e. if they start investing in long term illiquid assets. Similar to the earlier analysis, we use these series as additional variables in separate VARs. Figure X presents the results. House price index increases over time and its response is mostly significant in 68% confidence level although the variance share explained by the political risk shock shown in Table III is rather small for the house price index at all frequencies. Mortgages jump up on impact although the statistical significance of the response is short-lived and the shock explains 15% of its variance in the short term.

Capital and Non-performing Loans

Cúrdia and Woodford (2010) argue that credit spreads tighten as non-performing loans as a share of total loans decrease. This then leads to cheaper borrowing. Although they discuss their results based on an aggregate demand shock, we see merit in exploring what our analysis implies for non-performing loans. Similarly, we also investigate what the response of bank capital is when the economy is hit by a political risk shock (Meh and Moran (2010), Gerali et al. (2010)). We report these results in Figure XI. We observe improvements both in bank capital and non-performing loans with the variance shares accounted for by the shock are 11% for both in the long-term as reported in Table III.

[18]Data description is provided in Appendix B.

Figure X: Responses of the House Price Index and Mortgage Factor



Note: Modal responses to a positive political risk shock identified with the exogenous component of the Partisan Conflict Index. Mortgage factor: Data from 1978-Q1 to 2011-Q4 due to the availability of Call Reports data. House price index: Data from 1978-Q1 to 2016-Q2. Identification sample 1982-Q1:2006-Q4. These series are separately added to the benchmark VAR(4) presented in Section 3. Shaded areas denote 68% and 90% posterior coverage bands.

Table III: Error Variance Decomposition for Additional Variables

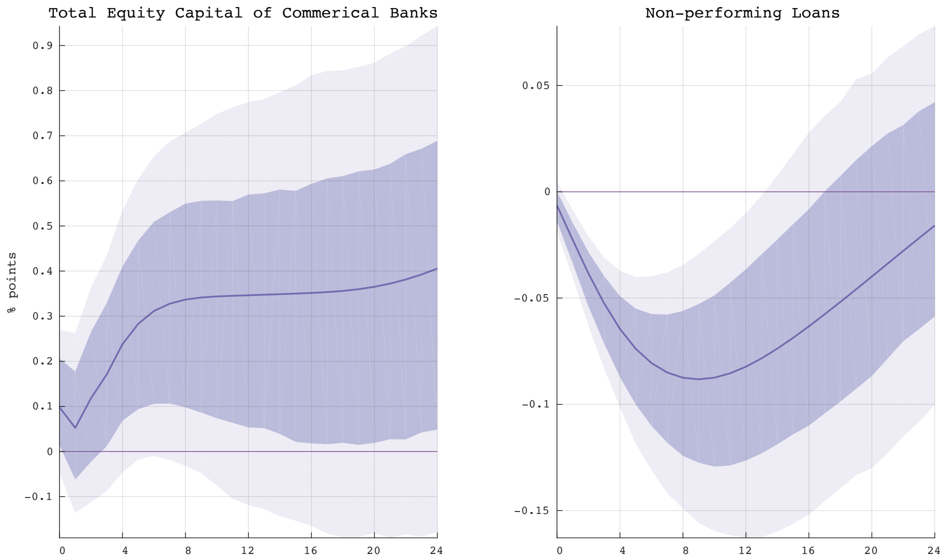
	Short Term (4-8quarters)	Medium Term (Business Cycle) (8-32quarters)	Long Term (32-100quarters)
Macro Uncertainty	0.02	0.07	0.13
Financial Uncertainty	0.05	0.02	0.11
Economic Policy Uncertainty	0.04	0.02	0.10
VIX	0.02	0.01	0.01
House Price Index	0.03	0.02	0.03
Mortgages	0.11	0.05	0.11
Capital	0.00	0.03	0.15
Non-performing Loans	0.05	0.06	0.17

Notes: Share of error variance accounted for by the identified political risk shock over different frequency intervals for the variables explored for robustness. Refer to figure notes for the specifications of each model where these variables are used. Numbers are percentage points. The algorithm used builds on Altig et al. (2011) and Miranda-Agrippino et al. (2018).

Other Shocks

We show that the political risk shock shown in Figure A.1 is uncorrelated with other

Figure XI: Responses of Capital and Non-performing Loans



Note: Modal responses to a positive political risk shock identified with the exogenous component of the Partisan Conflict Index. Data for non-performing loans is from 1988-Q4 to 2016-Q2. Data for capital is from 1984-Q4 to 2016-Q2. Identification sample 1982-Q1:2006-Q4. These series are added to the benchmark VAR(4) presented in Section 3 separately. Shaded areas denote 68% and 90% posterior coverage bands.

shocks widely studied in the literature. We explore 12 shocks, available in quarterly frequency, some of which are a subset of the shocks explored by Ramey (2016) alongside others. We first check the correlation between the political risk shock and the narrative monetary policy changes as in Romer and Romer (2004) which are extended until 2007 by Miranda-Agrippino and Rey (2015). The second set of shocks is the investment shocks and the TFP shock of Ben Zeev and Khan (2015). Next we consider Romer and Romer (2010)'s anticipated and unanticipated tax changes as in Mertens and Ravn (2011) and Mertens and Ravn (2012). Another set of shocks we consider are Justiniano et al. (2011, 2010)'s (JPT) investment and TFP shocks. Finally, we investigate the correlation between the political risk shock and Ramey and Zubairy (2018)'s defence news shocks, Baumeister and Hamilton (2019)'s oil supply shock, Bayer et al. (2019)'s income risk shock and Jermann and Quadrini (2012)'s financial shock estimated via Pfeifer (2016)'s routine.

Table IV reports the pairwise correlations of the political risk shock with other shocks. The correlations between the shock and others are both statistically and economically insignificant. These results provide additional support that the shock we identify does

Table IV: Correlation of the Political Risk Shock with Other Shocks

		Correlation with the Political Risk Shock
1	Romer-Romer Narrative Monetary Policy Changes	0.061
2	Ben Zeev-Khan Investment Specific News Shocks	−0.198
3	Ben Zeev-Khan Unanticipated Investment Specific Shocks	−0.001
4	Ben Zeev-Khan TFP Shocks	0.080
5	Romer-Romer Unanticipated Tax Changes	0.023
6	Romer-Romer Anticipated Tax Changes	−0.001
7	JPT TFP Shocks	−0.023
8	JPT Investment Specific Tech. Shocks	0.005
9	Ramey Military News	−0.001
10	Baumeister-Hamilton Oil Supply Shock	−0.002
11	Bayer-Luetticke-Pham Dao-Tjaden Income Risk Shock	−0.172
12	Jermann-Quadrini Financial Shock	−0.061

Notes: Pearson correlation of the political risk shock with other shocks. 1: Miranda-Agrippino and Rey (2015). 2-9: Ramey (2016), https://econweb.ucsd.edu/~vramey. 10: Baumeister and Hamilton (2019), https://sites.google.com/site/cjsbaumeister/research. 11: Bayer et al. (2019). 12: Generated using Pfeifer (2016)'s codes, https://github.com/JohannesPfeifer/DSGE_mod/tree/master/Jermann_Quadrini_2012. All the shocks are available for the time span of the political risk shock series, between 1982-Q1:2006-Q4.

not inherit the traces of other shocks.

6 Concluding Remarks

How do risks originating from the political environment affect the economy? We explore the answer to this question by focussing on the perceived political risk as a way to identify political risk shocks. Using an instrument based on Azzimonti (2018)'s Partisan Conflict Index, we identify these shocks in a large SVAR. We show that a positive shock is priced into stock prices which indicates an improvement in firms' worth. In such an environment, firms increase their dividends and debt issuance eventually. The shock creates an expansionary impact on the economy: credit availability, output and investment, consumption, business and consumer confidence, and labour supply all rise while producer price index and inflation decline. Our results provide empirical evidence related to the role of political risk in the missing disinflation debate.

We distinguish the supply and demand effects of political risk shocks. On the demand side, households reduce their precautionary savings and consume more while investing more than they consume. On the supply side, firms' marginal costs go down as credit availability improves. Both supply and demand increase but prices decline. These overall represent an economy where the changes in aggregate supply dominate the changes in aggregate demand and drive output and inflation into opposite directions. Moreover, our analysis suggests that political risk shocks are one of the drivers of inflation dynamics and overall economic activity, such as output, consumption, investment and labour supply, especially in the long term. Another way of looking at the same results would be that during turbulent periods, stabilizing increasing inflation and deteriorating economic growth presents a trade-off for monetary policy authorities when such shocks hit the economy.

An important point that is not covered in this paper is the heterogeneity in agents' responses to political risk shocks. As discussed by Hassan et al. (2019), the dispersion of such shocks among firms is as important as the effects of aggregate political risk shocks. Therefore, the natural way to extend our analysis is to construct a structural model to incorporate the channels through which political risk shocks feed into the economy, which would also capture such heterogeneity among different agents. These are currently beyond the scope of this paper and we leave them for future research.

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A Online Appendix: Additional Analysis and Charts

A.1 Endogeneity of the PCI and exogeneity tests on the instrument

The results reported in this section are to show that the PCI is autocorrelated and can be forecast by the expected economic conditions. Once isolated from the current and expected conditions and policy shocks, the instrument does not depict such features.

Table A1: Endogeneity of the Partisan Conflict Index

	I	II	III	IV
pci_{t-1}	−0.44	−0.48	−0.48	−0.47
	(0.09)	(0.09)	(0.09)	(0.09)
pci_{t-2}	−0.26	−0.32	−0.31	−0.30
	(0.08)	(0.09)	(0.09)	(0.09)
pci_{t-3}	−0.14	−0.18	−0.20	−0.18
	(0.11)	(0.10)	(0.10)	(0.10)
pci_{t-4}	0.08	0.04	0.02	0.04
	(0.09)	(0.10)	(0.10)	(0.10)
$\mathbb{E}_t[X_t]$		1.10		
		(0.37)		
$\mathbb{E}_t[X_{t+1}]$			1.96	
			(0.08)	
$\mathbb{E}_t[X_{t+4}]$				0.95
				(0.46)
R^2	0.19	0.24	0.24	0.22
obs	143	143	143	143

Notes: Granger Causality. Dependent variable: $pci_t = 100 \times (\ln PcI_t - \ln PCI_{t-1})$, quarterly Partisan Conflict Index. All regressions include an intercept. $\mathbb{E}_t[X_{t+h}]$ denotes SPF forecast published in quarter t. The forecast horizon is expressed in quarters. X contains forecasts for real output growth, the unemployment rate, inflation (GDP deflator), real federal government spending, real non-residential investments, and real corporate profits net of taxes. Top panel: robust standard errors in parentheses. Middle panel: Wald test statistics for joint significance of SPF forecasts.

Table A2: Exogeneity Diagnostics on the Instrument

	I	II	III	IV
m_{t-1}	−0.01	−0.01	−0.03	−0.02
	(0.12)	(0.12)	(0.12)	(0.12)
m_{t-2}	−0.04	−0.06	−0.06	−0.04
	(0.10)	(0.10	(0.10)	(0.11)
m_{t-3}	−0.01	−0.01	0.00	0.00
	(0.10)	(0.10)	(0.11)	(0.11)
m_{t-4}	−0.08	−0.08	−0.09	−0.09
	(0.10)	(0.11)	(0.10)	(0.11)
$\mathbb{E}_t[X_t]$		0.66		
		(0.68)		
$\mathbb{E}_t[X_{t+1}]$			0.23	
			(0.97)	
$\mathbb{E}_t[X_{t+4}]$				0.17
				(0.98)
R-sq	0.01	0.04	0.02	0.02
obs	95	95	95	95

Notes: Granger Causality. Dependent variable: the residual m_t of Eq. (1). All regressions include an intercept. $\mathbb{E}_t[X_{t+h}]$ denotes SPF forecast published in quarter t. The forecast horizon is expressed in quarters. X contains forecasts for real output growth, the unemployment rate, inflation (GDP deflator), real federal government spending, real non-residential investments, and real corporate profits net of taxes. Top panel: robust standard errors in parentheses. Middle panel: Wald test statistics for joint significance of SPF forecasts. The instrument is available from 1982-Q1 to 2006-Q4.

Table A3: Information Content of the PCI and Instrument

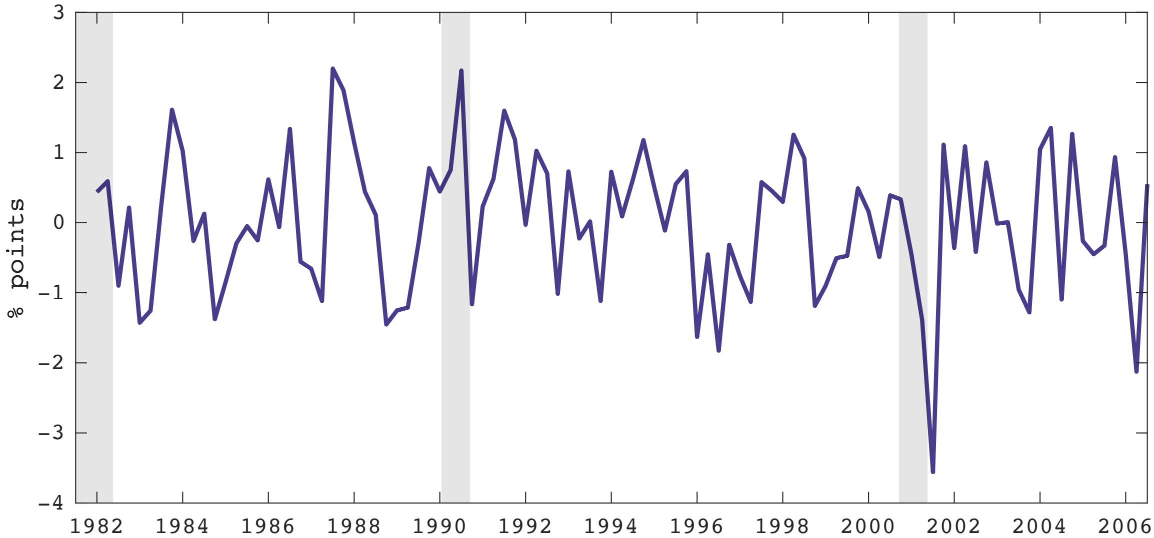
	F1	F2	F3	F4	F5	F6	F7
	pci						
Wald test stat	0.42	1.18	0.80	2.04	1.83	1.07	0.63
p-value	0.79	0.32	0.53	0.09	0.13	0.37	0.64
	Instrument						
Wald test stat	0.82	0.27	0.20	0.94	1.34	0.09	0.39
p-value	0.52	0.89	0.94	0.45	0.26	0.98	0.82

Notes: Wald test statistics for joint significance of the first 4 lags of each factor F_t. The factors are extracted from the quarterly dataset of McCracken and Ng (2016). The dependent variables are the quarterly growth rate of the PCI, pci_t and the instrument, m_t. All the regressions include an intercept.

A.2 The Political Risk Shock Series

Figure A.1 presents the political shock series we obtain from our SVAR.

Figure A.1: The Political Risk Shock



Note: Shock series of the benchmark VAR(4) presented in Section 3. The shaded areas denote the NBER recessions. Due to the time span of the identification sample, 1982-Q1:2006-Q4, the shock series does not span the same time period as the VAR variables.

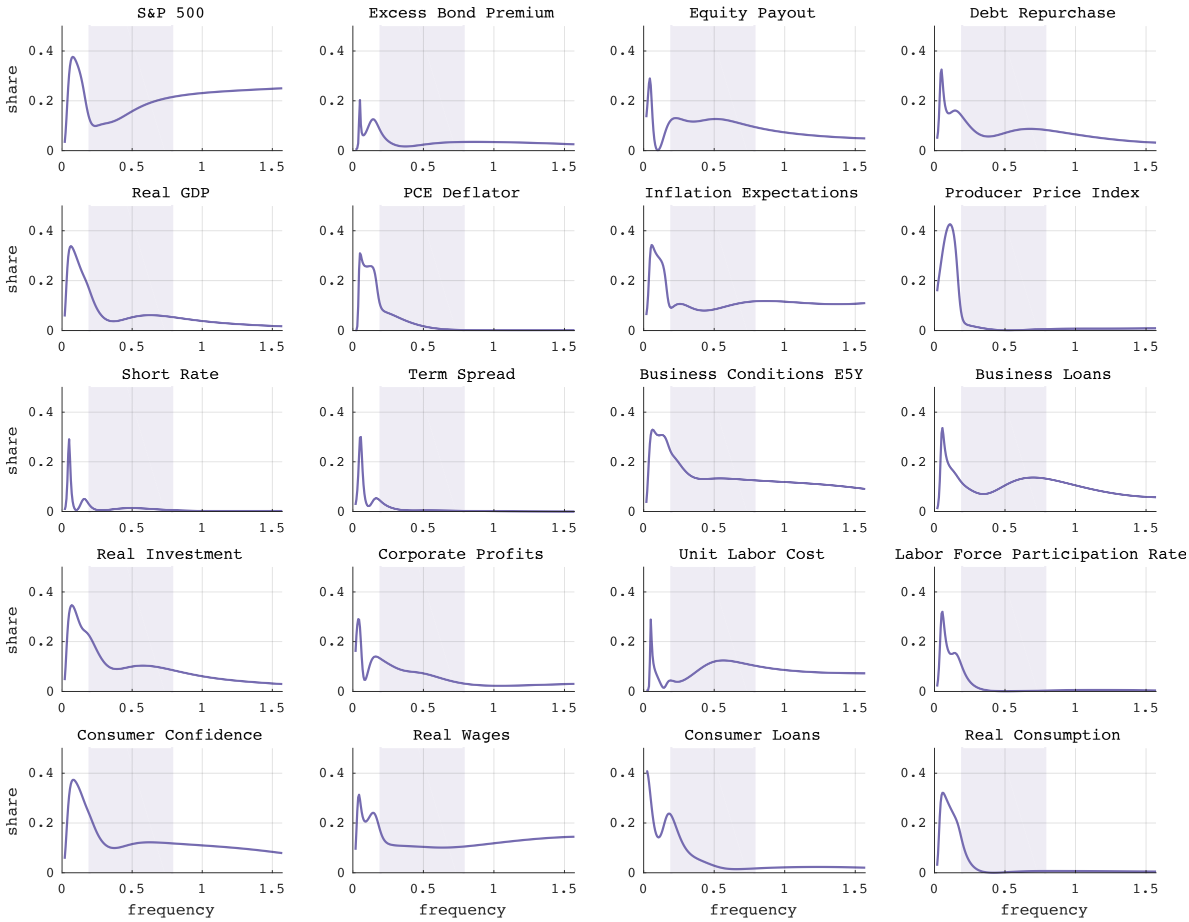
A.3 Error Variance Decomposition

Figure A.2 plots the shares of variances that are driven by the political risk shock. The results are for all the variables included in our benchmark VAR at all frequencies between 1 (highest frequency) and 100 (lowest frequency) years – frequency decreases as we go left in the x-axis. The shaded areas highlight business cycle frequencies (8-32 quarters). The results reported in Table II are the areas under the curve for the respective frequencies.

A.4 Sensitivity Analysis for the Instrument Construction

Section 2 explains how we construct our instrument. Recall that, we use the orthogonal component of the PCI to the current and expected economic conditions and policy shocks. That is, the residual m_t of the equation below is our instrument. Constructing our instrument as in Eq. (A.1) ensures that the instrument is unforecastable with the current and expected economic conditions. This is a way to show that the instrument satisfies

FIGURE A.2: ERROR VARIANCE DECOMPOSITION



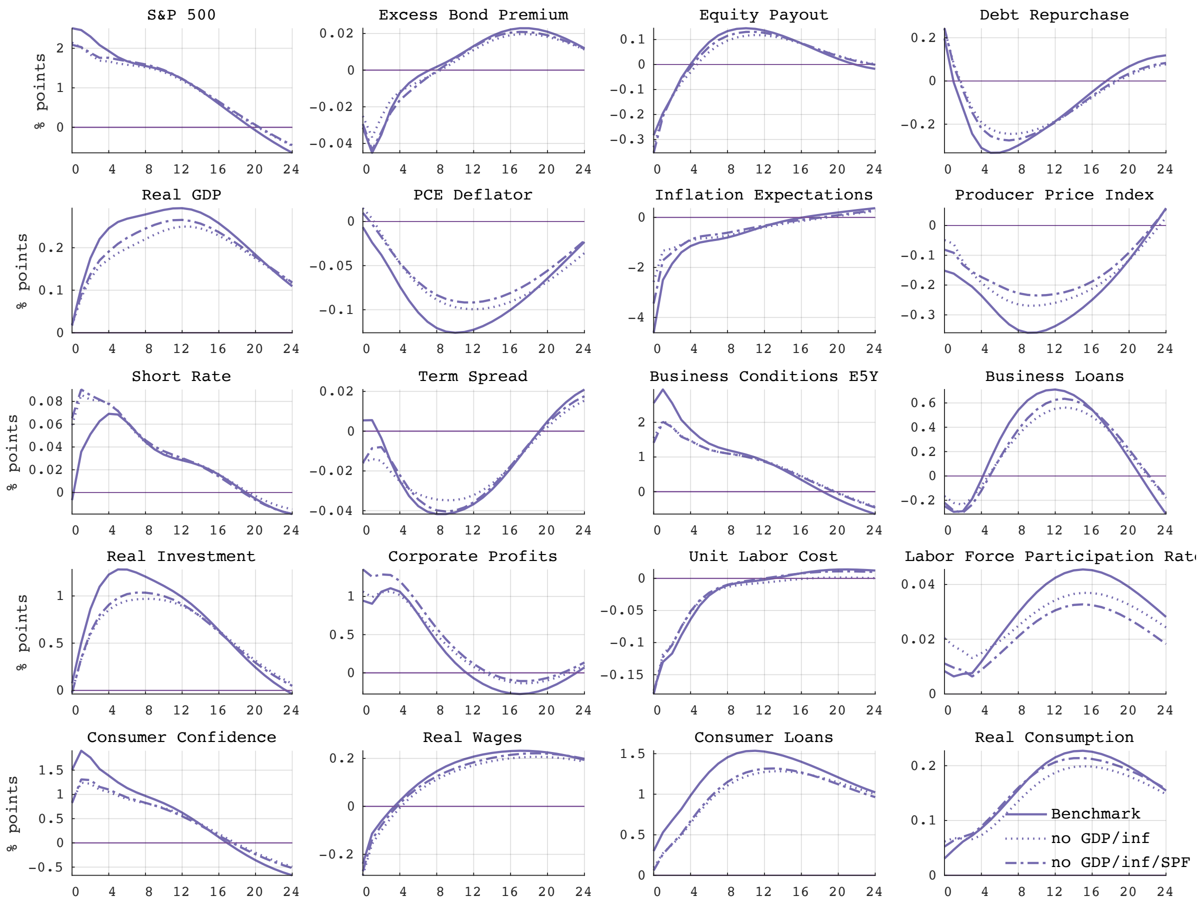
Note: Share of error variance accounted for by the political risk shock identified with political conflict based instrument. VAR(4) with standard macroeconomic priors. Estimation sample 1978-Q1:2016-Q2; Identification sample 1982-Q1:2006-Q4. Shaded areas denote business cycle frequencies (between 8 and 32 quarters) The algorithm follows Altig et al. (2011) and Miranda-Agrippino et al. (2018).

the exogeneity assumption in Section 2.3.

$$pci_t = c + \sum_{i=1}^{4} \alpha_i pci_{t-i} + \sum_{j=0}^{1} \psi_j \pi_{t-j} + \sum_{k=0}^{4} \phi_k g_{t-k} + \sum_{h=1,4} \beta_h \mathbb{E}_t[X_{t+h}] + \boldsymbol{\delta w_t} + m_t \tag{A.1}$$

Here we provide alternative ways of evaluating this univariate regression which ultimately creates different variants of our instrument. We see merit in this exercise to highlight that the instrument is not sensitive to perturbation in its generating process. Sequentially, we leave out some of the components of Eq. (A.1). First, we run the same regression without the current and lagged output and inflation. Second, we also exclude the SPF forecasts, $\mathbb{E}_t[X_{t+h}]$. Figure A.3 presents the impulse response functions of the VAR(4) specifications where the political risk shock is identified with the respective variants of the instrument. Except for slight quantitative changes in the responses, all of our conclusions hold.

Figure A.3: Sensitivity against Instrument Construction

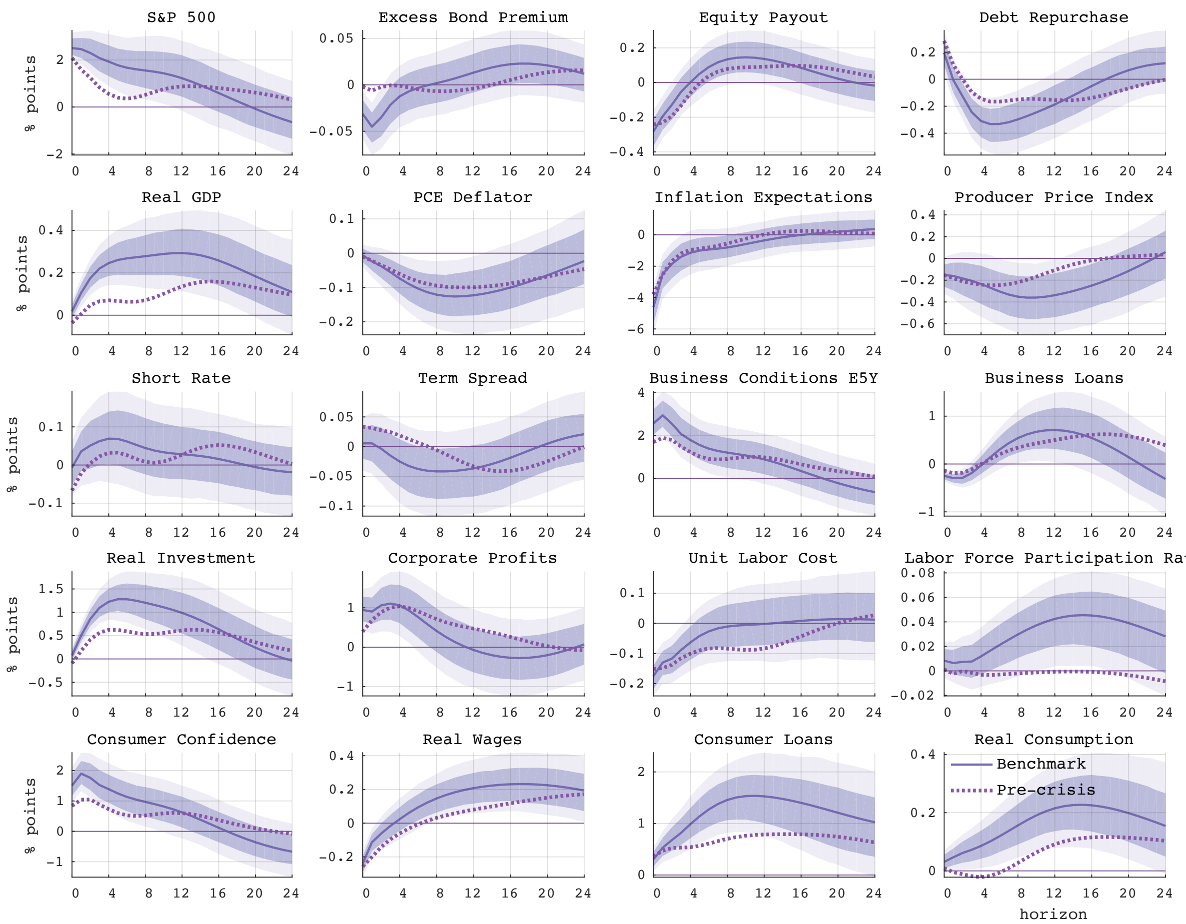


Note: Modal responses to a positive political risk shock identified with the exogenous component of the Partisan Conflict Index. VAR(4). Solid lines are benchmark results as in Section 3. Dotted lines is for the case where we exclude GDP and inflation; dash-dotted lines is where we sequentially exclude SPF forecasts. Estimation sample 1978-Q1:2016-Q2. Identification sample 1982-Q1:2006-Q4 for benchmark and no GDP/inf and no GDP/inf/SPF.

A.5 Benchmark versus Pre-crisis Sample Results

Figure A.4 plots our benchmark results along with the results from the VAR using the pre-crisis data until 2006-Q4. The results are quite similar to the benchmark except for the responses of some variables are smaller in magnitude.

Figure A.4: Full sample vs Pre-crisis

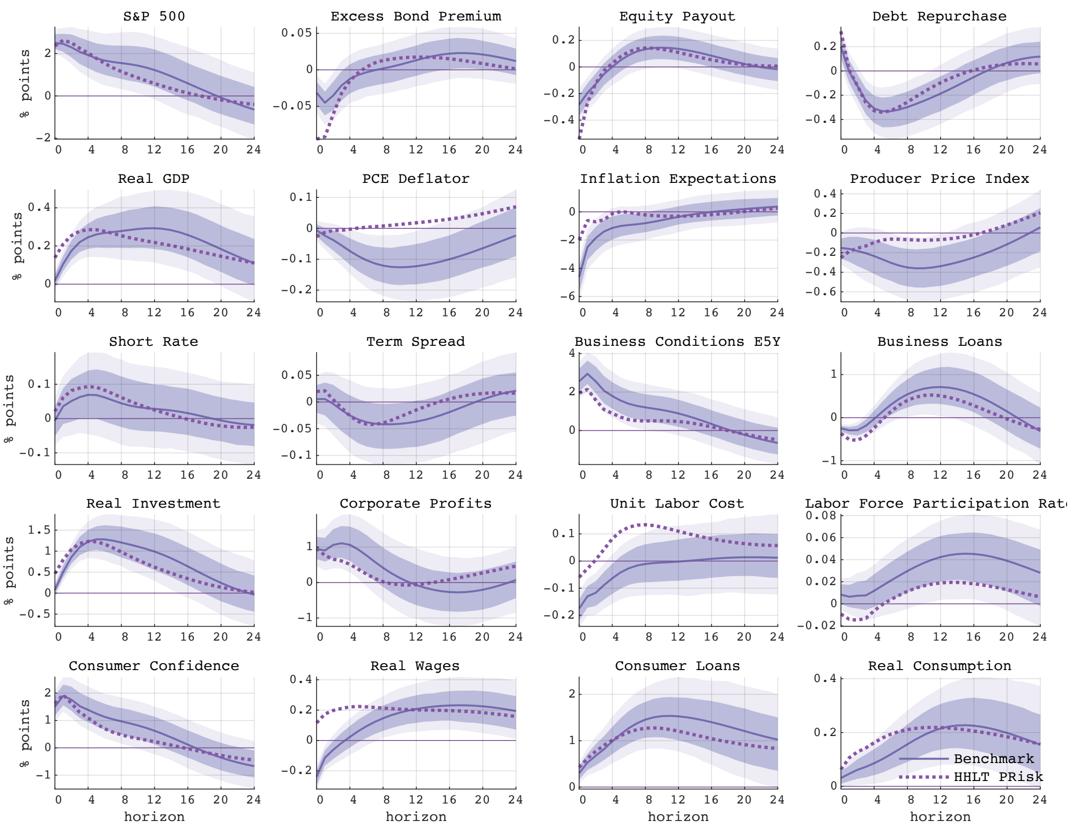


Note: Modal responses to a positive political risk shock identified with the exogenous component of the Partisan Conflict Index. VAR(4). Estimation sample of the benchmark 1978-Q1:2016-Q2. Estimation sample of the pre-crisis 1978-Q1:2006-Q4. Identification sample 1982-Q1:2006-Q4. Shaded areas denote 68% and 90% posterior coverage bands of the benchmark. Dotted lines are the model responses of the pre-crisis sample.

A.6 Benchmark identification vs identification using Hassan et al. (2019)'s aggregated political risk series

We repeat our estimation using the aggregated version of firm-specific the political risk indices in Hassan et al. (2019) as an external instrument. Figure A.5 below depicts the similarities between the benchmark case where we use the partisan conflict based instrument for identification (solid lines) vs the shock identification results with the political risk index (dotted lines). Most of our results stay similar, except e.g. inflation, due to the time-span of the political risk series.

Figure A.5: Benchmark identification vs identification using Hassan et al. (2019)'s political risk series



Note: Modal responses to a positive political risk shock identified with the exogenous component of the Partisan Conflict Index. VAR(4). Solid lines are benchmark results as in Section 3. Dotted lines is for the case where we use the aggregated version of Hassan et al. (2019)'s firm specific political risk indices. Estimation sample 1978-Q1:2016-Q2. Identification sample 1982-Q1:2006-Q4 for benchmark; 2002-Q1:2016-Q2 for Hassan et al. (2019) political risk series.

B Online Data Appendix

Table A1: Data Description

	Variable	Source	Codes if applicable	Treatment		
				log	pc	deflated
S&P	S&P 500	Shiller		✓		
Equity	Equity Payout	JQ				
Debt	Debt Repurchase	JQ				
EBP	Excess Bond Premium	GZ				
RGDP	Real GDP	FRED	GDPC1	✓	✓	
PCEdef	PCE Deflator	FRED	DPCERD3Q086SBEA	✓		
PCEFE	PCE exc Food and Energy	FRED	PCEPILFE	✓		
IE	Inflation Expectations	MSC	PX_MD	✓		
SHORTR	Short Rate	FRED	DGS1			
YCSLOPE	Term Spread	FRED	DGS10 - DGS1			
CCONF	Consumer Confidence	MSC	CCONF	✓		
BCE5Y	Business Conditions E5Y	MSC	BCE5Y	✓		
PPI	Producer Price Index	FRED	PPIACO	✓		
BUSLOANS	Commercial and Industrial Loans	FRED	BUSLOANS	✓	✓	
RINV	Real Investment	FRED	PCDG + GPDI	✓	✓	✓
CP	Corporate Profits after Tax	FRED	CPATAX (with IVA and CC Adj)	✓		✓
ULC	Unit Labour Cost	OECD	OECD_ULC	✓		
LFPR	Labour Force Participation Rate	FRED	CIVPART			
RWAGE	Real Wages	FRED	COMPRNFB	✓		
ConsLoans	Consumer Loans	FRED	DTCTHFNM	✓	✓	
RCONS	Real Consumption	FRED	PCND + PCESV	✓	✓	
		Additional Variables				
RAI	Risk Aversion Index	BEX		✓		
PRisk	Political Risk Index	HHLT		✓		
LIL	Liquid to Illiquid	BLPT		✓		
WY	Welfare to Income	BLPT		✓	✓	
RGPDI	R. Gross Private Domestic Invest.	FRED	GPDIC1	✓	✓	✓
PSR	Personal Saving Rate	FRED	PSAVERT	✓		
FinU	Financial uncertainty, h=3	JLN		✓		
MacroU	Macro uncertainty, h=3	JLN		✓		
EPU	Economic Policy Uncertainty	BBD		✓		
VIX	Stock Market Volatility	FRED	VIXCLS	✓		
Mortgages	Mortgages	Call Reports	$\frac{rcfd1410}{rcfd1400(\text{pre-1984Q1:}rcfd1400+rcfd2165)}$			✓
HPI	House Price Index	Shiller		✓		
Capital	Total Equity Capital	FRED	USTEQC	✓		✓
NPL	Non-performing Loans	FRED	NPTLTL			
Oil	Oil Prices	FRED	WTISPLC	✓		✓

Notes: pc denotes per capita. The deflated series are deflated by the GDP deflator (GDPDEF from FRED). FRED: St Louis FRED Database, https://fred.stlouisfed.org; MSC: University of Michigan Survey of Consumers, http://www.sca.isr.umich.edu; OECD: https://www.oecd-ilibrary.org/economics/data/labour/unit-labour-cost-quarterly-indicators-early-estimates_data-00607-en; Shiller: Shiller (2015), http://www.econ.yale.edu/~shiller/data.htm; GZ: Gilchrist and Zakrajšek (2012), http://people.bu.edu/sgilchri/Data/data.htm; JQ: Jermann and Quadrini (2012), https://www.aeaweb.org/articles?id=10.1257/aer.102.1.238; JLN: Jurado et al. (2015); BBD: Baker et al. (2016), http://www.policyuncertainty.com/; Call Reports: https://www.chicagofed.org/banking/financial-institution-reports/commercial-bank-data. BLPT: Bayer et al. (2019), https://www.econometricsociety.org/publications/econometrica/2019/01/01/precautionary-savings-illiquid-assets-and-aggregate. BEX: Bekaert et al. (2019), https://www.nancyxu.net/risk-aversion-index. HHLT: Hassan et al. (2019), https://sites.google.com/view/firmrisk/data-explorer.

Updating the Equity Payout and Debt Repurchase Series of Jermann and Quadrini (2012)

Jermann and Quadrini (2012) use the Flow of Funds Accounts of the Federal Reserve Board to construct the Equity Payout and Debt Repurchase series. They define Equity Payout as 'Net dividends of non-farm, non-financial business' (FA106120005, Table F.102, line 3), plus 'Net dividends of farm business' (FA136120003, Table F.7, line 24), minus 'Net increase in corporate equities of non-financial business' (FA103164103, F.101, line 35), minus 'Proprietors' net investment of non-financial business'(F.101, line 39). Debt Repurchase is the negative of 'Net increase in credit markets instruments of non-financial business' (FA144104005, Table F.101, line 28). Equity payout and debt repurchase are both divided by business value added from the National Income and Product Accounts (Table 1.3.5). See their Online Appendix, https://assets.aeaweb.org/assets/production/articles-attachments/aer/data/feb2012/20090995_app.pdf.

However, the codes of these variables have changed. The updated data is constructed in the following way. Equity Payout: minus 'Nonfinancial corporate business; corporate equities; liability' (FA103164103, FRED) plus 'Nonfinancial corporate business; net dividends paid' (FA106121075, Line 3 Table F.103) minus 'Nonfinancial noncorporate business; proprietors' equity in noncorporate business (net worth)' (FA112090205, Line 44 Table F.102). 'Net dividends of farm business' series is not available in the new tables. Debt Repurchase series is minus Nonfinancial business; debt securities and loans; liability (FA144104005, FRED). Both series are scaled by the Gross Value Added by Sector from the National Income and Product Accounts (Table 1.3.5) for the VAR analysis, https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2. The original series and the updated ones are 98% and 96% correlated.

Banking Data Used to Extract the Principal Components in Section 5

The data is from the Consolidated Report of Condition and Income (Call Reports). The data set captures the balance sheet and income statement information of all federally insured banks regulated by the Federal Reserve System, Federal Deposit Insurance Corporation, and the Office of Comptroller of the Currency. The dataset is quarterly and spans the time period of 1978Q1:2011Q4. We follow Stein and Kashyap (2000), den Haan et al. (2007) and Buch et al. (2014) to process the data, i.e. eliminate time and logical inconsistencies, outliers and mergers. We use a balanced panel of 1475 banks which operated during the full time span. Mortgages are defined as real estate loans/total loans. The identifiers for total loans is rcfd1400 (before 1984Q1: rcfd1400+rcfd2165) and real estate loans is rcfd1410. The raw data can be downloaded from `https://www.chicagofed.org/banking/financial-institution-reports/commercial-bank-data`. Data used for Mortgages are also standardized and stationarised for the Principal Component Analysis.