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U.S. Fiscal Policy and Asset Prices: The Role of Partisan Conflict

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Abstract

Fiscal policy shocks exert wide-reaching effects, including movements in asset markets. U.S. politics have been characterized historically by a high degree of partisan conflict. The combination of increasing polarization and divided government leads not only to significant Congressional gridlock, but also to spells of high fiscal policy uncertainty. This paper adds to the literature on the relationships between fiscal policy and asset prices in the U.S. economy, conditional on the degree of partisan conflict. We analyze whether a higher degree of partisan conflict (legislative gridlock) reduces the efficacy of the effect and response of fiscal policy on and to asset price movements, respectively. We find that partisan conflict does not significantly affect the relationships between the fiscal surplus to GDP and housing and equity returns. Rather, if important, partisan conflict affects the actual implementation of fiscal policy actions.

Keywords: Quantile structural VAR, fiscal policy, stock prices, house prices, partisan conflict

JEL Classification: C32, E62, G10, H30, R30

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1.   Introduction

Fiscal policy shocks exert wide-reaching effects, including movements in asset markets. Not surprisingly, there exists a large literature that analyzes the effect of fiscal policy on macroeconomic variables [e.g., Blanchard and Perotti (2002), Perotti (2005), Mountford and Uhlig (2009), Ramey (2011a, b), Mertens and Ravn (2010, 2013, 2014), Ellahie and Ricco (2014), Ricco (2014), Linnemann and Winkler (2016)]. These studies concur that fiscal policy does exert significant effects on the real economy, but the fiscal multiplier fell in magnitude after 1980.

While research on the linkages between economic policy and asset markets typically focus on monetary policy [see Simo-Kengne et al., (2016) for a detailed literature review], the zero lower bound on interest rates in the aftermath of the Great Recession precipitated a recent literature that analyzes not only the effect of fiscal policy on asset prices, but also the response of the fiscal stance to asset market movements [e.g., Jaeger and Schuknecht (2007), Morris and Schuknecht (2007), Afonso and Sousa (2011), Tagkalakis (2011a, b), Agnello et al., (2012), Agnello et al., (2013), Aye et al., (2012), Agnello and Sousa (2013), Chatziantoniou et al., (2013), Gupta et al., (2014), Liu et al., (2015), El Montasser et al., (2015), Ruiz and Vargas-Silva (2016), Mumtaz and Theodoridis (2017)].[1] In general, these papers conclude that bidirectional causality exists between fiscal policy and asset prices, with expansionary fiscal policy positively affecting asset prices and increases in asset prices resulting in contractionary fiscal policy.[2]

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[1] Tavares and Valkanov (2001) and Eschenbach and Schuknecht (2002) provide some earlier analysis involving fiscal policy and asset prices.

[2] Note that, on the one hand, fiscal policy can influence stock markets via its effect on sovereign risk spreads. It can affect housing markets directly through various taxes and subsidies on home ownership as well as indirectly through effects on macroeconomic variables that influence the housing market [Aye et al., (2012)]. While, on the other hand, two main channels exist through which asset prices affect fiscal policy: a direct channel where tax revenue increases in line with an increase in asset prices, and an indirect channel where an increase in asset prices boost consumer confidence and, hence, increases aggregate demand [El Montasser et al., (2015)].

The U.S. political process has been characterized historically by a high degree of partisan conflict. The combination of increasing polarization and divided government leads not only to significant Congressional gridlock, but also to spells of high fiscal policy uncertainty [Azzimonti, (2015)]. Alesina and Drazen (1991) note that legislative gridlock negatively affects the optimal response to adverse shocks and the quality of policy reforms aimed at preventing them.

Against this backdrop, our paper adds to the literature on the interaction between fiscal policy and asset prices of the U.S. economy, conditional on the degree of partisan conflict, with the objective of analyzing whether a higher degree of partisan conflict (legislative gridlock) reduces the efficacy of the effect and response of fiscal policy on and to asset price movements, respectively. More specifically, we empirically investigate the relationship between asset (house and stock) returns, government surplus as a percentage of GDP (our fiscal policy measure), and a measure of the degree of partisan conflict based on the index developed by Azzimonti (2015), covering historical annual data from 1891 to 2013.

To obtain the partisan conflict index (PCI), Azzimonti (2015) uses a semantic search approach to measure the frequency of newspaper coverage of articles reporting political disagreement about government policy (both within and between national parties) normalized by the total number of news articles within a given period. While a monthly version of the PCI is available from 1981, we decided to use the annual version of the index, since its behavior proves consistent with the slow-moving variables characterizing the political process (Azzimonti, 2015).

For our purpose, and consistent with the literature on fiscal policy and asset prices, which, in general, tends to use Vector Autoregressive (VAR) models, we use a quantile structural vector autoregressive (QSVAR), which, in turn, allows us to analyze the effect and response of fiscal policy on and to asset prices based on impulse response functions,

conditional on varied degrees of partisan conflict as given by the quantiles of the PCI.[3] To the best of our knowledge, this is the first paper to analyze the relationship between fiscal policy and asset prices in the U.S. economy conditional on low and high levels of partisan conflict as captured by the quantiles of the PCI respectively.[4]

The remainder of the paper is organized as follows. Section 2 describes the data. Section 3 discusses our model and econometric method. Section 4 examines the empirical results. Section 5 concludes.

2.   Data description

Our variables include the real U.S. house price index (RHP), real Standard and Poor's S&P 500 (RSP) index, and the U.S. primary surplus as a percent of Gross Domestic Product (FP), besides the PCI. The nominal surplus and GDP data come from the Global Financial Database while the RHP and RSP data come from the Online Data section of Professor Robert Shiller's website: http://www.econ.yale.edu/~shiller/data.htm. The data on the PCI come from the website of Professor Marina Azzimonti: http://marina-azzimonti.com/working-papers/.

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[3] As an alternative to the QSVAR, we could use the interacted SVAR (ISVAR) as in Aastveit et al., (2013) and Balcilar et al., (2016), where we would interact the various levels of the partisan conflict variable with the measure of fiscal policy, while using the impulse response functions. But, this approach requires that we assume an exogenous PCI variable. As noted by Azzimonti (2015), however, partisan conflict is probably endogenous (i.e., affected by conditions prevailing in the economy) especially for low frequency data over a long-horizon – something that we employ in this paper. We could also use a smooth transition or Markov-switching approaches. But, as described in Linnemann and Winkler (2016), quantile models do not rely on: (a) An *ex ante* classification of different regimes as in Markov-switching models; and (b) Specification of a parametric transition function. By contrast, the QSVAR model allows us to estimate the relationship between fiscal policy and asset prices on the whole conditional distribution of the PCI with parameters allowed to vary across different quantiles without constraints.

[4] One paper that somewhat relates to our work is Ricco et al., (2016). These authors investigate the effects of fiscal policy communication on the propagation of government spending shocks. They first proposes a new index measuring the coordination effects of policy communication on private agents' expectations, with this index based on the disagreement between U.S. professional forecasters on future government spending. Ricco et al., (2016) show that in times of low disagreement, the output response to fiscal spending innovations is positive and large, mainly due to private investment response, but for periods of elevated disagreement, a muted response on output exists. In sum, while both Ricco et al., (2016) and our paper deal with uncertainty relating to fiscal policy implementation, our paper deals with the role of political discord rather than forecaster disagreement in affecting the relationship between fiscal policy and asset prices.

Azzimonti (2015) describes the computation of the annual historical PCI from news articles in five major newspapers that have been digitalized since 1890 for the whole sample period: The Wall Street Journal, The New York Times, the Chicago Tribune, the Los Angeles Times, and The Washington Post. Azzimonti (2015) counts the number of articles that discuss disagreement between political parties, branches of government, or political actors in a given year. Specifically, Azzimonti conducts the search for articles containing at least one keyword in the following two categories: (i) political disagreement and (ii) government, with focus on articles including keywords at the intersection of those two categories. In addition, Azzimonti carries out the search for specific terms related to partisan conflict, such as "divided party", "partisan divisions", and "divided Congress". Note that the search involves terms related to the political debate, as well as the outcome of the partisan warfare.

Because the volume of digitalized news varies over time, Azzimonti (2015) scales the raw partisan conflict count by the total number of articles in the same newspapers over the same time interval. Specifically, Azzimonti divides the raw partisan conflict count by the number of articles every year that contain the word "the", rather than "today," since early in the sample, delays exist between the date of the event and the date of reporting. Finally, without any loss of generality, Azzimonti normalizes the PCI to an average score of 100 in the year 1990. Azzimonti reports a HP filter of the PCI to extract the trend and notes that the HP filtered PCI trends downward from 1891 through the early 1920s, remained relatively constant and did not trend up or down from the early 1920s through the mid-1960s, and trended upward from the mid-1960s through 2013 (see Azzimonti, 2014, p. 7-8). For further details regarding the construction of the PCI, see Azzimonti (2014, 2015).

We use annual data from 1890 to 2013, because data only occur at this frequency over this long-sample, with the start and end dates being governed by the availability of data on the historical PCI. Since the application of the QSVAR requires mean-reverting data, we use

5

yearly growth rates (log-differences) for the real house and stock prices, which approximate real house and stock returns (RHR and RSR, respectively), as well as the PCI (GPCI), which generates a total of 123 observations, covering the period of 1891 to 2013. The level of FP (i.e., the primary government surplus as a percent of GDP) and the transformation of the two asset prices into returns, besides the growth rate of the PCI, generate stationary series based on standard unit-root tests -- Augmented-Dickey-Fuller (ADF), [Dickey and Fuller, (1981)], Phillips-Perron (PP) [Phillips and Perron, (1988)], Dickey-Fuller with Generalized-Least-Squares-detrending (DF-GLS) [Elliott et al., (1996)], and the Ng-Perron modified version of the PP [Ng and Perron, (2001)] tests. Details of the unit-root tests are available upon request from the authors. Figure 1 plots the variables of interest.

3.   Methodology

As indicated earlier, this paper uses a quantile structural vector autoregressive (QSVAR) model to estimate quantile impulse responses of real asset returns (stock and housing) following a shock to the fiscal policy variable (government budget surplus as a percentage of GDP), and also the response of the fiscal policy to asset returns shocks. More importantly, we examine these dynamic responses by conditioning on various quantiles of the growth of the PCI that allows us to capture the various levels of political disagreements.

We began with the basics of quantile regression. We specify the τ-th quantile ($0 < \tau < 1$) of the conditional distribution of the vector of dependent variables y_t, given a vector of independent variables x_t, as follows:

$$Q_\tau(y_t|x_t) = x_t \beta(\tau), \tag{1}$$

where $Q_\tau(y_t) = F^{-1}(\tau)$ and $F(y_t)$ is the probability distribution function (pdf) of the y_t. The parameter vector $\beta(\tau)$ quantifies the responses of variables at different quantiles τ of the distribution.

We can estimate the parameters in equation (1) by minimizing the absolute value of the residual using the following objective function:

$$Q_\tau(\beta_\tau) = \text{argmin}_{\beta(\tau)} \sum_{i=1}^{T}\left(\tau - 1_{\{y_t < x_t\beta(\tau)\}}\right)|y_t - x_t\beta(\tau)|, \tag{2}$$

where $1_{\{y_t < x_t\beta(\tau)\}}$ is the indicator function, with the solution to the quantile regression model obtained using the programming algorithm suggested by Koenker and d'Orey (1987).

Building on the quantile regression framework in equation (1), we can specify the reduced-form VAR for τ^{th} quantile as follows, where the predictors are now lagged values of all the endogenous variables of the model:

$$y_t = c(\tau) + \sum_{i=1}^{p} B_i(\tau)\, y_{t-i} + \mu_t(\tau) \text{ for } t=1,...,T \tag{3}$$

where

$$y_t = \begin{bmatrix} GPCI \\ RHR \\ FP \\ RSR \end{bmatrix}; \quad c(\tau) = \begin{bmatrix} c_1(\tau_1) \\ c_2(\tau_2) \\ c_3(\tau_3) \\ c_4(\tau_4) \end{bmatrix}; \quad \mu_t(\tau) = \begin{bmatrix} \mu_t^{GPCI}(\tau_1) \\ \mu_t^{RHR}(\tau_2) \\ \mu_t^{FP}(\tau_3) \\ \mu_t^{RSR}(\tau_4) \end{bmatrix}; \text{ and}$$

$$B_i(\tau) = \begin{pmatrix} B_{i,11}(\tau_1) & B_{i,12}(\tau_1) & B_{i,13}(\tau_1) & B_{i,14}(\tau_1) \\ B_{i,21}(\tau_2) & B_{i,22}(\tau_2) & B_{i,23}(\tau_2) & B_{i,24}(\tau_2) \\ B_{i,31}(\tau_3) & B_{i,32}(\tau_3) & B_{i,33}(\tau_3) & B_{i,34}(\tau_3) \\ B_{i,41}(\tau_4) & B_{i,42}(\tau_4) & B_{i,43}(\tau_4) & B_{i,44}(\tau_4) \end{pmatrix},$$

where y_t is a 4x1 vector of endogenous variables containing the growth rate of the partisan conflict index (GPCI), real housing returns (RHR), the fiscal policy variable [i.e., primary surplus as a percentage of GDP (*G-T*)/*GDP*], and real stock returns (RSR). $c(\tau)$ is an intercept vector with quantiles $\tau=(\tau_1, \tau_2, \tau_3, \tau_4)$, $B_i(\tau)$ represents a 4x4 lagged coefficient matrix with quantiles $\tau=(\tau_1, \tau_2, \tau_3, \tau_4)$ with $i=1,...,p$, and the error terms with quantiles $\tau=(\tau_1, \tau_2, \tau_3, \tau_4)$ is denoted by a 4x1 vector of $\mu_t(\tau)$.

In our study, we use the above model to examine the effect of fiscal surplus shocks on real asset returns as well as fiscal policy's response to asset returns shocks, conditional on the

various quantiles of the growth rate of the PCI. Assuming that the error terms $\mu_t(\tau)$ obeys the restrictions of:

$$Q_\tau(\mu_t(\tau)|y_{t-1,\dots},y_{t-p}) = 0. \tag{4}$$

Combining equations (3) and (4), we obtain the population responses of y at quantiles $\tau=(\tau_1, \tau_2, \tau_3, \tau_4)$ such that:

$$Q_\tau(\mu_t(\tau)|y_{t-1,\dots},y_{t-p}) = c(\tau) + \sum_{i=1}^{p} B_i(\tau)\, y_{t-i} \tag{5}$$

We can estimate equation (5) for each quantile τ using the quantile regression approach of Cecchetti and Li (2008).

Following the decomposition procedure of Kilian and Park (2009), we can identify the shocks of the economic variables by imposing structural restrictions on the error term $\mu_t(\tau)$ such that:

$$\mu_t(\tau) = \begin{bmatrix} \mu_t^{GPCI}(\tau_1) \\ \mu_t^{RHR}(\tau_2) \\ \mu_t^{FP}(\tau_3) \\ \mu_t^{RSR}(\tau_4) \end{bmatrix} = \begin{bmatrix} a_{11}(\tau_1) & 0 & 0 & 0 \\ a_{21}(\tau_2) & a_{22}(\tau_2) & 0 & 0 \\ a_{31}(\tau_3) & a_{32}(\tau_3) & a_{33}(\tau_3) & 0 \\ a_{41}(\tau_4) & a_{42}(\tau_4) & a_{43}(\tau_4) & a_{44}(\tau_4) \end{bmatrix} \begin{bmatrix} \epsilon_t^{GPCI^{shock}}(\tau_1) \\ \epsilon_t^{RHR^{shock}}(\tau_2) \\ \epsilon_t^{FP^{shock}}(\tau_3) \\ \epsilon_t^{RSR^{shock}}(\tau_4) \end{bmatrix} \tag{6}$$

We assume the ϵ_t is a white noise process, and employ a standard Cholesky decomposition by imposing a lower triangular matrix. We order the variables from most exogenous to least exogenous with growth of the PCI first, followed by real housing returns, the primary surplus as a percentage of GDP, and then equity returns. This ordering of the fiscal policy and asset returns variable is theoretically justified (Gupta et al., 2014), since it implies that the house price does not respond contemporaneously to fiscal policy and equity price shocks, while fiscal policy reacts with a lag to equity price shocks. Thus, the equity return appears fourth in the ordering after the house return and measure of fiscal policy. The ordering of the growth of PCI first follows Azzimonti (2015) and Cheng *et al.*, (2016), who suggest putting this index before macroeconomic and financial variables in the VAR.

Once we orthogonalize the covariance matrix of the residuals in equation (6) using a Cholesky decomposition, we can calculate the associated quantile-specific impulse response function and obtain the 95 percent confidence interval by using a 'bootstrapping' approach (replicated 5000 times), which involves resampling from the estimated residuals. Linnemann and Winkler (2016) provide further details. We use the impulse response analysis to plot the effect of a one standard deviation increase in the innovation of the fiscal policy variable and real asset returns at time t on another variable at time $t+s$, by conditioning the impulse response functions on quantiles (τ=0.10, lower levels of political discord, and τ=0.90, higher levels of political discord) of the PCI growth.[5] We use the Schwarz information criterion (SIC) to select the optimal lag order in the QSVAR model with the lag-lengths equal to 1 at $\tau = 0.10$ and 0.90.

4.   Results of the Analysis

We now turn to the QSVAR model to analyze the response of asset returns to fiscal policy shocks as well as the response of fiscal policy to asset return shocks, conditional on lower and higher degrees of the PCI.[6]

Figures 2a and 2b show that both house and equity returns respond negatively to a fiscal surplus shock (as in El Montasser, 2015) under $\tau = 0.10$ and 0.90 over a ten year horizon. That is, contractionary fiscal policy leads to higher asset returns, which is consistent with the existing literature. Figure A1 in the Appendix presents the results separately across the two quantiles with confidence bands. The response of real house returns to a fiscal shock

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[5] Our results are qualitatively similar if we use τ=0.25 and 0.75 to characterize the lower and higher levels of partisan conflict. Complete details of these results are available upon request from the authors.

[6] Since a monthly version of the PCI also exists starting in 1981, we also conducted our analysis at this high frequency, with fiscal policy being measured by annualized surplus to debt. Using the sample period of January 1981 to October 2016 (i.e., data available at the time of writing the paper), we were however, unable to detect any significant effect of the fiscal surplus shocks on asset returns and also asset return shocks on the fiscal surplus. Similar observations also occurred when we converted the PCI to quarterly data, and the analysed the effect of fiscal surplus shocks on asset returns, and the response of the fiscal surplus to GDP variable to asset return shocks over the quarterly period of 1981Q1 to 2016Q3. Complete details of these results are available upon request from the authors.

is persistent and significant over the entire ten years of impulse response analyzed with the strongest effect in third year after the shock. While the effect on stock returns is also negative and persistent with the strongest effect felt in the first year, the effects are insignificant with the exceptionally wide confidence bands.

This negative response to fiscal surplus shocks reflects a standard market outcome. That is, when the primary surplus increases, or more likely the primary deficit decreases, the supply of government debt falls, driving up the price of government debt and lowering its interest rate. As such, the quantity demanded of government debt declines, moving to the housing and equity markets, lowering the returns in these markets. Only the effect on the housing return is significant, possibly reflecting a more important link between mortgage financing and housing returns than between margin financing of equity purchases.

The impulse responses of Figures 2c and 2d show how the primary balance as a percent of GDP reacts to asset return shocks under $\tau = 0.10$ and 0.90 over a ten year horizon. Both house and equity real return shocks lead to an increase in primary surpluses (as in El Montasser, 2015),with the effect exhibiting high persistent and reaching a peak at the second year after the shock. That is, a positive shock to house or equity returns leads to contractionary fiscal policy. Figure A2 in the Appendix presents the results separately across the two quantiles with confidence bands. Only the effect of equity return shocks proves significant, however.

We expect increases in house and equity returns, *a priori*, to increase automatically the revenue collected from these tax bases. At the same time, we also expect countercyclical spending from government during periods of buoyant growth, which probably results from the wealth effects of asset prices on consumption leading to higher aggregate demand and, hence, higher growth (Simo-Kengne et al., 2015).

Finally, Figures 2a and 2b also show that the negative effects of the fiscal surplus shock on house and stock returns do not differ significantly across different levels of partisan conflict (significance bands appear in Figure A1). Similarly, Figures 2c and 2d also show that the positive effects of the housing and equity return shocks on the fiscal surplus as a fraction of GDP do not differ significantly across different levels of partisan conflict (significance bands appear in Figure A2).

5.   Conclusion

This paper considers the interaction between fiscal policy and asset prices of the U.S. economy, conditional on the degree of partisan conflict, with the objective of analyzing whether a higher degree of partisan conflict (legislative gridlock) reduces the efficacy of the effect and response of fiscal policy on and to asset price movements, respectively. That is, we empirically investigate the relationship between asset (house and stock) returns, the government surplus as a percentage of GDP (our fiscal policy measure), and a measure of the degree of partisan conflict based on the index developed by Azzimonti (2015), covering historical annual data from 1891 to 2013.

We find that the degree of partisan conflict does not significantly affect the effects of fiscal surplus shocks on asset returns. The role of partisan conflict may only affect the ability of Congressional legislators to implement policies that lead to fiscal surplus shocks.

While we find that a positive shock to the fiscal surplus to GDP affects the house and stock returns negatively, only the house return effect proves significant. Conversely, while we find that positive shocks to house and stock returns positively affect the fiscal surplus to GDP, only the stock return effect proves significant.

The major difference between housing and equity assets relates to each asset's liquidity, whereby equity assets are much more liquid than housing assets. Put differently, the markets can transact equities more quickly and more frequently than houses. That is, the

11

market for equities proves much more efficient than the market for houses. Houses, because of their relatively low liquidity, provide a market environment for unrealized capital gains whereas the capital gains from equity holding probably get exercised much more frequently.

Thus, on the one hand, it seems reasonable that equity return shocks significantly affect the fiscal surplus to GDP while house return shocks do not. That is, changes in equity returns are more likely realized and cause changes in the fiscal surplus. Housing returns more likely remain unrealized. On the other hand, fiscal surplus shocks lead to significant effects on house returns but not on equity returns. That is, a fiscal surplus shock leads to changes in interest rates, which more closely links to prices and returns in the housing market.

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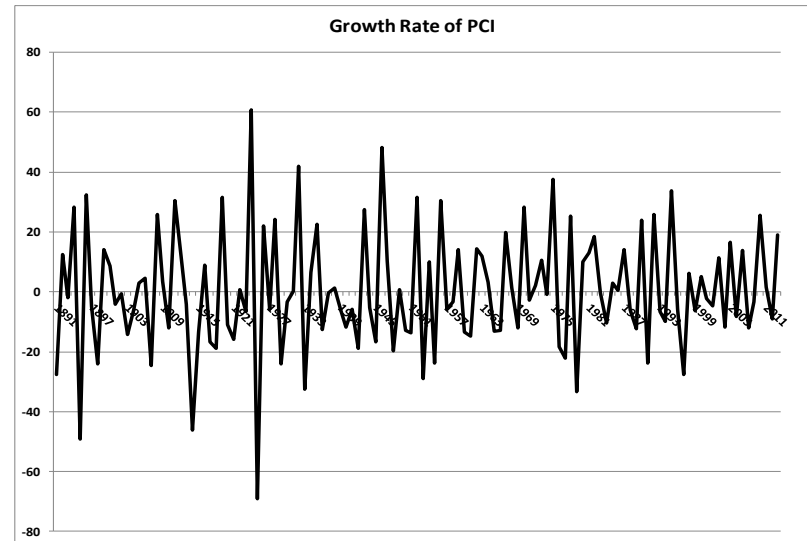
Figure 1: Data

a. Real House Return
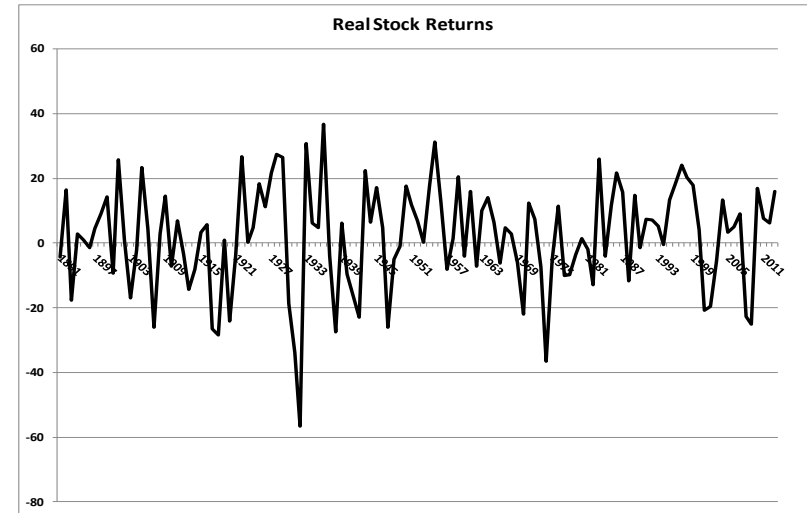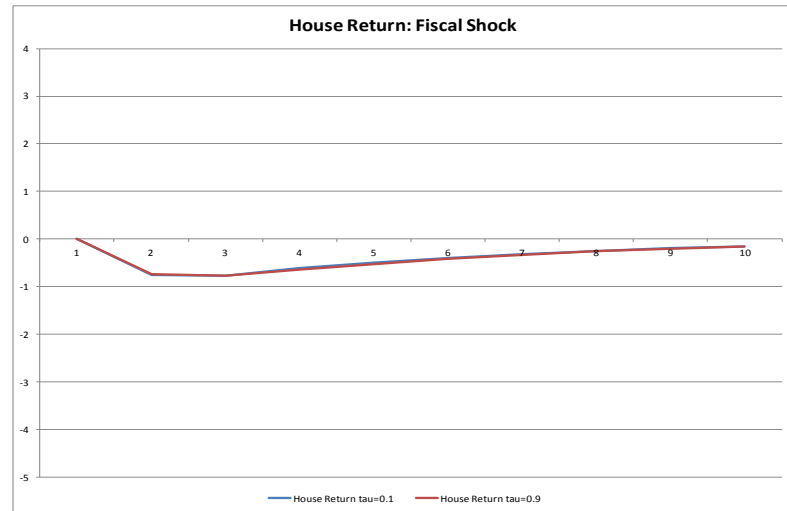
b. Real Stock Return
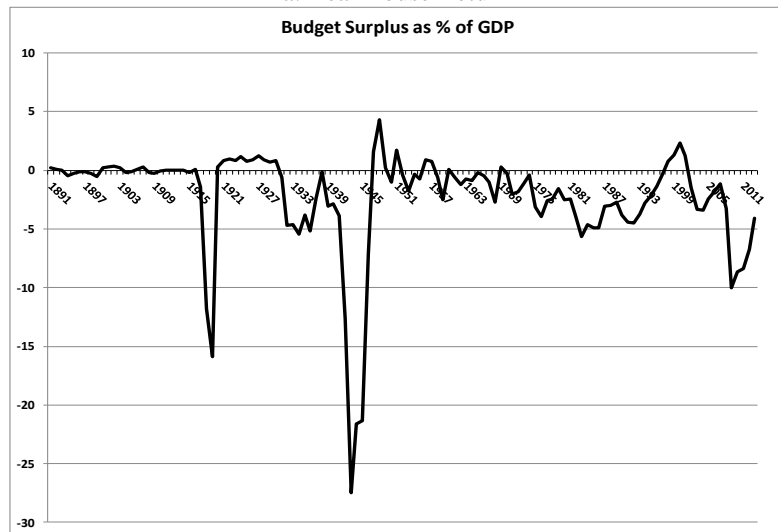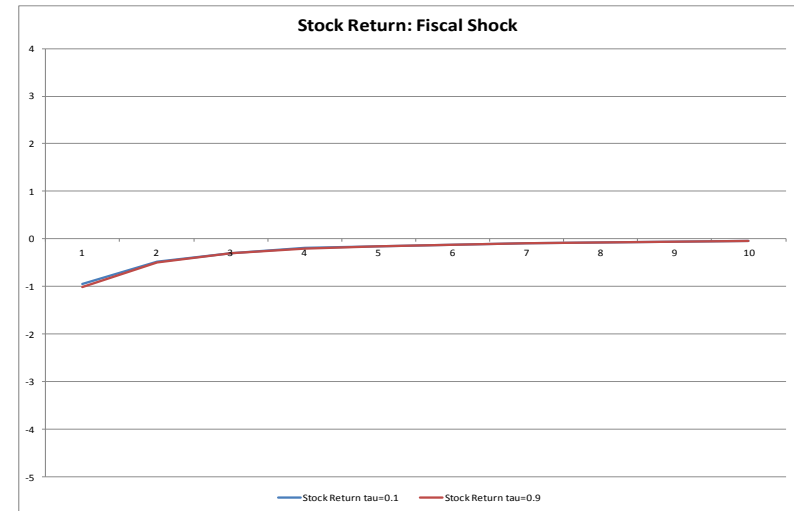
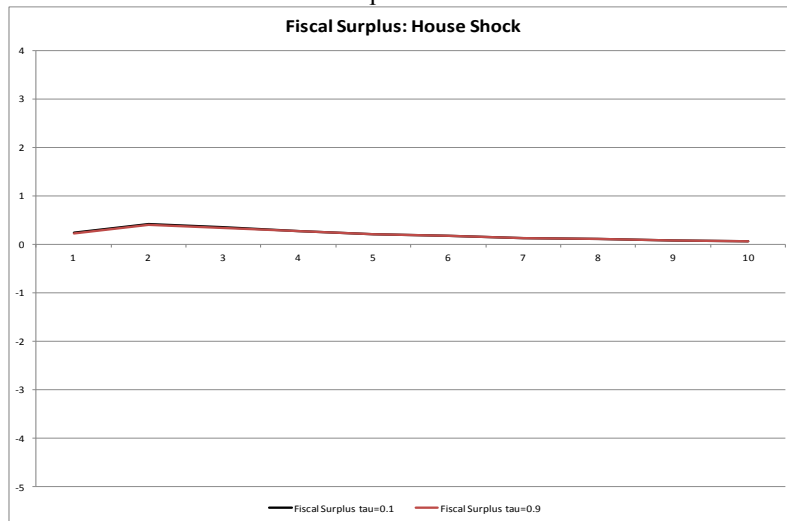c. Fiscal Surplus to GDP

d. Growth Rate Partisan Conflict Index

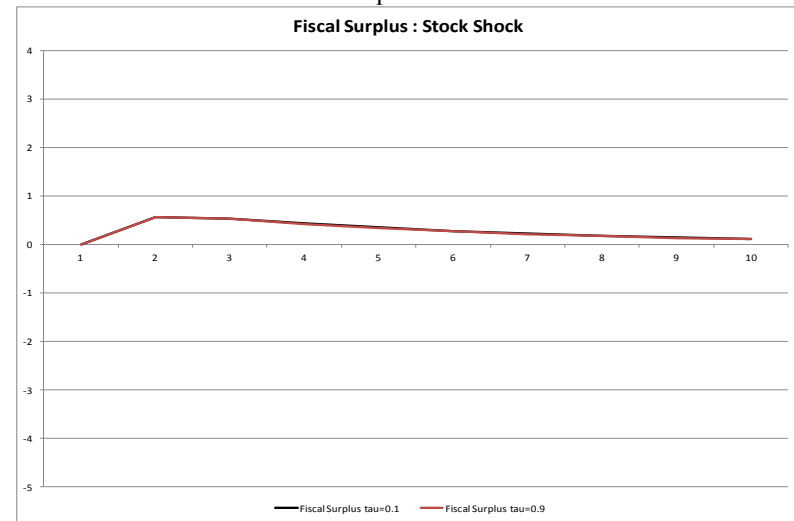Figure 2: Response of House and Stock Returns to Fiscal Shock and Fiscal Surplus to House and Stock Shocks

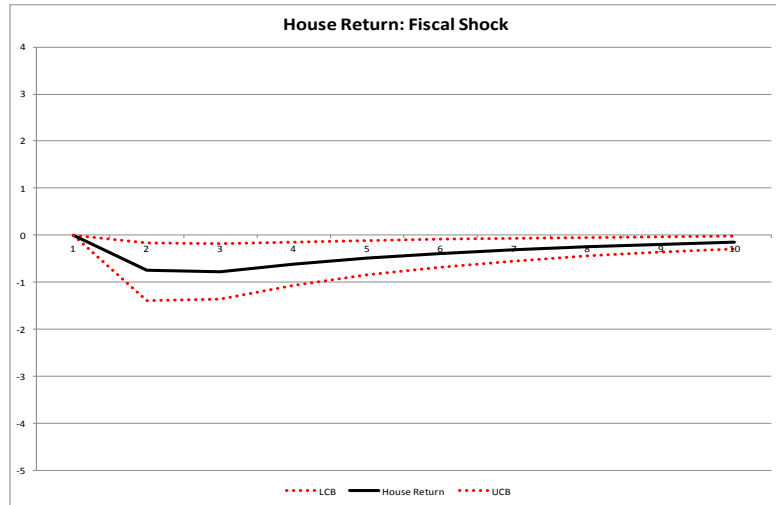

a. House Response: τ=0.1 & 0.9

b. Stock Response τ=0.1 & 0.9

c. Fiscal Surplus Response: τ=0.1 & 0.9

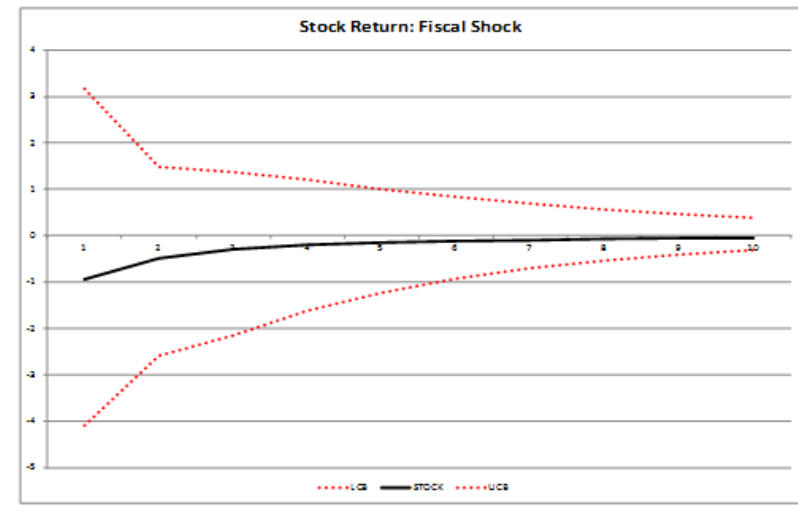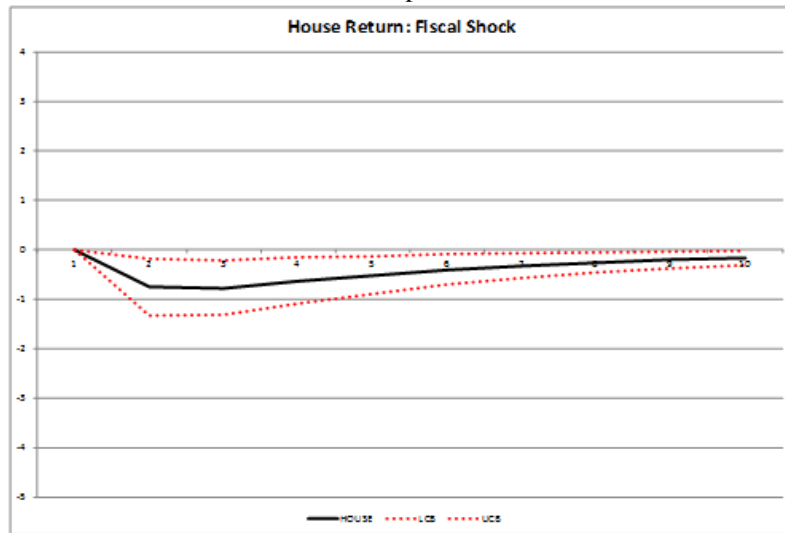c. Fiscal Surplus Response: τ=0.1 & 0.9

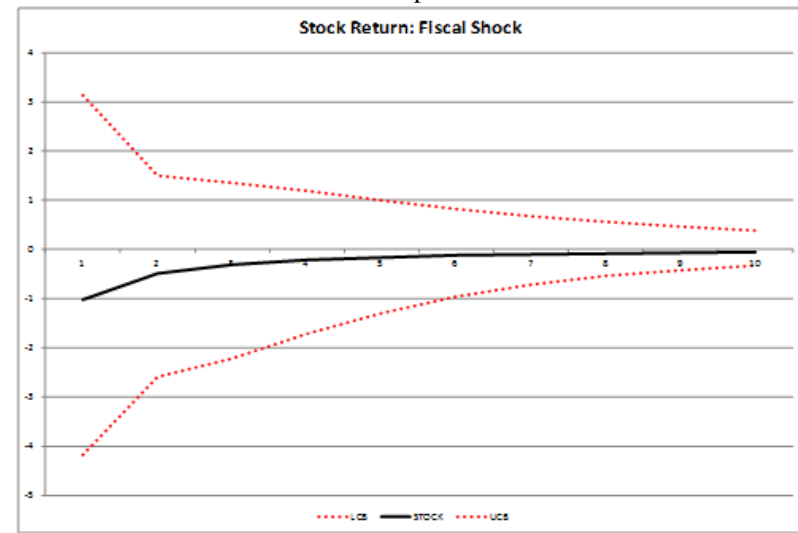Figure A1: Response of House and Stock Returns to Fiscal Shock

a. House Response: τ=0.1
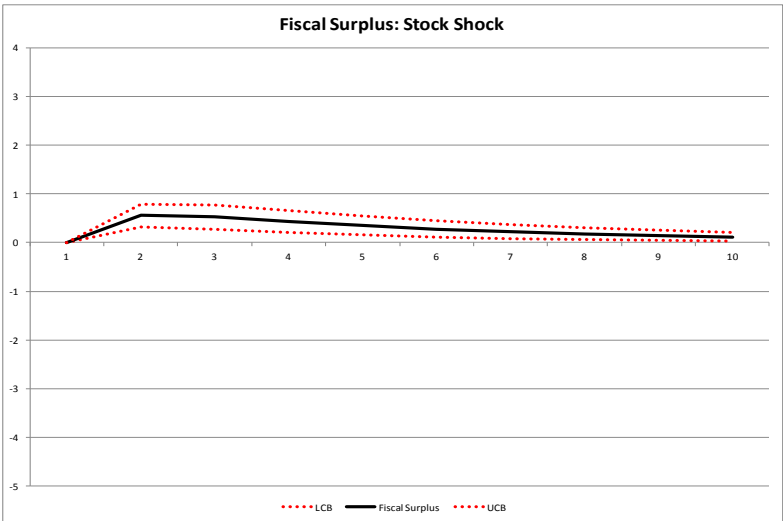

b. Stock Response τ=0.1

c. House Response: τ=0.9

d. Stock Response τ=0.9
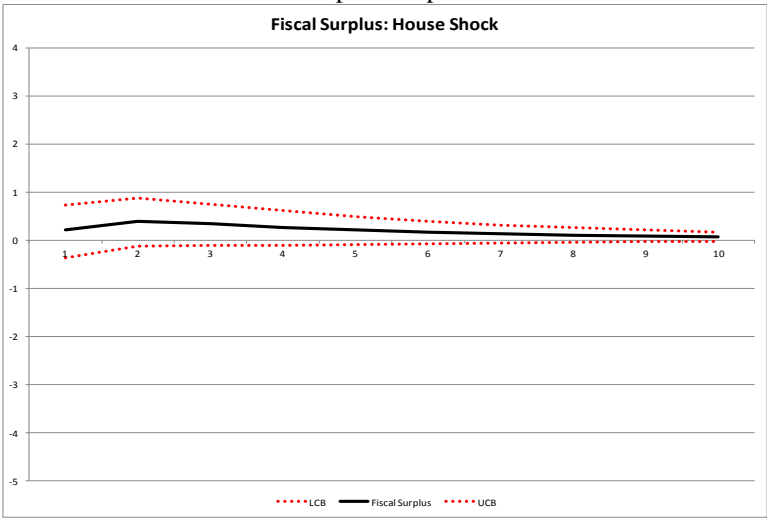
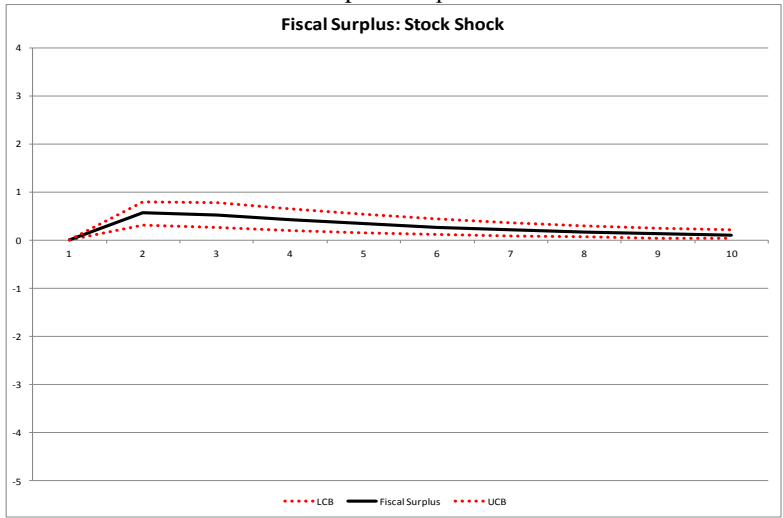Figure A2: Response of Fiscal Surplus to Stock and House Return Shocks
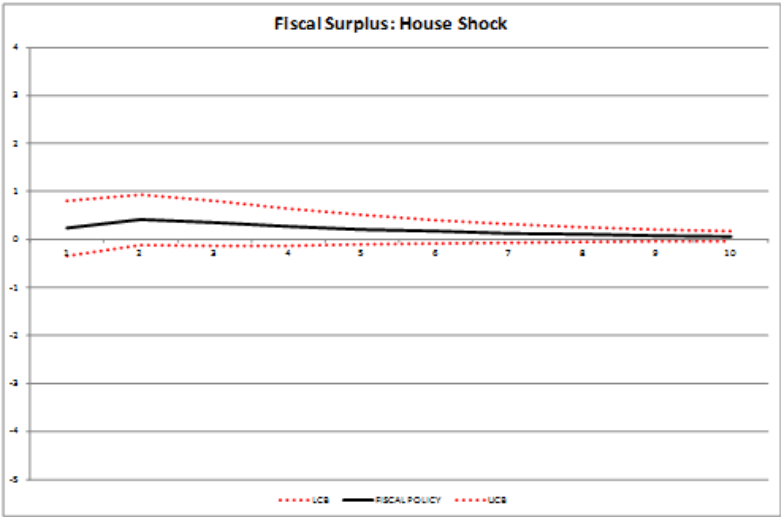
a. Fiscal Surplus Response: τ=0.1

b. Fiscal Surplus Response: τ=0.1

c. Fiscal Surplus Response: τ=0.9

d. Fiscal Surplus Response: τ=0.9