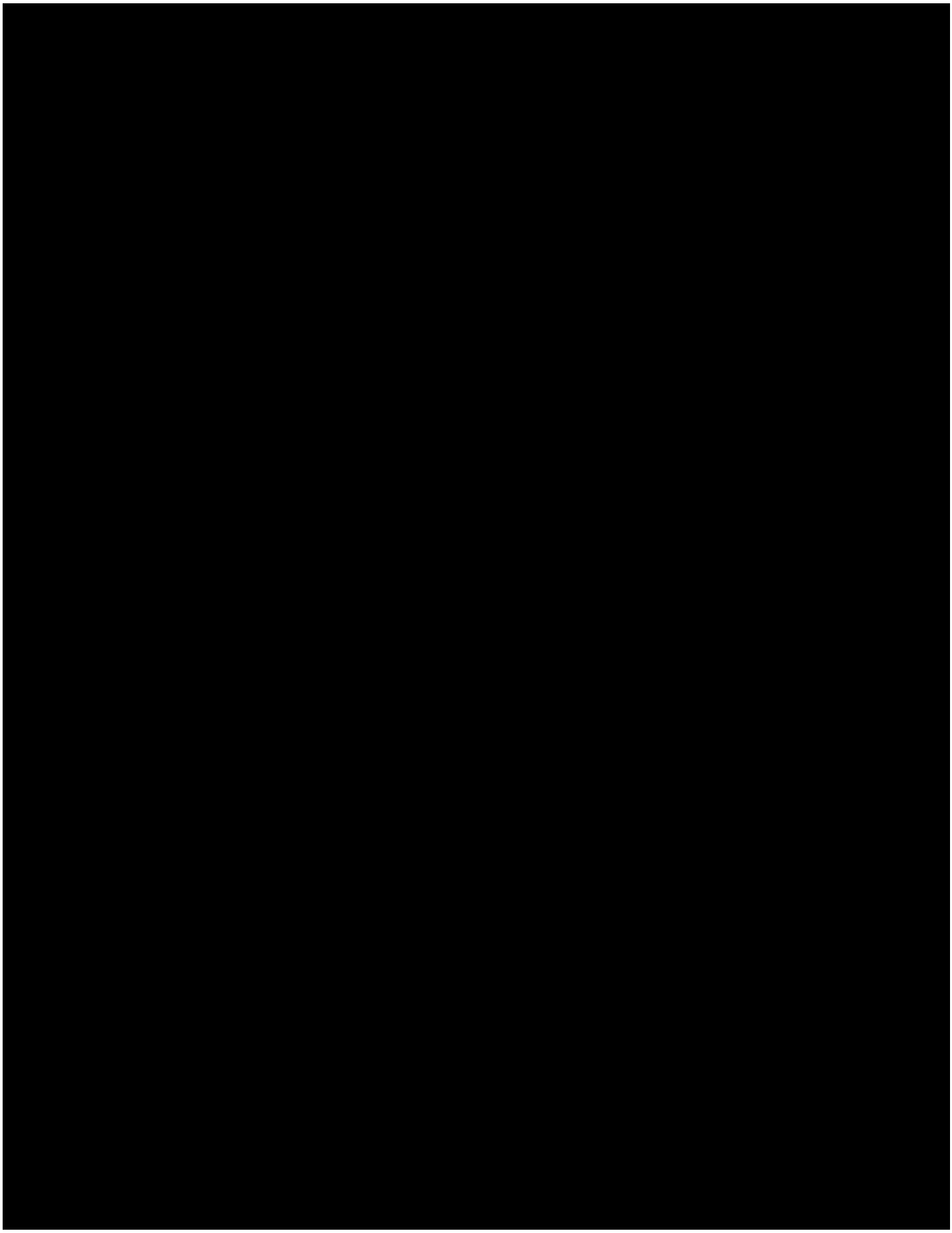

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Economic Policy Uncertainty in Turkey

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Abstract

Uncertainty over economic policy plays a key role in economic outcomes. But evidence and quantification for emerging markets are elusive because of measurement and reverse causality issues. In this paper, we construct a news-based economic policy uncertainty (EPU) index for Turkey and assess how it affects Turkish firms. To disentangle the issues of endogeneity and reverse causality, we use a difference-in-differences approach, exploiting the fact that firms with a high share of irreversible investment are more exposed to policy uncertainty. In sectors with large irreversible investment EPU has a greater effect on growth, investment, and leverage. The results are robust to different definitions of investment irreversibility, lag structure, and selection of sectors.

JEL Classification Numbers: D25, D80, E22, E66, L20, M51

Keywords: Policy uncertainty, economic uncertainty, Turkey, firm-level, sector-level, investment decisions, employment growth, leverage strategies, diff-in-diff estimation.

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I. INTRODUCTION[1]

"Even though the business man could not know in advance the results of individual ventures, he could operate and base his competitive offers upon accurate foreknowledge of the future if quantitative knowledge of the probability of every possible outcome can be had."

—Risk, Uncertainty, and Profit (Knight, 1921)—

"The state of long-term expectation, upon which our decisions are based, does not solely depend, therefore, on the most probable forecast we can make. It also depends on the confidence with which we make this forecast—on how highly we rate the likelihood of our best forecast turning out quite wrong. If we expect large changes but are very uncertain as to what precise form these changes will take, then our confidence will be weak. […] The state of confidence, as they term it, is a matter to which practical men always pay the closest and most anxious attention. But economists have not analysed it carefully and have been content, as a rule, to discuss it in general terms."

—The General Theory of Employment, Interest, and Money (Keynes, 1936)—

Uncertainty has long been a central concept in economics. At the micro level, economic agents prefer to postpone consumption and investment decisions when uncertainty is high (Arrow, 1968; Bernanke, 1983; Pindyck, 1988; and Rodrik, 1991). This rational individual response, in turn, can result in insufficient aggregate demand and consequently in an increase in unemployment at the macro level (Leduc and Liu, 2016). In recent years, concerns over uncertainty have focused on the policy aspect of uncertainty as it has been argued that policy uncertainty may have contributed to the slow recovery from the global economic crisis.[2] At the same time, continued political turmoil in many countries around the world has created more political uncertainty, which has possibly contributed to business decisions being put on pause.

While many countries have experienced economic policy uncertainty (EPU), Turkey stands out in the recent decade, making it an ideal case study. Past events – such as the failed coup attempt, the subsequent dismissal, detention or suspensions of many public employees, and the constitutional referendum to replace the parliamentary system with a presidential system – have brought policy uncertainty to the forefront of public perceptions, and made Turkey an interesting case to study the effect of EPU.

[1] We would like to thank Professor Steven Davis for invaluable suggestions and discussions in the preparation of the economic policy uncertainty index. We also acknowledge excellent research assistance provided by Jingzhou Meng. The views expressed in this paper are those of the authors and do not necessarily represent the views of the IMF, its Executive Board, or IMF management. All remaining errors are ours.

[2] See for example, IMF (2012); IMF (2013); Baker et al (2013); Williams (2013); Matthes and Sablik (2014); Bloomberg View (2015); ECB (2016); and Baker et al (2016).

(continued…)

The investigation of the role of EPU in Turkey presents two challenges. First, there is no publicly available and unbiased index of EPU for Turkey covering a long period until recent years;[3] and second, reverse causality could make our results difficult to interpret.

We construct a measure of EPU for Turkey, following the news-based approach of Baker et al (2016). The constructed EPU index measures the frequency of news articles about economic policy uncertainty, and hence, could reflect the public's perception of policy-related uncertainty. The main difference between a news-based uncertainty index and a traditional measure of volatility based on market indicators is that a news-based measure captures not only realizations of policy risks and uncertainty, but also anticipations of volatility. In addition, a news-based measure could be tailored to specific types of policy uncertainty beyond those related purely to financial markets. Finally, an EPU index measures also non-insurable uncertainty.

The EPU index is constructed on a monthly basis from 1996 to 2017, with the aim to examine how it has evolved over time and the relations between the constructed index and economic developments over the past two decades.

Our EPU index differs from most of the EPU indices constructed for other countries because it mainly uses *foreign* newspapers rather than *Turkish* newspapers as the primary source.[4] This is important as foreign newspapers directly capture international perceptions on Turkey's EPU, which could be more relevant given the connection between the economy and foreign sentiment. In addition, foreign news sources span longer periods than Turkish newspapers.

Despite its importance, the study of the effects of uncertainty on the economy has been problematic because of identification issues. Policy uncertainty affects macro-economic variables. At the same time, macro-economic shocks can generate policy uncertainty, especially if the policy makers' reactions are unclear.

To identify the causal effects of economic policy uncertainty, we adopt a difference-in-differences (DID) strategy, exploiting the fact that firms (or sectors) with high irreversible investments are more exposed to economic policy uncertainty (Bernanke, 1983; Pindyck, 1988; Rodrik, 1991; and Dixit and Pindyck, 1994). In other words, firms with more irreversible investments have higher upfront fixed and sunk costs and would benefit from waiting until uncertainty is reduced. They are therefore "treated" more intensely by an increase in economic policy uncertainty.

[3] A few studies have attempted to construct an EPU index for Turkey (Ermyisoglu and Kanik, 2013; and Sahinoz and Cosar (2018a; and 2018b). They however rely on domestic newspapers, which do not span a long period. While the domestic-based EPU index (Sahinoz and Cosar, 2018a; and 2018b) starts from 1996, foreign newspapers in our news sources, Dow Jones' Factiva news aggregator, are available from 1990 onwards. The domestic-based index also does not focus on international perceptions, which are crucial for the Turkish economy (as well as our outcome variables of interest) given its reliance on external conditions and sentiments. Furthermore, these indices are not publicly available.

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

We assess how EPU affects Turkish firms in the real sector in the three following aspects: (i) fixed investment decisions; (ii) employment decisions by companies; and (iii) leverage strategies. Fixed investment decisions have been the theoretical focus of the effect of uncertainty in economic decision (Dixit and Pindyck, 1994). Hiring and firing have also a high degree of irreversibility in Turkey given the stringent labour law. Finally, the decisions on leverage are a proxy for confidence about the state of the economy in the future.

Our empirical results point to a causal effect of policy uncertainty on investment and leverage strategies in sectors that have high exposure to economic policy uncertainty. For these sectors, an increase in economic policy uncertainty is found to lower investment as well as debt leverage. The deleveraging effects are driven more by a reduction in short-term borrowing, resulting in an impact of economic policy uncertainty on the term structure of debt issuance. Our results offer limited guidance about the policy uncertainty impacts on employment. This could be due to effects on the composition of employment, such as skilled versus low-skilled employment and short-term versus long-term contracts, instead of the overall level. In addition, the substantial increase in the labour supply over this period, as well as structural changes in the country's growth dynamics and drivers (IMF, 2018), could have muted the impact of policy uncertainty on employment. Overall, our results are robust to alternative measures of exposure to policy uncertainty and more restrictive specifications with a full set of time controls.

The paper is structured as follows. First, we discuss the related literature and how the paper contributes to the literature. Subsequently, Section III explains how we construct the EPU index for Turkey and discuss its evolution over time. The construction of the sector level data is presented in Section IV. In Section V, we describe the identification strategy. Section VI examines the impacts of economic policy uncertainty and Section VII provides robustness checks of the empirical estimation. Section VIII concludes.

II. Related Literature and Contribution to the Literature

The role of uncertainty has been long recognised in economics, particularly in investment decisions, which are generally defined as decisions to incur upfront costs in expectations of future returns. The early literature demonstrates that it is rationale to invest in any project with a positive net present value and higher uncertainty can actually increase returns to investment if it creates an upside risk to a project (Hartman, 1972; Abel, 1983; and Paddock et al, 1988). However, this conclusion relies on crucial assumptions that investors cannot delay investment but can adjust or reverse their investment without any costs to avoid investment losses when downside risks of uncertainty materialise. As most investments do not meet these conditions, more general investment models are further developed to address the interaction between uncertainty, irreversibility, and the choice of timing (Arrow, 1968; Bernanke, 1983; Pindyck, 1988).

In these more general models, the ability to delay irreversible investment can be viewed as a financial call option with the right (but not the obligation) to invest in an asset within a specific time in the future, and a decision to invest can be equivalent to the exercising of an option (Dixit and Pindyck, 1994). In this set up, investment irreversibility implies an opportunity cost of investing now as opposed to waiting. Similar to standard financial option contracts, higher uncertainty would raise the option value of waiting to invest, which results in greater incentives

to keep these options open. Therefore, uncertainty has a negative impact on business investment by discouraging or postponing investment. Subsequent studies extend the investment-uncertainty model to allow for multiple (heterogeneous) capital investment (Eberly and van Mieghem; 1997; Bloom et al, 2007; and Drakos, 2012). In the presence of multiple capital goods, a firm's gross investment could be decomposed into the number of capital goods a firm invests in (the extensive margins), and the investment per type of capital goods (the intensive margins). Most studies show that variations in uncertainty are associated with variations in investment at both the intensive and extensive margins.

Developed from the similar real option theoretical underpinnings, later literature focuses explicitly on the impact of *economic policy* uncertainty, as opposed to general *macroeconomic* uncertainty, on investment and business cycle volatility (see for example, Rodrik, 1991; Hassett and Metcalf, 1999; Altug et al, 2009; Fernandez-Villarverde et al, 2011; Born and Pfeifer, 2014; Fernandez-Villarverde et al, 2015; Gulen and Ion, 2015; Baker et al, 2016; and Hlatshwayo; 2016). These existing studies confirm negative impacts of uncertainty related to policy developments. Meanwhile, some studies further demonstrate possible effects of policy-related uncertainty on other outcome variables that are related to a firm's decision, such as hiring, borrowing, capital structure choices (see for example, Cao et al, 2013; Mathy and Ziebart, 2014; Baker et al, 2016; and Hlatshwayo, 2016). Similar to investment, these decisions are partially irreversible but delayable, and hence could be adversely affected by policy uncertainty.

Nonetheless, only very few of the studies that focus on policy uncertainty attempt to correct for pervasive endogeneity and reverse causality issues. Using firm-level micro data, these few studies address the issue of endogeneity between EPU and economic outcomes through the use of instrumental variables, or by introducing a measure of firm-specific exposure to EPU. For example, Gulen and Ion (2015) use the level of political polarization in the US as an instrument that has a strong relationship with policy uncertainty and affects investment only through this relationship. However, the validity of the chosen instrument has been called into question as political polarization was found to be affected by macroeconomic conditions and outcomes (Funke et al, 2015). Meanwhile, firms' exposure to EPU has been measured by its reliance on government purchases of goods and services (Baker et al, 2016), and/or its initial export share (Hlatshwayo, 2016), which have not been backed up by a well-established theoretical framework or empirical evidence.[5]

III. MEASURING ECONOMIC POLICY UNCERTAINTY

Economic uncertainty has been measured in several ways. Traditional measures of uncertainty include variations in macroeconomic variables (such as GDP, inflation, and exchange rates), their projections among forecasters, and their forecast errors. Some other market-driven measures include volatility in market indicators (such as, equity returns, and sales growth), and other risk proxies (such as, spreads on credit default swaps (CDS) and other financial

[5] This is unlike in our paper where firms' exposure to EPU is measured by the degree of investment irreversibility, which affects firms' investment decision especially during the period of high uncertainty (Bernanke, 1983; Pindyck, 1998; Rodrik, 1991; and Dixit and Pindyck, 1994).

(continued…)

instruments). Meanwhile, some other studies use various fluctuations in policy parameters as a measure of policy uncertainty. For example, monetary policy uncertainty is proxied by real interest rate volatility, while volatilities of tax and government spending policies are often adopted as measures of fiscal policy uncertainty. The calculation of these traditional measures is relatively straightforward and based on plausible assumptions.[6]

However, the validity of these traditional uncertainty measures has been subject to debate, both in academia and the media. First, the use market-driven indicators assume a link between the views of financial insiders and the general population, à la *Wall Street versus Main Street views* (Bloom, 2009; Alexopoulos and Cohen, 2009; and Lumnsdaine and Potter van Loon, 2013). Second and more generally, some of these traditional measures reflect uncertainty or policy uncertainty that has already taken place in some form; and exclude an anticipation of volatility that is not realised. Finally, most of the traditional measures do not directly capture economic policy-related uncertainty, which is often central to policy makers' interests, but rather broad macroeconomic uncertainty.

In light of these concerns about the validity of traditional measures of policy uncertainty, we construct our EPU measures based on a news-based approach (Alexopoulos and Cohen, 2009; and Baker et al, 2016). As standard in this literature, the degree of economic policy uncertainty is proxied by how often discussions related to EPU appear in major newspapers. Under this approach, discussions on uncertainty in the media can also be tailored to specific types of uncertainty – such as policy-related uncertainty, which is of our interests, or even further to uncertainty over specific policy arears. The news-based uncertainty measure can also capture anticipation of volatility, regardless of its realization.

Constructing a News-Based EPU Index for Turkey

In this paper, we construct an EPU index for Turkey, following closely the news-based approach proposed by Baker et al (2016). The monthly EPU index is constructed based on newspaper coverage frequency as follows.

First, our primary news source is Dow Jones' Factiva news aggregator.[7] Factiva's global news database covers nearly 33,000 news sources, both online and print, in 28 languages from nearly 200 countries since 1980s.[8] Among English-language sources, we further confine the news database to Turkish news sources and Factiva's Top Sources, which include major newswires

[6] For instance, variation among forecasters and the lack of predictability are explained by the degree of policy uncertainty; financial volatility can reflect the state of macroeconomic uncertainty; and there is a correlation between risks and uncertainty.

[7] https://global.factiva.com.

[8] As discussed in Section I, English-language newspapers directly reflect international perceptions on Turkey's EPU, which is likely more relevant to the economy. They also span longer period than Turkish newspapers.

(continued…)

and major digitized newspapers.[9] Being a major emerging economy, Turkey has plenty of external analysts and is often in the news; this ensures continue and careful coverage.

Second, we develop search algorithms to count articles that reflect discussions on economic policy uncertainty. News articles must mention words in each of the three following areas; *economics*, *policy*, and *uncertainty*. To ensure that articles are related to Turkey, these three mentions must be within 10 words of "Turkey" or "Turkish". In addition, searches are filtered by geographic coverage to cover only those tagged by Factiva to be related to Turkey.[10] Wordings related to *economics* and *uncertainty* are straightforward and similar to those of Baker et al (2016); namely, "economic" or "economy" and "uncertain" or "uncertainty" as well as their close synonyms and variants. However, mentions of *policy* could differ significantly across countries due to institutions and policy relevance. For article searches for Turkey, the *policy* term includes policies related to both fiscal and monetary issues, and relevant institutions – such as the Treasury, the Ministry of Finance, the Central Bank of Turkey, the Banking Regulation and Supervision Agency, and their respective variants and abbreviation. An eye-ball audit of articles is also conducted to help identify wordings that enable more precise search algorithms and pick up relevant articles. This is important because the media tends to use different vocabularies in different countries and during different time periods to reflect the three keywords. Appendix 1 lists the wordings for each of the three keywords.

Third, the monthly raw counts of EPU-related articles are normalized by the counts of all news articles. This is because the overall volume of articles varies over time, so an observed increase in mentions of policy uncertainty could simply reflect an increase in the overall volume of articles. It is also plausible that the overall volume of articles moves together with policy uncertainty (Baker et al, 2016). Like existing literature, due to search platform limitations, the normalizer is the total counts of economics- and politics-related articles in Factiva Top Sources and the English-language Turkish news sources, containing the common and neutral term "today".

Fourth and finally, for ease of interpretation, the scaled EPU index is standardized to a one-unit standard deviation and is normalized to a mean of 100 (from 1996 to 2017).

Evolution of the Constructed Economic Policy Uncertainty Index for Turkey

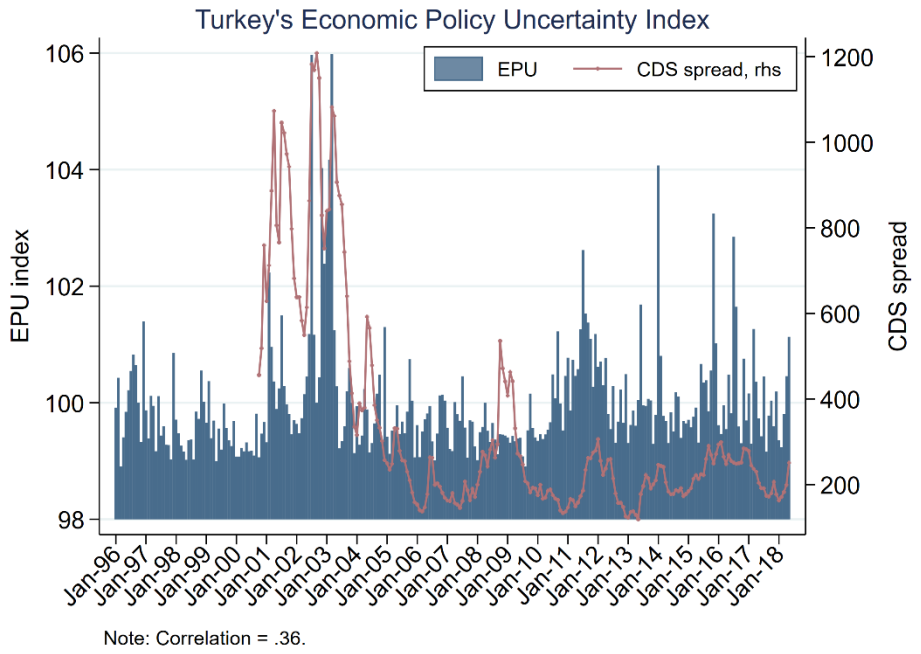
Figure 1 presents the resulting EPU index for Turkey, which increased sharply during the 2001 Turkish economic crisis, the 2002 general elections (when the AKP came to power), the 2003 crisis in Turkish-American relations, the 2011 general elections, the 2013 Gezi Park protest, the large depreciation in 2014, the 2015 sanctions by Russia and general elections, and the 2016 Istanbul Airport bombing and the failed coup attempt. Smaller spikes appear during, for

[9] Factiva's Top Sources contain about 100 news sources, including major new agencies such as Dow Jones Newswires, Reuters, the Wall Street Journal, the Times, the New York Times, the Guardian, and the Associated Press.

[10] Factiva enables news searches to be filtered by language, source location, geographic coverage (country/region), industry, and subject groups.

instance, the onset of the EU accession negotiations in 2005, and the 2010 referendum on constitutional reform.

Figure 1: Turkey's Economic Policy Uncertainty Index



The news-based EPU index is weakly correlated with CDS spread (correlation 0.36, see Figure 1), suggesting that the EPU index is likely to pick up aspects of uncertainty related to economic policy beyond materialized macroeconomic uncertainty. For instance, the EPU index spiked in 2013, capturing the Gezi protests, while the CDS spread remained subdued. Also, the EPU index spiked around the failed coup attempt, while the CDS spread did not increase.

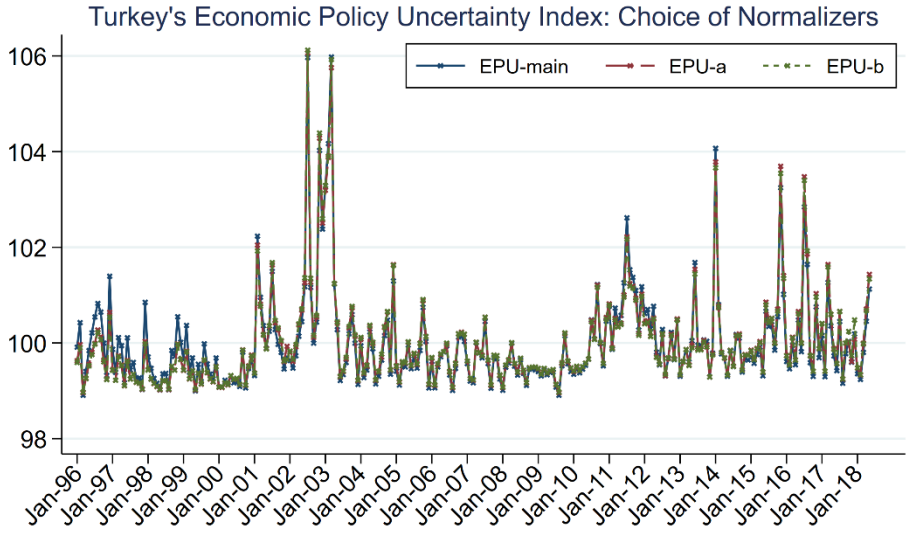
Unlike the EPU index constructed by Baker et al (2016) for several countries, our number of news sources is not constant over time and the search platform does not allow for counting all articles of all included sources. For this reason, an additional check on the normalization of the raw counts is conducted. The alternative EPU indices normalize the raw counts by (i) total counts of all "today"-articles in Factiva's Top Sources and English-language Turkish sources; and (ii) total counts of non-sports-related "today"-articles in Factiva's Top Sources and English-language Turkish sources. Figure 2 shows that different normalizers do not result affect the EPU index.

For the empirical analysis, we additionally construct an EPU index on an annual and a quarterly basis. The annual EPU index is computed by scaling the 12-month raw counts of the identified articles by the 12-month counts of the normalizer, and then standardize the index to a unit standard deviation with a mean of 100. In parallel, the quarterly EPU index is computed using the respective 3-month counts of news articles and normalizers, and the similar standardization is applied. Figures 3 and 4 present the annual and quarterly EPU indices together with the annual and quarterly average CDS spreads. The correlation between the two variables increases to around 0.5 but remains broadly similar to the monthly EPU index.

From Figures 1 to 4, immediate questions arise as to why the EPU index, on a monthly, quarterly, and annual basis, is relative low during the Global Financial Crisis of 2007-2009, and whether the EPU index accurately represents the degree of economic policy uncertainty in the country. The eye-ball audit suggests that the search algorithms perform well in selecting articles related to economic policy uncertainty in Turkey during the Global Financial Crisis. The relatively low index can be explained by the fact that all countries experienced a large increase in uncertainty and Turkey did not stand out. This is evident by a much larger number of total article counts, i.e. the normalizer, over this period, in part driven by the number of articles related to the implications of the crisis in the US and Europe. Therefore, the normalization implies that our EPU index reflects perceived economic policy uncertainty in the *Turkish economy* relative to other economies globally.[11] So, the constructed index is appropriate for the proposed research questions. Given increasing economic and financial globalization, enterprises in the real sector have options to invest both domestically and abroad. As a result, their decisions to get involved in a certain investment project and on the level of participation depend not only on the absolute economic policy uncertainty of a specific country, but also the degree of relative economic policy uncertainty. This could also explain a hike in the real investment rate in 2008 and a moderate level of the real investment rate observed in 2009 (Figure 5-a of the subsequent section).

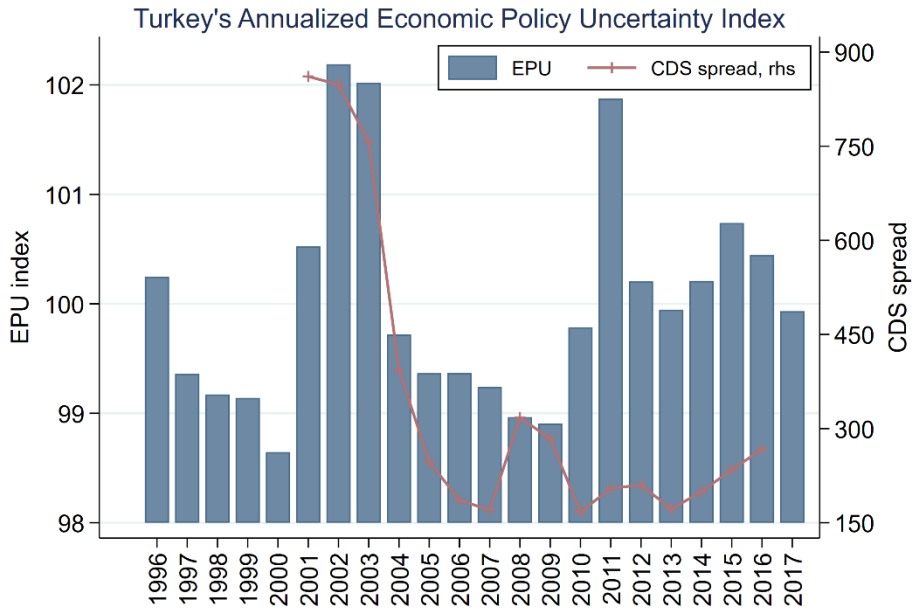
[11] Or at the very least, our EPU index reflects perceived policy uncertainty in Turkey relative to other economies covered by our selected English-language news base.

Figure 2: Turkey's Economic Policy Uncertainty Index: Choice of Normalizers



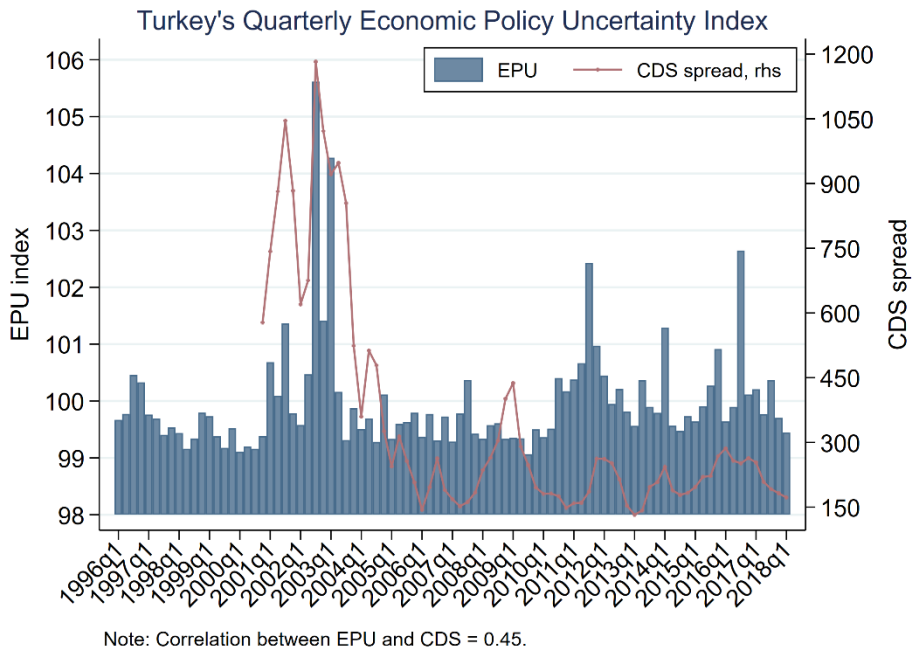
Note: The three EPU indices are based on three different normalizers.
EPU-main: # economics & politics articles in Factiva's Top Sources & English-language Turkish sources;
EPU-a: # all articles in Factiva's Top Sources & English-language Turkish sources;
EPU-b: # non-sports related articles in Factiva's Top Sources & English-language Turkish sources.

Figure 3: Turkey's Annualized Economic Policy Uncertainty Index



Note: Correlation between EPU and CDS = 0.57.

Figure 4: Turkey's Quarterly Economic Policy Uncertainty Index



IV. OTHER DATA

Company Accounts Data

Our analysis is based on sector level data from 1999 to 2015, using aggregate sectoral information on balance sheets, income statements, and other non-financial information of enterprises from the Company Accounts statistics compiled by the Central Bank of the Republic of Turkey (CBRT).

The main data for our analysis are from sectoral statistics of the Company Accounts data, compiled by the CBRT. The primary objective of the survey is to systematically monitor the sectoral developments using data from the financial statements of real sector enterprises. The Company Accounts data comprise companies' annual balance sheets, income statements, sources and uses of funds, and other general information – including the number of employees, aggregated credit balances, composition of assets and liabilities, and key financial ratios.[12] All data are checked for consistency and inconsistencies are verified or corrected.[13] The firm-level data are then aggregated according to sectors and firm size groups. The aggregated statistics

[12] The data are obtained from the financial institutions that have credit relationship with the companies if possible, and otherwise directly from the companies.

[13] Only data that pass the consistency check and/or are corrected are included in the final database for aggregation.

(continued…)

are publicly available on the CBRT's website.[14] The sector classification is based on economic activity classification NACE Rev.1.1 from 1999 to 2009, and NACE Rev.2 from 2010 onwards. From this sectoral aggregated data, we build a sector-level panel that extends over a 17-year period (1999-2015) and contains around 27 sectors of production that are comparable over time.

Despite the shortcomings of not being able to capture firm-level heterogeneity and not having a higher-frequency panel database, the sectoral aggregated statistics of the Company Accounts data have some strengths over other available firm-level data sources, particularly in terms of representativeness over the long period. Firm-level analyses have increasingly used financial statement databases from well-known vendors, such as the Bureau Van Dijk database (Amadeus and Oriana databases), Compustat Global, and FactSet Fundamentals (Ribeiro et al, 2010; and Dai, 2012). While these databases generally provide a good coverage of firms in advanced and emerging economies, this is not the case for Turkey, where the coverage ranges from below 100 firms in the 1990s to around 100-300 firms in the 2010s (Dai, 2012).[15] Bloomberg is another data source for companies' financial information, but it covers only around 300-400 companies with limited non-financial information such as employment and legal status. On the other hand, the coverage of the Company Accounts data is substantially larger. While the identification process does not involve any statistical sampling procedure, the Company Accounts survey aims at including largest possible representativeness of (i) those firms with active loan balance vis-à-vis the financial sector as of year-end of the last reporting period; and (ii) those firms whose data are used for GDP calculations by TURKSTAT in the previous year(s). The number of firms in the survey ranges from around 7,000 firms in 1999 to around 10,000 firms in 2015, most of which are private companies. In 2010, when the survey comprised nearly 8,100 firms, nearly 200 companies were listed in the Istanbul Stock Exchange (ISE), whereas about 700 were among the top 1,000 companies list of Istanbul Chamber of Industries (Samsar, 2011). A more representative sample will enable a better understanding of how policy uncertainty affects investment at the macro level.

The four main sectoral variables used in the paper are related to investment, employment, net borrowing, and investment irreversibility. They are defined as follows. First, the real investment rate is computed as a ratio of real (net) investment to the real stock of capital at the beginning of the year, where sector-level net investment and capital stock from the Company Accounts data are deflated by the gross fixed capital formation (GFCF) deflator.[16] Second, growth in employment is calculated as a simple annual (net) growth rate of employment. Third, three net borrowing variables are calculated – namely, total, short-term, and long-term net

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[14] http://www.tcmb.gov.tr/wps/wcm/connect/TCMB+EN/TCMB+EN/Main+Menu/STATISTICS/Real+Sector+Statistics/Company+Accounts/Company+Accounts+Data.

[15] Furthermore, in the Bureau Van Dijk database, there are many firms with missing financial accounts (Ribeiro et al, 2010).

[16] Deflating investment to obtain real investment values is crucial for understanding investment trends in a country with high inflation and periods of hyper-inflation.

(continued…)

borrowings, which are changes in total, short-term, and long-term liabilities. To avoid any appreciation/depreciation effects, all net borrowing variables are calculated in terms of US dollars. They are also normalized by their levels at the beginning of the year. Last, investment irreversibility is proxied by the share of machinery, plant, and equipment, as well as intangible fixed assets – including know-how, goodwill, and research and developments – to total assets.[17] The assumption is that investment in these fixed assets requires large upfront costs, and is specific to business lines. As a result, these investments are relatively more difficult to be reversed or re-sold.

Figure 5 presents summary statistics for the four key variables of the paper. The overall investment rate fluctuated over the period 2000-2015, with an average of around 8 percent. The investment rate was negative in 2001 and in the early 2010s, coinciding with the period when the EPU index was rising. Employment per firm and net borrowing statistics follow roughly the same trend during the 2000s. However, employment per firm peaked in 2010-2011 before deteriorating during the next three years. Total net borrowing moved largely together with net short-term borrowing but their correlation has declined over time as the share of short-term liabilities to total liabilities has decreased. Over the same period, investment irreversibility varied substantially across sectors (Figure 6). In the transport, manufacturing, mining, and health sectors, the share of irreversible assets exceeded 50 percent on average. Meanwhile, the trade, construction, and renting and leasing sectors have around or less than 10 percent of their assets being irreversible.

Other variables obtained from the sectoral statistics of the Company Accounts data are variables that will be used as controls in the regression analysis. They include sales growth in real terms, operating cashflows, real borrowing costs, and the debt to total asset ratios.

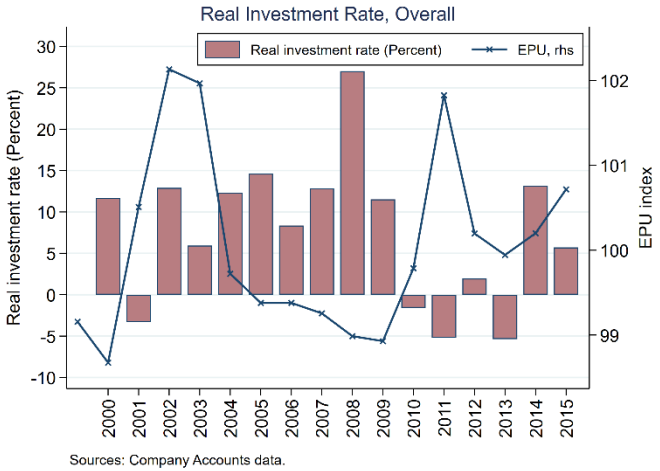
Other Data Sources

Other data sources include official macroeconomic statistics on GDP and inflations; GDP forecasts by economic and financial agents published by Consensus Economics, Inc.; the European EPU index from Baker et al (2016); and financial market data – such as the CDS spread and the volatility of stock price index for Turkey from Bloomberg. These variables are used as controls in various regression specifications.

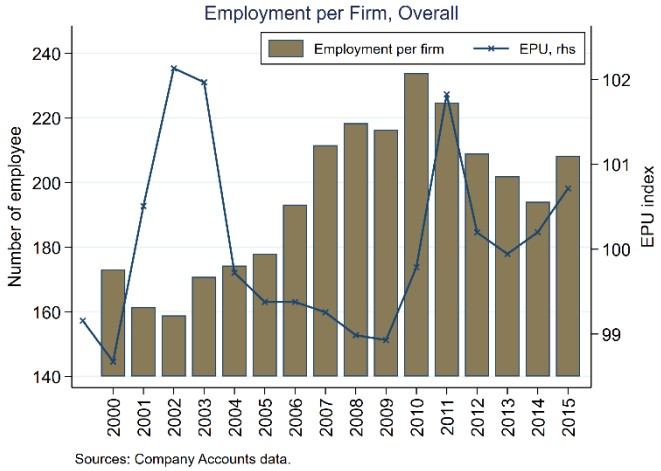
[17] Other studies use net property, plant, and equipment (PPE) as a measure of investment irreversibility (for example, Gulen and Ion (2015)). This includes land and buildings, which are not specific to an industry and could be re-sold or liquidated relatively easily.

Figure 5: Key Variables Used in the Analysis

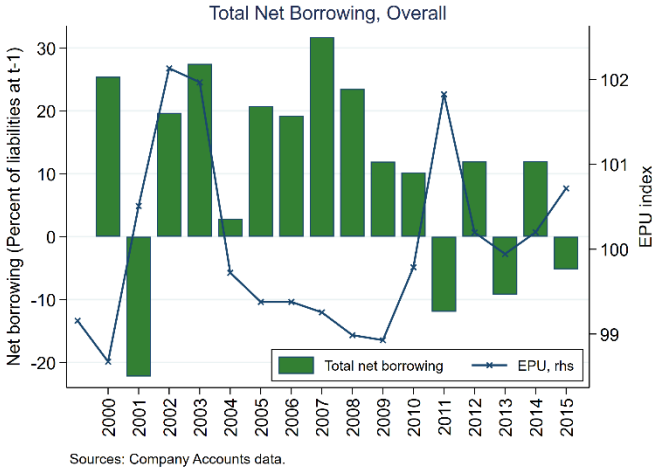
5a) Investment Rate



5b) Employment



5c) Net Borrowing



5d) Net Short-term and Long-term Borrowing

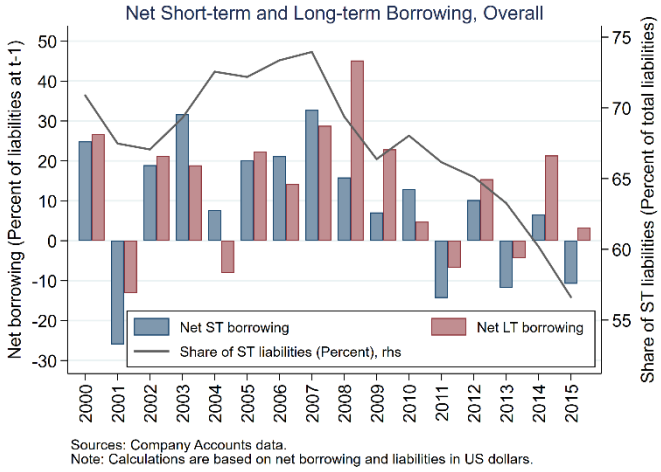
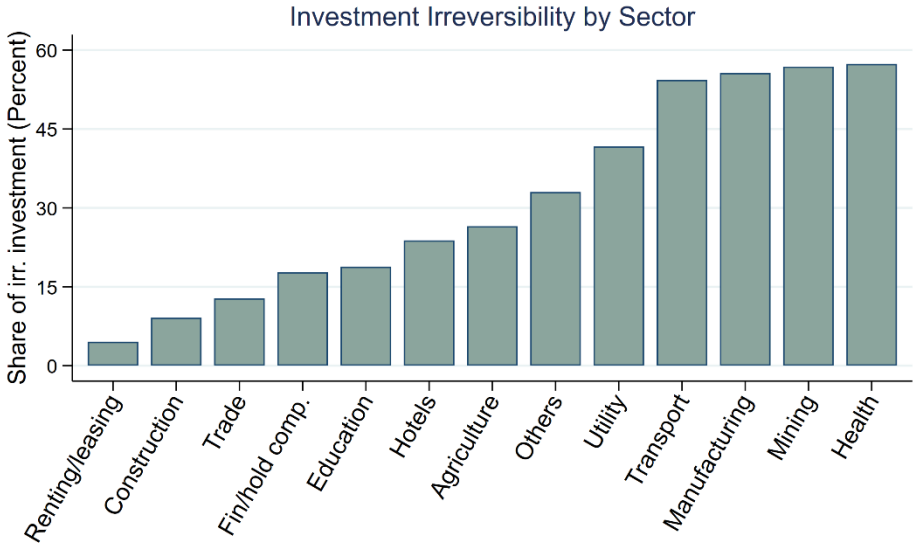


Figure 6: Investment Irreversibility by Sector



Sources: Company Accounts data.
Note: Investment irreversibility is measured by the share of machinery, plant, and equipment, and intangible assets, to total assets. Showing average between 2000-2015.
Manufacturing sector comprises 16 sub-manufacturing sectors.

V. EMPIRICAL FRAMEWORK

Baseline Framework

We investigate whether an increase in EPU has any impacts on business decisions – including investment, employment, and net borrowing. Given that these decisions are intended to maximize the expected value of the business, we apply a standard reduced-form firm-level investment model (Leahy and Whited, 1996; Guiso and Parigi, 1999; Ghosal and Loungani, 2000; Bloom et al, 2007). Our baseline regression can be written as:

$$Y_{s,t} = \alpha + \gamma U^{Q}_{t-l} + \boldsymbol{\beta}_1 \boldsymbol{Z}_{s,t-1} + \boldsymbol{\beta}_2 \boldsymbol{X}_{s,t} + \beta_3 \boldsymbol{K}_t + \theta_s + \lambda^*_t + \varepsilon_{s,t} \qquad (1)$$

where $Y_{s,t}$ is the outcome variable observed in sector s and in year t – namely the investment rate, employment growth, and net borrowing. $\boldsymbol{Z}_{s,t-1}$ and $\boldsymbol{X}_{s,t}$ are vectors of time-varying sector aggregates of firm characteristics reflecting performance and financial constraints – such as, sales growth, operating cashflows, real borrowing costs (specific to firms/sectors), and debt-to-total asset ratios. $\boldsymbol{K}_t$ is a vector of time-varying variables, which are common to firms in different sectors, to control for current economic and financial markets conditions and opportunities – for example, real GDP growth and inflation (and their one-year lags), and one-year ahead GDP forecast. The CDS spread is included to capture general economic and financial market uncertainty, which is likely to affect firms' decisions. In addition, the European EPU index constructed by Baker et al (2016) is included to control for a component of Turkish policy uncertainty that is driven by external markets. θ_s is a sector fixed effect and λ^*_t is a time trend.

We examine both contemporaneous and lagged impacts of policy uncertainty following recent studies focused on various types of uncertainty in other countries (see for example, Caggiano et al, 2014; Banerjee et al, 2015; Baker et al, 2016; Moor, 2016; and Kim and Kung, 2017, of which findings reflect strong impacts of uncertainty up to four quarters in the future). As our unit of analysis is sector-year, regressing the outcome variable on the annualized EPU index or its lag may be subject to identification problems and may not be informative.[18] As a result, the quarterly EPU index is used. U_{t-l}^{Q} represents the constructed quarterly EPU index, where $Q \in \{Q1, Q2, Q3, Q4\}$ denotes the chosen quarter and $l \in \{0,1\}$ stands for the annual lag of the quarterly EPU index with reference to the outcome variable, i.e. with reference to year t. In particular, the two main specifications use the EPU index of the first quarter of the current year, U_t^{Q1}, and the EPU index of the last quarter of the previous year, U_{t-1}^{Q4} as a regressor. This implies an assumption that final decisions on any investment in the current year are made either at the beginning of the year or at the end of the previous year. It is also important to test the impacts of policy uncertainty in other quarters of the preceding year in case decisions are simply made earlier than assumed.

Using a Difference-in-Differences Specification to Mitigate Endogeneity Issues

While we attempt to include proxies for potential omitted variables, such as economic and financial market conditions and prospects, which are expected to be correlated with both the outcome variables and the EPU index, some endogeneity problems remain. This means that the conditional correlation between the outcome variables and the EPU index could be driven by another omitted variable that influences both the outcome variables and policy uncertainty. Reverse causality could also be an issue. As EPU is expected to create adverse economic outcomes such as lower investment and employment, poor economic outcomes could also cause policy uncertainty. In this paper, we adopt the difference-in-differences (DID) technique to mitigate the issue of endogeneity and reverse causality. Under the DID framework, treatment sectors are defined as sectors with high exposure to EPU, in other words, being "treated" more intensely by the "treatment" of policy uncertainty. Control sectors are those with low exposure to policy uncertainty. The DID framework assumes that conditioning on other controls and in absence of policy uncertainty, treatment and control sectors evolve similarly. Under these assumptions, the DID approach will allow for a causal interpretation of the estimated impact of policy uncertainty of the treatment group, compared to their counterfactual outcomes which are deduced from the controlled group.

The theoretical and empirical literature demonstrates that the rationality of delay in investment decision hinges on the irreversibility of investment. When adjustment is costly or fixed costs of investment are large, a firm may regret an investment decision and could be better off by

[18] More specifically, the estimated contemporaneous effect will be prone to the problem of contemporaneous reverse causality. For example, the annualized EPU index measures aggregate policy uncertainty throughout the year, but policy uncertainty during the ending quarters could be influenced by economic outcomes in the beginning quarters, which are also parts of their annual outcomes. Furthermore, using the one-year lagged (annualized) EPU index imposes a minimum lagged impact of one year, which could be too restrictive compared to findings in recent literature.

waiting and seeing (see for example, Bernanke, 1983; Pindyck, 1988; Rodrik, 1991; Dixit and Pindyck, 1994; Auerbach and Hassett, 2002; and Kim and Kung, 2017). To exploit this evidence, we use the share of machinery, plant, and equipment, and intangible fixed assets to total assets as a measure of the degree to which sectoral investments are irreversible. The required assumption is that expenses on these assets are large and often specific to a firm's line of business. The panel DID regression with investment irreversibility, T_s, as a continuous treatment variable (i.e. a treatment intensity variable) can be written as follows.

$$Y_{s,t} = \alpha + \gamma U^{Q}_{t-l} + \psi\left(U^{Q}_{t-l} \cdot T_s\right) + \boldsymbol{\beta}_1 \boldsymbol{Z}_{s,t-1} + \boldsymbol{\beta}_2 \boldsymbol{X}_{s,t} + \beta_3 \boldsymbol{K}_t + \theta_s + \lambda^{*}_t + \varepsilon_{s,t} \qquad (2)$$

Our coefficient of interest, $\hat{\psi}$, measures the impact of a one standard deviation increase in the quarterly EPU index on the investment rate, employment growth, and net borrowing of firms. Note that T_s and θ_s are perfectly collinear so there is no need to include T_s separately in the specification.

VI. RESULTS

Equations (1) and (2) are estimated for each of the two choices of the quarterly EPU index, namely the EPU index of the first quarter of the current year, and that of the last quarter of the preceding year. Sector fixed effects are included, as well as both linear and quadratic time trends. All standard errors are clustered at the sector level.

Investment Decisions

The results of the investment regression are presented in Table 1. The first four columns show the results when using the real investment rate as a dependent variable. The baseline results, before introducing the DID treatment term – investment irreversibility, are presented in Columns (1) and (2). Column (1) regresses the real investment rate on the EPU index of the first quarter of the current year, while Column (2) uses the EPU index of the last quarter of the previous year as a regressor, respectively. The estimate of γ is statistically (at the 90 percent level) and economically significant when using the EPU index of the first quarter of the current year. A coefficient of nearly 5 (Column (1)) indicates that an increase in the first-quarter EPU index by one standard deviation, is associated with a 5-percentage point lower real annual investment rate in the same year. Higher operating cashflows and sales growth are associated with higher investment, while higher real borrowing costs significantly correlate with lower investment. EPU in Europe also has a statistically significant, albeit small, negative correlation with investment rates.

As the baseline results are likely biased for the reasons discussed earlier, the DID approach is applied with investment reversibility as a treatment intensity variable. The DID results are shown in Columns (3) to (4), using the two quarterly EPU indices as a regressor. The negative impact of policy uncertainty becomes larger, at around 9 to 13 percent, and are statistically significant for both choices of quarterly EPU index. This means, for instance, that a one standard deviation increase in the quarterly EPU index around the end of the earlier year or the beginning of the current year induces firms in sectors with a high degree of investment irreversibility to reduce their real annual investment rate by around 9 to 13 percentage points,

holding other things constant. In recent years, the EPU index increased by about 0.2 to 0.5 per year, implying a decline in the real investment rate for firms in these sectors by about 2 to 6.5 percentage points. This is a large effect, given that, for instance, the mean and median real investment is around 8 to 10 percent, respectively, for 2015. The correlations between the real investment rate and other controls remain broadly unchanged from the baseline results.

Table 1: Economic Policy Uncertainty on Investment

	I_t/K_{t-1} *(% In Real Terms)*				I_t/A_{t-1} *(%, In Real Terms)*			
	Baseline		Diff-in-Diff		Baseline		Diff-in-Diff	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPU index	-4.882**	-7.403	0.424	-3.551	-1.978	-3.623	0.874	-1.175
	(2.325)	(4.475)	(3.149)	(4.700)	(1.495)	(2.994)	(1.860)	(3.233)
EPU x Inv. irreversibility			-12.767**	-9.444*			-6.862**	-6.001*
			(5.168)	(5.022)			(3.021)	(3.409)
L.Operating cashflows (% of capital stock)	0.130*	0.164**	0.130*	0.167**	0.087**	0.103**	0.086**	0.105**
	(0.073)	(0.074)	(0.074)	(0.076)	(0.037)	(0.038)	(0.038)	(0.039)
L.Short-term debt-to-total asset ratio (%)	0.269	0.294	0.262	0.314	-0.005	0.006	-0.008	0.019
	(0.178)	(0.182)	(0.192)	(0.190)	(0.112)	(0.113)	(0.120)	(0.118)
L.Long-term debt-to-total asset ratio (%)	0.104	0.161	0.069	0.135	0.165	0.192	0.146	0.176
	(0.282)	(0.267)	(0.285)	(0.278)	(0.165)	(0.156)	(0.167)	(0.164)
Sales growth; real (%)	0.665***	0.666***	0.666***	0.671***	0.426***	0.427***	0.427***	0.429***
	(0.106)	(0.107)	(0.106)	(0.108)	(0.073)	(0.074)	(0.073)	(0.075)
Borrowing cost; real (%)	-1.328***	-1.611***	-1.356***	-1.655***	-0.677***	-0.829***	-0.692***	-0.857***
	(0.339)	(0.423)	(0.336)	(0.423)	(0.183)	(0.249)	(0.181)	(0.250)
BBD's European EPU	-0.151**	-0.057	-0.150**	-0.056	-0.067	-0.024	-0.067	-0.023
	(0.073)	(0.082)	(0.072)	(0.081)	(0.046)	(0.050)	(0.046)	(0.050)
One-year-ahead GDP forecast	5.559	7.655*	5.509	7.660*	3.708	4.640	3.681	4.644
	(3.745)	(4.420)	(3.765)	(4.425)	(2.381)	(2.846)	(2.392)	(2.847)
Quarterly EPU used in regression	$Q1_t$	$Q4_{t-1}$	$Q1_t$	$Q4_{t-1}$	$Q1_t$	$Q4_{t-1}$	$Q1_t$	$Q4_{t-1}$
Time	Trend	Trend	Trend	Trend	Trend	Trend	Trend	Trend
FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	383	383	383	383	383	383	383	383
R2	0.503	0.505	0.510	0.508	0.521	0.524	0.526	0.527

Note: 1/ * p<0.1; ** p<0.05; and *** p<0.01.

2/ Clustered standard errors (at the sector level) in parentheses.

3/ Regressions with time trends include linear and quadradic trends.

4/ Other controls include Real GDP growth (%) and Inflation (%) - as well as their one-period lags; and CDS spread.

Real investment rate, the dependent variable in specifications (1) to (4), may be biased due to the existence of a catch-up process and diminishing returns. Firms (and sectors) with a low initial capital stock are likely to invest (in net real terms) relatively more than those with a high capital stock, given diminishing marginal returns. This could bias the results in Table 1 if firms' capital stock also correlates with economic policy uncertainty. To mitigate this concern, we re-estimate the investment regression using a different independent variable – namely, real investment as a share of total assets (instead of the capital stock) at the beginning of the year. The results are presented in Columns (5) to (8) Table 1. The estimated impact of policy uncertainty on investment becomes smaller and is no longer statistically significant under the baseline regression (Columns (5) and (6)). However, the negative DID impact remains statistically significant (Columns (7) and (8)). The coefficient estimates suggest that a one standard deviation increase in the quarterly EPU index around the end of the previous year and the beginning of the current year could reduce the investment to total asset ratio in the current year by around 6 percentage points.

Table A.2 (Panels A and B) in the Appendix presents other specifications which use the EPU index of other earlier quarters of the previous year as a regressor. The results can be informative to whether investment decisions are made earlier, and hence affected by policy uncertainty in earlier quarters than assumed in the main specifications. The results show a weaker but statistically significant negative impact of policy uncertainty in the third quarter of the previous year on the real investment rate this year, suggesting that investment decisions could be made as early as the second half of the earlier year.

Employment Decisions

Table 2 contains the results from the employment regressions using employment growth as a dependent variable. The baseline results are in the opposite direction compared with previous literature. By including the DID treatment intensity term, i.e. the interaction between the EPU index and the degree of investment irreversibility, the estimated impact of policy uncertainty on employment growth becomes negative and is relatively. However, there are no statistically significant effects in the DID specifications.

Table 2: Economic Policy Uncertainty on Employment

	Employment Growth (%)			
	Baseline		Diff-in-Diff	
	(1)	(2)	(3)	(4)
EPU index	4.207	8.358**	5.595**	9.570**
	(2.486)	(3.249)	(2.709)	(4.300)
EPU x Inv. irreversibility			-3.341	-2.969
			(3.312)	(4.612)
L.Operating cashflows (% of capital stock)	0.058	0.022	0.058	0.023
	(0.051)	(0.056)	(0.051)	(0.055)
L.Short-term debt-to-total asset ratio (%)	-0.041	-0.065	-0.043	-0.059
	(0.177)	(0.168)	(0.181)	(0.169)
L.Long-term debt-to-total asset ratio (%)	0.082	0.019	0.073	0.011
	(0.288)	(0.305)	(0.292)	(0.314)
Sales growth; real (%)	0.546***	0.545***	0.546***	0.546***
	(0.072)	(0.073)	(0.072)	(0.073)
Borrowing cost; real (%)	-0.793***	-0.433	-0.800***	-0.447
	(0.232)	(0.307)	(0.231)	(0.300)
BBD's European EPU	-0.079	-0.177**	-0.079	-0.177**
	(0.069)	(0.081)	(0.069)	(0.082)
One-year-ahead GDP forecast	-0.473	-2.544	-0.486	-2.543
	(1.485)	(1.552)	(1.489)	(1.547)
Quarterly EPU used in regression	$Q1_t$	$Q4_{t-1}$	$Q1_t$	$Q4_{t-1}$
Time	Trend	Trend	Trend	Trend
FE	Yes	Yes	Yes	Yes
Observations	383	383	383	383
R2	0.473	0.483	0.474	0.484

Note: 1/ * p<0.1; ** p<0.05; and *** p<0.01.
2/ Clustered standard errors (at the sector level) in parentheses.
3/ Regressions with time trends include linear and quadradic trends.
4/ Other controls include Real GDP growth (%) and Inflation (%) - as well as their one-period lags; and CDS spread.

These estimates need to be interpreted carefully. First, the employment growth variable only reflects changes in the aggregate number of employees. It does not contain any information about changes in the composition of the human capital stock or employees with various types

of contracts.[19] With capital-skill complementarities (Machin, 2003), which are also evident in some economic sectors in Turkey (Yasar and Paul, 2008), one would expect firms not to recruit additional skilled workers when they reduce their investment in response to rising policy uncertainty. At the same time, companies that postpone investment because of uncertainty could substitute workers for investment in the short term, hence the negative correlation between hiring and uncertainty. Second, Turkey has experienced substantial changes in its labour force, which grew at an average of 3.5 percent per annum during the past decade. Particularly, the labour force grew by around 4 percent per annum during the years 2010-2011, and above 6 percent in 2014 when policy uncertainty picked up. This indicates structural changes in the labour supply, which could have implications on the relationship between policy uncertainty and overall employment growth. Last, the muted impact on employment may also be driven by structural changes towards greater reliance on capital accumulation after the Global Financial Crisis.

Leverage Strategy

In Table 3, we present the baseline and DID results of the impact on net borrowing. Economic policy uncertainty is associated with higher net borrowing in the baseline regressions (Columns (1) and (2)). This positive and significant correlation could be because companies prefer to increase their cash buffers and financing in uncertain times. It could also due to reverse causality if there is more uncertainty on the policy of the central bank during periods of rapid growth or overheating economy. For this reason, DID is important to interpret the results. The DID estimates reported in Columns (3) and (4) show that the coefficient on uncertainty is negative and statistically significant. A one standard deviation increase in the EPU index around the end of the previous year and the beginning of the current year would lead to around 17 to 21 percentage points reduction in the ratio of total net borrowing to total liabilities in the current year. The correlations between other controls and total net borrowing are similar to those of the investment regressions (e.g. Table 1), with a much stronger positive correlation between growth prospects and total net borrowing.

Columns (5) to (8) of Table 3 presents the DID results separately for short-term or long-term net borrowing. The above results for total net borrowing are driven by a reduction in net short-term borrowing while the results for long-term borrowing are smaller and insignificant when using the EPU index of the last quarter of the preceding year. Therefore, economic policy uncertainty could lead to a change in the structure of firms' liabilities.

Using different choices of quarterly EPU index shows that net borrowing of the current year is largely and negatively affected by policy uncertainty at the beginning of the year and at the end of the previous year. However, policy uncertainty two to three quarters earlier also negatively impacts net borrowing (Panels D, E, and F of Table A.2, Appendix).

[19] It does not capture whether the skill composition of employees or their contractual arrangements have changed. In this regard, investments in fixed assets are expected to have a positive association with the number of skilled workers and/or employees on medium- to long-term contracts.

Table 3: Economic Policy Uncertainty on Net Borrowing

	Total Net Borrowing (% of Total Liabilities)				*S/T Net Borrowing (% of S/T Liabilities)*		*L/T Net Borrowing (% of L/T Liabilities)*	
	Baseline		Diff-in-Diff		Diff-in-Diff		Diff-in-Diff	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPU index	5.323**	11.943***	14.078***	18.822***	18.170***	27.388***	5.829	2.645
	(2.428)	(4.254)	(4.119)	(4.979)	(5.592)	(6.645)	(4.153)	(5.648)
EPU x Inv. irreversibility			-21.064***	-16.864***	-19.778**	-19.211**	-19.029**	-10.421
			(6.735)	(5.269)	(7.931)	(7.620)	(8.966)	(9.183)
L.Operating cashflows (% of capital stock)	0.208***	0.157**	0.207***	0.163**	0.175**	0.098	0.461***	0.474***
	(0.059)	(0.070)	(0.057)	(0.070)	(0.073)	(0.076)	(0.164)	(0.168)
L.Short-term debt-to-total asset ratio (%)	-0.598**	-0.630**	-0.609**	-0.595**	-1.257***	-1.264***	0.427	0.468
	(0.256)	(0.256)	(0.281)	(0.271)	(0.404)	(0.400)	(0.448)	(0.445)
L.Long-term debt-to-total asset ratio (%)	-0.376	-0.465*	-0.433*	-0.510*	0.426**	0.282	-1.821***	-1.783***
	(0.225)	(0.245)	(0.236)	(0.263)	(0.178)	(0.172)	(0.622)	(0.621)
Sales growth; real (%)	0.598***	0.597***	0.598***	0.604***	0.670***	0.676***	0.548***	0.552***
	(0.126)	(0.125)	(0.124)	(0.124)	(0.150)	(0.149)	(0.123)	(0.124)
Borrowing cost; real (%)	-1.866***	-1.330***	-1.912***	-1.409***	-1.754***	-0.961***	-2.024***	-2.061**
	(0.242)	(0.353)	(0.232)	(0.340)	(0.241)	(0.313)	(0.693)	(0.830)
BBD's European EPU	-0.308***	-0.444***	-0.307***	-0.443***	-0.207***	-0.437***	-0.414***	-0.388***
	(0.077)	(0.097)	(0.076)	(0.097)	(0.065)	(0.091)	(0.114)	(0.129)
One-year-ahead GDP forecast	12.103***	9.299**	12.021***	9.308**	12.943***	8.160**	11.663**	12.428**
	(3.429)	(3.904)	(3.464)	(3.917)	(3.132)	(2.953)	(4.624)	(5.362)
Quarterly EPU used in regression	$Q1_t$	$Q4_{t-1}$	$Q1_t$	$Q4_{t-1}$	$Q1_t$	$Q4_{t-1}$	$Q1_t$	$Q4_{t-1}$
Time	Trend	Trend	Trend	Trend	Trend	Trend	Trend	Trend
FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	383	383	383	383	383	383	383	383
R2	0.538	0.553	0.555	0.563	0.527	0.549	0.365	0.358

Note: 1/ * p<0.1; ** p<0.05; and *** p<0.01.

2/ Clustered standard errors (at the sector level) in parentheses.

3/ Regressions with time trends include linear and quadradic trends.

4/ Other controls include Real GDP growth (%) and Inflation (%) - as well as their one-period lags; and CDS spread.

VII. ROBUSTNESS CHECKS

While the DID methodology could mitigate the issues of reverse causation and omitted variable bias, it relies on the assumption of a conditional common time trend. That is, conditional on other controls and in the absence the treatment, the treatment group will behave like the control group. In our context, this means that the DID estimates reflect the effect of policy uncertainty (i.e. the treatment) on decisions of firms with high investment irreversibility (the treatment group), with reference to their counterfactual outcomes had there been no policy uncertainty. Under this counterfactual, their investment would have evolved in a similar way to firms with low investment irreversibility (the control group). Therefore, depending on how the treatment group is chosen, the DID approach may still be subject to certain biases. In this section, we provide a few robustness checks. First, additional tests and analyses of the effect of policy uncertainty are conducted using alternative treatment intensity variables. Second, the more restrictive time-dummy model is applied to the DID regressions. Third, we exclude sectors in which the public sector is likely to have a role and re-examine whether the impact of policy uncertainty is present for the remaining sectors. Last, instead of the various choices of the quarterly EPU index, the contemporaneous and quarterly-lagged annualized EPU indices are used as a regressor. The empirical results are informative to whether economic decisions are made only with current information (at the time decisions are made) about policy uncertainty or also with recent history of policy uncertainty.

Using Different Treatment Intensity Variables

Two alternative treatment intensity variables are applied to the DID regressions: (i) the ratio of machinery, plants, and equipment to total assets, and (ii) the depreciation rate. First, the ratio of machinery, plants, and equipment to total assets is a narrower definition of investment irreversibility than the one previously used, as it excludes intangible fixed assets. Second, the depreciation rate is calculated as a ratio of total depreciation of tangible and intangible fixed assets and other long-term assets to total assets. The rationale is that upfront sunk costs on investment are lower for firms with rapidly depreciating capital (Chirinko and Schaller, 2009). So, these firms are expected to have less exposure to political uncertainty. As a result, the depreciation rate could be viewed as an inverse treatment intensity, or an identification of firms with low exposure to policy uncertainty.

The results are robust to using these alternative treatment intensity variables (Table A.3 in the Appendix). That is, policy uncertainty induces lower investment and short-term borrowing among firms with high exposure to policy uncertainty, measured by the ratio of machinery, plants, and equipment to total assets (Columns (1) to (5)). Similar to the main results, the effect of a one standard deviation increase in the EPU index at the beginning of the year would result in a 12-percentage point decline in the investment rate and around 20 percentage points lower net short-term borrowing (as a ratio of total short-term liabilities at the beginning of the year), compared to their counterfactual outcomes in absence of exposure to policy uncertainty.

As a high depreciation rate implies lower upfront irreversible costs on investment, it is associated with low exposure to policy uncertainty. By using the depreciation rate as the DID treatment intensity variable, the DID estimates implicitly indicate how firms with low exposure to policy uncertainty perform in a high policy uncertainty environment, compared with their counterfactual outcome had they been exposed to policy uncertainty. The positive coefficient estimates in Columns (6) to (10) of Table A.3 therefore confirms the robustness of the result that firms relatively less affected by policy uncertainty cut less investment and borrowing when policy uncertainty increases.

DID Regressions with Time Dummies

Despite the inclusion of linear and quadratic trends, the regression estimates from the over-time variation in the EPU index (at least from the baseline specifications) may capture not only the effect of policy uncertainty but also other unobserved time-varying factors influencing business decisions that are common to all sectors. Simple examples are domestic and external demand and economic prospects, which may not be perfectly captured by the included controls and the time trends. To investigate this issue, we estimate a more restrictive DID model which includes time-dummies instead of the linear and quadratic trend. Table A.4 in the Appendix shows that the results are generally robust to this more restrictive specification.

Exclusion of Basic Service and Construction Sectors

To test whether the negative impact of policy uncertainty is driven by the results among specific sectors, the sample of analysis is confined to exclude sectors that are relatively more influenced by the public sector or where the participation of the public sector is prevalent. These omitted sectors include fundamental service related sectors (such as health care, education, and energy sectors), and the construction sector where the Housing Development

Administration of Turkey (TOKI) has an active role.[20] These are also sectors which have a relatively higher share of irreversible investment, which could potentially be systematically different from other sectors. The results are robust to the exclusion of these sectors (Table A.5 in the Appendix). Similar to the main specification, a one standard deviation increase in the EPU index (at the end of the previous year and the beginning of the current year) induces a 9 to 13-percentage point decline in the real investment rate and a 20-percentage point reduction in total net borrowing as a share of total liabilities.

Using the Annualized EPU Index as A Regressor

Our main results suggest that investment and leverage strategies in the current year can be negatively affected by policy uncertainty in either the beginning (first quarter) of the year, at the end (fourth quarter) of the previous year, and/or somewhat during the early second half (third quarter) of the previous year. Supporting interpretation could be that firms' decisions on investment and leverage strategies are made during those specific quarters, and hence observed policy uncertainty in this period have an implication on these outcomes in the current year. However, the results are not fully informative to whether firms actually make their decisions based on collective information on policy uncertainty beyond a certain quarter.[21] To test this, the annualized EPU index is used as a regressor. The panel DID regression can be written as follows.

$$Y_{s,t} = \alpha + \gamma U^{A}_{t-k} + \psi(U^{A}_{t-k} \cdot T_s) + \boldsymbol{\beta}_1 \boldsymbol{Z}_{s,t-1} + \boldsymbol{\beta}_2 \boldsymbol{X}_{s,t} + \beta_3 \boldsymbol{K}_t + \theta_s + \lambda^{*}_t + \varepsilon_{s,t} \quad (3)$$

where U^{A}_{t-k} represents the annualized EPU index and $k \in \{0,1,2,3,4\}$ stands for the quarter lag between the annualized EPU index and the outcome variable. For example, U_{t-0} is the annualized contemporaneous EPU index, as described in Section III; U_{t-1} is the one-quarter lagged annualized index – i.e. the EPU index of which its 12-month counts start in October of year $t-1$ and ends in September of year t; U_{t-2} is the two-quarter lagged annualized index – i.e. the EPU index of which its 12-month counts start in July of year $t-1$ and ends in June of year t, and thereafter.

Table A.6 in the Appendix presents statistically significant negative effects of the two- and three-quarter lagged annualized EPU index (Columns (3) and (4)) on the real annual investment, total net borrowing, and net short-term borrowing. Meanwhile, lower net long-term borrowing seems to be driven only by the three-quarter lagged annualized EPU index. Overall, this implies that collective information on policy uncertainty from the third quarter last year onwards could influence investment and net borrowing of the current year. As discussed earlier, the estimate of the contemporaneous annual impact (Column (1)) is likely to be subject to contemporaneous reverse causality. It is important to note that the contemporaneous reverse causality weakens, but remains present, for longer-quarter lags of

[20] Whether or not state-owned or other public enterprises are in the Company Accounts data sample, the role of the public sector in these sectors could still affect other private companies in the same sectors. Hence, these sectors can be structurally different from the rest.

[21] While this is likely as the results are robust to a few choices of quarterly EPU index, it could not be inferred directly from the main specifications.

the annualized EPU index. This is a reason why we chose to use the quarter EPU index in the main specifications.

VIII. CONCLUSION

Uncertainty has been long recognized to have a key role in economic decision. Recent literature has exploited new news-based indices to study the aggregate effect of uncertainty. A strong a robust correlation between uncertainty and economic activity has been established. However,

a key challenge has been how to control for reverse causality and spurious correlation. This calls for the use a DID approach looking at different sectors.

At the same time, for most countries economic uncertainty is roughly constant for prolonged periods of time with some spikes in particular periods. Turkey is special in this respect because it has had frequent periods of exogenous political-driven uncertainty. Turkey is also special because it has a reliable database on sectoral data covering many uncertain years. The challenge is there is no publicly available index of economic policy uncertainty for Turkey. We constructed one following the established methodology by Baker et al. (2016). Given the economic importance of foreign sentiment as well as analysts' concerns about the local press we based our index on external news sources.

The results show that indeed economic policy uncertainty hinders investment. An increase in the first-quarter EPU index by one standard deviation is associated with a 5-percentage point lower real annual investment rate in the same year. The magnitude more than doubles for sectors with high degree of irreversibility. The results on employment growth indicate that uncertainty may increase employment, suggesting that, in the short term, firms may substitute labour for fixed capital when there is uncertainty. DID approach shows that sectors with more irreversibility hire in net terms relatively less when uncertainty is high. Similar results hold for short-term borrowing. Sectors with high level of irreversibility (relatively) reduce short-term borrowings in periods of uncertainty.

In conclusion, the results show the importance of economic policy uncertainty. This has policy implications because policy makers should strive to reduce policy uncertainty. These results also call for extending similar sectoral analysis in other emerging markets where uncertainty is still high.

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APPENDIX

Economic Policy Uncertainty Search Algorithms

The combination of word searches for the three keywords is applied to our selected Factiva's news database, i.e. Factiva's Top Sources and all English-language Turkish news sources. As mentioned in the main text, additional criteria are that one of the three mentions must be within 10 words of the word "Turkey" or "Turkish", and the searches are also filtered by geographic coverage to cover only those tagged as being related to Turkey. News articles must also contain more than 99 words, and be tagged as related to economics and politics.

Economic terms: *econom**

Fiscal policy terms: *(government or treasury or MOF or ministry of finance or Hazine) or ((spending or expenditure* or revenue*) near2 (government or public or fiscal or budget)) or (austerity or tax* or automatic stabili?er) or (debt near2 (public or national or sovereign or government)) or (budget near2 (surplus or deficit* or plan* or balance* or gap)) or deficit reduction or (fiscal near2 (policy or policies or plan* or cris?s or emergency or measure* or gap* or discipline* or consolidat* or stimulus or expansion*))*

Monetary and financial sector policy terms: *(monetary or monetary policy) or (yield* or interest rate* or overnight rate* or discount rate* or interest*) or (central bank or Central Bank of Turkey or Central Bank of the Republic of Turkey or TCMB or CBRT or Banking Regulation and Supervision Agency or BRSA) or (regulat* or bank* supervis*) or (quantitative easing or money supply or (tight* or loose*) near2 (money or monetary or policy)) or (accommod* policy or monetary accommod*) or (bond* purchas* or asset* purchas* or open market operation*)*

Uncertainty terms: *uncert* or (ambiguous or ambiguity) or dubious or precarious or unpredictable or undecided or undetermined or unresolved or unsettled or concern* or (worry* or worries) or (anxiety* or anxious) or doubt* or unclear*

not ("without doubt" or "no uncertainty" or "no doubt" or reduced concern or shares or equit* or stock market*)*

The normalizer is the total counts of economics- and politics-related news articles in Factiva's Top Sources and the English-language Turkish news sources, containing the common and neutral term "today", and comprising more than 99 words.

Robustness Checks

Table A.1: Effects of Policy Uncertainty in Other Quarters of the Previous Year

	Diff-in-Diff				
	(1)	(2)	(3)	(4)	(5)
A. I_t/K_{t-1} (%, In Real Terms)					
EPU index	0.424	-3.551	-3.886	2.134	-2.087
	(3.149)	(4.700)	(4.235)	(2.334)	(5.361)
EPU x Inv. irreversibility	-12.767**	-9.444*	-7.763*	-6.028	11.200
	(5.168)	(5.022)	(4.321)	(3.586)	(9.633)
R2	0.510	0.508	0.507	0.497	0.503
Linear Combination of Coefficients					
EPU index + EPU x Inv. Irreversibility	-12.342***	-12.995**	-11.650***	-3.894**	9.113*
	(3.643)	(5.488)	(4.137)	(2.555)	(5.304)
B. I_t/A_{t-1} (%, In Real Terms)					
EPU index	0.874	-1.175	-2.033	0.165	-2.552
	(1.860)	(3.233)	(2.787)	(1.244)	(3.195)
EPU x Inv. irreversibility	-6.862**	-6.001*	-4.095	-1.929	6.854
	(3.021)	(3.409)	(2.745)	(1.844)	(5.376)
R2	0.526	0.527	0.526	0.518	0.523
Linear Combination of Coefficients					
EPU index + EPU x Inv. Irreversibility	-5.988**	-7.176*	-6.128**	-1.764**	4.302**
	(2.335)	(3.584)	(2.651)	(1.419)	(2.963)
C. Employment Growth (%)					
EPU index	5.595**	9.570**	11.279**	5.131	-9.458***
	(2.709)	(4.300)	(4.586)	(5.018)	(3.269)
EPU x Inv. irreversibility	-3.341	-2.969	-6.024	-6.781	7.865
	(3.312)	(4.612)	(5.320)	(7.430)	(5.925)
R2	0.474	0.484	0.487	0.471	0.484
Linear Combination of Coefficients					
EPU index + EPU x Inv. Irreversibility	2.254	6.601*	5.256**	-1.649	-1.593
	(3.346)	(3.410)	(3.402)	(2.808)	(4.740)
Quarterly EPU used in regression	$Q1_t$	$Q4_{t-1}$	$Q3_{t-1}$	$Q2_{t-1}$	$Q1_{t-1}$
Time	Trend	Trend	Trend	Trend	Trend
FE	Yes	Yes	Yes	Yes	Yes
Observations	383	383	383	383	383

Note: 1/ * p<0.1; ** p<0.05; and *** p<0.01.

2/ Clustered standard errors (at the sector level) in parentheses.

3/ Regressions with time trends include linear and quadradic trends.

4/ All other controlling variables are similar to the main regressions in Tables 1 to 3.

Table A.2: Effects of Policy Uncertainty in Other Quarters of the Previous Year (cont.)

	Diff-in-Diff				
	(1)	(2)	(3)	(4)	(5)
D. Ratio of Net Borrowing to Total Liabilities at t-1 (%, in USD)					
EPU index	14.078***	18.822***	17.757***	11.330***	-9.997
	(4.119)	(4.979)	(5.894)	(2.380)	(7.444)
EPU x Inv. irreversibility	-21.064***	-16.864***	-16.605**	-13.589***	12.374
	(6.735)	(5.269)	(6.528)	(3.380)	(13.711)
R2	0.555	0.563	0.560	0.548	0.541
Linear Combination of Coefficients					
EPU index + EPU x Inv. Irreversibility	-6.986*	1.958	1.152	-2.259**	2.378
	(3.783)	(4.774)	(3.476)	(2.454)	(7.004)
E. Ratio of Net Short-Term Borrowing to Short-Term Liabilities at t-1 (%, in USD)					
EPU index	18.170***	27.388***	24.998***	12.123***	-14.580
	(5.592)	(6.645)	(7.438)	(3.013)	(9.429)
EPU x Inv. irreversibility	-19.778**	-19.211**	-17.128*	-13.926***	9.440
	(7.931)	(7.620)	(8.694)	(4.478)	(15.306)
R2	0.527	0.549	0.541	0.512	0.519
Linear Combination of Coefficients					
EPU index + EPU x Inv. Irreversibility	-1.607	8.178**	7.870**	-1.803**	-5.140
	(5.484)	(4.806)	(4.640)	(2.339)	(8.561)
F. Ratio of Net Long-Term Borrowing to Long-Term Liabilities at t-1 (%, in USD)					
EPU index	5.829	2.645	4.973	8.879***	-7.591
	(4.153)	(5.648)	(5.708)	(3.113)	(6.369)
EPU x Inv. irreversibility	-19.029**	-10.421	-13.668	-9.650	25.322*
	(8.966)	(9.183)	(8.329)	(7.345)	(12.709)
R2	0.365	0.358	0.360	0.363	0.372
Linear Combination of Coefficients					
EPU index + EPU x Inv. Irreversibility	-13.200**	-7.776**	-8.695**	-0.770	17.730**
	(5.769)	(9.072)	(7.460)	(5.619)	(7.698)
Quarterly EPU used in regression	$Q1_t$	$Q4_{t-1}$	$Q3_{t-1}$	$Q2_{t-1}$	$Q1_{t-1}$
Time	Trend	Trend	Trend	Trend	Trend
FE	Yes	Yes	Yes	Yes	Yes
Observations	383	383	383	383	383

Note: 1/ * p<0.1; ** p<0.05; and *** p<0.01.

2/ Clustered standard errors (at the sector level) in parentheses.

3/ Regressions with time trends include linear and quadradic trends.

4/ All other controlling variables are similar to the main regressions in Tables 1 to 3.

Table A.3: Alternative Treatment Intensity Variables

	Diff-in-Diff						Diff-in-Diff				
	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)
A. I_t/K_{t-1} (%, In Real Terms)											
L.EPU x MPE intensity	-12.096**	-7.564	-7.348	-5.032	12.727	L.EPU x Depreciation rate	16.575**	10.113*	11.058**	7.596*	-15.584
	(5.329)	(5.449)	(4.465)	(3.632)	(9.527)		(6.083)	(5.879)	(5.208)	(4.359)	(11.407)
R2	0.509	0.507	0.506	0.497	0.504	R2	0.511	0.508	0.508	0.497	0.504
B. I_t/A_{t-1} (%, In Real Terms)											
L.EPU x MPE intensity	-6.419**	-5.002	-3.894	-1.631	7.197	L.EPU x Depreciation rate	8.641**	6.361	5.699*	2.474	-9.286
	(3.074)	(3.600)	(2.769)	(1.819)	(5.278)		(3.452)	(4.008)	(3.177)	(2.215)	(6.241)
R2	0.525	0.526	0.526	0.518	0.523	R2	0.526	0.526	0.527	0.518	0.524
C. Employment Growth (%)											
L.EPU x MPE intensity	-2.514	-1.542	-5.078	-5.020	9.090	L.EPU x Depreciation rate	3.784	2.981	7.384	6.904	-10.951
	(3.467)	(5.018)	(5.509)	(7.921)	(5.607)		(3.941)	(5.650)	(6.327)	(9.073)	(6.844)
R2	0.474	0.483	0.486	0.470	0.485	R2	0.474	0.484	0.487	0.470	0.485
D. Ratio of Net Borrowing to Total Liabilities at t-1 (%, in USD)											
L.EPU x MPE intensity	-21.323***	-15.750***	-16.255**	-13.869***	12.388	L.EPU x Depreciation rate	24.696***	18.624**	19.447**	15.581***	-15.779
	(6.688)	(5.545)	(6.560)	(3.516)	(13.542)		(8.574)	(6.968)	(8.204)	(4.970)	(16.402)
R2	0.556	0.561	0.559	0.548	0.541	R2	0.554	0.561	0.559	0.547	0.542
E. Ratio of Net Short-Term Borrowing to Short-Term Liabilities at t-1 (%, in USD)											
L.EPU x MPE intensity	-20.563**	-19.087**	-17.168*	-14.044***	9.272	L.EPU x Depreciation rate	24.655**	22.980**	21.306*	15.917**	-13.003
	(7.891)	(7.586)	(8.634)	(4.442)	(15.129)		(9.995)	(9.577)	(10.690)	(6.026)	(18.392)
R2	0.528	0.549	0.541	0.512	0.519	R2	0.528	0.549	0.541	0.511	0.520
F. Ratio of Net Long-Term Borrowing to Long-Term Liabilities at t-1 (%, in USD)											
L.EPU x MPE intensity	-18.426**	-6.705	-12.414	-9.614	25.133*	L.EPU x Depreciation rate	20.913*	8.572	14.591	10.845	-29.128*
	(8.951)	(10.154)	(8.403)	(7.933)	(12.571)		(10.878)	(11.319)	(10.249)	(8.946)	(14.821)
R2	0.365	0.357	0.359	0.363	0.372	R2	0.364	0.357	0.359	0.362	0.370
Quarterly EPU used in regression	$Q1_t$	$Q4_{t-1}$	$Q3_{t-1}$	$Q2_{t-1}$	$Q1_{t-1}$	Quarterly EPU used in regression	$Q1_t$	$Q4_{t-1}$	$Q3_{t-1}$	$Q2_{t-1}$	$Q1_{t-1}$
Time	Trend	Trend	Trend	Trend	Trend	Time	Trend	Trend	Trend	Trend	Trend
FE	Yes	Yes	Yes	Yes	Yes	FE	Yes	Yes	Yes	Yes	Yes
Observations	383	383	383	383	383	Observations	383	383	383	383	383

Note: 1/ * p<0.1; ** p<0.05; and *** p<0.01.

2/ Clustered standard errors (at the sector level) in parentheses.

3/ All other controlling variables are similar to the main regressions in Tables 1 to 3.

Table A.4: DID Regressions with Time Dummies

	Diff-in-Diff				
	(1)	(2)	(3)	(4)	(5)
A. I_t/K_{t-1} (%, In Real Terms)					
L.EPU x Inv. irreversibility	-12.676**	-9.237*	-7.788*	-6.148	11.334
	(5.163)	(5.056)	(4.333)	(3.695)	(9.683)
R2	0.520	0.516	0.516	0.515	0.518
B. I_t/A_{t-1} (%, In Real Terms)					
L.EPU x Inv. irreversibility	-6.808**	-5.921*	-4.104	-1.953	6.921
	(3.030)	(3.419)	(2.740)	(1.904)	(5.378)
R2	0.538	0.536	0.534	0.533	0.538
C. Employment Growth (%)					
L.EPU x Inv. irreversibility	-3.353	-3.052	-5.997	-6.849	7.609
	(3.210)	(4.514)	(5.312)	(7.535)	(5.894)
R2	0.496	0.496	0.498	0.498	0.499
D. Ratio of Net Borrowing to Total Liabilities at t-1 (%, in USD)					
L.EPU x Inv. irreversibility	-20.934***	-16.544***	-16.370**	-13.471***	11.842
	(6.654)	(5.355)	(6.533)	(3.342)	(13.501)
R2	0.576	0.568	0.569	0.566	0.564
E. Ratio of Net Short-Term Borrowing to Short-Term Liabilities at t-1 (%, in USD)					
L.EPU x Inv. irreversibility	-19.665**	-19.028**	-16.848*	-13.717***	8.702
	(7.745)	(7.663)	(8.683)	(4.609)	(14.992)
R2	0.559	0.557	0.557	0.554	0.551
F. Ratio of Net Long-Term Borrowing to Long-Term Liabilities at t-1 (%, in USD)					
L.EPU x Inv. irreversibility	-18.857**	-9.922	-13.559	-9.818	25.156*
	(9.000)	(9.280)	(8.372)	(7.492)	(12.764)
R2	0.373	0.366	0.369	0.366	0.379
Quarterly EPU used in regression	$Q1_t$	$Q4_{t-1}$	$Q3_{t-1}$	$Q2_{t-1}$	$Q1_{t-1}$
Time	Dummy	Dummy	Dummy	Dummy	Dummy
FE	Yes	Yes	Yes	Yes	Yes
Observations	383	383	383	383	383

Note: 1/ * p<0.1; ** p<0.05; and *** p<0.01.

2/ Clustered standard errors (at the sector level) in parentheses.

3/ All other controlling variables are similar to the main regressions in Tables 1 to 3.

Table A.5: DID Regressions Excluding Some Sectors

	Diff-in-Diff				
	(1)	(2)	(3)	(4)	(5)
A. I_t/K_{t-1} (%, In Real Terms)					
L.EPU x Inv. irreversibility	-12.676**	-9.237*	-7.788*	-6.148	11.334
	(5.163)	(5.056)	(4.333)	(3.695)	(9.683)
R2	0.520	0.516	0.516	0.515	0.518
B. I_t/A_{t-1} (%, In Real Terms)					
L.EPU x Inv. irreversibility	-6.808**	-5.921*	-4.104	-1.953	6.921
	(3.030)	(3.419)	(2.740)	(1.904)	(5.378)
R2	0.538	0.536	0.534	0.533	0.538
C. Employment Growth (%)					
L.EPU x Inv. irreversibility	-3.353	-3.052	-5.997	-6.849	7.609
	(3.210)	(4.514)	(5.312)	(7.535)	(5.894)
R2	0.496	0.496	0.498	0.498	0.499
D. Ratio of Net Borrowing to Total Liabilities at t-1 (%, in USD)					
L.EPU x Inv. irreversibility	-20.934***	-16.544***	-16.370**	-13.471***	11.842
	(6.654)	(5.355)	(6.533)	(3.342)	(13.501)
R2	0.576	0.568	0.569	0.566	0.564
E. Ratio of Net Short-Term Borrowing to Short-Term Liabilities at t-1 (%, in USD)					
L.EPU x Inv. irreversibility	-19.665**	-19.028**	-16.848*	-13.717***	8.702
	(7.745)	(7.663)	(8.683)	(4.609)	(14.992)
R2	0.559	0.557	0.557	0.554	0.551
F. Ratio of Net Long-Term Borrowing to Long-Term Liabilities at t-1 (%, in USD)					
L.EPU x Inv. irreversibility	-18.857**	-9.922	-13.559	-9.818	25.156*
	(9.000)	(9.280)	(8.372)	(7.492)	(12.764)
R2	0.373	0.366	0.369	0.366	0.379
Quarterly EPU used in regression	$Q1_t$	$Q4_{t-1}$	$Q3_{t-1}$	$Q2_{t-1}$	$Q1_{t-1}$
Time	Trend	Trend	Trend	Trend	Trend
FE	Yes	Yes	Yes	Yes	Yes
Observations	383	383	383	383	383

Note: 1/ * p<0.1; ** p<0.05; and *** p<0.01.

2/ Clustered standard errors (at the sector level) in parentheses.

3/ All other controlling variables are similar to the main regressions in Tables 1 to 3.

4/ Excluding construction, energy, and education, and health care sectors.

Table A.6: DID Regressions Using the Annualized EPU Index as A Regressor

	Diff-in-Diff				
	(1)	(2)	(3)	(4)	(5)
A. I_t/K_{t-1} (%, In Real Terms)					
L.EPU x Inv. irreversibility	-1.862	-8.223	-9.400*	-10.554**	-0.563
	(4.133)	(5.182)	(4.620)	(4.410)	(4.872)
R2	0.499	0.505	0.509	0.510	0.497
B. I_t/A_{t-1} (%, In Real Terms)					
L.EPU x Inv. irreversibility	-2.657	-5.524*	-5.536*	-5.707*	0.007
	(2.411)	(2.923)	(2.873)	(2.777)	(2.522)
R2	0.520	0.523	0.527	0.527	0.521
C. Employment Growth (%)					
L.EPU x Inv. irreversibility	3.520	-0.976	-3.563	-4.304	-0.033
	(6.611)	(4.183)	(3.919)	(4.450)	(2.629)
R2	0.467	0.478	0.484	0.483	0.466
D. Ratio of Net Borrowing to Total Liabilities at t-1 (%, in USD)					
L.EPU x Inv. irreversibility	-6.870	-16.209**	-18.013***	-18.864***	-6.650
	(5.299)	(6.352)	(5.956)	(5.574)	(5.268)
R2	0.531	0.549	0.561	0.567	0.540
E. Ratio of Net Short-Term Borrowing to Short-Term Liabilities at t-1 (%, in USD)					
L.EPU x Inv. irreversibility	-6.028	-16.442*	-18.832**	-19.037**	-9.473**
	(6.205)	(8.111)	(8.015)	(7.441)	(4.426)
R2	0.498	0.531	0.546	0.548	0.506
F. Ratio of Net Long-Term Borrowing to Long-Term Liabilities at t-1 (%, in USD)					
L.EPU x Inv. irreversibility	-5.509	-14.450	-14.076	-15.186*	4.181
	(7.669)	(8.824)	(8.496)	(8.298)	(8.207)
R2	0.362	0.362	0.361	0.362	0.358
Nq_Lagged_EPU	0	1	2	3	4
Time	Trend	Trend	Trend	Trend	Trend
FE	Yes	Yes	Yes	Yes	Yes
Observations	383	383	383	383	383

Note: 1/ * p<0.1; ** p<0.05; and *** p<0.01.

2/ Clustered standard errors (at the sector level) in parentheses.

3/ Nq_Lagged_EPU reports the number of lagged quarters for the annualized EPU index.

4/ All other controlling variables are similar to the main regressions in Tables 1 to 3.