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Partisan conflict and private investment

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ABSTRACT

American politics have been characterized by a high degree of partisan conflict in recent years. Combined with a divided government, this has led not only to significant Congressional gridlock, but also to spells of high fiscal policy uncertainty. The unusually slow recovery from the Great Recession during the same period suggests the possibility that the two phenomena may be related. In this paper, I investigate the hypothesis that political discord depresses private investment. To this end, I construct a novel high-frequency indicator of partisan conflict. The partisan conflict index (PCI) uses a semantic search methodology to measure the frequency of newspaper articles reporting lawmakers' disagreement about policy. I find a negative relationship between the PCI and aggregate investment in the US. Moreover, the decline is persistent, which may help explain the slow recovery observed since the 2007 recession ended. Partisan conflict is also associated with lower capital investment rates at the firm level, even when economic policy uncertainty and macroeconomic conditions are controlled for. I estimate that about 27% of the decline in corporate investment between 2007–2009 can be attributed to a rise in partisan conflict.

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1. Introduction

American politics have been characterized by a high degree of partisan conflict in recent years. The combination of increasing polarization and divided government has led not only to significant Congressional gridlock (such as the budgetary warfare that eventually triggered the 18th government shutdown in US history in 2013), but also to spells of high fiscal policy uncertainty (such as the 2012 tax-expirations and the fiscal cliff). The unprecedented slow recovery in investment from the Great Recession during the same period suggests the possibility that the two phenomena may be related. Partisan conflict is relevant for the evolution of private investment for two reasons. First, because expected returns on investment become less predictable when the timing, size, and composition of fiscal policy is uncertain (Azzimonti and Talbert, 2013). To the extent that investment is irreversible and subject to fixed upfront costs, this induces delays in investment decisions (Bernanke (1983); Baker et al. (2016); Canes-Wrone and Park (2011)).[2] Second, because the resulting legislative gridlock negatively affects the optimal response to adverse shocks and the quality of policy reforms aimed at preventing them (Alesina and Drazen, 1991). This lowers expected returns, and hence discourages investment.

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[2] See Dixit and Pindyck (1994) for a review of the early theoretical literature on this topic.

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To test the hypothesis that partisan conflict depresses investment, I construct a novel indicator of the degree of partisan conflict based on news provided by the media. The *Partisan Conflict Index* (PCI) is computed monthly between 1981 and 2017 using a semantic search approach to measure the frequency of newspaper coverage of articles reporting political disagreement about government policy—both within and between national parties—normalized by the total number of news articles in 1990. The semantic search for this benchmark index is performed in Factiva, a newspaper database containing digitalized copies of all major US newspapers[3]. Because the time horizon of Factiva coverage is limited to recent decades, I also construct an auxiliary index, the *Historical Partisan Conflict* (HPC) index annually between 1891 and 2013. The semantic search for the HPC index is performed in ProQuest and based on a smaller set of newspapers which have been digitalized since 1890. The general method for computing the index is the same, but the measure is less precise, as explained in the next section. By analyzing HPC we can see that the behavior of partisan conflict is consistent with that of slow-moving variables characterizing the political process. First, I show that the long-run trend in the HPC mirrors the evolution of political polarization, as computed by Mc-Carty, Poole, and Rosenthal (2006)[4]. Second, I show that changes in (the trend of) the HPC: (i) are more pronounced under a divided government, (ii) are positively related to the number of cloture attempts (a proxy for filibusters), and (iii) decline with the share of seats in Congress controlled by the President's party (a proxy for political power). Third, I find that short-term increases in partisan conflict are associated with presidential elections and well-known fiscal policy debates, such as the Immigration Act of 1924, the debt ceiling debate, and debates on the Affordable Care Act (both related to its approval and potential repeal in early 2017). This is reassuring, suggesting that the indicator captures disagreement about well-known polemical issues. Interestingly, no clear relationship between partisan conflict and recessions (measured by NBER dates or by periods of high unemployment rates) was detected. For example, the index is much lower than average during the Great Depression, but reached significant levels during the panics of 1893 and 1911, and the Great Recession. Taken together, these observations indicate that the index is mainly capturing political factors, rather than the state of the economy.

It is worth noting that while the methodology used to compute the PCI (and HPC) is similar to the one used by Baker et al. (2016) to measure EPU, the two indexes represent different concepts and are therefore characterized by distinctive features. While there are cases in which increases in the PCI are associated with higher economic policy uncertainty (such as during the Obamacare debate and the tax-expirations of 2012, when investors could not predict which policies would be undertaken) this need not always be the case (e.g., the Great Depression and the 2013 shutdown). Interestingly, the indexes move in opposite direction when the country is at war or subject to national security threats, such as World War I, Pearl Harbor, and 9/11. The 9/11 attacks, for example, introduced uncertainty in the economy (so EPU was extremely high), but there was very little disagreement about which policies should be implemented (so PCI was extremely low). This suggests that American politics are very polarized regarding economic policy, but less divided when it comes to national defense issues. It also indicates the presence of a partisan 'rally around the flag" effect.

The HPC is also related to measures of political polarization, such as those computed by McCarty et al. (2006) from roll-call votes. This is to be expected: Policymakers' ideological differences, or polarization, are clearly an important determinant of political disagreement. The further apart parties' views over policies are, the higher the level of conflict should be. While the general trend of partisan conflict since the mid sixties is similar to the one observed in these measures, short-term fluctuations are remarkably different. This is due to the fact that polarization measures bundling Congressional behavior typically ignore filibuster threats and presidential vetoes, which constitute important sources of policy determination. The interaction between the executive and legislative branches, or between the House and the Senate under a divided government, are important factors affecting the determination of partisan conflict (as pointed out by Alesina and Rosenthal (1995)). Moreover, the HPC deviates significantly from the DW-nominate measure constructed by McCarty et al. (2006) in periods where one party controls Congress and the Presidency. Because the index is a signal about the outcome of a game (between two parties with different objectives in the political arena), rather than a measure of the distance in their ideal points, the index developed in this paper is conceptually different from polarization, and does not represent an alternative measure of it.

To quantify the effects of innovations in news about partisan conflict on private investment, I first consider a VAR specification using the historical partisan conflict series. Using data from 1929 to 2013, I find that an increase in HPC is associated with a large and persistent reduction in aggregate investment. Even though this approach does not allow me to uncover a causal relationship between the two variables, it illustrates their long-run co-movement. Moreover, it allows me to show that their relationship is not confounding the effects of other slow-moving variables, such as polarization, political power, or economic policy uncertainty.

I also study how news about partisan conflict affect the investment rates of publicly traded firms at a higher frequency. Using a quarterly panel of Compustat firms covering the period 1987:Q1 to 2017:Q2, I estimate how innovations in the benchmark PCI series (which is computed more accurately than the historical one) Affect corporate investment. The econometric model used is analogous to the one estimated by Gulen and Ion (2015) to compute the effects of policy uncertainty on investment rates. I first replicate their results—for the extended sample to 2017:Q2—for comparison purposes and then

[3] The Federal Reserve Bank of Philadelphia provides monthly updates of this series at: https://www.philadelphiafed.org/research-and-data/real-time-center/partisan-conict-index/.

[4] The measure has a similar relationship with political polarization computed by Jensen et al. (2012) from Congressional Records

augment their benchmark specification to include PCI as an additional control. I show that while both PCI and EPU have independent explanatory value in the model, the effect of EPU is tamed when PCI is also included (this is robust to considering only the news component of EPU). Besides the classic investment predictors (cash-flows, Tobin's Q and sales growth), I control for aggregate macroeconomic conditions (lagged GDP growth, expected GDP growth, and consumer sentiment) which proxy for investment opportunities. This is done to reduce the potential omitted variable bias and endogeneity concerns associated with a potential relationship between partisan conflict and the state of the economy. The results are robust to alternative specifications of the investment policy function which use firm size and sales instead of Tobin's Q as regressors (as in Gala and Gomes (2016)).

In the preferred specification, I estimate that a doubling of the PCI in a given quarter is associated with a decline of 13% in the investment rate of the average firm in the sample. The PCI increased by about 67% between 2007 and 2009, indicating that the effect of partisan conflict may account for slightly less than one third of the 32% decline in capital investment observed during the Great Recession.

2. Measuring partisan conflict

The main objective of this section is to construct an indicator of the degree of partisan conflict to analyze how it evolves over time, understand its determinants, and later assess how it affects private investment.

2.1. Index construction

To construct the partisan conflict index I use a search-based approach that measures the frequency of newspaper articles reporting political disagreement about government policy. The assumption underlying the index is that greater media coverage of ideologically divisive issues, legislative gridlock, presidential vetoes, or filibuster threats indicate intense disagreement between policymakers (either across party lines or within a party).

I will compute two indexes: *Historical Partisan Conflict* (HPC), covering the period 1891–2013, and a benchmark measure, *Partisan Conflict Index* (PCI), covering the interval 1981-present. The latter is updated monthly by the Federal Reserve Bank of Philadelphia, and available free of charge in their website.[5]

Historical Partisan Conflict is computed annually using news articles from five major newspapers that have been digitized since 1891 for the whole sample period: The Wall Street Journal, The New York Times, Chicago Tribune, Los Angeles Times, and The Washington Post. I abstract from other newspapers that have been digitized only for a sub-period, because with a small number of newspapers, the addition or elimination of a newspaper significantly changes the trend of the estimated index.[6] The advantage of this measure is that it allows us to characterize the long-run trend in partisan conflict and compare it with other slow-moving variables such as polarization and the composition of Congress. The main disadvantage is that the search cannot be refined to the same degree as the benchmark case is. While we can restrict the search over actual articles (excluding, for example, advertisements or obituaries), we cannot restrict it to domestic news or distinguish opinions and commentaries from regular news.

The search used in the construction of the *Partisan Conflict Index* is performed monthly in Factiva (by Dow Jones), covering the interval 1981-present. An advantage of using Factiva's search engine versus the ones provided by each particular newspaper is that the search outcome is homogeneous and an identical set of predefined filters can be applied. In particular, I restrict the comprehensive Boolean search to major US newspapers (see Table 1 in Appendix 1 for a full list of sources included) with news written exclusively in English and restricted to events occurring in, or related to, the US.[7] The top news sources resulting from the search are The Washington Post, The New York Times, Los Angeles Times, Chicago Tribune, The Wall Street Journal, Newsday, The Dallas Morning News, The Boston Globe, and Tampa Bay Times (see Fig. 1 in Appendix 1 for a decomposition).

Routine general news, reviews, interviews, etc. are also excluded in order to reduce the incidence of false positives. A comprehensive list of filters applied can be found in Appendix 2. Articles with less than 200 words and republished news are excluded (this is standard in the semantics literature). Note that the search is performed on full articles, not just titles or abstracts.

The index is computed as follows. First, I count the number of articles that discuss disagreement between political parties, branches of government, or political actors (e.g. candidates not yet in office, legislators, etc.) in a given month. In particular, I search for articles containing at least one keyword in the following two categories: (i) political disagreement and (ii) government. I focus on articles including keywords at the intersection of those two categories. In addition, I also

[5] The PCI is available free of charge at https://www.philadelphiafed.org/research-and-data/real-time-center/partisan-conflict-index.

[6] The benchmark series is constructed from the whole sample of newspapers for which digitized versions exist. Because the number of newspapers included is much larger, jumps in the series do not appear as newspapers are included or excluded at particular points in time.

[7] Factiva indexes articles according to the region they are most related to through a semantic algorithm. To filter out news that are not related to the US, I exclude articles which have been indexed to countries/regions *other* than the US. This will include articles which are indexed to the US, as well as articles which have not been coded.

search for specific terms related to partisan conflict, such as "divided party," "partisan divisions," and "divided Congress." Note that the search involves terms related to the political debate (e.g., "fail to compromise"), as well as the outcome of the partisan warfare (e.g. "gridlock" and "filibuster"). The complete set of words included in each category can be found in Appendix 3, which summarizes the resulting terms used in each category and is illustrated Fig. 2 in the same Appendix.

The search captures disagreement not only about economic policy (e.g., related to budgetary decisions, tax rates, deficit levels, welfare programs, etc.), but also about private-sector regulation (e.g., financial and immigration reform), national defense issues (e.g., wars, terrorism), and other dimensions that divide policymakers' views (e.g., same-sex marriage, gun control, abortion rights, among others).

For the PCI benchmark series, the particular words included in each category were chosen using a two-stage procedure. In the first stage, I selected words normally used in the political economy and political science literatures that refer to political disagreement. From the outcome of this first-stage search, three articles per month over the period 1981–2012 were selected at random from The New York Times and thoroughly read by the author. Additional words used by the media that were identified during this human audit were incorporated into the initial search in the second stage. The objective of this refinement was to reduce the incidence of false negatives. Some of the original keywords were eliminated in order to reduce false positives. Articles were identified as false positives or false negatives by analyzing whether the article was indeed describing disagreement between policymakers. Words were eliminated when the incidence of false-positives (or negatives) was higher than 30% of the articles selected. In addition, the words "polarization" and "dysfunctional" were excluded from the historical search used to construct HPC because these words entered the media language only in the 1980s. The remaining words were observed with a relatively constant frequency in the historical newspapers (using 10-year intervals). In addition "political" and "disagreement" have also been excluded from the historical search because they retrieved a disproportionate amount of foreign news (notably during WWI and WWII). This shortcoming does not arise in the benchmark search used to construct PCI where we can restrict it to domestic articles.[8]

Because the volume of digitized news varies over time, I scale the raw partisan conflict count by the total number of articles in the same newspapers over the same time interval. To do this in the benchmark PCI, I perform a search every month from January 1981 until the present containing the word "today."[9] For the historical series, HPC, I divide the raw partisan conflict count by the number of articles every year that contain the word "the," rather than "today," due to the fact that, early in the sample, there was usually a delay between the date at which an event happened and the date at which it was reported. Finally, I normalize both the PCI and HPC scores to average 100 in the year 1990. This normalization is without loss of generality.

2.2. The historical evolution of partisan conflict

In this section, I study the behavior of the HPC index over a long period of time (1891–2013). By comparing its evolution to other indicators of political discord, I attempt to validate the index as an informative signal of true partisan conflict. The HPC index declined between 1891 and the early 1920s, remained relatively stable until 1965, and exhibited an increasing trend thereafter, as seen in the top panel of Fig. 1. The rise in partisan conflict accelerated during the Great Recession, peaking with the 2013 government shutdown. This behavior, as shown in the next subsections, is consistent with that of other slow-moving variables characterizing political disagreement, such as political polarization and the distribution of political power (e.g. whether the government is divided or not, the degree of presidential influence in Congress, the number of filibusters, etc.) and media trends. Because these variables are related with the PCI at different frequencies than other shocks (such as elections and wars), the analysis will be divided in two parts: (i) the long-run trend and (ii) short-term fluctuations. To isolate long-run trends from short-term fluctuations, I apply an HP-filter to the series. Since HPC is computed annually, it is filtered using a weight of $w = 6.25$ (see in Ravn and Uhlig, 2002).[10] Figure 5 in Appendix 5 shows the evolution of the resulting two components of partisan conflict for the HPC series.

2.2.1. Long-run trend of HPC

I first focus on the relationship between the long-run trend of the HPC series and variables which, according to the political economy literature, reflect political discord. I also discuss the relationship between the index and trends in media coverage.

Political determinants. Polarization is possibly one of the most important factors (although not the only one) determining partisan conflict. We should expect partisan conflict to intensify when political polarization rises. Intuitively, it is more difficult for parties to agree on the course of social and economic policy when their ideological differences are large. Interestingly, McCarty et al. (2006) document that polarization between political parties has risen significantly in the postwar era. This pattern is consistent with the sustained increase in HPC over the same period, as shown in Fig. 4 in Appendix 5.

[8] Robustness to the set of words is discussed in Appendix 4.

[9] Using the word "the" to count the total number of articles instead causes no noticeable difference in the index.

[10] HP filtering has been chosen rather than first differences because the trend is not completely removed from the series when using differences. Using a smoothing parameter of $w = 100$ also resulted in slow-moving trends observed in the residual. More details are available from the author upon request.

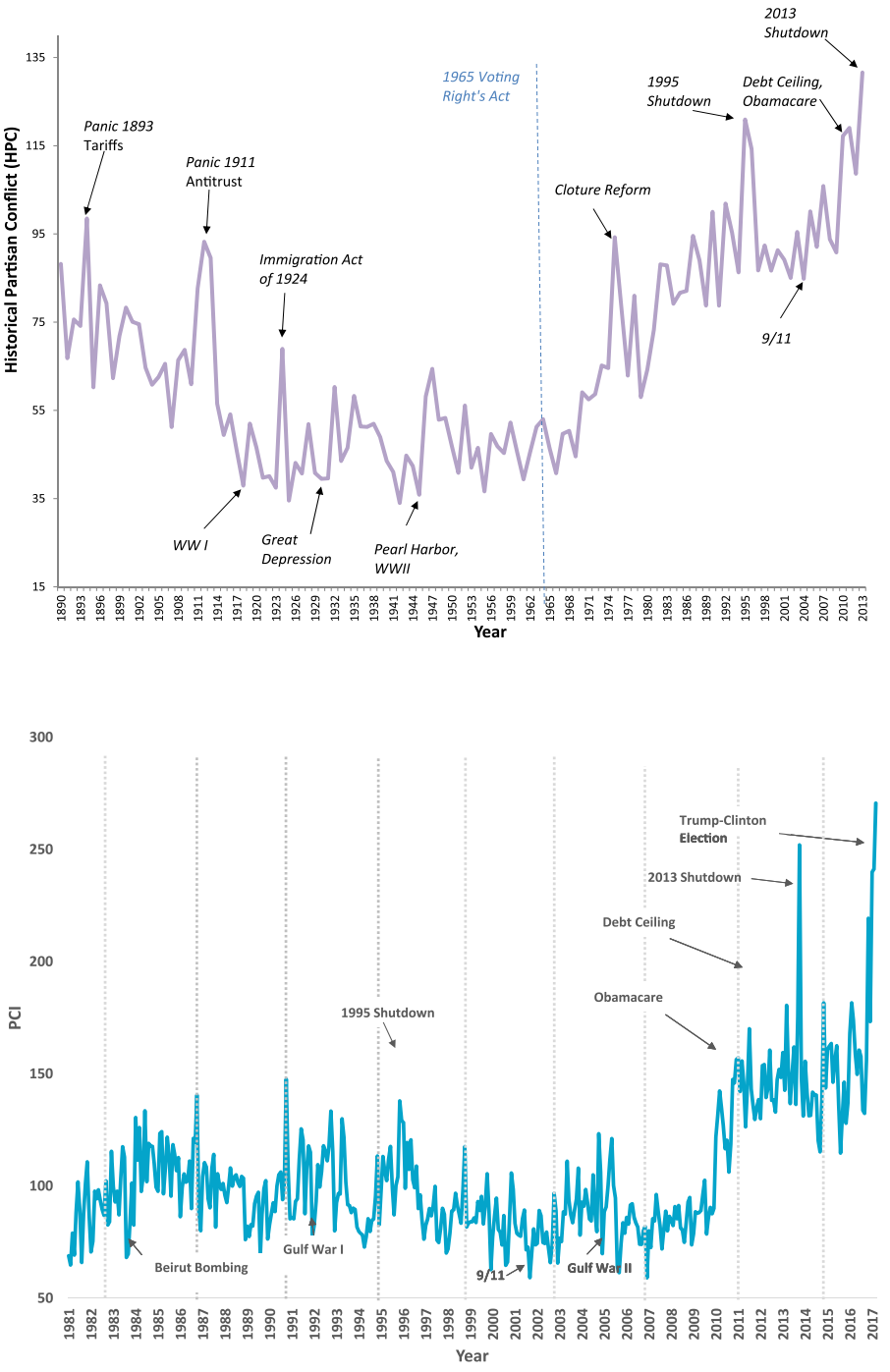

Fig. 1. Top panel: Historical partisan conflict, 1891–2013 (annual). Bottom panel: benchmark PCI, 1981–2017 (monthly).

While both series exhibit a decline early in the sample, partisan conflict decreases at a much faster rate and lies below polarization until the 72nd Congress. As the HPC index identifies political outcomes rather than policymakers' preferences, the divergence in the two series could be explained by changes in the composition of the government, affecting the political power of the Democratic and Republican parties. For example, between the 63rd and the 71st Congresses both chambers had a Democratic majority. Therefore, even if parties were very polarized, de facto disagreement—as proxied by the HPC series—, was not.

To test the conjecture that polarization is associated with higher partisan conflict whereas control of the government by one party is associated with lower partisan conflict, I estimate the following model over the period 1891–2012 (from the

Table 1
The long-run behavior of HPC.

Dep var: ΔHPC_c	(1)	(2)	(3)	(4)	(5)
$\Delta Polar_c$	0.195**	0.189**	0.144**	−0.077	0.113*
	(0.0732)	(0.0735)	(0.0634)	(0.060)	(0.062)
$I_{div,c}$	2.502***	2.307***	2.008***	1.86***	1.93***
	(0.681)	(0.743)	(0.664)	(0.46)	(0.47)
$\Delta Pres\ Seats\ H_c$		−41.45**		−16.72	
		(16.07)		(10.75)	
$\Delta Pres\ Seats\ S_c$			−4.289		
			(10.61)		
$\Delta Cloture_c$				0.51***	
				(0.13)	
$\Delta MediaCov_c$					0.61***
					(0.09)
Observations	60	52	52	46	60
R-squared	0.145	0.181	0.093	0.55	0.59

Note: The dependent variable is the first difference in the trend of partisan conflict. The independent variables in specification (1) are $I_{div,c}$ and the first difference of the polarization trend. Specification (2) includes the first difference in the trend component of the share of seats controlled by the President's party in the House, $\Delta Pres\ Seats\ H_c$, while specification (3) includes the equivalent measure in the Senate, $\Delta Pres\ Seats\ S_c$. Sample period is 1891–2012. Specification (4) augments Specification (2) by adding changes in the trend to cloture motions filed. Specification (5) extends Specification (1) to account for trends media coverage, $\Delta MediaCov_c$. Each observation corresponds to a Congress. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

62nd to the 112th Congresses):

$$\Delta HPC_c = \alpha_0 + \alpha_1 \Delta Polar_c + \alpha_2 I_{div,c} + \epsilon_c, \tag{1}$$

where $c =$ denotes a particular Congress. The dependent variable is the first difference in the trend of partisan conflict, ΔHPC_c.[11] The variable $\Delta Polar_c$ represents changes in the trend of political polarization (also de-trended using the HP filter), obtained from McCarty et al. (2006; see note in Fig. 4 for more details). The dichotomic variable $I_{div,c}$ equals 1 under a divided government (that is, when a party has a majority in the House and the other party a majority in the Senate) and 0 otherwise. Finally, ϵ_c represents the error term.

The estimated coefficients are reported in the first column of Table 1. Both are positive and statistically significant, indicating that polarization and partisan conflict are indeed positively related, and that HPC is typically higher under a divided Congress.

I consider an alternative measure of partisan control, *Pres Seats* H_c, representing the share of seats held by the President's party in the House. Including changes in its trend as an additional explanatory variable does not change the results from the benchmark case, as shown in the second column of Table 1. A negative and statistically significant coefficient associated with $\Delta Pres\ Seats\ H_c$ indicates that when the Presidency and the House are controlled by the same party, political disagreement—as reported by the media—declines.[12]

Interestingly, the share of seats controlled by the President's party in the Senate *Pres Seats* S_c has no significant impact on the partisan conflict index, as shown in column (3) of this table. This is reasonable given super-majority rules and filibusters in the Senate. For much of US history, filibusters were rare and only used in matters of great importance. Nowadays, they have become a major tool by which a large part of the majority party's Senate agenda is blocked by an organized minority party filibuster. The threat of a filibuster is typically proxied by the number of cloture motions filed, as they are filed not only to interrupt filibusters in progress, but also to preempt anticipated filibusters. The evolution of partisan conflict is remarkably similar to that of cloture motions filed (see Figure 7 in Appendix 5). Their correlation, computed between the 66th and 112th Congress, is 89%.[13]

The strong positive relationship between partisan conflict and cloture holds even after controlling for polarization and the distribution of political power, as seen from the highly significant coefficient of $\Delta Cloture_c$ in column (4) of Table 1. The model estimated is identical to the one in Specification (2), but augmented to incorporate changes in the trend of cloture motions filed. The model fit is better than in previous specifications, as indicated by an R2 of 0.55. Interestingly, polarization becomes insignificant once cloture is considered. This could be due to the fact that partisan conflict captures filibuster threats (recall that 'filibuster' is a word used in the search), whereas polarization is based only on actual votes. Notice,

[11] First differences are used to ensure stationarity.

[12] Notice that the trend is calculated by HP-filtering *Pres Seats* H_c.

[13] The number of motions filed prior to 1975 was close to zero, exhibited a large spike in early 1975 (beginning of the 94th Congress). This is due to a procedural reform by which the number of Senators needed to invoke cloture is reduced from two-thirds to three-fifths (about 60 out of 100). While this reform would explain an increase in the average number of motions filed, it does not explain the rising trend. Barber and McCarthy (2013) conjecture that the increasing portion arises as a result of rising polarization.

Table 2
The cyclical behavior of HPC.

Dep var: $\hat{HPC}_t$	(1)	(2)	(3)	(4)
$PresElec_t$	3.32**		3.12*	3.10*
	(1.53)		(1.63)	(1.63)
$MidtermElec_t$		1.91		
		(1.35)		
War_t	−2.95**	−3.28**	−2.37*	−2.39*
	(1.45)	(1.52)	(1.42)	(1.40)
$Recess_t$	−0.35	−0.28		
	(1.66)	(1.65)		
U_{t-1}			−0.024	−0.25
			(0.118)	(0.38)
Observations	123	123	112	112
R-squared	0.0580	0.038	0.049	0.05

Notes: The dependent variable is HP-filtered (using weight $w = 6.25$) historical partisan conflict. The independent variables in specification (1) are the dichotomic variables which take a value of 1 if there is a Presidential election ($PresElec_t$), a war (War_t) or a recession ($Recess_t$). Specification (2) considers a midterm election instead ($MidtermElec_t$). Specification (3) includes considers the lagged unemployment rate (U_{t-1}) as an alternative proxy for a recession, while specification (4) considers HP-filtered values of the unemployment rate (lagged one period). Sample period is 1891–2013 for specifications 1–3, and 1901–2013 for specifications (3) and (4). Each observation corresponds to a calendar year. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

however, that since I only have observations from the 66th Congress and onwards, the sample over which Specifications (2) and (4) are computed is different.

Media coverage. Because the partisan conflict index is based on news reports, changes in media coverage are also likely to impact the measure. The two variables exhibit a very similar trend (see Figure 6 in Appendix 5). Extending the benchmark regression in Eq. (1) to include changes in the trend of media coverage we find that the correlation between changes in the trend of media coverage and those in HPC is about 0.6, and statistically significant. Moreover, the resulting R2 is increased from 0.145 in the benchmark case (Specification 1) to 0.59 in Specification (5), as seen in Table 1. This result is robust to including other control variables such as the share of seats controlled by the President in the House or Senate, or the trends in cloture. Results are omitted due to space constraints, but are available upon request from the author.

That the HPC index is highly correlated with the share of news devoted to politics over time could be due to the fact that newspapers devote a larger share of news to politics in periods of high disagreement, precisely when investors are most interested in obtaining a signal about true partisan conflict. On the other hand, it could well be the case that trends in media coverage respond to other factors, such as competition from alternative news sources (i.e. TV, radio, or the internet) that emphasize political disagreement. The HPC index would be a more accurate reflection of true partisan conflict in the former case than in the latter case. I am mostly interested in the effect of news about partisan conflict on investors' decisions, regardless of whether these news are reporting true changes in political discord or are simply an artifact of media manipulation. It would be interesting, in future work, to try to disentangle the effects of these two forces more systematically.

2.2.2. Short-run fluctuations of HPC

In this section, I focus on the relationship between the HPC index and determinants of (true) partisan conflict at shorter frequencies. More specifically, I consider how changes in the cyclical component of HPC are related to: (i) elections, (ii) recessions, and (iii) wars. The benchmark model follows.

$$\hat{HPC}_t = \beta_0 + \beta_1 PresElec_t + \beta_2 War_t + \beta_3 Recess_t + \epsilon_t,$$

where $\hat{HPC}_t$ denotes the cycle component of HP-filtered partisan conflict data in year t, $PresElec_t$ denotes a dummy variable that takes a value of 1 in years where a presidential election is held. The dichotomic variable War_t takes a value of 1 if there is more than 1 military death per 100,000 people in the population in a given year and 0 otherwise.[14] This variable captures, for example, the Spanish-American War, WWI, WWII, the Korean War, and the most violent years of the Vietnam war. The variable $Recess_t$, which follows the NBER definition of a recession, is obtained from the Federal Reserve Bank of St. Louis FRED dataset. The results for the benchmark specification are summarized in the first column of Table 2, and will be discussed below.

(i) Elections. The most natural source of short-run fluctuations in the PC indicator is the arrival of election dates, an anticipated shock. We should expect the index to be higher than average during elections purely for mechanical reasons: Newspapers increase the proportion of articles covering political debates and emphasize differences between candidates during

[14] Data are obtained from http://violentdeathproject.com/countries/united-states.

those periods. In addition, partisan conflict may also intensify endogenously, as legislators try to pursue a particular agenda or block specific legislation to tilt election results in their party's favor (see Groseclose and McCarty, 2001 on strategic disagreement). Political agents (incumbent legislators, the opposition, the President, etc.) have incentives to exaggerate their positions to signal a particular type in an attempt to attract votes, also referred to as 'posturing' in the political economy literature (see Ash et al. (2014)). An estimated coefficient of $\beta_1 = 3.32$ indicates that the index does indeed spike in years in which Presidential elections take place. This is not the case when midterm elections are considered (see Specification 2). This result should be taken with caution, however, since there is a midterm election every other year in the historical sample. When shorter intervals are analyzed (e.g., at a monthly frequency), periods surrounding a midterm election are indeed characterized by higher observations of the index.

(ii) Recessions. The state of the economy can potentially affect true partisan conflict, and hence the index, in the short run. Recessions are periods when automatic stabilizers (such as unemployment benefits) kick in. Several of these stabilizers are highly redistributive in nature, and thus potentially conflictive. We should expect partisan conflict to intensify in "bad times," when revenues tend to be low and spending needs tend to be large. An example is the 2007 recession, when the subsequent conflict over tax-cut expirations led to gridlock and hence extreme values in HPC. Surprisingly, the HPC index is not statistically different during booms and recessions, as seen by the high standard error on the coefficient to *Recess*. This could be explained by the fact that recessions are seen as periods of 'national emergency,' were policy response is highly valued by voters. Inspection of Fig. 1 reveals that while HPC is significantly higher during the 1893 and 1911 panics, it takes one of it lowest values of the century during the Great Depression. To test the robustness of this result, I include alternative proxies for recessions in specifications (3) and (4). In (3), a lagged value of the unemployment rate (obtained from FRED) is introduced. In (4), a lagged value of the HP-filtered unemployment rate is used instead. The coefficients are statistically insignificant, reinforcing the observations that the state of the economy is not an important determinant of the cyclical behavior of the HPC index, at least at the annual frequency.[15]

(iii) Wars. Finally, I analyze how wars affect news about partisan conflict. Following Mueller (1973), a large strand of the political science literature has analyzed the effects of dramatic and sharply focused international crises (or wars) on the popular support of the President of the United States. The unprecedented increase in George W. Bush's public approval ratings, from 51% to 86% following the September 11th terrorist attacks, is a typical example of the 'rally around the flag" effect. Mathews (1919) argues that *one effect of war upon the party system (...) is to bring about, at least for a time, a relatively greater stability of party control, if not complete quiescence of partisanship, either through coalition or through cessation of party opposition, or both.* This would suggest that a rally around the flag should be observed at the party level. Interestingly, lower-than-average HPC scores are recorded during episodes of war and national security threats in the historical series. The clearest examples are given by the First War World and the Second War World in Fig. 1. As the third row of Table 2 indicates, HPC is significantly lower during wars even after other sources of short-term fluctuations are considered. One may argue that lower PC scores are observed during wars because newspapers devote a larger percentage of coverage to documenting events related to the war itself, rather than to government policy. Inspection of the evolution of the EPU suggests that this is not the case, as this series increases significantly during these events. An example is given by the large spike in EPU observed during 9/11, a period where partisan conflict reached record lows (relative to trend).[16]. This is discussed in more detail in Section 2.4, where I contrast the evolution of partisan conflict to that of EPU.

Taken together, the results of this section indicate that: (i) HPC is higher during Presidential elections, (ii) there exists a *partisan* rally-around-the flag, (iii) there is no evidence that HPC is higher during recessions than it is in booms (at annual frequencies).

2.3. The (more recent) evolution of partisan conflict

In this section I describe the more recent evolution of partisan conflict. The bottom panel of Fig. 1 depicts the benchmark PCI measure. Recall that this measure is more precise, due to the greater availability of digitized newspapers and the possibility of filtering out foreign news, among others. Additionally, it is computed at a monthly frequency, which allows us to better analyze the behavior of partisan conflict at shorter frequencies.

The first observation is that the index has fluctuated around a constant mean for most of the sample, but exhibited an increasing trend starting at the outset of the Great Recession (e.g., around 2007). The index reached its highest level of our 30-year sample period during the shutdown of 2013, a value closely followed by the unexpected victory of D. Trump in the 2016 Presidential election and his first two months in office.

The vertical lines in Fig. 1 (bottom panel) indicate months in which Congress held midterm elections. Consistently with fact (i), the index spikes when elections are held. The rally-around-the flag effect (fact ii. above) is even more evident when analyzing the monthly PCI, as the series is clearly below average during both Gulf Wars, the Beirut and Oklahoma City bombings and, particularly, 9/11 when it decreased dramatically from the spike associated with the Bush vs Gore election.

[15] Lagged values of GDP growth can also be used as alternative proxies for a recession (omitted due to space constraints). Their coefficients are also statistically insignificant.

[16] Recall that both EPU and the HPC index share the same denominator, namely, the number of newspaper articles during a period

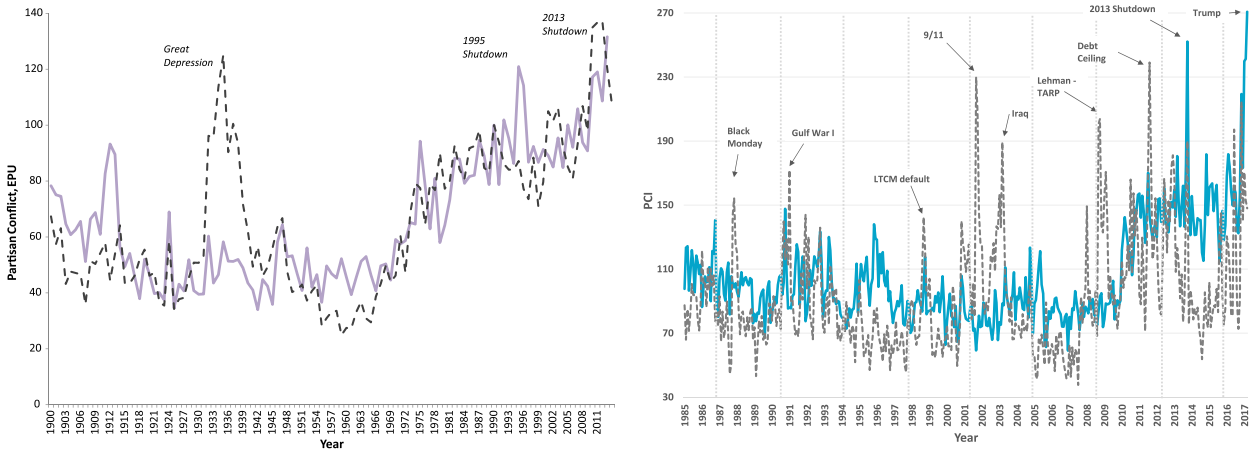

Fig. 2. Partisan conflict (solid) and news-based economic policy uncertainty (dashed). Left panel: Historical partisan conflict. Right panel: Benchmark PCI.

This reinforces the previous observation that partisan conflict subsides significantly not only when the country is at war, but also when it is subject to national security threats.

The figure also displays other historical events that resulted in deviations from the trend. Most noticeable are the government shutdowns of 1995 and 2013, the passage of "Obamacare," the debt ceiling debate, the partisan divide on immigration, and the potential repeal of the Affordable Care Act in early 2016. This is reassuring, suggesting that the indicator captures disagreement about well-known polemic issues. True partisan conflict is also expected to increase at short frequencies when polemic issues over which a decision must be taken arise in the legislative agenda. As Lowell (1902) noted *... the amount of party voting depends largely upon the accident of some question in which the parties are sharply divided happening to come up for decision... in England, parties frame the issues. In America the issues do not, indeed, make the parties, but determine the extent of their opposition to each other in matters of legislation.*[17]

2.4. Partisan conflict and economic policy uncertainty

The methodology used to compute the PCI is similar to the one Baker et al. (2016) followed to construct EPU. While we both use a semantic search approach to identify relevant newspaper articles, the set of words used in the searches is dramatically different. While these authors include the words 'economic/economy,' 'uncertainty' and proxies for 'policy,' I search for words that indicate disagreement between policymakers.

In addition, as EPU and PCI represent different concepts, they are characterized by distinctive features. High levels of partisan conflict are interpreted as situations where agreement between two parties that share decision-making power is hard to reach, so policies are expected to be less effective at preventing recessions and tail risks. Moderate levels of partisan conflict should be associated with positive economic policy uncertainty, as investors cannot predict which policies will be undertaken. Examples are the debt ceiling debate (will the government change taxes to avoid a fiscal cliff?), the passage of Obamacare (will Congress modify the health care system effectively, or will this result in an explosion of public debt?), or the uncertainty associated with tax expirations (will tax cuts expire or will the two parties agree on further extensions?). In situations like these, we would expect government dysfunction to induce economic policy uncertainty and the two indexes to move in tandem. Fig. 2, which depicts the PCI (solid line) together with the news-based EPU index (dashed line), shows that the indexes share a similar trend. The left panel of the picture includes historical partisan conflict, HPC whereas the right panel in the picture shows the benchmark PCI measure (monthly) alongside EPU.

Partisan conflict need not, however, always cause economic policy uncertainty to increase. Under extreme levels of partisan disagreement (e.g., when Congress is divided and polarization levels are high) the government may enter a gridlock state, or even a shutdown and the relationship between EPU and PCI may break, at least in the short-run. This is consistent with the behavior of the series in the right panel of Fig. 2 around the 2013 shutdown and more recently in the first half of 2017. Notice, however, that stalemate may still be detrimental for the economy. When the PCI reaches extreme values, investors become very pessimistic about the ability of the government to take the appropriate measures to reduce tail risks or less the effects of recessions, and this may depress investment (see Azzimonti, 2016).

There is no clear relationship between cyclical PCI and EPU (that is, between deviations from trend of these two variables). This happens because measured EPU may fluctuate as a consequence of factors unrelated to policy and regulation

[17] At a particular point in time, it is impossible, unfortunately, to disentangle whether partisan conflict is high because parties are ideologically far apart on a particular issue from the relevance of the issue per se. Polarization levels cannot, therefore, be inferred from PCI at very short frequencies. The index can be a better proxy for polarization over longer time spans where specific issues are "averaged out."

determined by the executive and legislative powers, and thus to partisan conflict. Inspecting the right panel of Fig. 2, we can see that EPU is affected by monetary policy (such as interest rate cuts by the Federal Reserve) but the PCI is completely unresponsive to it. This is reasonable, as monetary policy is chosen by an independent authority, but may cause (monetary) policy uncertainty. Finally, there are important differences in the behavior of the two variables in the presence of military conflict: While the EPU increases during wars or under national security threats (for example, 9/11 or the Gulf Wars), partisan conflict tends to remain relatively low or even decrease. The fact that the EPU increases sharply during these events indicates the existence of a substantial proportion of newspaper articles discussing government policy. These articles are not, however, reporting high levels of conflict between parties. This suggests that lower-than-average values of the PCI during national threats do indeed reflect rallies around the flag, rather than just being a by-product of changes in media coverage toward war-related news. Because of all these factors, the correlation between partisan conflict and the news-based index of economic policy uncertainty developed by Baker et al. (2016) is only 0.4 in the recent period (1985–2017).[18]

The last important difference between the two series lies on the fact that there exist two types of EPU. The first one, which has been explored in the theoretical section, relates to *which* policies would be chosen at each point in time, or more specifically, whether preventives policies would be implemented at all. The second one is associated with the uncertain *consequences* of policies that have already been chosen by the government (see Pastor and Veronesi (2013) for a theoretical discussion). Partisan conflict only causes the first type of uncertainty. Discussions surrounding the approval of a stimulus package or whether the debt-ceiling would be lifted to avert default are clear examples. The policies implemented in response to the Great Depression, 9/11, or the Iraq wars, on the other hand, faced little or no opposition, in a period of low political disagreement. For example, the New Deal was easily approved with a Democratic supermajority in both houses. The response to the terrorist attacks in 2001 was clearly a bipartisan effort. The large spikes observed in the EPU series result from uncertainty about whether the implemented policies would be effective (to end the Great Depression, to discourage further attacks, or to avoid a war with other Middle-Eastern countries), rather than about whether they would be implemented or not. The disconnect between the two series in these episodes is evident by looking a the historical partisan conflict and economic policy uncertainty series, depicted in the left panel of Fig. 2.

3. Partisan conflict and private investment

In this section, I explore empirically the effects of news about partisan conflict on private investment. In particular, I want to test whether innovations to the partisan conflict indicator and private investment are negatively related.

To do so, I take two complementary approaches. In the first one, I consider a VAR specification using yearly data from 1929 to 2013. Although this approach does not allow me to robustly identify a causal relationship between HPC and investment, it illustrates their long-run co-movement. Moreover, I can show that their relationship is not confounding the effects of other slow-moving variables such as polarization or the share of seats held by the President in Congress, neither it is capturing the effects of economic policy uncertainty.

In the second approach, I use the benchmark PCI series and panel data of publicly traded firms to identify the effects of partisan conflict on private investment. Using firm-level regressions that control for firm fixed-effects and calendar-quarter fixed-effects, I find that there is a significant negative correlation between the PCI and investment rates.

3.1. VAR approach

To test the impact of partisan conflict on aggregate investment, I estimate a vector auto regression (VAR) model and recover orthogonal shocks by using a Cholesky decomposition of the following: War, Recession, Divided Congress, Historical Partisan Conflict, Interest Rates, Log-Investment, and Log-GDP. War is proxied with the number of military deaths per 100,000 people in the population in a given year, while the recession indicator is obtained from the NBER. Investment and output are obtained from the Bureau of Economic Analysis (BEA), and correspond to seasonally adjusted 'Gross Private Domestic Investment' and 'Gross Domestic Product,' respectively. Real variables are constructed using the GDP deflator, and expressed in billions of 2005 dollars. Interest rates are proxied by Moody's Seasoned AAA Corporate Bond Yield, as this series goes back to 1929.[19] The sample is restricted to the period 1929–2013 due to lack of investment data prior to the start date.

In the baseline specification, I use yearly data with three-year lags. The VAR is stable, so impulse-response functions can be constructed. The top panel of Fig. 3 shows that an increase of a one-standard deviation of the—orthogonalized—shock to the historical partisan conflict index causes a significant and persistent reduction of log-investment. A standard deviation of the HPC corresponds to a 22.5 point increase in the index, implying a 13% reduction (on average) in aggregate real investment upon impact. The largest impact is seen after one year, in which investment declines 16%. Interestingly, HPC

[18] This correlation is computed using only the news-based index of economic policy uncertainty and not the final EPU. The reason is that tax expirations account for about one-third of the EPU index, which I wanted to exclude to make the comparison. If I use the benchmark EPU measure, which includes tax expirations, the correlation between the two indexes is about 0.43.

[19] Mortgage rates are available only since 1971 whereas the Federal Funds Rate is available from 1954.

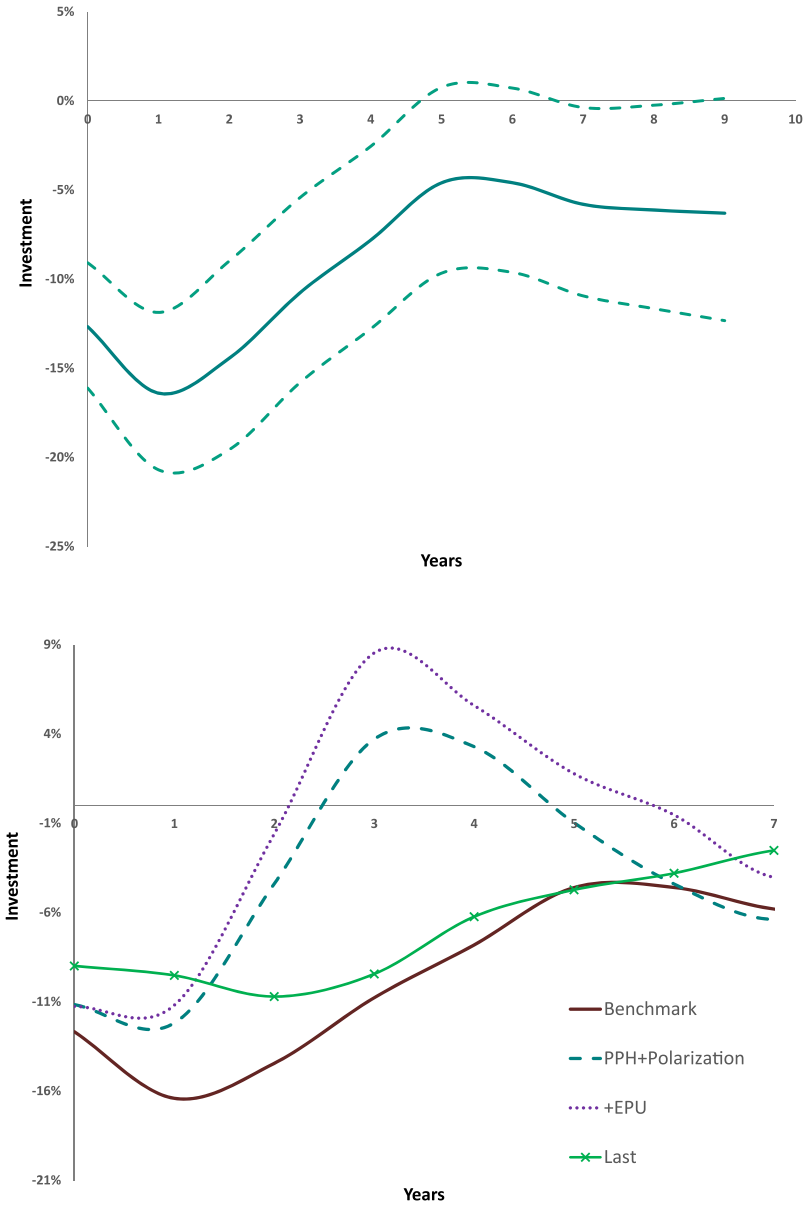

Fig. 3. Impulse-response function of investment to a one-standard deviation increase in HPC.
Notes top panel: Solid line: mean estimate; dashed outer lines: one-standard-error bands. Estimated using a yearly Cholesky VAR model with War, Recession, Divided Congress, Historical Partisan Conflict, Interest Rates, Log-Investment, and Log-GDP (in that order).
Notes bottom panel: 'Benchmark' (solid line) estimated using a VAR with War, Recession, Divided Congress, HPC, Interest Rates, Log-Investment, and Log-GDP (in that order); 'Last' (x-marker) uses War, Recession, Divided Congress, Log-Investment, Log-GDP, HPC; 'PPH+Polarization' (dashed line) includes: War, Recession, Divided Congress, PPH, Polarization, HPC, Log-Investment, and Log-GDP (in that order); Finally, '+EPU' (dotted line) considers: War, Recession, Divided Congress, PPH, Polarization, HPC, EPU, Interest Rates, Log-Investment, and Log-GDP (in that order).

increased by about 26 points (slightly above a one-standard deviation) between 2010 and 2011, suggesting that part of the slow recovery in investment could have resulted from investors' reaction to news about political turmoil.

Robustness to specification. The bottom panel of Fig. 3 shows the response of log-investment under alternative specifications. The solid line replicates the response obtained under the benchmark model. The line denoted 'Last' (solid with x-markers) considers an alternative ordering of the Cholesky decomposition: War, Recession, Divided Congress, Interest Rates, Log-Investment, Log-GDP, and HPC. That is, we allow for the possibility of log-investment and log-output to cause HPC. Even though the response is smaller, the qualitative result holds: increases in HPC are associated with declines in private investment. The dashed-line includes polarization and the share of seats held by the President in the House (PPH), two variables which were shown to be significant determinants in the trend of HPC. The model considers War, Recession, Divided

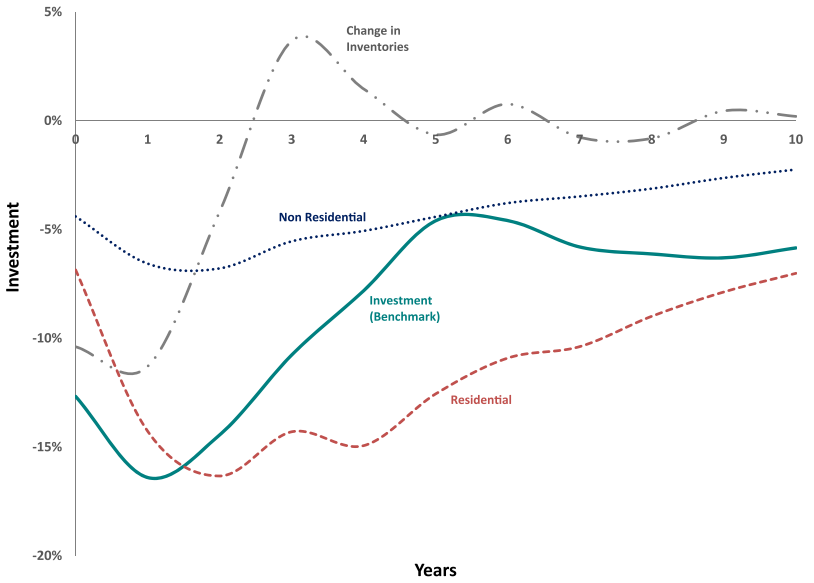

Fig. 4. Impulse-response function for different investment measures (of a one-standard deviation increase in HPC).
Notes: Solid line: Investment (in logs, benchmark measure). Dashed line: Private Residential Fixed Investment (in logs). Dotted line: Private non-residential fixed investment (in logs). Semi-dashed line: Change in Inventories. Estimated using a yearly Cholesky VAR model with War, Recession, Divided Congress, Historical Partisan Conflict, Interest Rates, Change in Inventories, Log-Non-Residential Investment, Log-Residential Investment, and Log-GDP (in that order).

Congress, PPH, Polarization, HPC, Interest Rates, Log-Investment, and Log-GDP (in that order). Finally, the dotted line incorporates EPU to the model.[20] We can see that the main result, namely that the relationship between HPC and log-investment is negative, is robust to several modifications of the benchmark model.

Decomposing the changes in investment. It is possible to decompose how the private sector reacts to a shock in partisan conflict by investigating the response of investment components, namely fixed residential and non-residential investment, as well as changes in inventories. The series 'Private Residential Fixed Investment,' 'Private Nonresidential Fixed Investment,' and 'Change in Private Inventories' are obtained from FRED (under the labels PRFIA, PNFIA, and CBIA, respectively).[21] Real variables are constructed using the GDP deflator, and expressed in billions of 2005 dollars. The VAR specification is analogous to the benchmark model, the only difference being the introduction of the three investment components. The Cholesky decomposition is now: War, Recession, Divided Congress, Historical Partisan Conflict, Interest Rates, Change in Inventories, Log-Non-Residential Investment, Log-Residential Investment, and Log-GDP. The results are presented in Fig. 4, which also depicts the response of our benchmark investment measure for ease of comparison.

The first thing to note is that the immediate (e.g. on impact) response of each individual investment component is smaller than in the benchmark model, with the largest effect observed in the decline of inventories. Secondly, the overall impact is much larger in residential investment (dashed line) than in non-residential investment (dotted line). Finally, the reductions in fixed investment (both residential and non-residential) are more persistent than those of inventories. The effect of partisan conflict vanishes in inventories after two years (standard errors omitted in the figure, but available upon request).[22]

In light of this result, a natural question arises as to whether these changes are driven by the recent housing and financial crisis. Figure 8 in Appendix 5 depicts the response of investment as computed in Figs. 3 and 4, together with those obtained by computing the same VAR models over the period 1929–2006 (e.g. excluding the Great Recession). The solid line in the first panel depicts the results for the benchmark investment measure, whereas the dashed lines represent standard errors. For ease of comparison, the dotted line replicates the response computed using the whole sample (1929–2013). The two estimations are similar, with persistence being somewhat smaller once the Great Recession is excluded (note that the previous estimation falls within the one-standard deviation band of the new model). This indicates that the response of investment to partisan conflict is not driven by the reaction of investment to the most recent financial crisis.

The second panel of Figure 8 in Appendix 5 shows the response of investment components for the two sample periods. The most noticeable difference, as expected, corresponds to the response of residential fixed investment. When the Great

[20] The ordering is War, Recession, Divided Congress, PPH, Polarization, HPC, EPU, Interest Rates, Log-Investment, and Log-GDP in that case.
[21] In contrast to the benchmark investment measure, these are not seasonally adjusted.
[22] For robustness, I have also computed the response to a partisan conflict shock of each component in a separate VAR model and the results are qualitatively similar. The joint specification seems more reasonable though, as errors affecting each component are likely to be correlated.

Recession is excluded from the sample, the estimated response of residential fixed investment (dotted line with circles) is smaller and significantly less persistent than when the full period is considered (solid line with circles). The standard errors are not shown for readability, but it is worth mentioning that the reduction in residential investment is statistically significant only for the first three periods after the innovation in partisan conflict. Even though the magnitude of the response to the shock is smaller when the period 2007–2013 is excluded, residential investment responds negatively to increases in partisan conflict. The response of non-residential investment is similar in the first few periods to the one obtained in the full sample (dotted and solid lines, respectively).

Taken together, these figures indicate that the lower persistence in overall investment to a partisan conflict shock is due to the behavior of residential investment. Its reduction upon impact, on the other hand, does not seem to depend significantly on whether the Great Recession period is excluded form the sample (this happens because the response of inventories is more marked for the period 1929–2006 than it is for the full sample, result omitted).

The results from this VAR specification should be interpreted as "informed correlations" between these variables, as the exercise does not allow us to isolate the causal effect of partisan conflict on aggregate investment.

3.2. Firm-level data approach

In this section, I exploit the heterogeneity of US publicly traded firms to study the effects of partisan conflict on private investment using a panel of Compustat firms. The econometric model is analogous to the one used by Gulen and Ion (2015) to understand the effects of policy uncertainty on corporate investment, but augmented to include the PCI as an additional regressor. I show that PCI is negatively related to firms' investment rates when both PCI and EPU are included. The result is robust to controlling for other determinants of corporate investment—such as firms' sales growth, Tobin's Q, and cash flows—and for aggregate economic conditions (such as GDP growth and expectations).

3.3. Data

Firm-level data is obtained from Compustat for the period 1987:Q1-2017:Q2. This time period has been selected to match the availability of the PCI at the quarterly level as well as operating cash-flows, obtained from the cash flow statement.

The benchmark specification, common to the investment literature, augments Gulen and Ion (2015)'s econometric model to include partisan conflict

$$\frac{CAPX_{i,t+1}}{TA_{i,t}} = \alpha_i + \beta_1 \ln(PCI_t) + \beta_2 TQ_{i,t} + \beta_3 SG_{i,t} + \beta_4 \frac{CF_{i,t}}{TA_{i,t-1}} + \beta_5 \ln(EPU_t) + \gamma \mathbf{M}_t + QTR_t + \epsilon_{i,t+1} \quad (2)$$

where i indexes firms and t indexes calendar quarters. The α_i's represent firm fixed-effects, whereas QTR_t is a set of calendar- and fiscal- quarter dummies, included to control for seasonality on corporate investment. Standard errors will be clustered at the firm and calendar-quarter levels to control for serial as well as cross-sectional correlation in the error term $\epsilon_{i,t+1}$ (see Petersen (2009)).

The dependent variable, $\frac{CAPX_{i,t+1}}{TA_{i,t}}$, represents the investment rate, e.g. capital investment (CAPX) as a percentage of lagged total assets (TA, corresponding to ATQ in Compustat).[23] The term $\frac{CF_{i,t}}{TA_{i,t-1}}$ denotes operating cash-flows normalized by total assets at the beginning of the period. Both CAPX and cash-flows (OANCF) are taken from the statement of cash-flows and 'quarterized' from their year-to-date values by taking first differences for fiscal quarters 2–4. The term $TQ_{i,t}$ denotes Tobin's Q, computed as the market value of equity plus the book value of assets minus the book value of equity, minus deferred taxes, all as a percentage of the book value of assets.[24] Sales growth $SG_{i,t}$ is computed as year-on-year growth in quarterly firm sales (SALEQ), included to control for firm investment opportunities.[25]

The main departure from the standard investment equation used in finance arises by including economic policy uncertainty and partisan conflict as additional controls. Partisan conflict is the natural logarithm of the quarterly index, $\ln(PCI_t)$ whereas EPU is the natural logarithm of the EPU index computed by Baker et al. (2016), $\ln(EPU_t)$. Note that I cannot include time fixed-effects in the specification, as it would absorb all the explanatory value of PCI and EPU. Because of this, it is important to also control for aggregate macroeconomic conditions $\mathbf{M}_t$ that may directly affect corporate investment opportunities (such as productivity or expectations) and may be correlated with the PCI at the quarterly frequency. In the benchmark model, $\mathbf{M}$ corresponds to lagged GDP growth, measured by the compounded annual rate of change of GDP (GDPC1 in FRED). Robustness tests will include other measures of expectations, described in more detail in the following section.

I exclude firms with less than three consecutive years (e.g. 12 observations) in the panel as well as firm-quarter observations with missing values in the relevant variables. I also exclude observations in which sales and total assets are either zero or negative. Finally, all primary variables are trimmed at the 1st and 99th percentiles of their distributions to reduce

[23] Quarter t corresponds to the calendar quarter rather than the fiscal quarter. This is done for consistency with PCI measures.

[24] More specifically, Tobin's Q (TQ) = [Market value of equity (PRCCQ * CSHOQ) + total assets (ATQ) - book value of equity (CEQQ) - deferred taxes (TXDITCQ)] / total assets (ATQ).

[25] Variables expressed in Canadian dollars, e.g., those with CURCDQ=CAD are converted to US dollars using quarterly exchange rate (EXCAUS), obtained from FRED.

Table 3
Standard investment regressions.

Dep. var.:CAPX/TA	(1)	(2)	(3)
Tobin's Q	0.165***		0.166***
	(0.005)		(0.005)
Cash flows/TA		0.028***	0.032***
		(0.0022)	(0.0022)
Observations	449,828	449,828	449,828
R-sq	0.026	0.006	0.027
Number of firms	14,143	14,143	14,143
Fixed effects	yes	yes	yes
Calendar- and fiscal- quarter dummies	yes	yes	yes

Notes: I regress quarterly investment rates CAPX/lagged total assets on the first lag of Tobin's Q and the first lag of operating cash-flows/ lagged total assets, fixed effects and a set of calendar- and fiscal-quarter dummies. Robust standard errors are in parentheses, clustered by firm and quarter. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4
Benchmark investment regressions.

	EPU			news-EPU	
Dep. var.:CAPX/TA	(1)	(2)	(3)	(4)	(5)
Partisan conflict,	−0.144***		−0.098***		−0.102***
	(0.011)		(0.011)		(0.011)
Economic policy uncertainty		−0.136***	−0.099***	−0.117***	−0.089***
		(0.008)	(0.008)	(0.006)	(0.006)
Tobin's Q	0.150***	0.147***	0.147***	0.147***	0.147***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Cash flows/TA	0.031***	0.031***	0.031***	0.031***	0.031***
	(0.00215)	(0.002)	(0.002)	(0.002)	(0.002)
Sales growth	0.059***	0.059***	0.058***	0.059***	0.058***
	(0.0023)	(0.002)	(0.002)	(0.002)	(0.002)
GDP growth	0.029***	0.013***	0.018***	0.013***	0.017***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	449,828	449,828	449,828	449,828	449,828
R-squared	0.035	0.035	0.036	0.036	0.036
Number of firms	14,143	14,143	14,143	14,143	14,143
Firm fixed effects	yes	yes	yes	yes	yes
Quarter dummies	yes	yes	yes	yes	yes

Notes: I regress quarterly investment rates CAPX/lagged total assets on first lags of: Tobin's Q, operating cash-flows/ lagged total assets, sales growth, macroeconomic conditions (GDP growth), economic policy uncertainty, partisan conflict, fixed effects and a set of calendar- and fiscal-quarter dummies. Robust standard errors are in parentheses, clustered by firm and quarter. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

the influence of outliers. This results in 492,744 firm-quarter observations, for a total of 14,143 firms. Summary statistics for the main variables of interest at the firm level are shown on Appendix 5 at Table 2.[26]

3.4. Investment rates and PCI

In order to ease comparison with previous studies, it is useful to present fixed-effect investment regressions using only Tobin's Q and operating cash-flows as independent variables. The results, summarized in Table 3, indicate that both variables have independent explanatory value. This is consistent with the findings in Erickson and Withed (2000) and Gulen and Ion (2015).

All variables have been normalized by their sample standard deviation in order to simplify the interpretation of coefficients and ease comparison across covariates. Hence, each estimated coefficient represents the change in investment rates as a proportion to their standard deviation to a one-standard-deviation increase in the respective independent variable.

The effects of partisan conflict on corporate investment are estimated in Table 4. The results corresponding to our benchmark specification, Eq. (2), are displayed in column (3). The first two columns present the results considering exclusively PCI (column 1) and EPU (column 2). Note that since both PCI and EPU have been logged, the normalizing constant is absorbed by the firm fixed-effects. The coefficients have then to be interpreted as the number of standard deviations by which the investment rate falls when PCI (or EPU) are increased by 100%. In the first case (when EPU is excluded), when PCI doubles, the investment rate declines in 0.144 standard deviations. If instead we were to consider only EPU (excluding PCI), a doubling of economic policy uncertainty would be associated with a decline in 0.136 standard deviations in the investment

[26] Because I excluded observations following a similar procedure to Gulen and Ion (2015), the sample has similar characteristics in terms of the moments displayed in Table 2. This can be seen by comparing the means and standard deviations above with those in Table 1 of their paper.

rate. It is worth mentioning that this value is very similar to that found by Gulen and Ion (2015) of 0.168 using basically the same econometric model (but a panel ending in 2013).

The interesting case of analysis is the one in which both EPU and PCI are included as regressors, under column (3). If PCI were to double, corporate investment rate would decline by 0.098 standard deviations once we control for EPU, equivalent to a decline of about 13% of the sample mean. The effect of EPU is similar in magnitude. Even though the coefficients of both variables are slightly lower when included simultaneously, they have independent explanatory value. This finding is reasonable, as the benchmark EPU measure is composed of three components: (i) the news search term, in which the authors look at the frequency of news using the word 'economic', 'policy', and 'uncertainty', (ii) a component which measures disagreement in inflation forecasts, and (iii) the amount of tax expirations, to control for uncertainty about future fiscal policy. The first and second components capture, among other things, uncertainty about monetary policy which the PCI ignores by construction. Hence, it is reasonable to expect EPU having a statistically significant effect after PCI is included. Interestingly, PCI is also statistically significant, indicating that the PCI is not just a proxy for EPU. While PCI may rise under policy uncertainty, it is also affected by gridlock and filibuster, which do not necessarily result in high levels of EPU. The coefficients suggest that partisan conflict may negatively affect investment rates through a first moment effect rather than only through a second moment (e.g. uncertainty).

The third component of EPU, tax expirations, is closely related to PCI. The reason being that partisan conflict tends to increase when tax expirations are approaching (as parties have a hard time agreeing on how to face potential changes in the budget). Because of this, it is worth analyzing what happens when the news component of EPU is included instead of the overall EPU measure in our econometric model. The results are displayed in columns 4 and 5. Comparing the economic policy uncertainty coefficients in columns 2 and 4, we can see that the effect of news-EPU on corporate investment is lower than that of the overall index even when PCI is not considered. In column 5, I include both PCI and news-EPU. While, as in the benchmark case (column 3), both coefficients are negative and statistically significant, I find that PCI has a stronger effect than news-EPU on investment rates. Finally, note that the coefficients on the firm-specific control variables (cash-flows, Tobin's Q, and sales growth) are basically unchanged across columns.

3.5. Omitted variables: the role of expectations

A common problem in interpreting the causal effect of the coefficients on PCI and EPU arises because these variables may be capturing the effect of changes in firm's investment opportunities. For example, high levels of EPU may be observed when the economy is in a downturn and investment opportunities are low. Policymakers may be pushed to enact new legislation or decide to give out bailouts during recessions, which may at the same time heighten partisan conflict. To the extent that EPU and PCI are countercyclical, the estimates may be biased due to omitted variables in the control set. The literature has tried to address this by augmenting the model to include alternative measures of expectations (see Gulen and Ion (2015) or Baker et al. (2016)).

In this section, I augment the benchmark specification to include expected GDP growth and the Michigan consumer confidence index, to proxy for expectations. Expected GDP growth (USSLIND) is obtained from the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters. The measure predicts the six-month growth rate between the mean GDP forecast and the current GDP level. The consumer confidence index (UMCSENT), constructed by the University of Michigan, is included to control for consumer expectations about the economy.

The estimated coefficients are shown in Table 5. The first two columns use the overall EPU index as a measure of policy uncertainty, whereas the last two use the news-EPU component of the index. The coefficients on Tobin's Q, sales growth and cash-flows are unchanged from Table 4, and hence omitted from the table for readability. In the first and third columns, I only consider changes in expected GDP growth. Intuitively, increases in expected GDP growth induce more corporate investment. In columns 2 and 4, I include growth expectations as well as consumer confidence as regressors. The relationship between consumer confidence and investment rates is also positive and statistically significant. Interestingly, the coefficient on EPU becomes smaller in magnitude (though still statistically significant) whereas that on PCI becomes larger. This is potentially due to the fact that the correlation between consumer sentiment and EPU (-0.71) is much higher than that between consumer confidence and the PCI (-0.29). When expectations are controlled for, I estimate that capital investment declines by as much as 0.165 standard deviations when PCI doubles if using the overall EPU index and 0.156 if using news-EPU instead.

3.6. Model mis-specification: investment without Q

Another potential problem with the results presented so far is that the coefficients could be biased because of mis-specification in the equation determining corporate investment at the firm level. Gala and Gomes (2016) provide an alternative specification for the investment policy function which does not rely on Tobin's Q, and hence does not require information about market value. In general, the rate of investment can be written as

$$\frac{I_{t+1}}{K_t} = G(K_t, Z_t)$$

where K_t denotes the stock of capital, I_{t+1} investment, and Z_t a set of state variables affecting investment. The functional form of G depends on assumptions about the production function, the revenue and profit functions, etc. But, according to the

Table 5
Including additional controls for macroeconomic conditions.

	EPU		news-EPU	
Dep. var.:CAPX/TA	(1)	(2)	(3)	(4)
Partisan conflict	−0.170***	−0.165***	−0.170***	−0.156***
	(0.0121)	(0.0119)	(0.0124)	(0.0119)
Economic policy uncertainty	−0.064***	−0.051***	−0.060***	−0.053***
	(0.00855)	(0.010)	(0.007)	(0.007)
GDP growth	−0.002	−0.002	−0.002	−0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Expected GDP growth	0.035***	0.032***	0.034***	0.029***
	(0.003)	(0.003)	(0.003)	(0.003)
Consumer confidence		0.008**		0.012***
		(0.003)		(0.003)
Observations	449,828	449,828	449,828	449,828
R-squared	0.037	0.037	0.037	0.037
Number of firms	14,143	14,143	14,143	14,143
Quarter dummies	yes	yes	yes	yes

Notes: I regress quarterly investment rates CAPX/lagged total assets on lags of: Tobin's Q, operating cash-flows/ lagged total assets, sales growth, economic policy uncertainty, partisan conflict, fixed effects and a set of calendar- and fiscal-quarter dummies. To control for macroeconomic conditions, columns 1 and 3 include lagged realized GDP growth and expected GDP growth; columns 2 and 4 include, in addition, the (lagged) Michigan consumer confidence index. Columns 1 and 2 use overall EPU index, whereas columns 3 and 4 use the news-based index as measures of policy uncertainty. Robust standard errors are in parentheses, clustered by firm and quarter. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

authors, it can be approximated using a simple polynomial (of second order in their favored specification). In this section, I analyze the robustness of previous results to a specification that follows Gala and Gomes (2016). In particular, I estimate the following equation

$$\frac{I_{i,t+1}}{K_{i,t}} = \alpha_i + \beta_1 \ln(PCI_t) + \beta_2 \ln\left(\frac{Y_{i,t}}{K_{i,t-1}}\right) + \beta_3 \ln K_{i,t-1} + \beta_4 \ln(EPU_t) + \gamma \mathbf{M}_t + QTR_t + \epsilon_{i,t+1} \tag{3}$$

where i indexes firms, t indexes calendar quarters, α_i's represent firm fixed-effects, and QTR_t a set of calendar- and fiscal-quarter dummies. The term $\ln K_{i,t-1}$ captures firm size at the beginning of the period, whereas $\frac{Y_{i,t}}{K_{i,t-1}}$ represents the sales-to-capital ratio. Partisan conflict and economic policy uncertainty are in natural logarithms, as in the previous section. The term $\mathbf{M}_t$ includes GDP growth, expectations about GDP growth, and the Michigan consumer confidence index, described in more detail in Section 3.5.

Firm size is proxied by the natural logarithm of net property, plant and equipment $K_{i,t} = PPNTQ$, where $K_{i,t}$ denotes the capital stock. Investment is proxied by the first difference in (gross) property plant and equipment ($I_{i,t} = PPGTQ_{i,t} - PPGTQ_{i,t-1}$). This variable is used because capital expenditures in plant and equipment are unavailable at the quarterly level. The investment rate is simply the ratio between $I_{i,t}$ and the capital stock $K_{i,t-1}$ at the beginning of the period. Sales $Y_{i,t}$ (SALEQ) are scaled by the beginning of the period capital stock as well. Following Gala and Gomes (2016), the sample only includes manufacturing firms (SIC 2000–3999). I restrict them to have at least three years of consecutive data in the interval 1987:Q1-2017:Q2. Observations in which total capital, the book value of assets, and sales are negative or zero are excluded. Finally, I eliminate outliers by excluding the 1st and 99th percentile of the distribution of all relevant variables. The final sample is composed of 126,196 firm-quarter observations, for a total of 4418 distinct firms.[27]

Table 6 summarizes the estimated coefficients of Eq. (3). The first column includes only linear terms, whereas the second column adds quadratic terms for sales and firm size. The last column considers news-EPU instead of the overall index. As in previous sections all variables are normalized by their sample standard deviations, with the exception of partisan conflict and EPU. The interpretation of our coefficient of interest is the same: if PCI doubles, we would expect the investment rate of manufacturing firms to decline by 0.095 standard deviations. To put this number on perspective, note that $\ln PCI$ was 4.42 in 2007 and reached 4.97 in 2011. This 0.55 change (if it happened all in a single quarter) would have been associated with a 14.5% decline in the investment rate of the average manufacturing firm.[28]

[27] There are some differences in the sample relative to Gala and Gomes (2016). First, they consider annual data between 1970–2010 whereas I focus on quarterly data between 1987–2017. Second, my measure of investment is different, as they are using capital expenditures on property, plant and equipment whereas I construct this from the capital stock (due to unavailability at the quarter frequency of their proxy). In addition, the regression equation is not identical. This is due to the fact that they control for time fixed-effects. Since I want to estimate the effects of PCI, I cannot include time fixed-effects and I am instead including quarter fixed effects to deal with seasonality as well as the set of variables M to control for aggregate macroeconomic conditions.

[28] This number is computed as follows. The average investment rate in the sample is 0.051, with a standard deviation of 0.14. Hence, the change in investment is $0.095 \times 0.55 \times 0.14/0.051 \times 100$.

Table 6
Alternative investment policy function.

	EPU		news-EPU
Dep. var.:I/K	(1)	(2)	(3)
Partisan conflict	−0.095***	−0.096***	−0.096***
	(0.022)	(0.022)	(0.022)
Economic policy uncertainty	−0.062***	−0.061***	−0.043***
	(0.019)	(0.019)	(0.014)
$\ln \frac{Y}{K}$	0.193***	0.190***	0.190***
	(0.011)	(0.011)	(0.011)
$\ln K$	−0.305***	−0.247***	−0.246***
	(0.020)	(0.036)	(0.036)
$\left(\ln \frac{Y}{K}\right)^2$		0.026***	0.026***
		(0.005)	(0.005)
$(\ln K)^2$		−0.017	−0.016
		(0.011)	(0.011)
GDP growth	−0.003	−0.003	−0.002
	(0.004)	(0.004)	(0.004)
Expected GDP growth	0.029***	0.029***	0.028***
	(0.005)	(0.005)	(0.005)
Consumer confidence	0.016***	0.016***	0.021***
	(0.006)	(0.006)	(0.005)
Observations	126,196	126,196	126,196
R-squared	0.030	0.030	0.030
Number of firms	4418	4418	4418
Quarter dummies	yes	yes	yes

Notes: I regress quarterly investment rates on lags of: sales-to-capital, firm size, economic policy uncertainty, and partisan conflict, fixed firm effects and a set of calendar- and fiscal-quarter dummies. To control for macroeconomic conditions, I include lagged realized GDP growth, expected GDP growth and the (lagged) Michigan consumer confidence index. columns 1 and 2 use overall EPU index, whereas column 3 uses the news-based index as measures of policy uncertainty. Robust standard errors are in parentheses, clustered by firm and quarter. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4. Conclusion and extensions

This paper investigates whether news about partisan conflict and private investment are negatively related. I develop an index of partisan conflict based on a semantic-search approach on newspaper articles. This index is constructed both annually for a long time horizon (1891–2013) and monthly between 1981 and 2017. The latter is updated every month by the Real Data Center of the Federal Reserve Bank of Philadelphia.

I first show that the indicator has a plausible behavior, consistent with that of other variables determining the political process such as polarization and political power, trends in media coverage, and short-term shocks that are expected to affect true partisan conflict. Using annual data, I show that the historical index is negatively associated with real aggregate investment in the US. Using quarterly data from Compustat, I show that innovations to the benchmark PCI index result in lower investment rates at the firm level. This is robust to including other standard regressors such as cash-flows, Tobin's Q, sales growth of the firm, EPU, and proxies for macroeconomic conditions.

This is a first step towards understanding the effects of political disagreement on economic outcomes, and as such it could be improved in several dimensions. First, the index only considers the frequency of articles reporting political discord but ignores the intensity and relevance of alternative news articles. Second, the analysis makes exclusive use of newspapers, ignoring other sources of news such as cable TV, internet outlets, and social media. It may be interesting to study the effect of these alternative sources of information, particularly social media, on investors' expectations in future work. Finally, the series is computed for the US by focusing on national newspapers. It would be interesting to compute the PCI at the state or regional level to understand the effects of local partisan conflict on investment decisions.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at 10.1016/j.jmoneco.2017.10.007.

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