Tax News Shocks, Political Cycles, and Asset Prices*

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ABSTRACT

Using two instruments of perceived probabilities of income tax changes, I show that the implications of tax news shocks on the economy and asset prices are asymmetric across the political partisan cycle. Tax shocks cause high wealth states during Republican administrations. To compensate for high amount of systematic risk during Republican terms, investors command a premium to hold assets that co-vary positively with tax shocks. In contrast, the wealth effect and premium for tax shocks are trivial during Democratic regimes. An investment strategy that exploits the time-varying premium across the political cycle generates significant returns over commonly used factor models.

JEL Codes: G12.

1 Introduction

Tax policy changes have important implications for the real economy and asset prices. The *Tax Cuts and Jobs Act* of 2017 and the upcoming presidential elections in 2020 have brought income taxes to the forefront of policy debates in mainstream media, academia, and many advocacy groups. The fiscal policy literature debates on whether tax cuts have a significant effect on economic growth.[1] The discourse is further complicated since tax policy implications are asymmetric across the political cycle.[2] For instance, at the state level, both the taxes and tax revenues are higher when Democrats control the state budgetary process (e.g., Besley and Case (1995); Alt and Lowry (2000); Knight (2000); Reed (2006)). Since there is a large dispersion in policy goals between Democratic and Republican administrations (e.g., Schlesinger (1975); Hibbs (1977); Wittman (1983); Alesina (1987)), I conjecture that the implications of tax news shocks (i.e., perceived probabilities of income tax changes) on the economy and asset prices vary across the political cycle.[3] Nevertheless, there is a paucity of literature that examines the impact of income tax news shocks on macro dynamics and asset prices *across* the partisan cycle. The goal of this paper is to fill this gap in the literature.

The identification of tax news shocks remains a challenge in finance, economics, and accounting literature. Most studies use one of two methods to isolate the effects of income taxes from other business cycle effects. A strand of literature uses structural vector autoregressions (VAR) to exploit institutional features of tax and transfer systems (e.g., Blanchard and Perotti (2002)). However, measures based on a VAR identification may suffer from questionable parameter restrictions and produce shocks with incorrect timing (Ramey (2011)). The econometrician may incorrectly measure "tax shocks" that are linear combinations of all the disturbances at various leads and lags (Leeper et. al. (2013)). Another strand of literature uses a narrative approach to identify tax changes (e.g. Romer and Romer (2010); Mertens and Ravn (2013)). This method identifies legislated tax changes

1. A strand of literature argues that tax cuts have a trivial effect (Poterba (1988), Blanchard and Perotti (2002)). Another strand argues for expansionary effects in the short-run (Kneller, Bleaney, and Gemmell (1999), Lee and Gordon (2005), Arnold et. al. (2011), Barro and Redlick (2011), Gemmell, Kneller, and Sanz (2011), Padovano and Galli (2001), Mountford and Uhlig (2009), and Mertens and Ravn (2012)).

2. For example, Page (1978) finds that the policy standards of the Republican and Democratic candidates are significantly different using campaign texts and transcripts from 1932 onward. Tufte (1978) finds different ideologies between Democratic and Republican regimes, measured using party platforms and by statements of presidents and their top economic advisors.

3. This is commonly referred to as the partisan view of political cycles. For example, cutting taxes to stimulate the economy was part of the Republican platform adopted at the GOP national convention on August 2000. On the other hand, increasing taxes for families making more than $200,000 per year was part of the Democratic platform for America approved on July 2004.

by collecting data from documents produced by policymakers such as the Economic Report of the President and presidential speeches and statements. These accounts isolate the relevant information from a potentially very large information set and is more likely to identify the correct timing of news. Narrative measures have a few non-zero observations, neglect small policy changes, and are available at a lower frequency, and thus posing a challenge for asset pricing.

To identify the primary measure of tax news shocks, I combine information from large tax announcements with information from equity prices.[4] Often the arrival of relevant public news announcements is observable to the agent. It is well documented that consumers respond to changes in the current and future disposable income (Shapiro and Slemrod (1995), Parker (1999a), Souleles (1999), and Johnson, Parker and Souleles (2006)). In fact, households respond to news about future taxes even before the rates change (Kueng (2018)). The income tax announcements have heterogenous effects on the cross-section of industries. I exploit this industry heterogeneity (at the 3-digit SIC level) to income tax announcements to construct a tax-news mimicking portfolio (*TMP,* hereinafter). For each announcement, using the narrative accounts of federal tax legislation compiled by Romer and Romer (2010), I compute the present value of the magnitude of tax change at the prevailing level of GDP at a monthly frequency. I only use tax announcements that are motivated to reduce government debt and tax changes proposed to improve long-run economic growth. Romer and Romer (2010) classify such changes as exogenous announcements that are uncorrelated with business cycle variation. I use a long portfolio of firms in industries with the highest sensitivity to tax announcements minus a portfolio of firms in industries with the lowest sensitivity to tax announcements to create the *TMP* spread.

Sialm (2009) shows that there is a significant cross-sectional variation in investment tax burdens across dividend paying and non-paying stocks. The dividend paying stocks have an effective tax rate that is significantly more than for the non-dividend paying stocks. The aggregate tax burden on dividend paying equity securities is substantially larger than that for non-dividend paying securities. Hence, the cross-sectional return spread between stocks paying high dividend yields and stocks paying zero dividend yields should be pronounced during periods when investor's perceived

4. A recent strand of literature uses municipal bond spreads to identify personal income tax shocks. Using data from 2001 to 2008, Longstaff (2011) examine risk premium incorporated into the term structure as compensation to investors for bearing the risk of time variation in the marginal tax rate. Kueng (2018) use the spread examine the implications of income tax shocks on consumption. I complement this strand of literature by using the spread on equity returns, as opposed to bond yields, to identify tax shocks.

probabilities of tax changes are higher. I exploit this heterogeneity in these two portfolios to construct the secondary measure of tax news shocks. I construct a portfolio of long high dividend yield stocks minus zero dividend stocks (*HMZ,* hereinafter) to proxy of tax news shocks.

Since both measures are novel constructions, I verify that they capture future changes in income taxes. I use the National Bureau of Economic Research (NBER) TaxSim program, which is widely used in academia and government agencies, to gauge the marginal tax rates. Using a panel regression with state fixed effects and macro level controls, I show that both the *TMP* spread and the *HMZ* spread predict a significant drop in the *wage income tax rate* in the following year. In addition to the wage taxes, *HMZ* return spread can significantly predict a drop in dividend income tax rate. Both instruments have no explanatory power predicting long-term capital gains taxes.[5]

To understand investor's wealth dynamics, I explore the response of consumption and residential investment following a tax news shock.[6] The Jordà (2005) local projection (LP) method is used to generate the responses. Since there are differences in tax policies between Democratic and Republican regimes, I conjecture that investors view tax news shocks differently across the political partisan cycle. Following Ramey and Zubairy (2018), I augment the LP method to estimate a two state model. The generated consumption and residential investment responses are strikingly different across the political regimes. During Democratic administrations, tax news shocks cause an inconsequential impact on consumption and residential investment. This implies that tax news shocks carry a low amount of risk for investors during Democratic administrations. In contrast, during Republican administrations, tax news shocks cause a significant increase in both consumption and residential investment. Hence, tax news shocks cause high wealth states during Republican regimes. In terms of pricing, tax news shocks should carry a significant amount of risk for investors during Republican administrations. During Republican regimes, the risk premium for assets with high sensitivity to tax news shocks should be positive because of their "positive

5. Literature remains divided on the effects of long-term capital gains taxes on asset prices. Due to the capitalization effect, investors may demand lower prices to hold assets on which they have to pay capital gains taxes in the future (e.g., Lang and Shackelford (2000); Ayers et al. (2003); Dai et al. (2008)). On the other hand, investors may demand higher prices to sell assets if they have to pay taxes on selling them (e.g., Feldstein, Slemrod, and Yitzhaki (1980); Poterba and Weisbenner (2001); Klein (2001); Blouin et al. (2003); Jin (2006); George and Hwang (2007)). The implications of long-term capital gains taxes on asset prices is outside the scope of this study.

6. Since the medium-term provides a better measure of risk than the contemporaneous covariance of consumption and payoffs (Gabaix and Laibson (2001); Parker (2001); Parker and Julliard (2005)), I examine the consumption and residential investment up to 3 years following the tax news shock. The medium-term provides a better estimate since consumption displays smoothness in response to wealth shocks (e.g., Flavin (1981); Hall and Mishkin (1982); Parker (1999b)).

consumption beta."[7]

I use time-series and cross-sectional asset pricing tests to examine the tax shocks premium. The annualized time-series mean of the *TMP* portfolio is approximately 3.6 percent for the sample from January 1967 to December 2018. The time-series mean is approximately -0.31 and 6.5 percent during Democratic administrations and Republican administrations, respectively. During Republican terms, *TMP* spread and *HMZ* spread generate a return of 4.3 and 4.7 percent, respectively, in excess of the Fama and French (1993) 3-factor model. Further examination reveals that the tax shocks premium is either negative or insignificant during each Democratic presidential term in the sample. In contrast, the average of the *TMP* spread is positive for each of the Republican terms except for the presidency of George H. W. Bush, who famously went back on his "no new taxes pledge" to raise taxes, and the 2^{nd} term of George W. Bush, which was largely marred by the financial crisis of $2007-2008$. The time-series results are consistent with tax news shocks carrying a significant amount of risk during Republican regimes and a low amount of risk in Democratic regimes.

I document that stocks with high sensitivity to tax shocks have higher returns than stocks with low sensitivity to the shocks. In June of each year, I sort firms into 5 quintiles by their sensitivity to the tax news shock (univariate beta with respect to the *TMP* spread or *HMZ* spread). I compute the value-weighted returns on the tax exposure portfolios for the next 12 months, from July to June. The average returns in excess of the risk-free rate increase with the tax exposure portfolios. The variation in the expected returns across the tax exposure portfolios is negligible during Democratic administrations. In contrast, the returns vary significantly across the tax exposure portfolios during Republican administrations; the annualized long-short return spread sorted on β^{tmp} (or β^{hmz}) is approximately 7.4 (or 8.4) percent during Republican administrations. The results are consistent with tax shocks increasing the amount of risk for investors during Republican administrations.

Using a conditional factor model, I examine whether the time-varying premium generated through tax news shocks is subsumed by recent empirical risk factor models. The investment factor, especially in the Hou, Xue, and Zhang (2015) q-factor model, is positively correlated with the tax shocks premium. The discount rate effect (reduction in cost of capital) caused by tax news

7. During Republican regimes, assets with high exposure to tax news shocks increase the risk for the investor since they have high payoffs during high consumption states.

shocks further increases the net present value of new projects and increases investment, all else equal. This increases the spread between the return on a portfolio of low investment stocks and the return on a portfolio of high investment stocks. By controlling for the investment factor, the tax shocks premium is reduced during Republican regimes, and the premium in turns negative during Democratic regimes. Controlling for the q-factor and Fama and French (2015) 5-factor models downward mean shifts the tax shocks premium preserving the spread.

I also employ Fama and MacBeth (1973) two-pass regression framework to gauge the time-varying tax shocks premium. To capture the additional risk during Republican regimes, I create a conditional-TMP ($CTMP$) factor. The conditional factor equals TMP spread in Republican regimes, and zero otherwise. To represent as diverse cross-sections as possible, I use 15 portfolios as test assets; 5×3 portfolios sorted on β^{tmp} and size, 5×3 portfolios sorted on investment and size, and 5×3 portfolios sorted on ROE and size. Using two-pass regressions, I show that the $CTMP$ factor is significantly priced in the cross-section, even controlling for the q-factor and 5-factor models.

Given the time-varying nature of the tax shocks premium, in the spirit of Belo, Gala, and Li (2013), I create an investment strategy that exploits the presidential cycle predictability. During Republican administrations, the strategy goes long on the TMP return spread. During Democratic administrations, the strategy takes a short position on the TMP return spread. The investment strategy generates an annualized average return of approximately 3.8 percent and 5.0 percent in excess of the Hou, Xue, and Zhang (2015) q-factor model and the Fama and French (2015) 5-factor model, respectively. A similar strategy using the HMZ spread generates an annualized average return of approximately 5.4 percent and 7.2 percent in excess of the Hou, Xue, and Zhang (2015) q-factor model and the Fama and French (2015) 5-factor model, respectively.

I verify that the results are robust to alternate measure, methodology, and controls. To create an alternate measure, I use a principal component analysis (PCA) to extract tax news from six portfolio spreads that likely contain information on expectations about tax changes. The six portfolios include three return spreads based on sensitivity to tax announcements and three return spreads based on differences in the dividend yield. I find consistent asset pricing results using the first component, which proxies (ex-post) tax news shocks.

I examine the consistency of the macro dynamics using a VAR framework. Using a threshold

VAR, I generate impulse response functions for each political regime. The impulse responses generated by the threshold VAR is surprisingly similar to the results from the state dependent local projections. There is a significant increase in consumption and residential investment during Republican terms. In contrast, during Democratic terms, consumption remains steady at the normal levels following a positive shock to tax news.

Finally, I examine whether political cycles best explain the time-variation in the tax shocks premium. I control for several potential state variables that may correlate with political cycles. Literature has shown that the Republican administrations are associated with slower output growth (Alesina and Rosenthal (1995); Alesina, Roubini, and Cohen (1997)) and lower stock returns (Santa-Clara and Valkanov (2003); Pastor and Veronesi (2019)). Hence, it is possible that political cycles may capture variations in economic growth. I control for four proxies that are known to predict aggregate investment opportunities; default spread, Treasury bill rate, dividend yield, and earnings to price ratio. In addition, I include an indicator variable for NBER recessions. Using a conditional factor model, I find that the political cycles best explains the time-varying tax shocks premium controlling for all the business cycle proxies. I also show that macroeconomic uncertainty, economic policy uncertainty, aggregate liquidity, and consumer sentiment fail to explain the time-varying tax shocks premium.

This paper contributes to the growing literature on fiscal policy and asset prices. Sialm (2006) analyzes the effects of stochastic taxes on asset prices in a general equilibrium setting. Croce et. al. (2012) explores the effects of tax uncertainty on asset prices in a production economy with recursive preferences. Some studies have empirically examined tax policy changes on asset prices (Lang and Shackelford (2000); Tavares and Valkanov (2001); Auerbach and Hassett (2005); Amromin, Harrison, and Sharpe (2008); Sialm (2009); Longstaff (2011)). I contribute to this literature by empirically investigating the dynamic nature of the tax news shocks, which are *unanticipated information* about future changes in after-tax income rather than the *realized change* in taxes, on the risk premium over political cycles.

The paper is organized as follows. Section 2 describes the data and construction of tax news shocks. Section 3 shows the macro dynamics. Section 4 presents the asset pricing results. Section 5 further discusses the results. Section 6 concludes.

2 Identification and the Measures

In this section, I describe the data used in this study and the methodology used to construct the empirical proxies for tax news shocks.

2.1 Data

Stock return data are from the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ obtained from the Center for Research in Security Prices (CRSP). I require at least 12-months of returns to be included in the sample. Following the literature, I exclude firms in the heavily regulated utility (SIC codes between $4900 - 4949$) and financial (SIC codes between $6000 - 6999$) sectors from the sample.

Accounting data are from Compustat. I use screening to satisfy the standard requirements in finance literature. A firm must have a December fiscal-year end and at least two years of data to be included in the sample. I merge the Compustat data with hand-collected book equity values from Moody's Industrial, Public Utility, Transportation, and Bank and Finance Manuals used in Davis, Fama, and French (2000).

The market value of equity (ME), the stock price times the number of shares outstanding, is computed using CRSP data each year at end of June. Following Fama and French (1993), the book value of equity (BE) of a firm is computed as the Compustat book value of stockholder's equity plus balance sheet deferred taxes and investment tax credits minus the book value of preferred stock. Depending on the availability of data, redemption, liquidation, or par value is used to estimate the book value of preferred stock. The book-to-market equity (BE/ME) of a firm is the book equity for the fiscal year ending in calendar year $t-1$ divided by the market equity at the end of December of $t-1$. Negative and zero book values are treated as missing.

2.2 Tax Shocks Mimicking Portfolio (TMP)

Changes in household balance sheets are responsible for sharp and persistent changes in aggregate demand (Mian and Sufi (2010), Hall (2011), Eggertsson and Krugman (2012), Mian, Rao and Sufi (2013)). Mian, Rao and Sufi (2013), for example, show that wealth shocks to household balance sheets resulting from the $2007-09$ housing collapse caused part of the decline in consumer demand. Personal income tax news shocks alter household balance sheets and aggregate consumer demand. However, wealth shocks have heterogenous effects across industries since the marginal propensity to consume differs by the type of spending (Johnson, Parker and Souleles (2006); Agarwal, Liu and Souleles (2007); Mian, Rao and Sufi (2013)). The cross-sectional variation across industry demand implies a heterogenous effect on industry performance. Based on this reasoning, I make the following assumption:

Assumption 1. *The cross-sectional return difference between stocks with differential sensitivities to tax news are pronounced during times when investor's perceived probabilities of income tax changes are high.*

I exploit this heterogeneity in industry returns to obtain additional information about the perceived probabilities of income tax changes. Asset prices contain information about policy changes and other sources of systematic risk. However, detangling the expectations about tax policy changes from other sources of risk is a challenge. To overcome this issue, I exploit the heterogeneity in industry variation to narratively identified tax news announcements.

I use the narrative analysis of the federal tax legislation compiled by Romer and Romer (2010) (R&R, hereinafter) to identify the largest and most significant tax news announcements in the U.S. R&R use three contemporary primary sources to identify the magnitude, timing, and motivation of policy interventions; *i)* the Economic Report of the President, *ii)* the Annual Report of the Secretary of the Treasury on the State of the Finances, and *iii)* the Budget of the United States Government. R&R also include secondary sources of information including the presidential speeches and statements, Congressional documents, the report of the Ways and Means Committee of The State of the Union Address, the Annual Budget Message, speeches announcing tax proposals, and statements upon signing tax bills.

I use the present value of the magnitude of tax change at the prevailing level of GDP at the time of the news announcement. The tax revenues are discounted using the 3-month Treasury bill rate. The discounted tax revenue is then then scaled by the nominal GDP at the time of the tax change. I re-construct the R&R narrative time-series at the monthly frequency. I exclude endogenous tax events that are largely spending-driven (motivated by a change in government spending) and countercyclical (motivated to increase GDP growth to normal level). I only focus on the tax changes that are motivated to reduce deficit (motivated to reduce government debt), and to improve long-run economic growth. R&R classify such changes as exogenous tax announcements.

My goal is to construct a measure of the *perceived probabilities of tax changes* or simply news shocks about future taxes. To do so, I propose a long-short portfolio approach.[8] Under the assumption that the market is an efficient aggregator of information and *Assumption 1*, a long portfolio of firms with the highest sensitivity minus a portfolio of firms with the lowest sensitivity to R&R tax announcements should approximate perceived probabilities of future tax changes. To reduce the noise from firm level idiosyncratic variations, I create 3-digit SIC industry portfolios using ordinary common shares from the CRSP database. In each month, I restrict the sample to industry portfolios with more than 15 firms to minimize the idiosyncratic noise.

To estimate the heterogeneity in industry sensitivities to income tax announcements, I estimate time-series regressions on the 3-digit SIC industry portfolio returns. Industry sensitivities are computed using the following rolling estimation:

$$r_{i,t} - r_{f,t} = \alpha_{i,t} + \beta^{z}_{i,t} x^{z}_{t} + \beta^{mkt}_{i,t}(r^{mkt}_{t} - r_{f,t}) + \beta^{hml}_{i,t} r^{hml}_{t} + \beta^{smb}_{i,t} r^{smb}_{t} + \epsilon_{i,t}, \tag{1}$$

where i represents the 3-digit SIC industry, x^z is the R&R exogenous tax announcements, r^{mkt} is the return on the market portfolio, r_f is the risk-free rate, r^{hml} is the return on a high minus low book-to-market portfolio, and r^{smb}_t is the return on a small minus big market capitalization portfolio. This is an augmented version of the Fama and French (1993) 3-factor model.[9] I use 60 monthly observations to estimate conditional betas. Time t represents months with a non-zero present value of tax announcements. For months with a present value of zero, I use the β^z_i from the nearest previous month with non-zero present value. Since industry betas are calculated using the information available upto t, the instrument is not subjected to look-ahead bias.

To create the *TMP* return spread, I exploit the variation in industry $\beta^z_{i,t}$. I exclude NASDAQ stocks to avoid discontinuity in the number of firms. Most anomalies reported in literature become insignificant when microcaps stocks, which are stocks that are smaller than the 20^{th} percentile of

8. Using linear projections to construct mimicking portfolios for non-traded assets is a method often used in the literature (see, for e.g., Vassalou (2003); Jagannathan and Wang (2007); Adrian, Etula, and Muir (2014)). A linear projection weighting assumes that the narrative accounts reflect the structural shocks without error. The long-short portfolio approach is a more robust alternative to a linear projection method.

9. I use the 3-factor model since the Hou, Xue, and Zhang (2015) q-factors and the Fama and French (2015) 5-factors are unavailable (through public sources) prior to 1963. Using hand-collected data, Wahal (2019) shows that there is no reliable relation between investment and returns prior to 1963.

market equity for NYSE stocks (Hou, Xue, and Zhang (2015)). To mitigate this concern, I exclude all microcap stocks when constructing the *TMP* spread.[10] I exclude firms with headquarters outside the U.S. since they are less likely to be impacted by domestic tax announcements. At each point in time, I classify stocks in the top quintile (top 20^{th} percentile of $\beta^z_{i,t}$ industries) as high β^z_i firms. Similarly, in each month, I classify stocks in the bottom quintile (bottom 20^{th} percentile of $\beta^z_{i,t}$ industries) as low β^z_i firms. In addition, I independently sort stocks based on NYSE size cutoffs; small (less than 50^{th}percentile), medium (greater than 50^{th}percentile and less than 80^{th}percentile), and large (greater than 80^{th}percentile). I construct six portfolios from the intersection of β^z_i and size (low β^z_i/S, low β^z_i/M, low β^z_i/L, high β^z_i/S, high β^z_i/M, high β^z_i/L). Although the splits are arbitrary, the results are not sensitive to these choices.

TMP is the spread, each month, between the simple average of the returns on the three high β^z_i stock portfolios (high β^z_i/S, high β^z_i/M, high β^z_i/L) and the simple average of the three low β^z_i stock portfolios (low β^z_i/S, low β^z_i/M, low β^z_i/L).[11] Hence, *TMP* is the return spread between firms with high sensitivity minus low sensitivity to tax news announcements portfolios with approximately the same weighted average market equity.

2.3 Alternative Measure: HMZ Portfolio Returns

I propose an alternative instrument that captures the perceived probabilities of tax changes. Under the tax capitalization hypothesis, income taxes are directly incorporated into equity prices (Sialm (2006)). The equity prices tend to be lower and the before-tax equity returns tend to be higher when dividend taxes are relatively high compared to capital gains taxes. In response, low-tax or tax-exempt investors are more likely to hold high dividend yield stocks and high income tax investors hold low- or no-dividend stocks to reduce the tax burden (Miller and Modigliani (1961); Allen, Bernardo, and Welch (2000)).

Sialm (2009) empirically show that there is significant cross-sectional variation in the investment tax burden since dividends tend to be taxed more heavily than capital gains. On average, dividend paying stocks have an effective tax rate that is more than three times the effective tax rate of non-dividend paying stocks. Hence, the aggregate tax burden on dividend paying equity securities

10. I later include both NASDAQ stocks and micro-cap stocks in the asset pricing tests.
11. I report portfolio characteristics in the Appendix Table A2 .

is substantially larger than for non-dividend paying securities. Motivated by the findings in Sialm (2009), I make the following assumption:

Assumption 2. *The cross-sectional return differences between stocks with differential dividend yields are pronounced during times when investor expectations about investment income taxes are high.*

I exploit this heterogeneity in the equity returns based on dividend yields to gauge the perceived probabilities of investment income tax changes. Since the anticipated dividend yield is not observable, I assume that the anticipated dividend yield of each portfolio equals the actual dividend payments made during the prior year divided by the stock price one year ago. This is a weak assumption since the dividend payout policies are highly persistent over time.

As with the previous measure, I exclude NASDAQ stocks, microcaps stocks, and firms with headquarters outside of the U.S. to reduce noise. I split NYSE and AMEX stocks into 3 portfolios based on the dividend yield. I split firms into zero dividends (Z div portfolio) and dividend paying stocks. I further split the dividend paying stocks based on the NYSE cutoffs; low 70^{th} percentile and high 30^{th} percentile (H div portfolio). In addition, I independently sort stocks on size based on NYSE cutoffs; small (less than 50^{th}percentile), medium (greater than 50^{th}percentile and less than 80^{th}percentile), and large (greater than 80^{th}percentile). Next, I construct six portfolios from the intersection of dividend yield and size portfolios (Z div $/S$, Z div $/M$, Z div $/L$, H div $/S$, H div $/M$, H div $/L$).

HMZ is the spread, each month, between the simple average of the returns on the three high dividend yield stock portfolios (H div $/S$, H div $/M$, H div $/L$) and the simple average of the three zero dividend portfolios (Z div $/S$, Z div $/M$, Z div $/L$). Thus, *HMZ* is the return spread between high dividend yield minus zero dividend portfolios with approximately the same weighted average market equity.

2.4 Factor Correlations

Table 1 shows the correlations between the tax news shocks and some of the most commonly used factors in the literature. The correlations between the *TMP* return spread and the excess market returns, size, momentum, and profitability factors are small in magnitude. However, *TMP* return spread has a positive correlation with the value factor (*HML*, which a diversified portfolio of high book-to-market stocks minus low book-to-market stocks), and the investment factors in Fama and French (2015) 5-factor model (*CMA*, which is a diversified portfolio of conservative investment firms minus aggressive investment firms), and Hou, Xue, and Zhang (2015) q-factor model (I/A, which is the difference between the return on a portfolio of low investment stocks and the return on a portfolio of high investment stocks). The book-to-market ratio and capital investment contain largely the same information (Anderson and Garcia-Feijóo (2006); Xing (2007)). High investment firms are likely to be low book-to-market firms (i.e., growth firms) with greater investment opportunities.

HMZ spread also has a positive correlation with value and investment factors. In addition, *HMZ* portfolio has a negative correlation with the market portfolio. This is expected since *HMZ* spread approximates investment income tax cuts. In times of economic growth, investors expect investment tax hikes.

Figure 1 shows the time-series of the newly constructed tax news shocks proxies; the *TMP* spread (in solid line) and the *HMZ* spread (in dashed line). It appears that most of the large spikes in the *TMP* return spread and the *HMZ* return spread coincide with each other, implying a common source of systematic risk.

3 Macroeconomic Dynamics and Hypothesis Development

Since the *TMP* and *HMZ* spreads are novel constructions, I verify whether they capture expectations about income tax policy changes. Subsequently, I examine the implications of tax news shocks on investor wealth across the partisan cycle.

3.1 Predictive Regressions

The National Bureau of Economic Research (NBER) TaxSim program is widely used in academia and many government agencies (e.g., U.S. Bureau of Labor Statistics; U.S. Census Bureau) to gauge the marginal tax rates in the U.S.[12] TaxSim runs a fixed sample of tax returns through different tax schedules every year and accounts for most features of the tax code. To compute marginal tax rates, TaxSim computes the tax liability of each eligible return. Next, each income or deduction

12. See Feenberg and Coutts (1993) for an overview of the NBER TaxSim program.

type is increased by one percent of its value and the tax is re-calculated under the assumption that other incomes and expenses are constant. The difference in aggregate tax divided by the difference in aggregate income or deduction is the *marginal* tax rate on the average dollar of that income or deduction type.

I estimate the following model:

$$TaxRate_{i,t+1} = \kappa_i + Inst_t + Controls_t + TaxRate_{i,t} + \epsilon_{i,t+1}, \tag{2}$$

where κ_i denotes the state fixed effects and $Inst$ is the instrument of tax news (either *TMP* returns or *HMZ* returns). $Controls$ include the growth rate in the real GDP, 3-month T-bill rate, default spread (10 year minus 2 year treasury bond spread), and inflation rate. $TaxRate$ is the TaxSim marginal federal plus state income tax rate. I examine 5 different types of tax rates; tax rate on wage income (Wages), dividend income (Dividends), short term gains (ST Gains), long term gains (LT Gains), and taxable pension income (Pensions). I cluster the standard errors by state and year.

Table 2 shows the results. An increase in the *TMP* return spread predicts a significant, at the conventional 5 percent level, drop in *wage* income and dividend income tax rates in the following year. *TMP* return spread has no predictive power for either long-term or short-term capital gains tax rates. This confirms that that *TMP* return spread is an instrument of *wage* income tax news shocks.

HMZ return spread captures a broader range of income taxes; the instrument has significant predictive power, at the conventional 5 percent level, for wage income, taxable pension income, dividend income, and short-term gains tax rates. Similar to the *TMP* return spread, the *HMZ* return spread has no power predicting long-term capital gains taxes.

3.2 Partisan Cycle Dependent Model

There are two potential methods to estimate impulse response functions. First method is to estimate responses using vector autoregressions (VARs). This technique poses a challenge since the econometrician is required to impose an ordering of the variables to generate orthogonalized impulse responses. Second method is to use the Jordà (2005) local projections (LP). The LP method is more robust and can be easily adapted to estimate a state dependent model. State-dependent LP models have been recently used in the fiscal policy literature (e.g., Auerbach and Gorodnichenko (2013); Ramey and Zubairy (2018)). Given the advantages, I use LPs to estimate the baseline response functions.[13]

Literature documents significant differences in tax policies between Democratic and Republican administrations (Hibbs (1977); Alesina (1987)). Investor's expectations of future tax policy changes likely depend on the political cycle. Following Ramey and Zubairy (2018), I augment the LP method to estimate a two state model. Specifically, I use a political partisan cycle dependent LP model. This method requires the estimation of a series of regressions for each horizon h for each variable. I estimate the following model that allows for state dependence:

$$\begin{aligned} x_{t+h} = {} & I_t \left[\alpha_{D,h} + \psi_{D,h}(L)\ z_{t-1} + \beta_{D,h}\ shock_t\right] \\ & + (1 - I_t)\left[\alpha_{R,h} + \psi_{R,h}(L)\ z_{t-1} + \beta_{R,h}\ shock_t\right] + \epsilon_{t+h}, \end{aligned} \tag{3}$$

where I is an indicator variable that takes the value 1 if the shock occurs within a Democratic administration, and zero otherwise. x is the variable of interest, z is a vector of controls, and $\psi_h(L)$ is a polynomial in the lag operator of order 2. The identified shock variable is the *TMP* return spread.[14] I allow for the coefficients of the model to vary according to the partisan cycle and allow the forecast of x_{t+h} to differ according to the political regime when the shock hit.

The vector of control variables, z, contains the real per capita GDP, 3-month T-bill rate, real per capita government spending, real per capita consumption, real per capita residential investment, and Baker, Bloom, and Davis (2016) economic policy uncertainty index. All controls are in natural logarithm. The vector z also includes the lags of the *shock* variable to control for any serial correlation in the variable and a linear time trend. The coefficient β_h is the response of x at time $t + h$ to the shock at time t. The impulse responses are constructed as a sequence of the β_h's estimated in a series of single regressions for each horizon.

The variables of interest are the real per capita consumption and the real per capita residential investment, which proxy the wealth state. In addition to aggregate consumption growth, residential

13. In Section 5.2 , I find similar results by generating orthogonalized impulse responses using a threshold VAR.
14. The results are qualitatively consistent with the *HMZ* return spread as the identified shock. For parsimony, I only report the results using the *TMP* return spread as a proxy for tax news shocks.

investment growth is known to predict wealth states (Cochrane (1996)). In fact, literature considers housing both as an asset and as a consumption good (Lustig and Van Nieuwerburgh (2005); Piazzesi, Schneider and Tuzel (2007)). Positive responses (growth) in consumption and residential investment would imply a low marginal utility of consumption state (i.e., high wealth state) for investors. Based on the intuition of the consumption-CAPM, the covariance of asset returns and the consumption growth of stockholders determines asset riskiness and payoffs (Breeden (1979)). Gabaix and Laibson (2001), Parker (2001), and Parker and Julliard (2005) show that contemporaneous covariance of consumption and wealth understates the risk of equity and suggests that the medium-term provides a better measure of risk. The medium-term, i.e., up to 3 years, provides a better estimate since consumption displays smoothness in response to wealth shocks (e.g., Flavin (1981); Hall and Mishkin (1982); Parker (1999b); Parker (2001)). Hence, I examine impulse response functions up to 3 years following the shock.

Figure 2 shows the responses of consumption and residential investment using the state-dependent model in (3) .[15] There are clear differences between the two regimes. The medium-term responses in consumption and residential investment are trivial during Democratic administrations. In contrast, during Republican administrations, there is a significant increase in both consumption and residential investment. The macro dynamics imply that tax news shocks induce different wealth effects across the partisan cycle.

3.3 Hypothesis Development

I use the empirically observed macro dynamics to develop testable asset pricing hypotheses. During Democratic regimes, tax news shocks induce negligible effects on investor's wealth. Hence, tax news shocks carry a low amount or no risk during Democratic regimes. I propose the following:

Hypothesis 1. *During Democratic regimes, tax news shocks carry an insignificant risk premium (low amount of risk).*

In contrast, tax news shocks cause high wealth states during Republican administrations. During Republican administrations, rational investors are likely to demand compensation for holding

15. Figure A1 presents the impulse response functions for other variables using the state-dependent model. GDP increases only during Republican regimes following a tax news shock. I find trivial effects for the response in government spending and T-bill rate.

assets that co-move positively with tax news shocks because they increase their consumption volatility. Based on this intuition, I propose the following:

Hypothesis 2. *During Republican administrations, investors command a positive risk premium (high amount of risk) to hold assets that co-move positively with tax news shocks.*

4 Asset Pricing Results

I test the proposed hypotheses by performing asset pricing tests. I use time-series tests including simple averages of the tax shocks proxies across political regimes and portfolio sorts, and cross-sectional tests.

4.1 Time-Series Mean

4.1.1 Democratic versus Republican

The risk premium should approximate the average return on the traded portfolio. I begin by examining the simple time-series average of the tax news shocks proxies, either the *TMP* spread or the *HMZ* spread, during Democratic regimes and Republican regimes. To capture expectations, each presidential term in starts in November when the candidate is announced as the President elect. The exception is the resignation of Richard Nixon in August 1974 and Gerald Ford taking office afterwards. This corresponds to 262 Democratic months and 362 Republican months.

Table 3 shows the average returns of the *TMP* return spread and the *HMZ* return spread for the full sample, Democratic regimes, and Republican regimes. For the full sample, the average annualized return of the *TMP* spread is approximately 3.6 percent and approximately 4.3 percent over the CAPM. The time-series average of the *TMP* return spread is insignificant during Democratic administrations, consistent with the *Hypothesis 1.* During Democratic regimes, investors are less concerned about tax news shocks since the shocks cause a trivial effect on wealth dynamics (low amount of risk). In contrast, the average of the *TMP* spread is highly significant during Republican administrations. During Republican regimes, the average annualized return of the *TMP* spread is approximately 7.5 percent and approximately 7.8 percent over the CAPM. This evidence clearly supports the *Hypothesis 2* that investors command a positive risk premium to compensate for the high amount of risk during Republican regimes.

The *HMZ* spread generates consistent results. The average of the *HMZ* spread is insignificant during Democratic administrations. However, during Republican regimes, the average annualized return of the *HMZ* spread is approximately 7.2 percent. The average annualized return of the *HMZ* spread is approximately 7.9 percent over the CAPM.

4.1.2 Premium During Each Presidential Term

For a detailed examination, I explore the time-series mean of the *TMP* return spread over each presidential term. There are 9 Republican terms and 6 Democratic terms in the sample from 1967 to 2018.

Figure 3 shows the average annualized return of the *TMP* spread for each presidential term. During Democratic administrations, the average of the *TMP* return spread is negative for all terms, except for the 2^{nd} term of Barack Obama, in which the spread is close to zero. The average *TMP* return spread is significantly positive for most Republican terms. The spread is only slightly positive for the term of President George H. W. Bush, who famously went back on his "no new taxes pledge" and raised taxes, and the 2^{nd} term of George W. Bush, which was largely marred by the financial crisis of $2007 - 2008$. The positive premium for tax shocks during the Republican regimes is consistent with the discount rate effect.

4.2 Portfolio Sorts

Next, I use portfolio sorts to gauge the association between a stock's beta to tax news shocks and it's returns. Following Fama and French (1993) procedure, I create portfolios based on the pre-rank betas with respect to the tax news shocks. Here, I use all stocks from NYSE, AMEX, and Nasdaq.

4.2.1 Tax Exposure Portfolios

To measure a firm's sensitivity to tax news shocks, I compute a stock's univariate beta with respect to the shock (either the *TMP* return spread or the *HMZ* return spread). Specifically, I estimate the following time-series regression for each firm:

$$r_{i,t} - r_{f,t} = \alpha_{i,t} + \beta_{i,t}^{tax} r_t^{tax} + \epsilon_{i,t}, \tag{4}$$

where r_i is the monthly stock return for firm i, $r_{f,t}$ is the risk-free rate, and r^{tmp} is the tax news shock. The $\beta_{i,t}^{tax}$ captures firm i's exposure to the shock at time t. Following Fama and French (1992), I use a 60 month window to estimate the betas.

I sort firms into quintiles by their pre-ranking β^{tax} as of June of each year. Table 4 , Panel A, shows the summary statistics of the tax exposure portfolios sorted on β^{tmp}. The average firm pre-ranking β^{tmp} ranges from -1.17 to 1.06. To compute post-ranking betas, I regress the time-series of each portfolio return on the *TMP* spread. The average post-ranking β^{tmp} monotonically increases from -0.58 to 0.30, suggesting that the exposure to tax news shocks is driving the variation in returns. I also report β^{mkt}, which measures the sensitivity to the aggregate market portfolio. $\beta^{mkt\prime}s$ fail to explain the tax exposure portfolios. Pre-ranking $\beta^{hmz}s$ increase with the tax exposure portfolios. This suggests that *TMP* and *HMZ* capture a common source of systematic risk, which is the exposure to tax news shocks. The tax exposure portfolios sorted on β^{hmz} in Panel B generates consistent results.

Table 5 shows the value-weighted monthly returns on the portfolios for the next 12 months, from July to June. Panels A and B show the average excess returns and the average returns over the CAPM (α_{CAPM}) for portfolios sorted on β^{tmp} during Republican and Democratic presidencies, respectively. During Republican regimes, both the average excess returns and the average α_{CAPM} increase monotonically as the exposure to the tax news shocks increase. The annualized long-short portfolio return spread sorted on β^{tmp} is approximately 7.4 percent during Republican regimes. In contrast, during the Democratic administrations, the average excess returns show no significant variation across the tax exposure portfolios.

Panels C and D show the results using β^{hmz} portfolio sorts. The average excess return and the average α_{CAPM} increase monotonically during Republican presidencies. Although the excess returns decrease, there is no significant variation in the average α_{CAPM} for portfolios sorted on β^{hmz} during Democratic regimes. The portfolio sorts generate results that are consistent with the hypothesis 1 and 2.

4.2.2 Dividend Paying versus Non-paying Stocks

An increase in income tax rates reduces the valuation of equity securities generating higher expected before-tax returns. Perhaps, the premium is largely driven by a direct tax burden on dividends rather than the exposure to consumption risk. If this is the case, the tax news premium should exist only in dividend paying stocks; investors demand higher expected returns to hold assets on which they must pay higher dividend taxes in the future. In contrast, a discount rate effect impacts all firms and the impact is proportional to the exposure to the tax news shock. If the impact is driven by a discount rate effect as implied by macro dynamics, then the tax shocks premium should exist in both the dividend paying and non-dividend paying stocks.

I use a sub-sample analysis to disentangle the impact of a direct burden on the dividends from the discount rate effects. First, I split the sample into stocks paying dividends and stocks non-paying dividends. Second, within each sample, I sort firms into quintiles by their pre-ranking β^{tax} as of June each year. I calculate the value-weighted monthly returns on the portfolios for the next 12 months, from July to June. Finally, I examine the long-short portfolio spread sorted on β^{tax}.

Table 6 , Panel A, shows the portfolio sorts on pre-ranking β^{tmp}. During Republican terms, the average return spread and the average α_{CAPM} on the long-short spread are positive and statistically significant in *both* the dividend paying and non-paying stocks. In contrast, during Democratic terms, the average return spread and the average α_{CAPM} on the long-short spread are trivial in both samples. Panel B shows similar results using sorts on pre-rank β^{hmz}. The positive premium during Republican terms in both the dividend paying and non-dividend paying stocks is consistent with the discount rate effect.

4.3 Factor Model Tests

The differences in the tax shocks premium across the partisan cycle is striking. Here, I examine whether the premium is captured by some of the commonly used empirical factor models in the literature. To do so, I employ the following factor model:

$$r_{i,t} = \sum_{f} \left[\beta_i^k r_{k,t} + \beta_{i,DEM}^k \left(r_{k,t} * DEM_t \right) \right] + \alpha_i + \alpha_{i,DEM} DEM_t + \epsilon_t, \tag{5}$$

where $r_{i,t}$ is the return on portfolio i, $r_{k,t}$ is the returns of factor k, and DEM_t is an indicator variable that is equal to one if month t falls within a Democratic presidency and zero otherwise. For each model, the intercept and all factors are interacted with the indicator variable to allow for variation in the coefficients.

Table 7 reports α and α_{DEM} for four proxies of the tax shocks premium: TMP and HMZ spreads, the spread on the long-short portfolio quintiles sorted on β^{tmp} and β^{hmz}. During Republican terms, all four proxies of the tax shocks premium remains positive controlling for the Fama and French (1993) 3-factor model, which includes the market, size, and value factors.

Next, I examine whether recent empirical models, Fama and French (2015) 5-factor and Hou, Xue, and Zhang (2015) q-factor models, capture the tax news shocks premium. The 5-factor model includes the 3-factors plus investment (CMA) and profitability (RMW) factors and the q-factor model includes the market, size, investment (I/A), and profitability factors (ROE). The investment factor, CMA in the 5-factor model and I/A in the q-factor model, loads positively on the tax shocks premium. The implied real interest rate is low since a tax news shock cause a short- to medium-term increase in consumption. This reduction in the cost of capital further increases the net present value of new projects and increases investment, all else equal. This increases the spread between the return on a portfolio of low investment stocks and the return on a portfolio of high investment stocks.

There is a *mean shift* in the tax shocks premium when I control for the 5-factor and q-factor models. Since investment factor loads positively, the positive premium is greatly reduced during Republican regimes, and the trivial tax shocks premium in Democratic regimes turns significantly negative. This implies that the recent empirical models do not fully subsume the tax shocks premium. However, controlling for the investment factor downward mean shifts the premium preserving the spread.

4.4 Fama-McBeth Regression Approach

I also test the risk premium using a Fama and MacBeth (1973) two-pass regression. Since I hypothesize that the tax-shock premium is partisan cycle dependent, I model it as a function of scaled factors. Specifically, I define a conditional TMP factor:

$$CTMP_t = I_t \cdot TMP_t, \tag{6}$$

where $CTMP$ is given by the product of an indicator variable I and TMP. I_t is an indicator variable that takes a value of 1 if the month falls within a Republican presidency, and 0 otherwise.

To understand the role of $CTMP$, consider the return generating process:

$$r_{i,t} - r_{f,t} = \alpha_i + \sum_f \left[\beta_i^k r_{k,t}\right] + \beta_{i,tmp} TMP_t + \beta_{i,ctmp} CTMP_t + \epsilon_{i,t}, \tag{7}$$

where $r_{k,t}$ is the return on factor k. The above equation can be rewritten as:

$$r_{i,t} - r_{f,t} = \alpha_i + \sum_f \left[\beta_i^k r_{k,t}\right] + \left(\beta_{i,tmp} + \beta_{i,ctmp}\ I_t\right) TMP_t + \epsilon_{i,t}. \tag{8}$$

From the above equation, it is evident that the beta is effectively $\beta_{i,tmp}$ during the Democratic presidencies. $\beta_{i,ctmp}$ captures the exposure to an additional quantity of risk in the Republican presidencies. I use the entire sample in the first-pass beta estimation. In this type of a conditional set-up, rolling beta approach is redundant because $\beta_{i,ctmp}$ is effectively time-varying.[16] As test assets, I include 15 portfolios independently sorted on β^{tmp} and size, 15 portfolios independently sorted on investment and size, and 15 portfolios independently sorted on ROE and size. The t-statistics are reported in brackets using Shanken (1992) corrected standard errors.

Table 8 reports the 2^{nd} stage results. Column (1), (2), and (3) control for the Fama and French (1993) 3-factor model, Hou, Xue, and Zhang (2015) q-factor model, and Fama and French (2015) 5-factor model, respectively. TMP factor is insignificant in all three specifications. However, the $CTMP$ factor carries a significant premium. The results imply a significant time-variation in the tax news shocks premium.

4.5 Political Cycle Investment Strategy

By exploiting the time-varying nature of the tax shocks premium, I show a simple political cycle investment strategy that generates significant risk adjusted returns. During Republican administrations, the strategy goes long on the tax news shocks portfolio (TMP portfolio or HMZ portfolio). During Democratic administrations, the long and short positions are reversed. Specifically, the

16. See Watanabe and Watanabe (2007) for a set-up with an indicator variable. The authors show that it is inappropriate use rolling betas in a set-up that makes use of an indicator variable.

investment strategy is formed as follows:

$$r_t^{IS} = \{ \begin{array}{cc} r_t^{tax} & \text{if DEM} = 0 \\ -r_t^{tax} & \text{if DEM} = 1 \end{array} , \quad (9)$$

where r_t^{IS} is the return on the investment strategy, r_t^{tax} is the tax news shocks mimicking portfolio (*TMP* portfolio or *HMZ* portfolio), and DEM_t is an indicator variable that is equal to 1 if the month falls within a Democratic term, and 0 otherwise. I estimate the risk adjusted returns of the investment strategy by estimating the following:

$$r_t^{IS} = \sum_k \left[\beta_i^k r_{k,t} \right] + \alpha_i^{IS} + \epsilon_t, \quad (10)$$

where $r_{k,t}$ is the returns of factor k. I report the coefficients and Newey and West (1987) heteroskedasticity and serial-correlation robust t-statistics. The annualized time-series mean of the r^{IS} using the *TMP* spread and *HMZ* spread are approximately 5.1 percent and 5.4 percent, respectively.

Table 9 shows the results. Panel A and Panel B show the results using the *TMP* portfolio or *HMZ* portfolio, respectively. I examine the α_i^{IS} over the Fama and French (1993) 3-factor model, Hou, Xue, and Zhang (2015) q-factor model, Fama and French (2015) 5-factor model, and Fama and French (2018) 6-factor model.[17] In all specifications, α^{IS} is positive and significant at the 1 percent level. The investment strategy using the *TMP* portfolio generates excess returns of approximately 3.8 percent over the Fama and French (2018) 6-factor model. Similarly, the investment strategy using the *HMZ* portfolio generates excess returns of approximately 4.2 percent over the Fama and French (2018) 6-factor model.

5 Discussion

In this section, I discuss the robustness of the results. First, I examine whether the asset pricing results are sensitive to the instrument of tax news shocks. I use a principal component analysis

17. The Fama and French (2018) 6-factor model is essentially the Carhart (1997) 4-factor model (market, size, value, and momentum factors) plus the investment and profitability factors.

(PCA) to extract the common component from six different portfolios and test whether the asset pricing results continue to hold. Second, I examine the robustness of the macro dynamics using a threshold VAR methodology. Third, I examine whether alternate state variables can potentially explain the time-variation in the tax shocks premium.

5.1 Tax News Measure Using Principal Component Analysis

It is possible that the asset pricing results are sensitive to the instruments of tax news shocks. To mitigate such concerns, I construct an alternate measure of tax news shocks. I use six portfolios that embody information about tax news. Using the β_i^z, the industry portfolio return sensitivity to R&R exogenous tax announcements, I construct 3 different portfolios; high β_i^z/S minus low β_i^z/S, high β_i^z/M minus low β_i^z/M, and high β_i^z/L minus low β_i^z/L portfolios.[18] As before, S/M/L are the small (greater than 20^{th}percentile and less than 50^{th}percentile), medium (greater than 50^{th}percentile and less than 80^{th}percentile), and large (greater than 80^{th}percentile) portfolios based on NYSE cutoffs. In addition, I construct 3 portfolios based on the dividend yield. Specifically, I construct high div $/S$ minus zero div $/S$, high div $/M$ minus zero div $/M$, and high div $/L$ minus zero div $/L$ portfolios.

I use a principal component analysis (PCA) on the six portfolios to extract the most common variation, which I presume to be the perceived probabilities of tax changes. The first principal component (*PCA-Tax*) captures approximately 48 percent of the total variation. *PCA-Tax* component has a correlation of 0.78 and 0.87 with *TMP* spread and *HMZ* spread, respectively. Although the *PCA-Tax* component may have greater information regarding the perceived probabilities of tax changes, this is an ex-post non-tradable portfolio.

I compute univariate betas for each stock with respect to the *PCA-Tax* measure using 60 month rolling regressions. Specifically, I estimate the following for each firm:

$$r_{i,t} - r_{f,t} = \alpha_{i,t} + \beta_{i,t}^{PCA-Tax} r_t^{PCA-Tax} + \epsilon_{i,t}, \tag{11}$$

where r_i is the monthly stock return for firm i, $r_{f,t}$ is the risk-free rate, and $r^{PCA-Tax}$ is the *PCA-*

18. At each point in time, I classify stocks in the top quintile (top 20^{th} percentile of $\beta_{i,t}^z$ industries) as high β_i^z firms and any firm in the bottom quintile (bottom 20^{th} percentile of $\beta_{i,t}^z$ industries) as , low β_i^z firms.

Tax component. The $\beta_{i,t}^{PCA-Tax}$ captures firm i's exposure to the tax news shock at time t. Next, I sort firms into quintiles by their pre-ranking $\beta^{PCA-Tax}$ as of June of each year.

Table 10 shows the average value-weighted returns on $\beta^{PCA-Tax}$ sorted portfolios. The long-short portfolio spread sorted on $\beta^{PCA-Tax}$ is positive and significant during Republican terms. In addition, α_{CAPM} and α_{FF3} on the long-short portfolio spread are positive and statistically significant during Republican terms. During Democratic regimes, the $\beta^{PCA-Tax}$ sorts do not generate a significant variation.

Controlling for Hou, Xue, and Zhang (2015) q-factor and Fama and French (2015) 5-factor models downward shifts the tax shocks premium; $\alpha's$ become negative and significant during Democratic terms. The results are consistent with the results generated using β^{TMP} and β^{HMZ} sorts.

5.2 Macro Dynamics Using Threshold Vector Autoregression (TVAR)

VAR models are perhaps the most commonly used methodology used to investigate the effects of fiscal policy. However, generating impulse responses in nonlinear VAR models is significantly more difficult; complexities arise when the system moves from linear to nonlinear (Koop, Pesaran, Potter (1996)). Unlike the state dependent projections in (3) , generating impulse responses in nonlinear VAR models require assumptions on how the economy transitions from one state to the other and how the shocks affect the state (Ramey and Zubairy (2018)).

Following Balke (2000) and Ramey and Zubairy (2018), I employ a threshold VAR (TVAR), which is a relatively simple way to capture possible nonlinearities such as asymmetric reactions to shocks or the existence of multiple equilibria. The effects of the shocks are allowed to depend on the magnitude and the sign of the tax news shock. I consider the following reduced-form TVAR:

$$Y_t = I_{t-1}\Psi_D(L)Y_{t-1} + (1 - I_{t-1})\,\Psi_R(L)Y_{t-1} + \upsilon_t, \tag{12}$$

where I is an indicator variable that takes the value 1 if the news shock occurs within a Democratic administration and zero otherwise, and $\upsilon_t \sim (0, \Omega)$. I assume that $\Omega = I_{t-1}\Omega_D + (1 - I_{t-1})\,\Omega_R$, and $\Psi(L)$ is a polynomial of order 8. Since there is no theoretical structure to guide the orthogonalization, I restrict the VAR to only four variables; *TMP* return spread, log of real per capita tax revenues, consumption (or residential investment), and GDP. I also include exogenous linear, quadratic, and cubic time trends.

Figure 4 shows the impulse responses generated following a positive shock to the *TMP* return spread. The shaded areas represent the 90 percent confidence intervals. The impulse responses generated through the TVAR is surprisingly similar to the generated responses from the state dependent local projection method in (3) . Following a tax news shock, the per capita consumption and residential investment increase significantly during Republican terms, whereas they remain at normal levels during Democratic terms. The impulse responses generated through the TVAR suggest that, during Republican terms, tax news shocks have a direct impact on the investor's consumption level, hence the discount factor.

5.3 *Alternate Explanations for the Risk Premium*

The responses from the state dependent projections in (3) and the impulse response functions from the TVAR in (12) show that tax shocks cause high wealth states during Republican regimes. Literature has shown that Republican presidencies are associated with slower GDP growth (Alesina and Rosenthal (1995); Alesina, Roubini, and Cohen (1997)) and lower stock returns (Santa-Clara and Valkanov (2003)). Hence, I examine whether the results are driven by low growth states or other state variables which may coincide with some of the Republican presidencies. To do so, I estimate the model:

$$r_t^{Spread} = \alpha_i + \alpha_{i,REP} REP_t + \sum_f \beta_i^k \; S_{k,t} + \epsilon_t, \tag{13}$$

where r_t^{Spread} is the return spread on value-weighted tax exposure portfolios sorted on pre-ranking β^{tmp}, S_k is an indicator variable that is equal to one if month t is within a particular state k and zero otherwise.

I use four potential business cycle predictors to proxy low growth states; the default spread, T-bill rate, dividend yield, and earnings to price ratio. In addition, I employ an indicator for NBER recessions.[19] In addition to business cycle variation, it is possible that macroeconomic uncertainty (MEU) and economic policy uncertainty (EPU) are state variables that may explain

19. NBER does not define a recession in the conventional terms of two consecutive quarters of decline in real GDP. Instead, the NBER's Business Cycle Dating Committee determines a recession based on a significant decline in economic activity which lasts more than a few months, and is normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales.

the time-varying tax shocks premium. I create a state variable for low macro uncertainty, *Low MEU*, which is an indicator variable that is equal to one if Jurado, Ludvigson, and Ng (2015) MEU index is below median in month t and zero otherwise. I also create a state variable for low policy uncertainty, *Low EPU*, which is an indicator variable that equals one if Baker, Bloom, and Davis (2016) EPU index is below median in month t and zero otherwise.

Perhaps the Republican regimes are associated with higher consumer sentiment. To examine whether sentiment explains the time-varying premium, I create a high sentiment indicator variable, which equals one if the consumer sentiment index from the University of Michigan is above median and zero otherwise.

It is also possible that tax cuts are implemented to alleviate low levels of liquidity in the market. To address this concern, I create a high liquidity state variable, *HIGH LIQ,* which is an indicator variable that is equal to one if Pastor and Stambaugh (2003) traded liquidity factor is in above median in month t and zero otherwise.

Table 11 shows the results. In all specifications, the Republican indicator dominates all other state variables. Hence, business cycle variation, high macroeconomic and policy uncertainties, consumer sentiment, and aggregate liquidity fail to explain the time-variation in tax shocks premium.

6 Concluding Remarks

Political polarization runs particularly deep in the U.S. I show that the implications of income tax news shocks on the economy and asset prices are asymmetric across the political partisan cycle. I construct two measures of unanticipated changes in the perceived probabilities of income tax changes, i.e., tax news shocks. To construct the first measure, I combine information from narrative accounts on large tax announcements with information from equity prices. Specifically, I exploit industry heterogeneity to income tax announcements that are intended to reduce government debt and improve long-run economic growth to construct a tax-news mimicking portfolio (TMP). As a secondary measure, I construct a portfolio of long high dividend yield stocks minus zero dividend stocks (HMZ) to approximate tax news shocks. Intuitively, the cross-sectional return spread between stocks paying high dividend yields and stocks paying zero dividends are pronounced when the investor's perceived probabilities of tax changes are high.

To explore the macro dynamics, I augment Jordà (2005) linear local projection method to implement a two state model. I find clear differences across the political cycle in terms of the response in consumption and residential investment following a tax news shock. The response in consumption and residential investment is trivial during Democratic administrations. In contrast, during Republican administrations, tax news shocks cause a significant increase in consumption and residential investment. This implies that tax news shocks carry a significant amount of risk in Republican terms and a low amount of risk during Democratic regimes.

Asset pricing tests confirm that tax news shocks carry a positive risk premium during Republican presidencies and an insignificant premium during Democratic presidencies. *TMP* spread generates a premium of 3.9 percent in excess of the Fama and French (1993) 3-factor model during Republican terms. *HMZ* spread generates similar results. Exploiting the asymmetry in the tax shocks premium, I construct a trading strategy that generates risk-adjusted returns of approximately 3.8 percent and 5.0 percent over the Hou, Xue, and Zhang (2015) q-factor model and the Fama and French (2015) 5-factor model, respectively.

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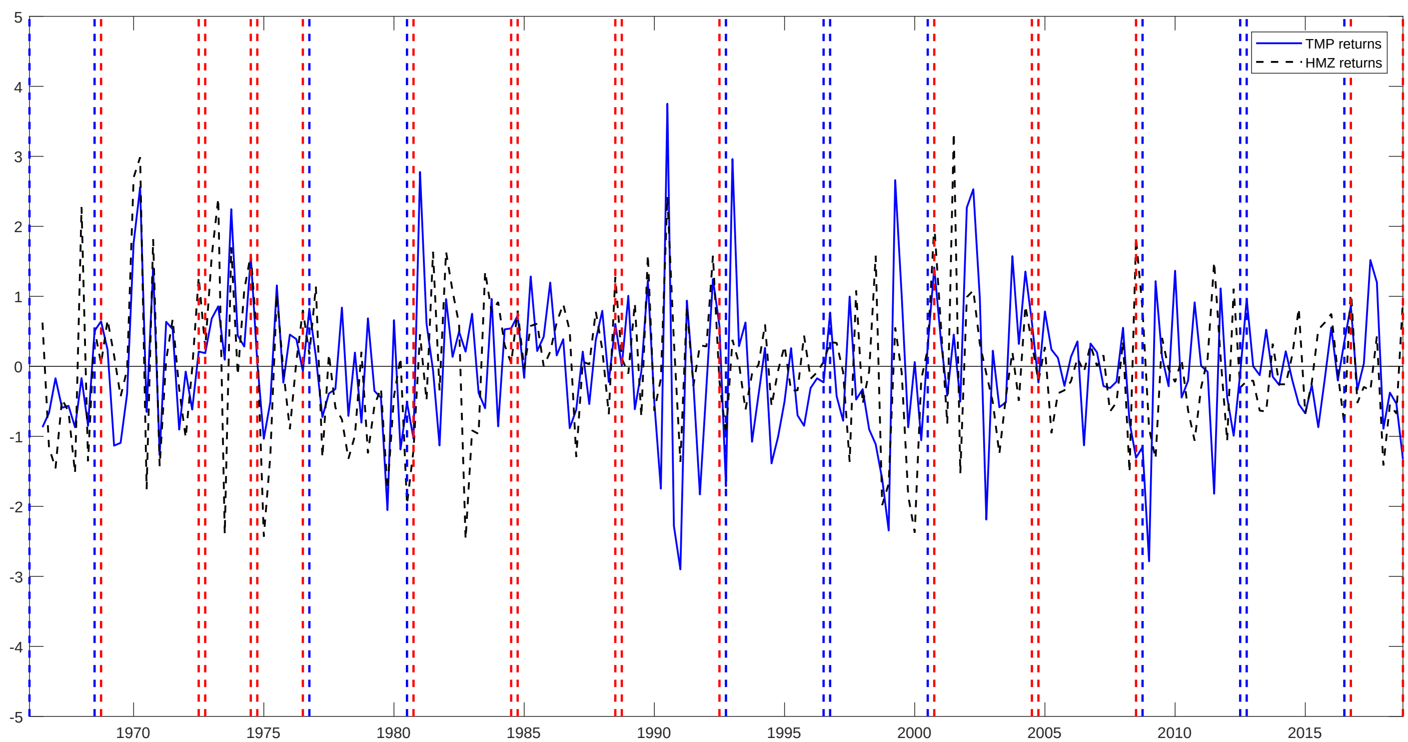


Figure 1

Tax News Shocks

This figure plots the TMP return spread (in solid line) and HMZ return spread (in dashed line). TMP is the return spread between firms with high sensitivity minus low sensitivity to tax news announcements with approximately the same weighted average market equity. HMZ is the return spread between high dividend yield minus zero dividend portfolios with approximately the same weighted average market equity. The blue vertical lines indicate the beginning and the end of a Democratic presidential term. The red vertical lines indicate the beginning and the end of a Republican presidential term.

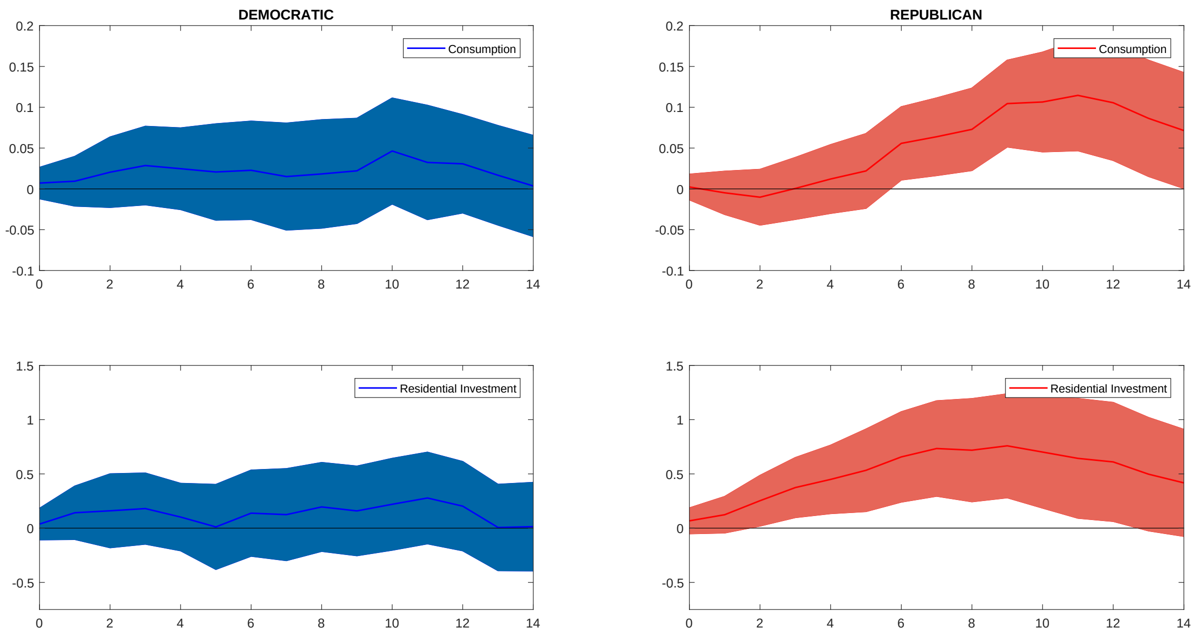


FIGURE 2

RESPONSE TO A TAX SHOCK: CONSIDERING POLITICAL REGIMES

This figure presents the response of consumption and residential investment to a positive shock to TMP spread. The shaded areas represent 90 percent confidence intervals. I use a state dependent local projection method in (3) using a vector of baseline control variables (in natural logarithm): per capita real GDP, 3-month T-bill rate, per capita real government spending, per capita real consumption, per capita real residential investment, and Baker, Bloom, and Davis (2016) economic policy uncertainty index. I use 2 lags of each variable and 2 lags of the news shocks instrument to control for any serial correlation. I also control for a linear time trend. The sample includes quarterly data from 1967 q1 to 2018 q4.

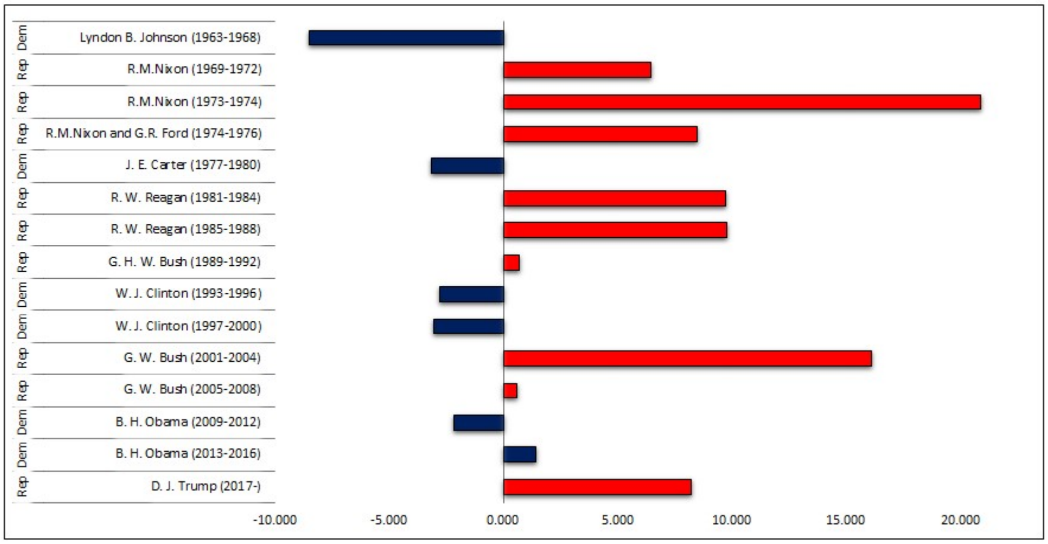


Figure 3

Average TMP Spread in Each Presidential Term

The figure plots the average annualized value-weighted excess returns of the TMP returns across each presidential term. TMP is the return spread between firms with high sensitivity minus low sensitivity to tax news announcements with approximately the same weighted average market equity. A term starts at the beginning of the quarter of the Presidential election (to capture the anticipation effect) and ends in the quarter before the following presidential election. The Democratic Presidential terms are in blue and the Republican Presidential terms are in red.

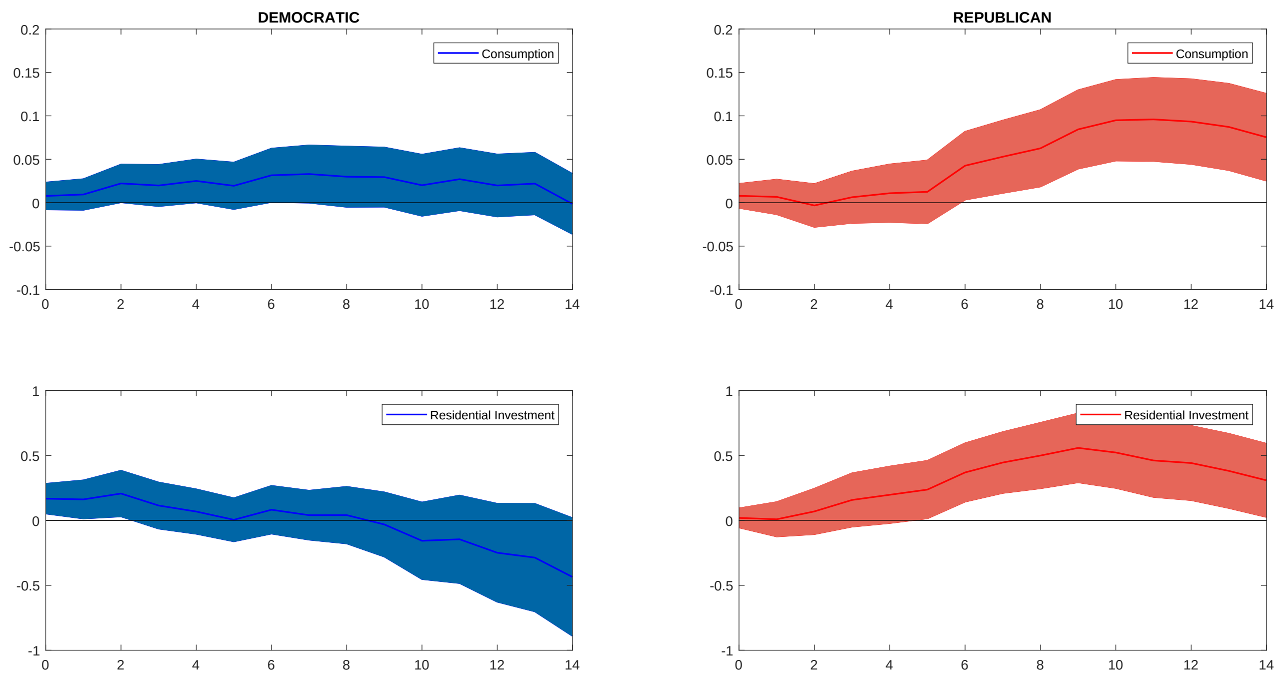


FIGURE 4

IMPULSE RESPONSE FUNCTIONS USING A THRESHOLD VAR

This figure presents the impulse response functions generated using a threshold vector autoregression (TVAR) framework in (12) . I show the response of per capita real consumption and per capita real residential investment following a positive shock to the TMP return spread. The shaded areas represent 90 percent confidence intervals. The set of variables include the *TMP* return spread, log of real per capita tax revenues, consumption (or residential investment), and GDP. I include linear, quadratic, and cubic time trends. The sample includes quarterly data from 1967 q1 to 2018 q4.

TABLE 1

Factor Correlations

	TMN	HMZ	Mkt-rf	SMB	HML	MOM	RMW	CMA	IA	ROE
HMZ	0.358	1.000								
	(0.00)									
Mkt-rf	-0.152	-0.559	1.000							
	(0.00)	(0.00)								
SMB	-0.092	-0.515	0.293	1.000						
	(0.00)	(0.00)	(0.00)							
HML	0.467	0.509	-0.258	-0.195	1.000					
	(0.00)	(0.00)	(0.00)	(0.00)						
MOM	-0.042	0.025	-0.128	0.023	-0.190	1.000				
	(0.29)	(0.54)	(0.00)	(0.56)	(0.00)					
RMW	0.018	0.272	-0.230	-0.414	0.078	0.112	1.000			
	(0.65)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)				
CMA	0.407	0.561	-0.383	-0.161	0.700	-0.029	-0.036	1.000		
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.46)	(0.35)			
I/A	0.403	0.581	-0.381	-0.245	0.676	0.015	0.083	0.914	1.000	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.72)	(0.04)	(0.00)		
ROE	-0.059	0.160	-0.200	-0.371	-0.136	0.494	0.674	-0.082	0.036	1.000
	(0.14)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.37)	

This table reports factor correlations. The sample includes monthly data from January 1967 to December 2018. TMP is the return spread between firms with high sensitivity minus low sensitivity to tax news announcements with approximately the same weighted average market equity. HMZ is the return spread between high dividend yield minus zero dividend portfolios with approximately the same weighted average market equity. Mkt-rf, SMB, HML are the market, size, and value factors from the Fama and French (1993) 3-factor model. MOM is the momentum factor from Carhart (1997) 4-factor model. RMW and CMA are the profitability and investment factors from the Fama and French (2015) 5-factor model. I/A and ROE are the profitability and investment factors from the Hou, Xue, and Zhang (2015) q-factor model.

TABLE 2

Predictability Regressions - Marginal Tax Rates by Income Type

	(1) $Wages_{t+1}$	(2) $Wages_{t+1}$	(3) $Dividends_{t+1}$	(4) $Dividends_{t+1}$	(5) $Pensions_{t+1}$	(6) $Pensions_{t+1}$	(7) ST $Gains_{t+1}$	(8) ST $Gains_{t+1}$	(9) LT $Gains_{t+1}$	(10) LT $Gains_{t+1}$
TMP_t	-2.791***		-5.042*		-2.977		-5.135		-1.475	
	(-3.036)		(-2.037)		(-1.634)		(-1.370)		(-0.599)	
HMZ_t		-6.317***		-16.073***		-5.988**		-20.502***		1.161
		(-5.093)		(-3.599)		(-2.452)		(-3.754)		(0.291)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,479	1,479	1,479	1,479	1,377	1,377	1,479	1,479	1,479	1,479
Adjusted R^2	0.887	0.896	0.743	0.772	0.462	0.467	0.208	0.252	0.794	0.794

This table reports the results estimating (2) . The standard errors are clustered two-ways by state and year. The dependent variables are based on the estimates from the NBER TAXSIM model's dollar weighted average marginal federal plus state income tax rates by state and year. *Wages* is the tax rate on wage income. *Dividends* is the tax rate on dividend income. *ST Gains* and *LT Gains* are the tax rate on the short-term and long-term gains, respectively. Pensions is the tax rate on the taxable pension income. * Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level. The sample includes yearly data from 1979 to 2008.

TABLE 3

Time-Series Averages of the Tax News Shocks

	Full sample	Democratic	Republican
	Panel A: TMP returns		
Average returns	0.300	-0.143	0.621
(t-stat)	(2.14)	(-0.69)	(3.30)
α_{CAPM}	0.361	-0.219	0.653
(t-stat)	(2.60)	(-1.03)	(3.61)
	Panel B: HMZ returns		
Average returns	0.222	-0.295	0.596
(t-stat)	(1.65)	(-1.45)	(3.29)
α_{CAPM}	0.444	0.131	0.661
(t-stat)	(3.90)	(0.73)	(4.47)

The table reports the time-series averages for the TMP return spread and the HMZ return spread. A term starts at the beginning of the month of the Presidential election (to capture the anticipation effect) and ends in the month before the following presidential election. TMP is the return spread between firms with high sensitivity minus low sensitivity to tax news announcements portfolios. HMZ is the return spread between high dividend yield minus zero dividend portfolios. α_{CAPM} is the returns over the CAPM. The sample includes monthly data from January 1967 to December 2018.

TABLE 4

Risk Exposures and Characteristics of the Portfolios Sorted on Tax News Shocks

	L	2	3	4	H
Panel A: β^{tmp} sorted portfolios					
Sensitivity Measures					
Pre-ranked β^{tmp}	-1.165	-0.312	0.012	0.324	1.055
Post-ranked β^{tmp}	-0.581	-0.259	-0.107	0.013	0.296
Pre-ranked β^{hmz}	-1.797	-1.189	-1.033	-0.965	-0.938
Post-ranked β^{hmz}	-1.095	-0.788	-0.673	-0.675	-0.740
Pre-ranked β^{mkt}	1.446	1.143	1.084	1.072	1.140
Post-ranked β^{mkt}	1.139	1.004	0.963	0.963	1.044
Characteristics					
Book-to-market	0.800	0.860	0.875	0.912	1.006
Log Size	14.90	14.80	14.58	14.41	13.95
ROE	-0.036	0.080	0.063	0.066	0.025
Investment	0.064	0.069	0.065	0.060	0.045
Dividend Yield	0.162	0.311	0.413	0.419	0.307
Panel B: β^{hmz} sorted portfolios					
Sensitivity Measures					
Pre-ranked β^{tmp}	-0.493	-0.127	-0.017	0.058	0.217
Post-ranked β^{tmp}	-0.528	-0.253	-0.179	-0.162	-0.010
Pre-ranked β^{hmz}	-2.498	-1.338	-0.936	-0.611	-0.018
Post-ranked β^{hmz}	-1.681	-1.104	-0.785	-0.561	-0.365
Pre-ranked β^{mkt}	1.788	1.243	1.048	0.879	0.615
Post-ranked β^{mkt}	1.475	1.166	1.015	0.911	0.776
Characteristics					
Book-to-market	0.863	0.910	0.897	0.894	0.909
Log Size	13.85	14.33	14.60	14.94	15.21
ROE	-0.042	0.025	0.053	0.076	0.079
Investment	0.059	0.068	0.065	0.058	0.051
Dividend Yield	0.077	0.217	0.360	0.494	0.511

The table reports the characteristics of 5 portfolios (quintiles) of firms sorted on the exposure to the tax news shock. Panel A shows the portfolio quintile sorts on β^{tmp}. Panel B shows the portfolio quintile sorts on β^{hmz}. The sample includes data from July 1967 to December 2018.

TABLE 5

Value-weighted Returns of Portfolios Sorted on Exposure to Tax Shocks

	L	2	3	4	H	H-L
Panel A - β^{tmp} sorted portfolio - Republican terms						
Excess returns	-0.031	0.045	0.299	0.465	0.584	0.615
(t-stat)	(-0.09)	(0.16)	(1.14)	(1.77)	(1.97)	(2.22)
α_{CAPM}	-0.258	-0.142	0.127	0.296	0.410	0.668
(t-stat)	(-1.65)	(-1.47)	(1.47)	(3.09)	(2.60)	(2.49)
Panel B - β^{tmp} sorted portfolio - Democratic terms						
Excess returns	1.191	1.043	1.083	0.897	0.914	-0.277
(t-stat)	(4.10)	(3.75)	(3.73)	(2.89)	(2.41)	(-0.95)
α_{CAPM}	0.220	0.062	0.072	-0.150	-0.311	-0.531
(t-stat)	(1.64)	(0.66)	(0.66)	(-1.10)	(-1.58)	(-1.82)
Panel C - β^{hmz}sorted portfolio - Republican terms						
Excess returns	-0.249	0.111	0.370	0.370	0.448	0.697
(t-stat)	(-0.58)	(0.34)	(1.30)	(1.39)	(1.96)	(2.23)
α_{CAPM}	-0.520	-0.105	0.183	0.198	0.306	0.826
(t-stat)	(-2.98)	(-0.94)	(2.06)	(2.11)	(3.01)	(3.29)
Panel D - β^{hmz}sorted portfolio - Democratic terms						
Excess returns	1.545	1.201	1.080	1.003	0.790	-0.755
(t-stat)	(3.49)	(3.62)	(3.72)	(3.84)	(3.20)	(-2.15)
α_{CAPM}	0.082	0.050	0.065	0.131	0.002	-0.080
(t-stat)	(0.39)	(0.39)	(0.61)	(1.08)	(0.01)	(-0.26)

The table reports summary statistics of value-weighted excess returns on 5 portfolios (quintiles) of firms sorted on the exposure to tax news shocks. TMP is the return spread between firms with high sensitivity minus low sensitivity to tax news announcements portfolios. HMZ is the return spread between high dividend yield minus zero dividend portfolios. α_{CAPM} is the excess returns over the CAPM.

TABLE 6

Sub-Sample Analysis

	Dividend paying stocks		No dividend stocks	
	Republican	Democratic	Republican	Democratic
Panel A: Long-short portfolio quintile spread sorted on β^{tmp}				
Average returns	0.582	-0.055	0.547	-0.429
(t-stat)	(2.26)	(-0.21)	(1.73)	(-1.21)
α_{CAPM}	0.606	-0.331	0.611	-0.567
(t-stat)	(2.37)	(-1.27)	(2.01)	(-1.56)
Panel B: Long-short portfolio quintile spread sorted on β^{hmz}				
Average returns	0.674	-0.391	0.573	-0.601
(t-stat)	(2.51)	(-1.30)	(1.74)	(-1.79)
α_{CAPM}	0.780	0.173	0.683	-0.103
(t-stat)	(3.51)	(0.65)	(2.36)	(-0.33)

This table shows the returns during Democratic and Republican administrations for dividend paying (within the past year) and non-paying stocks. The dependent variable is the long-short portfolio quintiles sorted on the TMP spread (Panel A) and the long-short portfolio quintiles sorted on the HMZ spread (Panel B). α_{CAPM} is the returns over the CAPM.

TABLE 7

Factor model tests on tax beta-sorted portfolios

	TMP Spread		H-L Spread on β^{tmp}		HMZ Spread		H-L Spread on β^{hmz}	
	Democratic	Republican	Democratic	Republican	Democratic	Republican	Democratic	Republican
α_{FF3}	-0.298	0.362	-0.608	0.412	0.161	0.389	-0.071	0.444
(t-stat)	(-1.60)	(2.14)	(-2.06)	(1.71)	(1.10)	(3.32)	(-0.30)	(2.18)
α_{FF5}	-0.346	0.299	-0.659	0.237	0.029	0.241	-0.426	-0.038
(t-stat)	(-1.80)	(1.71)	(-2.70)	(0.99)	(0.20)	(1.98)	(-1.87)	(-0.21)
α_{q4}	-0.328	0.270	-0.577	0.052	0.042	0.276	-0.511	-0.050
(t-stat)	(-1.66)	(1.46)	(-2.03)	(0.19)	(0.29)	(2.07)	(-2.12)	(-0.25)

This table shows the alphas from various factor models during Democratic and Republican administrations. The dependent variables are the TMP return spread, the long-short portfolio quintiles sorted on β^{tmp}, the HMZ return spread, the long-short portfolio quintiles sorted on β^{hmz}. I estimate the conditional model,

$$r_{i,t}=\sum_{f}\left[\beta_i^k r_{k,t} + \beta_{i,REP}^k \left(r_{k,t} * \text{REP}_t\right)\right] +\alpha_i+\alpha_{i,REP}\text{REP}_t+\epsilon_t,$$

where $r_{i,t}$ is the return on portfolio i, $r_{k,t}$ is the returns of factor k, and REP is a dummy variable that is equal to one if month t is within a Republican presidency and zero otherwise. The estimates α and β's are omitted for clarity of exposition. α_{FF3}, α_{FF5}, and α_{q4} are the returns in excess of the Fama and French (1993) 3-factor model, Fama and French (2015) 5-factor model, and Hou, Xue, and Zhang (2015) q-factor model, respectively.

TABLE 8

Estimated Risk Premiums

	(1)		(2)		(3)	
	λ	(t-stat)	λ	(t-stat)	λ	(t-stat)
Const	1.255***	(3.13)	0.787**	(2.32)	0.877***	(2.59)
MKT-RF	-0.623	(-1.20)	-0.180	(-0.39)	-0.279	(-0.60)
TMP	0.090	(0.31)	0.065	(0.24)	0.055	(0.19)
CTMP	0.570**	(2.26)	0.630**	(2.49)	0.613**	(2.42)
SMB	0.515**	(2.53)			0.495**	(2.45)
HML	0.337	(1.46)			0.266	(1.08)
ME			0.552***	(2.83)		
IA			0.270**	(2.10)		
ROE			0.222	(0.93)		
CMA					0.282**	(2.12)
RMW					0.039	(0.24)

This table reports monthly percentage price of risk (λ) estimated using a two stage Fama and MacBeth (1973) procedure. The test portfolios include 15 portfolios independently sorted on $\beta^{tmp}$and size, 15 portfolios independently sorted on investment and size, and 15 portfolios independently sorted on ROE and size. The t-statistics in brackets are reported using Shanken (1992) corrected standard errors. CTMP is the conditional TMP portfolio given by the product of an indicator variable I and TMP, where I takes the value of 1 if it's a republican presidency. MKT-RF is the excess return on the CRSP value-weighted portfolio, SMB, and HML are the size and value factors from the Fama and French (1993) 3-factor model. ME, IA, and ROE are the size, investment, and profitability factors from Hou, Xue, and Zhang (2015) 4-factor model. RMW and CMA are the profitability and investment factors from the Fama and French (2015) 5-factor model. * Significant at the 10 percent level. ** Significant at the 5 percent level.

TABLE 9: Political Cycle Investment Strategy

Model	Fama and French (1993) 3-factor model	Hou, Xue, and Zhang (2015) 4 factor model	Fama and French (2015) 5-factor model	Fama and French (2018) 6-factor model
	Panel A: TMP portfolio returns			
α^{IS}	0.487***	0.366***	0.470***	0.319***
(t-stat)	(4.34)	(2.78)	(3.77)	(2.90)
Kernel	Bartlett	Bartlett	Bartlett	Bartlett
Bandwidth	22	31	31	31
Adjusted R^2	0.048	0.056	0.052	0.116
	Panel B: HMZ portfolio returns			
α^{IS}	0.481***	0.368**	0.496***	0.349***
(t-stat)	(3.97)	(2.47)	(3.40)	(2.59)
Kernel	Bartlett	Bartlett	Bartlett	Bartlett
Bandwidth	31	31	31	19
Adjusted R^2	0.039	0.045	0.041	0.106

This table reports the average excess risk-adjusted returns (α^{IS}) of the political cycle based investment strategy. Specifically, the investment strategy is formed as follows:

$$r_t^{IS} = \begin{cases} r_t^{tax} & \text{if DEM} = 0 \\ -r_t^{tax} & \text{if DEM} = 1 \end{cases},$$

where r_t^{IS} is the return on the investment strategy, r_t^{tax} is the instrument of tax news shocks (TMP portfolio spread or HMZ portfolio spread), and DEM is an indicator variable that is equal to 1 if the month is in a Democratic presidency and zero otherwise. I estimate the alphas of the investment strategy by running the regression:

$$r_t^{IS} = \sum_k \left[\beta_i^k r_{k,t}\right] + \alpha^{IS} + \epsilon_t,$$

where $r_{k,t}$ is the returns of factor k. I report the coefficients and Newey and West (1987) heteroskedasticity and serial-correlation robust t-statistics. The bandwidth selection procedure follows Newey and West (1994).

TABLE 10

Portfolio Sorts on Tax News Shocks based on Principal Component Analysis

	L	2	3	4	H	H-L
Panel A - $\beta^{PCA-Tax}$ sorted portfolio - Republican terms						
Excess returns	-0.195	-0.195	0.230	0.316	0.537	0.732
(t-stat)	(-0.46)	(-0.46)	(0.84)	(1.23)	(2.12)	(2.41)
α_{CAPM}	-0.460	0.010	0.053	0.151	0.383	0.843
(t-stat)	(-2.64)	(0.09)	(0.52)	(1.55)	(3.11)	(3.25)
α_{FF3}	-0.193	-0.033	0.020	0.100	0.256	0.449
(t-stat)	(-1.31)	(-0.30)	(0.19)	(1.04)	(2.08)	(1.94)
α_{q4}	0.080	-0.026	-0.190	-0.146	0.096	0.016
(t-stat)	(0.52)	(-0.22)	(-1.87)	(-1.62)	(0.78)	(0.07)
α_{FF5}	0.0162	-0.1808	-0.2279	-0.1554	0.0853	0.0691
(t-stat)	(0.11)	(-1.70)	(-2.55)	(-1.91)	(0.71)	(0.31)
Panel B - $\beta^{PCA-Tax}$ sorted portfolio - Democratic terms						
Excess returns	1.599	1.129	0.840	0.936	1.048	-0.551
(t-stat)	(4.18)	(3.97)	(3.22)	(3.31)	(3.22)	(-1.81)
α_{CAPM}	0.326	0.152	-0.037	0.000	0.031	-0.295
(t-stat)	(1.82)	(1.31)	(-0.32)	(-0.00)	(0.17)	(-0.96)
α_{FF3}	0.335	0.170	-0.026	-0.005	0.003	-0.331
(t-stat)	(2.45)	(1.54)	(-0.25)	(-0.04)	(0.02)	(-1.48)
α_{q4}	0.514	0.100	-0.218	-0.231	-0.127	-0.642
(t-stat)	(3.50)	(0.87)	(-2.09)	(-1.86)	(-0.77)	(-2.62)
α_{FF5}	0.463	0.087	-0.217	-0.242	-0.179	-0.642
(t-stat)	(3.49)	(0.85)	(-2.31)	(-2.29)	(-1.16)	(-2.97)

This table reports summary statistics of value-weighted excess returns on 5 portfolios (quintiles) sorted on the exposure to the PCA tax news shocks. I compute the PCA tax news shocks using a Principal component analysis (PCA) on 6 portfolios; high β_i^z/S minus low β_i^z/S, high β_i^z/M minus low β_i^z/M, high β_i^z/L minus low β_i^z/L, high div/S minus zero div/S, high div/M minus zero div/M, high div/L minus zero div/L, where β_i^z is the 3-digit SIC industry portfolio return sensitivity to R&R exogenous tax announcements, S/M/L are small (greater than 20^{th} percentile and less than 50^{th} percentile), medium (greater than 50^{th} percentile and less than 80^{th} percentile), and large (greater than 80^{th} percentile) portfolios based on NYSE cutoffs. PCA tax news shock is the first principal component.

TABLE 11

Alternate Explanations for the Premium

	(1)	(2)	(3)	(4)	(5)	(6)
Republican	0.007***	0.008***	0.008***	0.007***	0.007**	0.007**
	(2.712)	(2.755)	(2.727)	(2.582)	(2.430)	(2.470)
Default spread	-0.287	-0.368	-0.227	-0.225	-0.279	-0.424
	(-0.656)	(-0.965)	(-0.585)	(-0.587)	(-0.704)	(-0.929)
T-bill rate	0.011	0.026	0.022	0.004	0.013	0.022
	(0.211)	(0.524)	(0.473)	(0.072)	(0.268)	(0.386)
Dividend yield	-0.006	-0.006	-0.007	-0.006	-0.006	-0.006
	(-1.051)	(-1.002)	(-1.094)	(-0.930)	(-0.882)	(-0.950)
Earnings to price ratio	0.005	0.005	0.005	0.005	0.004	0.004
	(1.168)	(1.027)	(1.059)	(1.143)	(1.037)	(0.938)
NBER recession	0.002					0.002
	(0.353)					(0.342)
Low policy uncertainty		-0.004				-0.003
		(-1.312)				(-1.139)
Low macro uncertainty			0.003			0.003
			(0.878)			(0.902)
High sentiment				0.001		0.001
				(0.522)		(0.413)
High liquidity					0.000	-0.000
					(0.055)	(-0.006)
Constant	-0.008	-0.006	-0.014	-0.006	-0.006	-0.007
	(-0.340)	(-0.280)	(-0.603)	(-0.271)	(-0.257)	(-0.312)
Observations	612	612	612	612	600	600
R-squared	0.013	0.015	0.014	0.013	0.012	0.015

This table shows the Republican alphas controlling for other state variables. I estimate the model:

$$r_t^{Spread} = \alpha_i + \alpha_{i,REP} REP_t + \sum_f \beta_i^k \ SV_{k,t} + \epsilon_t,$$

where r_t^{Spread} is the return spread on value-weighted portfolio quintiles sorted on β^{tmp} and $S_k$is a dummy variable that equals one if month t is within a particular state k and zero otherwise. LOW MEU is a dummy variable that equals one if Jurado, Ludvigson, and Ng (2015) macroeconomic uncertainty index in month t is below median and zero otherwise. LOW EPU is a dummy variable that equals one if Baker, Bloom, and Davis (2016) economic policy uncertainty index in month t is below median and zero otherwise. HIGH LIQ is a dummy variable that equals one if Pastor and Stambaugh (2003) traded liquidity factor in month t is above median and equal to zero otherwise. RECESSION is a dummy variable that equals one if month t is within a NBER recession period and zero otherwise. I report the coefficients and Newey and West (1987) heteroskedasticity and serial-correlation robust t-statistics. The bandwidth selection procedure follows Newey and West (1994). The estimates of β's are omitted for clarity of exposition.

7 Appendix

TABLE A1

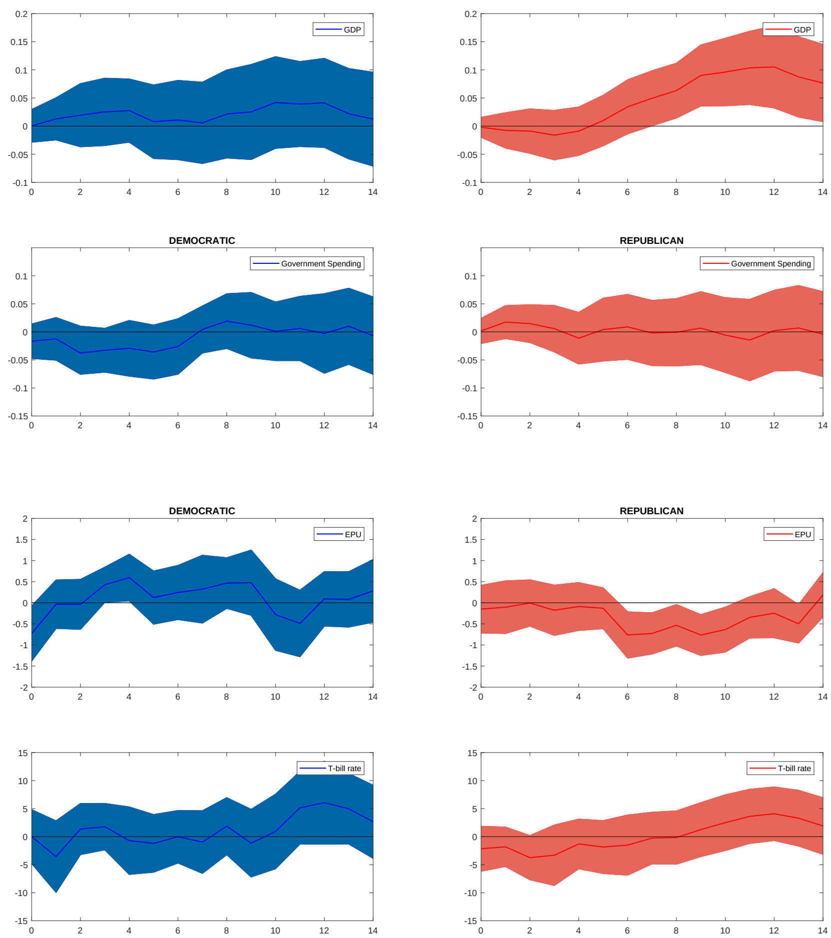
TMP Portfolio Construction

	Long Portfolio		Short Portfolio	
	Coeff	(t-stat)	Coeff	(t-stat)
Panel A: Returns				
Small	0.468	(1.74)	0.090	(0.30)
Medium	0.868	(3.55)	0.556	(2.12)
Big	1.063	(5.33)	0.844	(4.05)
Average	0.799	(3.54)	0.497	(2.09)
Panel B: Returns in Democratic Administrations				
Small	0.923	(2.18)	0.927	(2.12)
Medium	1.291	(3.40)	1.183	(3.41)
Big	1.242	(4.18)	1.424	(5.22)
Average	1.152	(3.31)	1.178	(3.72)
Panel C: Returns in Republican Administrations				
Small	0.132	(0.38)	-0.528	(-1.30)
Medium	0.555	(1.74)	0.092	(0.25)
Big	0.930	(3.46)	0.417	(1.39)
Average	0.539	(1.82)	-0.006	(-0.02)
Panel D: Number of firms				
Small	44.7	(69.61)	52.4	(56.25)
Medium	39.6	(79.90)	44.6	(53.15)
Big	30.2	(59.89)	31.5	(52.63)

This table reports the returns on the portfolios used to construct the TMP spread. Long portfolio consists of firms in the top 20^{th}percentile of industries in terms of the exposure to R&R tax news announcements. Short portfolio consists of firms in the bottom 20^{th}percentile of industries in terms of the exposure to R&R tax news announcements. Small, Medium, and Large are based on NYSE size cutoffs at $50^{th}$and 80^{th}percentiles.

Figure A1

Macroeconomic Effects of a Tax Shock: Considering Political Regimes



This figure presents the state-dependent response functions following a positive tax news shock. The shaded areas represent 90 percent confidence intervals. I use a state dependent local projection method in (3) using a vector of baseline control variables (in natural logarithm): per capita real GDP, 3-month T-bill rate, per capita real government spending, per capita real consumption, per capita real residential investment, and Baker, Bloom, and Davis (2016) economic policy uncertainty index. I use 2 lags of each variable and 2 lags of the news shocks instrument to control for any serial correlation. I also control for a linear time trend. The sample includes quarterly data from 1967 q1 to 2018 q4.

TABLE A2

Tax Mimicking Portfolio Composition

	Short Portfolio			Long portfolio		
	Median	10%	90%	Median	10%	90%
Panel A: TMP returns						
Market capitalization	11.400	8.712	14.633	11.633	8.769	14.807
Book-to-market ratio	0.475	0.088	1.418	0.687	0.169	1.954
Debt-to-assets ratio	0.123	0.000	0.461	0.253	0.007	0.529
Cashflow-to-assets ratio	0.065	-0.340	0.169	0.083	-0.055	0.164
Investment	0.064	-0.303	0.374	0.062	-0.147	0.309
Operating profitability	0.058	-0.701	0.239	0.085	-0.258	0.233
ROA	0.025	-0.415	0.125	0.037	-0.123	0.113
Panel B: HMZ returns						
Market capitalization	13.417	11.161	15.259	14.010	11.608	16.820
Book-to-market ratio	0.442	0.089	1.169	0.617	0.193	1.405
Debt-to-assets ratio	0.283	0.014	0.576	0.218	0.028	0.404
Cashflow-to-assets ratio	0.082	0.005	0.171	0.109	0.060	0.176
Investment	0.094	-0.084	0.397	0.060	-0.038	0.172
Operating profitability	0.098	-0.147	0.273	0.131	0.047	0.268
ROA	0.042	-0.051	0.120	0.066	0.022	0.130

This table reports the portfolio composition of the long and short portfolios in the tax news shocks instruments (TMP spread and HMZ spread). I report the market capitalization, book equity-to-market equity ratio, debt-to-assets ratio, cash flows-to-assets ratio, change in investment, operating profitability, and the return on assets (ROA).