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**REPUBLICANS, DEMOCRATS AND  
BUDGET DEFICITS: FISCAL DYNAMICS  
IN POLITICAL PERSPECTIVE**

Jaime Pereira and José Tavares

***MACROECONOMICS AND GROWTH and  
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## Abstract

We use an asymmetric cointegration framework to explore politically motivated fiscal asymmetries in the US, from Eisenhower to Obama. We analyze fiscal dynamics in response to deficits as an asymmetric process, sensitive to partisan and electoral motivations, characterizing the response of Republican and Democratic administrations to budget disequilibria. In a novel approach to empirical fiscal policy, we incorporate narrative data in our partisan framework, in order to distinguish between responses to automatic and discretionary fiscal changes. We conclude that partisanship is a key factor in the fiscal response to budget disequilibria, with Democrats and Republicans exhibiting distinct corrective behavior. On the other hand, the timing of elections does not seem to be a key determinant of the fiscal response to unsustainable budget deviations.

JEL Classification: H30, H62, H68

Keywords: Fiscal Dynamics, Asymmetric cointegration approach, Democrats, Republicans

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# Republicans, Democrats and Budget Deficits: Fiscal Dynamics in Political Perspective

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We use an asymmetric cointegration framework to explore politically motivated fiscal asymmetries in the US, from Eisenhower to Obama. We analyze fiscal dynamics in response to deficits as an asymmetric process, sensitive to partisan and electoral motivations, characterizing the response of Republican and Democratic administrations to budget disequilibria. In a novel approach to empirical fiscal policy, we incorporate narrative data in our partisan framework, in order to distinguish between responses to automatic and discretionary fiscal changes. We conclude that partisanship is a key factor in the fiscal response to budget disequilibria, with Democrats and Republicans exhibiting distinct corrective behavior. On the other hand, the timing of elections does not seem to be a key determinant of the fiscal response to unsustainable budget deviations.

*Keywords:* Fiscal Policy, Political, Asymmetric Cointegration Approach, Narrative

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## 1. Motivation

Fiscal policy is an important macroeconomic tool, often used for short-term counter-cyclical policies that partially insure against economic downturns. Any sensible use of deficits as a policy instrument needs to take into account longer-term sustainability. In the presence of deviations from long-term balance, when and how policy-makers counter budget deficits becomes key. Policy choices are eventually bound by an intertemporal budget constraint. But the political inclination of the Incumbent and the timing of elections may affect how expenditure cuts or tax increases and to what extent fiscal balance is redressed after a significant deviation. This paper analyzes US data on the economy and the polity from the Eisenhower to Obama administration in order to determine whether, when, and how Democrats and Republicans move to recover fiscal balance in the presence of budget deficits.

Empirical analyses of fiscal dynamics tend to assume a benevolent, non-partisan, and non-opportunistic policy-maker. This ignores the fact that political ideologies and the timing of elections are likely to affect the governments political priorities, namely, its fiscal stance. Non-partisan and non-opportunistic policy-makers are a convenient conceptual benchmark at best. We investigate whether the response to deficits is asymmetric across political parties and in relation to the timing of elections. Our analysis of US data leads us to conclude that political factors such as the party of the President and the time to the next election significantly determine the response to unsustainable budget deviations.

The paper is organized as follows. Section 2 reviews the economics literature. Section 3 presents the data. Section 4 presents the methodology adopted, which incorporates political factors into standard empirical methodologies. Section 5 summarizes and discusses the results of the econometric estimates. Section 6 concludes.

## 2. Literature Review

The political economy literature on fiscal policy has long identified theoretical incentives affecting the timing and nature of fiscal adjustments. A partisan theory of economic policy was first proposed in Hibbs (1977), with political parties' policies responding to the preferences of their different constituencies: parties on the left focus on lowering unemployment and catering to labor interests, while parties to the right prioritize low inflation, as favoured by business interests. Whereas parties on the left would increase public spending, parties on the right pursue a stricter fiscal discipline with a view to keep inflation in check. Nordhaus' (1975) political business cycle theory assumes that political incumbents adjust opportunistically to

coming elections, so to maximize the chances of re-election. The cycle emerges with the incumbent "starting with relative austerity in early years and ending with the spending potlatch right before elections". A third strand in the literature put forward in Persson and Svensson (1989) suggests that conservative governments, averse to high levels of government spending, may actually drive up deficits to constrain future expenditure by leftist cabinets<sup>1</sup>. Alesina and Tabellini (1990) explain how public debt can be used strategically by a partisan cabinet to limit future expenditures by policymakers with opposite spending preferences. In sum, the political identity of the fiscal incumbent, the proximity to the next elections, and the likelihood of remaining in power, are expected to influence fiscal stance.

Different authors have explored the empirical link between politics and fiscal policy. Cameron (1978) tackles the determinants of the size of government, identifying a clear partisan effect whereby left-wing parties are associated with higher rates of growth of both spending and taxation. Volkerink and de Haan (2001) analyze public deficits: left-wing parties do not seem to indulge in larger public deficits, as they accompany higher spending with higher taxation, consistent with Cameron. Mulas-Granados (2003) and Tavares (2004) study the political economy of fiscal adjustments. Mulas-Granados (2003) shows that leftist governments have relied mostly on public spending increases, but resorted mostly to increases in taxation when cutting the deficit. Tavares showed that leftist governments rely mostly on taxation for adjustments, while rightist governments rely primarily on spending cuts. Tavares (2004) concludes that expenditure based adjustments pursued by leftist governments tend to be more successful, possibly because they are more credible.

The theoretical literature suggests four ways of thinking about the link between tax receipts and public expenditure. There is the tax-spend hypothesis, with Buchanan and Wagner (1977) advocating that an increase in taxes results in a decrease in spending as the public perceives the real cost of higher expenditure, and Friedman (1978) suggesting that in a fiscal adjustment setting, an increase in taxes results in a subsequent expansion in expenditure. The spend-tax hypothesis proposed by Barro (1979), within a ricardian equivalence setting, suggests that expenditure today implies higher taxes tomorrow. The synchronization hypothesis proposed by Meltzer and Richard (1981) argues that taxes and expenditure are synchronously decided. Finally, Wildavsky (1988) proposed the institutional separation hypothesis, in which

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<sup>1</sup>According to the authors a conservative government expecting to be replaced by a government favoring higher spending would postpone a fiscal adjustment or raise deficits. Though not the focus of the argument, the argument applies, symmetrically, to a government favoring higher public spending, which would tend to run down deficits.

each fiscal aggregate is decided independently from its counterpart, by different institutions.

The empirical literature has progressively tried to explicitly accommodate both the short-run fiscal dynamics and its long-run constraints. Payne (2003) surveys the tax-spend literature and uncovers a wide discrepancy in results of Granger-causality tests for the United States. Miller and Russek (1989) introduce cointegration, allowing explicitly for short and long-run horizons, but still come across substantial inconsistencies. Given the variety of results, some researchers have allowed for non-linearities in fiscal behavior. Arestis, Cipollini, and Fattouh (2004) relaxed the assumption of symmetric adjustments and, resorting to TAR and MTAR techniques, built an asymmetric cointegration model in which they determined that fiscal aggregates respond significantly to deficit-enhancing fiscal deviations only after a given threshold has been passed<sup>2</sup>. Young (2011) introduces an asymmetric linear model approach, assuming a priori asymmetries. In contrast with most studies with non-linear features, Young finds a significant short-run causal relationship between tax and expenditure, more specifically positive responses of expenditure to increases in taxes.

In this paper we consider, for the first time, the response of taxes and expenditure to deficits when non-linear partisan responses, as well as election-sensitive responses, are taken explicitly into account.

### 3. Data

Our empirical analysis is focused on US federal expenditure and receipts, as well as the resulting federal budget deficit<sup>3</sup>. We rely on quarterly data between 1952:Q1 and 2015:Q2, and each quarter refers to the calendar year. All variables are used as natural logarithms, and series are seasonally adjusted at the source<sup>4</sup>. Each quarter refers to the calendar year. Both expenditures and receipts are deflated using the US GDP implicit deflator and divided by the

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<sup>2</sup>Ewing et al. (2006) and Cipollini, Fattouh, and Mouratidis (2009) also explored non-linear fiscal responses, confirming that expenditure and taxes respond to budgetary disequilibria only after a given threshold.

<sup>3</sup>For federal expenditure we look at Line 42 of the National Income and Product Accounts Table 3.2, that is, Total Federal Expenditures. Federal receipts are taken original from NIPA Table 3.2, Line 39, Total Federal Receipts.

<sup>4</sup>Official seasonal adjustment techniques from the Bureau of Economic Analysis are X-12 and X-13 ARIMA methods.

quarterly population data<sup>5</sup>. Our proxy for the business cycle is the lagged first difference of GDP per capital, in natural logarithms<sup>6</sup>.

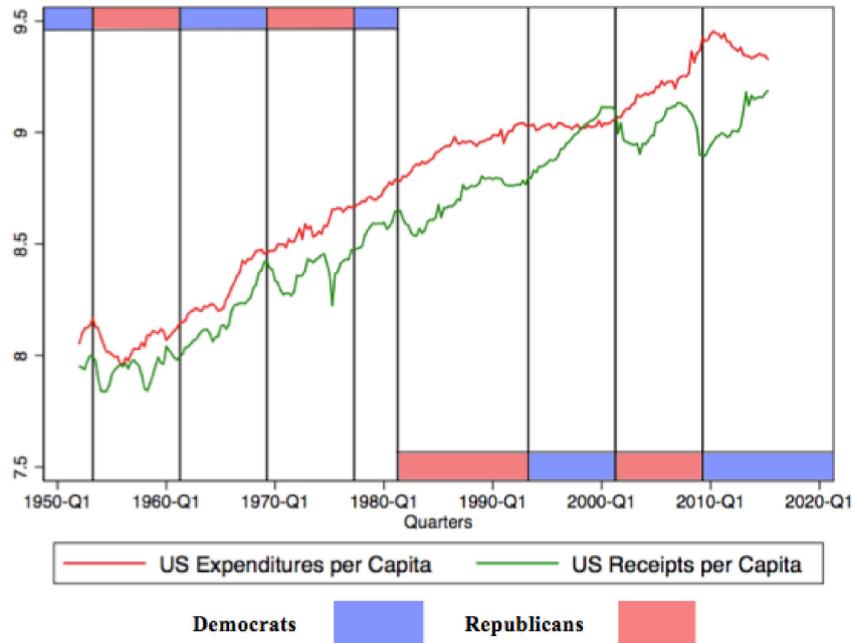


Figure 1: US Expenditures and Receipts per Capita, 1952:Q1 to 2015:Q2

We construct six dummy variables that capture different characteristics of the incumbent, the fiscal stance, or the electoral cycle:

- *Political Dummy*: signals the political segment of the federal administration, 1 if Democrat, and 0 if Republican. We assume an institutional lag after elections so that the elected administration assumes full office in the second quarter after elections<sup>7</sup>.
- *Signal Dummy*: Takes the value 1 if the ECT signal is positive, negative otherwise.
- *Exogenous Dummy*: From Romer and Romer's (2010) list of tax episodes and Ramey's

<sup>5</sup>The GDP deflator is obtained from Federal Reserve Economic Research (FRED), while US population was taken from the Bureau of Economic Statistics (BEA).

<sup>6</sup>GDP per capita has been computed as expenditure and receipts per capita. Real GDP from FRED is divided by the US Population from BEA.

<sup>7</sup>Elections in the US take place on the fourth quarter of the election year. The Presidential Inauguration takes place in the quarter after the election. We assume that fiscal aggregates respond to the newly elected two quarters after the election.

(2011) expenditure episodes, capturing the character of the fiscal response. Unlike the other dummy variables, the exogenous dummy is available only until 2013:Q4<sup>8</sup>. This variable captures discretionary fiscal changes, and does not distinguish between tax and expenditure changes.

- *Dimension Dummy*: Captures the dimension of the ECT, and discriminates between normal and large ECTs. Larger dimensioned ECTs are observations larger than  $\pm 1$  Std. Error, coded as 1, while regular sized ECTs are coded as 0.
- *Election Dummy*: It signals a five-quarter period before a new administration comes into power, consistent with the institutional lag assumption.

#### 4. Methodology

In this paper we model US fiscal dynamics as an asymmetric process, sensitive to partisan and electoral motivations. We adapt the methodology in Kollias, Papadamou, and Psarianos (2014), which explores asymmetric UK fiscal dynamics, differentiating between actions by the Labor and Conservative parties<sup>9</sup>. In a second phase of our analysis we incorporate an empirical narrative into our model, so to isolate discretionary fiscal responses, a novel approach to empirical literature on asymmetrical fiscal dynamics.

We model the behavior of US fiscal aggregates using a Vector Error Correction Model (VECM) which allows for simultaneous examination of short and long-run dynamics:

$$Y_t = c + \beta_1 Y_{t-1} + \dots + \beta_i Y_{t-i} + \delta \Delta GDP_{t-1} + \gamma e_{t-1} + \varepsilon_t, Y_t = (T_t, G_t) \quad (1)$$

$$T_t = c + \beta_2 G_t + e_{t-1} \Leftrightarrow e_{t-1} = T_t - \beta_2 G_t - c \quad (2)$$

Where the Error Correction Term (ECT),  $e_{t-1}$ , represents deviations from a linear combination of  $Y_t = (T_t, G_t)$  that departs from a long-run equation where  $\beta_2 = 1$ , whereby tax receipts and public spending change in tandem. We model the cointegration relationship as an estimate of a sustainable balance, as in Legrenzi and Milas (2012), the ECT thus representing

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<sup>8</sup>Ramey's expenditure episodes are available from 1889:Q4 to 2013:Q4 while Romer and Romer's tax episodes are available from 1945:Q1 to 2007:Q4. The exogenous dummy signals each expenditure and tax episode identified by both authors from 1952:Q1 to 2013:Q4.

<sup>9</sup>The authors concluded that "Conservative Governments invariably tend to operate under a hard budget constraint, exhibiting a stronger fiscal vigilance vis--vis Labour administrations".

deviations from a sustainable path<sup>10</sup>. Positive ECTs represent surplus-enhancing deviations, while negative ECTs represent deficit-enhancing deviances. We focus on the adjustment coefficient associated with each VECM,  $\gamma$ , which represents each fiscal aggregate's response to deviations from the long-run sustainable path. We control for the business cycle when in each estimated model, taking the first difference in lagged GDP as an exogenous variable, associated with the coefficient  $\delta$ .

We now allow for politically motivated fiscal asymmetry and assume that Democrats and Republicans react differently to surplus and deficit departures from a balanced budget<sup>11</sup>. We estimate a VECM in which we separate the ECT into two regimes a surplus-enhancing regime, restricted to years in which ECT is positive, and a deficit-enhancing regime, associated with years with negative values of ECT. These ECTs are then interacted with a political dummy indicating whether a Democrat or a Republican administration was in place:

$$Y_t = c + \beta_1 Y_{t-1} + \dots + Dem.e_{t-1}^+ + Rep.e_{t-1}^+ + Dem.e_{t-1}^- + Rep.e_{t-1}^- + \varepsilon_t \quad (3)$$

Each estimated VECM hereafter will always separate the ECT into surplus and deficits, then adding alternative divisions. Our analysis in Section 5 will focus on responses to deficits.

Next, having in mind that the estimated responses to budget disequilibrium may arise endogenously or exogenously, that is, through automatic fiscal stabilizers or by discretionary fiscal action, we expand the framework with exogenous dummies distinguishing fiscal responses between discretionary and automatic, taken by Democrats and Republicans. By interacting the ECT with an exogenous dummy we signal discretionary fiscal responses to fiscal disequilibrium, separately estimating automatic and discretionary responses. The basis for our breakdown of fiscal responses into endogenous and exogenous is the narrative approach to fiscal policy, originating in the fiscal multipliers literature, initiated in Ramey and Shapiro (1998), which identifies spending and revenue changes and analyzes the effects of such episodes on output<sup>12</sup>.

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<sup>10</sup>According to Quintos (1995), with  $\beta_2 = 1$  we have an instance of sustainability in fiscal balances, as receipts fully accompany expenditure. With  $0 < \beta_2 < 1$ , expenditure expands at a higher rate than receipts, leading to a weaker degree of sustainability or outright unsustainability.

<sup>11</sup>Ewing et al.'s (2006) justified modelling asymmetrical fiscal responses to disequilibrium: "*fiscal policymakers may respond differently to a deviation of the deficit or surplus from its long-run trend*". Kollias et al. (2014) suggested the importance of considering political motivated asymmetry.

<sup>12</sup>See also Edelberg et al. (1999), Eichenbaum and Fisher (2004), and more recently, Romer and Romer (2010) and Ramey (2011).

Our second specification is thus:

$$Y_t = c + \beta_1 Y_{t-1} + \dots + Dem.e_{t-1}^{Ex} + Rep.e_{t-1}^{Ex} + Dem.e_{t-1}^{En} + Rep.e_{t-1}^{En} + \varepsilon_t \quad (4)$$

Subsequently, motivated by the non-linear approach in the empirical literature, in which fiscal aggregates respond significantly only to those deficit-enhancing deviations above a given threshold, we interact the ECT with a dummy accounting for the size of the budget deviation. We divide the ECT into unusually large and normal budget deviations, so as to estimate different responses to large and moderate budget disequilibria. We again, as always, differentiate the fiscal responses according to the nature of the fiscal incumbent, Democrat or Republican:

$$Y_t = c + \beta_1 Y_{t-1} + \dots + Dem.e_{t-1}^{Us} + Rep.e_{t-1}^{Us} + Dem.e_{t-1}^{Un} + Rep.e_{t-1}^{Un} + \varepsilon_t \quad (5)$$

Finally, in the spirit of Nordhaus, we test whether fiscal responses are electorally motivated, allowing for the possibility that Democrats and Republicans may react differently to budget deviations in electoral and non-electoral periods. Our ECT is interacted with an election dummy that takes the value 1 in the five quarters preceding a presidential election:

$$Y_t = c + \beta_1 Y_{t-1} + \dots + \beta_i Y_{t-i} + Dem.e_{t-1}^{El} + Rep.e_{t-1}^{El} + Dem.e_{t-1}^{Ne} + Rep.e_{t-1}^{Ne} + \varepsilon_t \quad (6)$$

In sum, we estimate the differentiated responses by Democrat and Republican administration in the presence of reasonable or large deviations to budget balance, in those episodes identified as corresponding to exogenous changes in taxes or expenditures, and in the period immediately before elections. The next section presents and discusses our results.

## 5. Estimation and Results

We first estimate a VECM and the underlying cointegration relationship between fiscal aggregates. We start by assessing whether the variables have the same order of integration, more specifically if they are I(1). This is a necessary condition for the existence of cointegration. As observable in Appendix Table A.2, all tests - the Augmented Dickey-Fuller (ADF), the heteroskedasticity robust Philips Perron (PP), and the efficient unit root statistic, the Elliot, Rothenberg, and Stock Test, - indicate that both receipts and expenditure are I(1).

As the integration order condition is satisfied, we proceed with testing for cointegration. Analyzing the maximum eigenvalue test<sup>13</sup>, the null of no CE relationships is rejected at the 5% significance level. On the other hand, the null of at least one relationship cannot be rejected at standard levels, thus leading us to conclude that US federal receipts and expenditures are cointegrated, exhibiting one CE relationship.

Building on the assumption of Gaussian residuals, the Johansen test requires a Test VAR with Gaussian residuals for valid inference on such statistic. Observing Table A.2, the Test VAR exhibits non-normal residuals and a heteroskedastic variance. Still, according to Silvapulle and Podivinsky (2000), the Johansen tests are robust to non-normality in finite samples, allowing us to draw conclusions on the test when dealing with non-normal residuals. On heteroskedasticity, Maki (2013) concentrates on the maximum eigenvalue test and supports the robustness of the test to GARCH processes<sup>14</sup>.

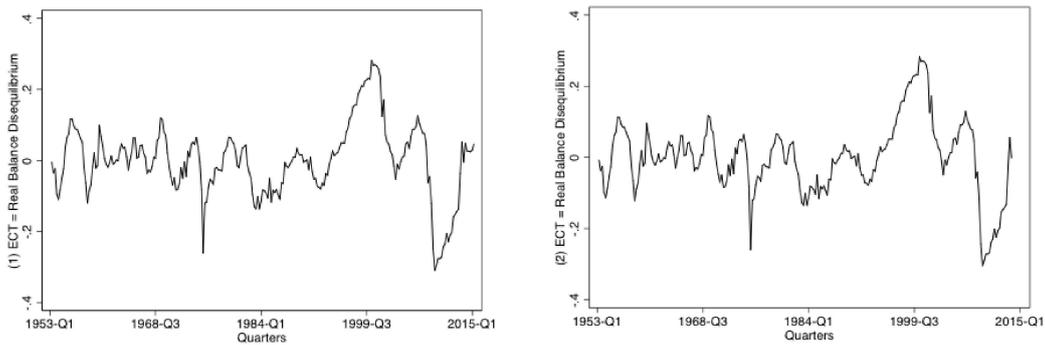


Figure 2: **Error Correction Terms, 1953:Q2 to 2015:Q2 and 2013:Q4**

By confirming the robustness of the derived statistics and hence the validity of the identified cointegration relationship, we estimate a VECM as follows. We first estimate the ECT, product of the CE relationship, with Full Information MLE, following Johansens cointegration approach; we then insert exogenously the ECT into the 1st differenced VAR, forming the VECM that is estimated with SUR<sup>15</sup>. For the ECT, two Error Correction Terms are estimated

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<sup>13</sup>Lütkepohl et al. (2001) identify a higher susceptibility from the trace test to size distortions when dealing with small samples. Aiming to minimize size distortions, we focus on the maximum eigenvalue test.

<sup>14</sup>Given the low frequency of the analyzed data, the identified heteroskedasticity will follow mild ARCH/GARCH processes, thus the Maximum Eigenvalue Statistic is a valid target for statistical inference.

<sup>15</sup>Seemingly Unrelated Regressions is used for robustness purposes having in mind heteroskedasticity, the coefficients being estimated with OLS, and the covariance matrix being estimated with GLS.

from the asymmetric models computed. The ECTs and estimated Cointegration Vectors are presented below.

To understand whether inference is valid for both fiscal aggregates, as far as the long-run cointegration relationship, we present the adjustment coefficients from the full sample VECM. As observable in Table 1, the ECT is statistically significant for both fiscal aggregates, meaning that they adjust significantly to deviations from the derived cointegration relationship.

Table 1: **Full Sample VECM Adjustment Coefficients**

$\Delta T$	<i>ECT</i>	-0.055970*	$\Delta G$	<i>ECT</i>	0.030650*
		(0.0018)			(0.0120)

1. \* Indicates significant coefficients at least at a 10% Significance Level (P-Values in parentheses).
2. Complete Data on the Linear VECM in the Appendix.
3. The Estimated VECM is a VECM (4) as the Test VAR is a VAR (5).

Our analysis focuses on the adjustment coefficients in the estimated VECMs, which indicate the fiscal aggregate's response to budget imbalances. Since the variables under analysis are entered as natural logarithms, the ECT is also denominated in natural logarithms. The adjustment coefficients thus become fiscal elasticities, that is, the percentage change in the fiscal aggregate in response to a one-percentage point variation from budget balance. We focus on the sign and magnitude of each of the latter coefficients, with the aim of uncovering asymmetric fiscal responses to budget disequilibria.

### 5.1. Responses to Deficit

We first estimate generic responses to budget imbalances, in Table 2, as a 0.07 % tax increase and a 0.05 % decrease in expenditures. In other words, deviations from budget balance lead to tax increases and expenditure decreases, as expected.

Table 2: **General and Partisan Adjustment to Deficit Coefficients**

	<i>Generic</i>		<i>Partisan</i>		<i>Generic</i>		<i>Partisan</i>
$\Delta T$	0.072638*	<i>Dem</i>	0.057265*	$\Delta G$	-0.052648*	<i>Dem</i>	-0.041078*
	(0.0169)	<i>Rep</i>	0.083737		(0.0108)	<i>Rep</i>	-0.087017*
			(0.1139)				(0.0166)

- (1) \* Indicates significant coefficients at least at a 10% Significance Level (P-Values in parenthesis).

We then compute the specific Democrat and Republican responses to find that while

Democrats raise taxes 0.057 % and decrease expenditures by 0.04 %, Republicans cut expenditures further, and the response as far as taxation is not significantly different from 0. Thus, while Democrats adjust through both fiscal aggregates, but mostly through tax increases, Republicans adjust solely through expenditure cuts.

We now examine those changes in the budget deficit that are classified as exogenous. Republicans display deep aversion to deficits, and adjust strongly through both fiscal aggregates, though more through increases in receipts. Democrats adjust through expenditure cuts only, and not more intensely than in normal times.

Table 3: **Partisan and Exogenous (Discretionary) Adjustment to Deficit Coefficients**

		<i>Partisan</i>	<i>Exogenous</i>			<i>Partisan</i>	<i>Exogenous</i>
$\Delta T$	<b>Dem</b>	0.057265*	0.045650	$\Delta G$	<b>Dem</b>	-0.041078*	-0.115402*
		(0.0702)	(0.4747)			(0.0578)	(0.0090)
	<b>Rep</b>	0.083737	0.182761*		<b>Rep</b>	-0.087017*	-0.140571*
		(0.1139)	(0.0208)			(0.0166)	(0.0099)

(1) \* Indicates significant coefficients at least at a 10% Significance Level (P-Values in parenthesis).

We now isolate large deviations from budget balance and estimate partisan responses to such deviations. These deficits are those higher than the standard deviation of all budget departures. Again, Republicans adjust to large deficits through appropriate changes in both fiscal aggregates, and more intensely than usual. Democrats, on the other hand, adjust through expenditure but less intensely than usual.

Table 4: **Partisan and Unusual Adjustment to Deficit Coefficients**

		<i>Partisan</i>	<i>Large</i>			<i>Partisan</i>	<i>Large</i>
$\Delta T$	<b>Dem</b>	0.057265*	0.049612	$\Delta G$	<b>Dem</b>	-0.041078*	-0.038845*
		(0.0702)	(0.1163)			(0.0578)	(0.0813)
	<b>Rep</b>	0.083737	0.206975*		<b>Rep</b>	-0.087017*	-0.106896*
		(0.1139)	(0.0007)			(0.0166)	(0.0132)

(1) \* Indicates significant coefficients at least at a 10% Significance Level (P-Values in parenthesis).

Following Nordhaus (1975), we investigate whether periods immediately preceding elections may induce players to react more (or less) to fiscal imbalances. We find no significant response in pre-election periods, for Democrats or Republicans.

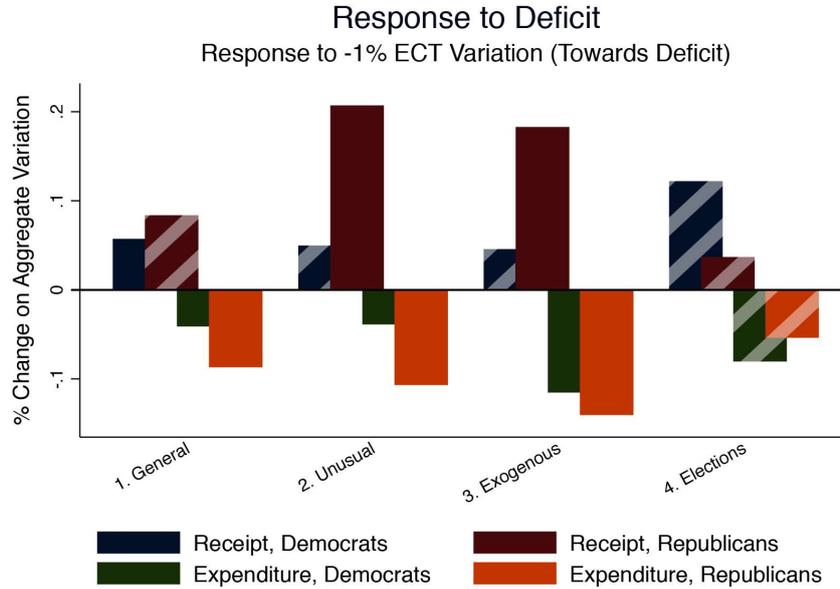


Figure 3: **Responses to Deficit Budget Departures**

Figure 3 present our results. It becomes evident how Republicans tend to react more than Democrats to fiscal deficits. The Republican response makes use of both tax increases and expenditures cuts, while Democrats tend to cut expenditures only. Moreover, the Republican response to deficits is more intense in the case of exogenous or large deficit increases, while the Democrat response does not intensify concomitantly. This evidence is different and, in some respects, stands in contrast to earlier reported findings. The lack of evidence for political budget cycle seems to confirm most earlier analyses, but is indicative of a cross-partisan decrease in deficit aversion in electoral periods.

## 6. Conclusion

We analyze US fiscal dynamics with a view to test for partisan responses to budget imbalances. We find that Democrats adjust to deficits through tax increases and expenditure cuts, mostly through the latter, while Republicans decrease expenditures, and more so than Democrats. In times of exogenous or large deficit imbalances, only Republicans react significantly, and more so than in normal times. Finally, election periods do not seem to elicit any particular significant responses from either Democrats or Republicans.

We believe our empirical approach can be used in the future to infer whether the value of fiscal multipliers varies across the political spectrum. Our current results show that, indeed, partisanship matters statistically and quantitatively for fiscal performance.

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## Appendix

Table 1: Data Description

<b>Variables</b>	<b>Frequency</b>	<b>Time-Span</b>	<b>Source</b>	<b>Computation</b>	<b>Transformation</b>	<b>Adjustment</b>
Population	Quarterly	1952:Q1 2015:Q2	BEA	Original from Source	None	None
1 <sup>st</sup> Differenced per Capita Real GDP	Quarterly	1952:Q1 2015:Q2	FRED	Variation of Real GDP Divided by Population	Natural Logarithms	Seasonal Adjustment from Source
Expenditure per Capita	Quarterly	1952:Q1 2015:Q2	BEA	Deflated and Divided by Population	Natural Logarithms	Seasonal Adjustment from Source
Receipts per Capita	Quarterly	1952:Q1 2015:Q2	BEA	Deflated and Divided by Population	Natural Logarithms	Seasonal Adjustment from Source
<b>Dummy Variables</b>		<b>Time-Span</b>	<b>Description</b>			
Signal		1952:1 - 1952:2	Positive ECT (=1) / Negative ECT (=0)			
Political		1952:1 - 1952:2	Democratic Government (=1) / Republican Government (=0)			
Exogenous		1952:1 - 1952:4	Institutional Lag Assumed - Elected Government Recognized 2 Quarters After Election			
Dimension		1952:1 - 1952:2	Discretionary Fiscal Change (=1) / Automatic Fiscal Change (=0) Romney and Romney's (2010) Tax Episodes and Romney's (2011) Expenditure Episodes ± 1 Std. Dev. ECT (=1) / Within Std. Dev. Interval ECT (0)			
Election		1952:1 - 1952:2	Electoral Period (=1) / Non-Electoral Period (=0) Five-Quarter Election Period = 3Q Pre-Election + 1Q Election Quarter + 1Q Institutional Lag			

1. Seasonal Adjustment from Source refers to adjustment techniques such as X-12 and X-13 ARIMA methods.
2. Expenditure refers to Total Federal Expenditure, Line 42 of BEA's NIPA Table 3.2.
3. Receipts refer to Total Federal Receipts, Line 39 of BEA's NIPA Table 3.2.

Table 2: Unit Root, Cointegration Tests and Test VAR Adequacy Tests

	<i>k</i>	<i>ADF</i>	<i>PP</i>	<i>KPSS</i>	<i>ERS</i>
<i>t<sub>t</sub></i>	2	-0.834	-0.702	2.004***	99.416
$\Delta t_t$	1	-9.245***	-15.159***	0.035	0.296***
<i>g<sub>t</sub></i>	4	-0.693	-0.961	1.977***	230.0583
$\Delta g_t$	3	-5.727***	-18.802***	0.118	3.905*

<i>CE Relations</i>	<i>Eigenvalue</i>	<i>Trace Stat.</i>	<i>P – Value</i>	<i>Max Eigen Stat.</i>	<i>P – Value</i>
None	0.056770	14.82668	0.0629	14.55290	0.0450
At most 1	0.001099	0.273775	0.6008	0.273775	0.6008

	<i>Portmanteau (16)</i>	<i>White</i>	<i>Jarque – Bera</i>
Test VAR	29.26643 (0.9388)	87.57786*** (0.0116)	352.4596*** (0.0000)

1. Rejection of Null Hypothesis with 10% (\*), 5% (\*\*\*) and 1% (\*\*\*) Significance Level.

2. The Elliot, Rothenberg and Stock were performed for both variables with the MAIC Lag Criteria.

3. Considering Receipts, the MAIC is 2 in Levels and 10 in 1<sup>st</sup> Differences while the SC is 0 and 1 in 1<sup>st</sup> Differences.

4. Considering Expenditures, the MAIC is 4 in Levels and 4 in 1<sup>st</sup> Differences while the SC is 4 in Levels and 3 in 1<sup>st</sup> Differences.