

FEDERAL DEFICIT SPENDING AND PARTISANSHIP:
AN ECONOMIC ANALYSIS

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ABSTRACT

The United States federal government has a substantial budget every year for various programs in the public interest. The money for these programs must come from somewhere: usually, either taxes or deficit spending. The concern of this paper is the latter element.

Specifically, it is the goal of this paper to uncover whether annual budget deficits are affected by the partisan makeup of the institutions that decide how to spend money and how to obtain it: namely, Congress and the presidency. Does a Democratic president tend to cause higher deficits than a Republican? Is the behavior of a party any different in Congress than it would be in the presidency? These questions will be explored.

After an historical overview and a literature review, I formulate a simple theoretical model to provide a basis for what I am trying to find. Then, I frame the questions of the paper into hypotheses and test manifold empirical models. After establishing which I find to be most fitting and subsequently revising that model, I discuss its implications and suggest areas for future research.

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At the end of 2006, the United States public debt stood at nearly \$8.7 trillion. In other words, that is how much money the United States government owes to various parties, both foreign and domestic. That figure grows and contracts with each passing year. While the former is usually the case—meaning that the government is spending more than it takes in, causing budget deficits—there is some pressure on the government to rein in spending. Whereas during the 1990’s, there was talk of paying down the debt—thanks to budget surpluses and a booming economy—the conversation has shifted to one of turning large deficits into smaller ones.

While the spending authority of the government rests with the Congress, the president has considerable control as well: Congress acts on—either by accepting, altering, or throwing out—a budget request initiated by him. Somewhat clever nicknames like Spendocrat and Reporklican highlight the fact that, depending on one’s side of the political aisle, either Democrats or Republicans, respectively, are to blame.

However, it is not that clear cut. Looking at the data, one can see that, since the 1970’s, the United States government has only rarely enjoyed a year without a deficit. Over the last hundred years, Democrats and Republicans alike have occupied the presidency and Congress. So, which party nickname is truly justified: one, both or neither?

Through a time series statistical analysis of outlays and receipts that controls for party makeup of the federal government as well as several other variables, I will attempt to explain changes in the deficit. Before this, however, in section I, I will provide an historical overview and a review of prior research pertaining to the topic of this paper. In section II, I will take a theoretical model of government expenditure and partisanship and

simplify it for the purposes of this paper. Section III will describe the data and the empirical models employed, and in section IV, I will explain which model performed best in fitting the data and discuss its implications.

SECTION I—BACKGROUND

This section contains two parts: an historical overview and a literature review. The former summarizes critical moments in United States fiscal policy. While most of the overview will be concerned with the twentieth century and the beginnings of the twenty-first, the discussion will begin with the founding moments of the republic. The literature review delves into prior research in the areas of partisan politics and institutional structures.

1.1—Historical Overview

Ratified in 1788, the United States Constitution lays the framework of the United States government. Therein, at least as it is enumerated, it would appear that the bulk of the financial power of the federal government is held by Congress. “All bills for raising Revenue” are first introduced in the House of Representatives and then sent to the Senate.¹ On dispersing money, the Constitution states: “No money shall be drawn from the Treasury, but in Consequence of Appropriations made by Law.”² The president’s only power in these matters is to veto entire pieces of legislation, but two-thirds of both

¹ “The Constitution of the United States,” Article I, Section 7, Clause 1.

² *Ibid.*, art. I, § 9, cl. 7.

houses can override that veto. Within Article I, section 8, Congress is afforded the rights of taxation and borrowing. All told, of the twenty-nine clauses within sections 7 through 9 of Article I, eight are directly related to government financing.

The nation's history with debt began shortly after ratification. On an evening in June of 1790, Treasury Secretary Alexander Hamilton first proposed a plan to assume the debts the states had acquired during the Revolutionary War.³ Hamilton's plan was ultimately adopted that July in exchange for moving the permanent capital of the United States to a site on the Potomac River to appease Virginia. The debt that was assumed by the federal government amounted to \$21.5 million (nominal dollars). Using the Consumer Price Index (CPI), in real dollars that translates into nearly \$200 million.⁴

As might be suggested by the sheer volume of financial powers given to Congress in the Constitution, Congress' role in budgeting was much more expansive than the president's until 1921.⁵ Early appropriation bills consisted of several specific line items. For example, one June 1796 bill provided funding for clerks' pay, books and stationary.⁶ Clearly, this practice became impractical. As the work of the ways and means and finance committees of the House and Senate, respectively, became more taxing in the mid-1800's, the duties of spending were imparted to separate appropriations committees, allowing the existing committees to focus entirely on revenue legislation.⁷

³ Joseph J. Ellis, *Founding Brothers: The Revolutionary Generation* (New York: Random House, 2000): 50.

⁴ Samuel H. Williamson, "Five Ways to Compute the Relative Value of a U.S. Dollar Amount, 1790 - 2006" (2007), <http://www.measuringworth.com/>, accessed 15 October 2007.

⁵ Allen Schick, with the assistance of Felix LoStracco, *The Federal Budget: Politics, Policy, Process* (Washington: Brookings, 2000), 9.

⁶ An Act making further appropriations for the year one thousand seven hundred and ninety-six. 1796. Statutes at-Large. 4th Cong. Ch. 50; 1 Stat. 493.

⁷ Schick, *Budget*, 13.

**TABLE 1: Federal Budget Process: Deadlines
Fiscal Year 2009 Budget***

Agency/Office and its Actions		CBO	President	OMB
2007				
Jul - Sep				Receives executive branch agencies' requests
Oct - Dec			Reviews appeals from agencies; makes final decisions	Reviews requests; reviews appeals from agencies; makes final decisions
2008				
Jan		Releases <i>Economic and Budget Outlook</i>		
Feb, 1st Monday			Submits FY2009 budget proposal	
15th Mar	Agency-concerned committees provide input to budget committees			
15th Apr	Adopts FY2009 budget resolution			
Jun - Aug	Act on FY2009 appropriations**	New revenue and expenditure projections for FY2009		New revenue and expenditure projections for FY2009
Sep	Enactment of appropriations			

Fiscal year 2009 begins.

1st Oct

Adapted from Schick, *Budget*, 31 (table).

*FY2009 is only used as an example; this does not imply that the FY2009 budget process will actually follow the deadlines. It is often the case that they are not followed.

**At some point before appropriation bills are considered, legislation to authorize or re-authorize the programs, agencies, etc. must be adopted. This process varies from committee to committee.

In 1913, the sixteenth amendment to the Constitution was adopted, which definitively clarified the legality of the income tax.⁸ It was also 1913 that Charles O. Galvin identified as the beginning year of a period during which Congress utilized separate revenue acts to put the tax laws into place.⁹ Meanwhile, it was not until the Budget and Accounting Act of 1921 that the president was given an explicit role in the budget process.¹⁰ This act required the president to submit budget recommendations to Congress, a practice that proponents believed would stymie fiscal irresponsibility and promote restraint. The Bureau of the Budget—currently the Office of Management and Budget (OMB)—was also established in that legislation.¹¹ This office gives budgetary recommendations to the president.

Until 1939, the federal government had little need for revenues. In fact, its surpluses prompted the Treasury Secretary to encourage tax cuts for one year and refunds for the previous.¹² After the enactment of the Internal Revenue Code of 1939, events like World War II and the Korean War necessitated more government revenue. By 1944, the progressive income tax was brought to a range of 23 to 90 percent for persons with an income below \$2000 and above \$200,000, respectively (both in nominal dollars).¹³ More people paying taxes led to persuasive lobbying from interest groups to provide myriad special provisions, prompting the enactment of the Internal Revenue Code of 1954.¹⁴ A 1964 act reduced the progressivity of the income tax by lowering the highest tax bracket:

⁸ U.S. Const. amend. XVI.

⁹ Charles O. Galvin, "Tax Reform in the United States and Canada: A Comparison," *Law and Contemporary Problems* (Summer 1981): 131-142.

¹⁰ Schick, *Budget*, 14.

¹¹ *Ibid.*

¹² Galvin, "Tax Reform."

¹³ Robert A. Wilson, "Personal Exemptions and Individual Income Tax Rates, 1913-2002," United States Internal Revenue Service, <http://www.irs.gov/pub/irs-soi/02inpetr.pdf>, accessed 15 October 2007.

¹⁴ Galvin, "Tax Reform."

those with incomes in excess of \$400,000 would face a rate of 77 percent in 1964 and then 70 percent the next year.¹⁵

The Congressional Budget and Impoundment Control Act of 1974 (CBA) created the budget process that is in current use. The act added standing budget committees into both chambers of Congress and established the Congressional Budget Office (CBO).¹⁶ The CBO is Congress' economic research arm and has been noted for being a non-partisan organization.¹⁷ This is in contrast to the OMB, which is partisan due to its nature as an arm of the presidency. Consequently, CBO numbers tend to be preferred when they contradict OMB numbers.¹⁸ According to a Senate Budget Committee print, the measures adopted under the CBA were much needed, as before this act, Congress struggled with how to remain effective in times of increased public spending.¹⁹

One of the important responsibilities of the budget committees is the preparation of a concurrent budget resolution, which sets forth a multi-year budget that includes outlays, receipts, surplus (or deficit) and the public debt.²⁰ The budget resolution has no legal weight, however; it is a guideline that has rather variable influence on the actual formulation of the budget.²¹ Once the budget committees complete their work, revenue, authorization and appropriation legislation is considered separately and generally in that order.²² For more detail on the budget process timeline, please see Table 1.

¹⁵ Wilson, *Tax Rates*.

¹⁶ 93 Pub. L. No. 344, 88 Stat. 297 (1974).

¹⁷ Schick, *Budget*, 32, 87.

¹⁸ *Ibid.*, 87.

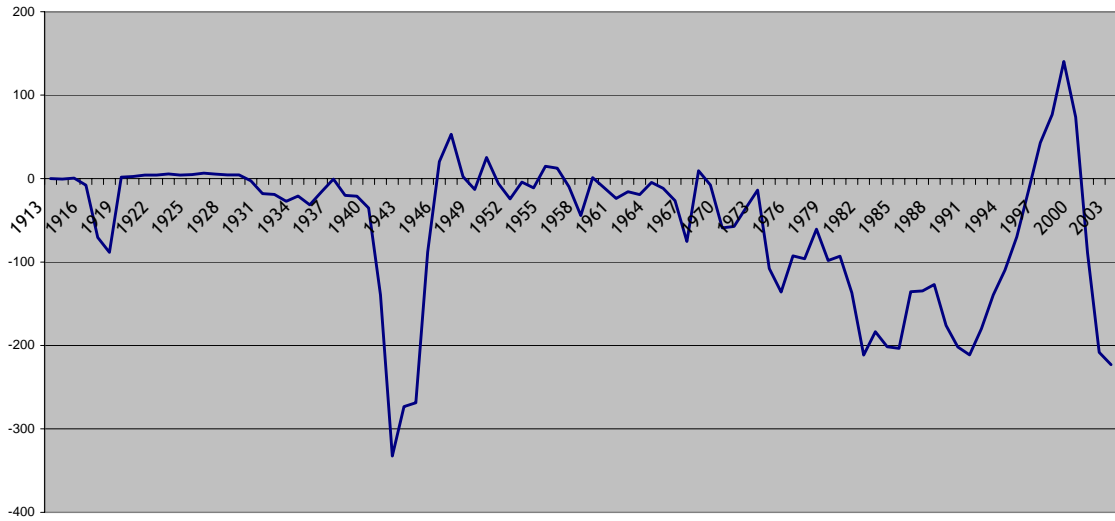
¹⁹ U.S. Congress. Senate. Committee on the Budget. *The Congressional Budget Process: An Explanation*. 105th Cong., 2nd sess., S. Prt. 105-67 (1998): 6.

²⁰ Schick, *Budget*, 32.

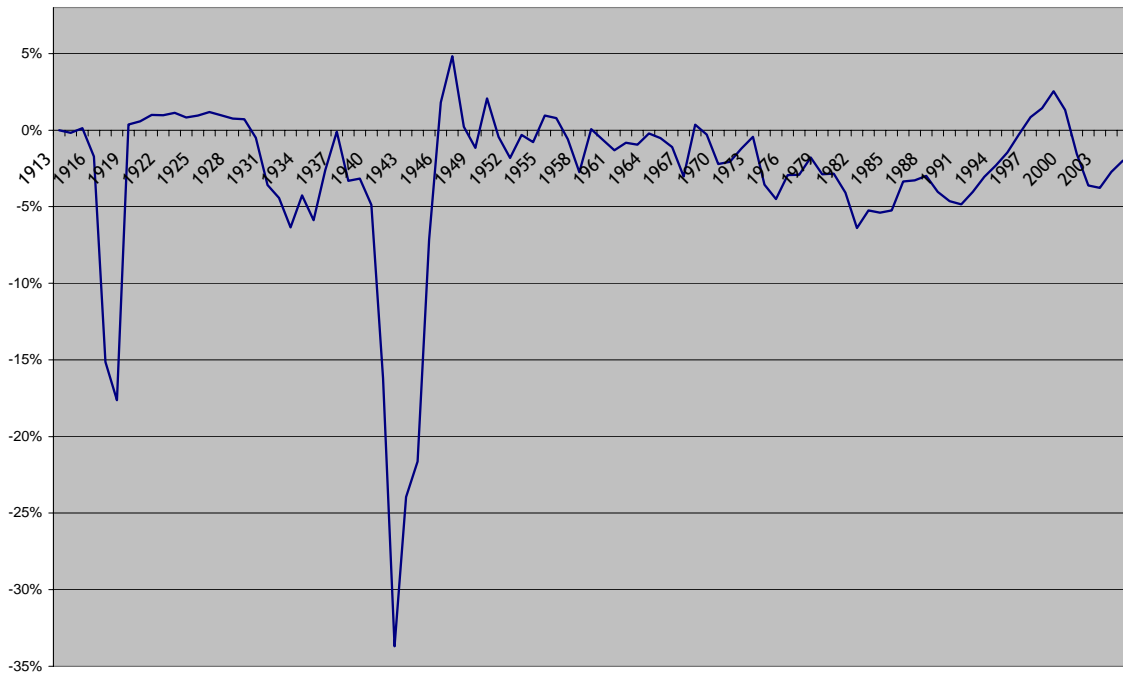
²¹ *Ibid.*, 32-33.

²² *Ibid.*, 33-34.

GRAPH 1: Surplus (in real \$bn)



GRAPH 2: Surplus as a Percentage of GDP



Shortly after the enactment of this critical budget legislation, the budget deficit hit the largest levels seen since World War II. Graph 1 charts the surplus over time from 1913 to 2003 and can therefore provide a visual of the magnitude of deficits and surpluses. The federal government experienced deficits during 43 of the years from 1914

to 1975, or 68 percent; nearly 86 percent of the years from 1975 to 2003 were spent in deficit. Graph 2 shows the surplus as a percentage of gross domestic product (GDP). Here, most dramatic are the values during World War I and World War II, just as in Graph 1, though with a higher magnitude.

In 1981, President Ronald Reagan enacted a budget that, save military expenditures, was smaller across the board, while simultaneously signing the Economic Recovery Tax Act of 1981.²³ This act provided a 25 percent tax cut spread over three years and established that taxes would be indexed to the CPI starting in 1985. Deficits continued to rise under Reagan until 1985 when it reached \$240 billion—six times the 1976 value. After a modest deficit reduction in 1986, it continued to build until 1991, when it weighed in at almost \$400 billion (real dollars).²⁴

A practice that became popular in the 1990's in the Senate was the inclusion of “Pay As You Go” (PAYGO) provisions in the budget resolutions.²⁵ These provisions barred the Senate from considering legislation that would increase the deficit during the next ten years, five of which are generally covered by the resolution. For example, the

²³ Galvin, “Tax Reform.”

²⁴ Here, real dollars are indexed to the Consumer Price Index: base year 1980 = 100.

²⁵ U.S. Congress. House. *Concurrent Resolution on the Budget for fiscal year 1994*. 103rd Cong., 1st sess., H. Con. Res. 64. (1993); U.S. Congress. House. *Concurrent Resolution on the Budget for fiscal year 1995*. 103rd Cong., 2nd sess., H. Con. Res. 218. (1994); U.S. Congress. House. *Concurrent Resolution on the Budget for fiscal year 1996*. 104th Cong., 1st sess., H. Con. Res. 67. (1995); U.S. Congress. House. *Concurrent Resolution on the Budget for fiscal year 1997*. 104th Cong., 2nd sess., H. Con. Res. 178. (1996); U.S. Congress. House. *Concurrent Resolution on the Budget for fiscal year 1998*. 105th Cong., 1st sess., H. Con. Res. 84. (1997); U.S. Congress. House. *Concurrent Resolution on the Budget for fiscal year 2000*. 106th Cong., 1st sess., H. Con. Res. 68. (1999); U.S. Congress. House. *Concurrent Resolution on the Budget for fiscal year 2001*. 106th Cong., 2nd sess., H. Con. Res. 290. (2000); U.S. Congress. House. *Concurrent Resolution on the Budget for fiscal year 2002*. 107th Cong., 1st sess., H. Con. Res. 83. (2001); U.S. Congress. House. *Concurrent Resolution on the Budget for fiscal year 2004*. 108th Cong., 1st sess., H. Con. Res. 95. (2003); U.S. Congress. Senate. *Concurrent Resolution on the Budget for fiscal year 1999* (engrossed as agreed to or passed by Senate). 105th Cong., 1st sess., S. Con. Res. 86. (1998); U.S. Congress. Senate. *Concurrent Resolution on the Budget for fiscal year 2005* (engrossed as agreed to or passed by Senate). 108th Cong., 2nd sess., S. Con. Res. 95. http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong_bills&docid=f:sc95es.txt.pdf (2004), accessed 30 September 2007.

first budget resolution to include PAYGO covered fiscal years 1994 through 1998; the PAYGO rule covered those years as well as years up to 2003.²⁶ The implications of PAYGO were that increases in spending had to be offset by equal increases in revenue; likewise, tax cuts would need to be offset by spending cuts.

Another common feature to the PAYGO rules is the waiver: Three-fifths of the total Senate membership could override the rule.²⁷ With the exception of the first PAYGO rule, it was also typical to include an expiry date. For most resolutions, this date was September 30, 2002; that date came and went without any action to renew the rule.²⁸

At the time, the policy of PAYGO was important to continue as part of the Republicans' 1994 congressional victory, which was a huge upset over the Democrats after decades of power in Congress. After all, the major components of the so-called "Republican Revolution" were accountability and responsibility.²⁹ Bill Clinton was in power from 1993 to 2001, being the first Democratic president since Jimmy Carter, who left office in 1981.

During this time, the United States enjoyed deficit reduction and even large surpluses. Though pundits may be quick to give congratulations, the regime switching in both the executive and legislative branches makes a cursory glance a weak method to determine who ought to receive credit. Nevertheless, the deficit of \$34.6 billion in 1996 was the smallest since thirty years prior, and this was followed by four years of unparalleled surpluses that totaled almost \$1 trillion—approximately all government revenues collected from 1913 to 1972.

²⁶ *FY1994 Budget Resolution*.

²⁷ See footnote 16.

²⁸ *Ibid.*

²⁹ James W. Robinson, and Russ Colliau, *After the Revolution: A Citizen's Guide to the First Republican Congress in 40 Years* (Rocklin, CA: Prima, 1997).

In 2001, President George W. Bush signed into law the Economic Growth and Tax Relief Reconciliation Act—tax cuts that created lower tax rates and several subsidies, cuts that at the time were to be paid for out of the surplus.³⁰ The 2003 Jobs and Growth Tax Relief Reconciliation Act reduced the tax rates for capital gains and dividends on stock.³¹ For a summary of tax policy changes accompanied by the respective party compositions of Congress and the presidency, please see Table 2.

After the September 11th, 2001 attacks, the deficit ballooned to its largest real levels. Military actions in Afghanistan and Iraq have kept the government in deficit. Talk of surpluses and paying down the debt is a fleeting memory. This has been replaced by goals of simply reducing the deficit, juxtaposed by the tax cuts, which have to some degree contributed to the deficits that have been experienced. There have been recent improvements, however: October 2007 numbers from the Department of the Treasury reveal that fiscal year 2007 ended with a deficit of only \$163 billion (nominal dollars).³² According to the Treasury Department, this represents the lowest deficit in five years, while the White House has suggested that a balanced budget could be achieved by 2012.^{33, 34}

³⁰ William G. Gale, and Peter R. Orzag, “Economic Effects of Making the 2001 and 2003 Tax Cuts Permanent,” *International Tax and Public Finance* (2005): 193-232.

³¹ *Ibid.*

³² “Joint Statement of Henry M. Paulson, Jr., Secretary of the Treasury, and Jim Nussle, Director of the Office of Management and Budget, on Budget Results for Fiscal Year 2007,” United States Department of the Treasury, <http://www.treasury.gov/press/releases/hp603.htm>, accessed 13 October 2007.

³³ “Federal Deficit Lowest in 5 Years,” *NewsroomAmerica.com* (12 October 2007), <http://www.newsroomamerica.com/politics/story.php?id=395573>, accessed 13 October 2007.

³⁴ Scott Stearns, “Bush Says Low Taxes Cut US Budget Deficit,” *VOA News* (11 October 2007), <http://www.voanews.com/english/2007-10-11-voa68.cfm>, accessed 13 October 2007.

TABLE 2: Major Changes in Tax Policy, 1913 - 2003

Year	President's Party	Congress' Party	Major Effects
1925	Republican	Republican	Current year tax reductions; refunds for previous year
1939	Democrat	Democrat	Recodification; fewer exemptions; dramatic progressivity—20 to 90 percent
1954	Republican	Republican	Recodification
1964	Democrat	Democrat	Reduced rate range to 14 to 70 percent
1981	Republican	Democrat	Tax cut; shift from taxing income to taxing consumption
1986	Republican	Democrat	Reduced highest tax bracket to 28 percent; transferred much of tax burden from individuals to businesses
1990	Republican	Democrat	Increased highest bracket to 31 percent
1993	Democrat	Democrat	Increased highest bracket to 39.6 percent
1997	Democrat	Republican	Small tax cut; Per Child Tax credit
2001	Republican	Republican	Tax cut; established lower rates; provided more exemptions
2003	Republican	Republican	Tax cut on capital gains, stock

SOURCES:

1913 - 1981 : Galvin, "Tax Reform;"

1981 - 1997 : "Fact Sheet on the History of the U.S. Tax System," United States Department of the Treasury, <http://www.treas.gov/education/fact-sheets/taxes/ustax.shtml>, accessed 1 October 2007;

2001, 2003 : Gale and Orzag, "Economic Effects of Making the 2001 and 2003 Tax Cuts Permanent," *International Tax and Public Finance* (2005): 193-232.

A salient point on which to end this historical discussion is that taxation and spending are two disparate propositions. Neither the Constitution nor any law requires that monies must “be drawn from the Treasury” in “bills for raising Revenue.” In other words, Congress and the president consider appropriation and taxation legislation entirely separately from one another.

Efforts such as Pay As You Go policies and having unified budget resolutions seek to remedy this, but Congress generally needs not consider the ramifications of spending measures on the deficit. While there has been fleeting support for balanced budget constitutional amendments, the implications of such constraints are perhaps more onerous than simply tying each spending measure to its own revenue source. This is important to note because the fractured nature of the existing budget process almost foreshadows the disparity seen between outlays and receipts in the form of deficits—particularly, of course, in the twentieth century and most dramatically in the past three decades.

1.2—Literature Review

James Alt and Robert Lowry explored the impact of party control of state government on budget deficits.³⁵ Specifically, they used empirical models to determine how the governments react in spending and revenue-raising to unexpected surpluses and deficits. They identified several possibilities for the makeup of a state government. The unified government exists when the same party controls both houses of the legislature as well as the governorship. Split branch occurs when one party controls the legislature and the other controls the executive branch. Split legislature is the case in which the legislature itself is split.

Rather than identifying certain states as Democrat or Republican (a practice that has evidently become more popular in making casual observations since this article was

³⁵ James E. Alt and Robert C. Lowry, “Divided Government, Fiscal Institutions, and Budget Deficits: Evidence from the States,” *American Political Science Review* (December 1994): 811-828.

published, seeing as now we have “blue” and “red” states), Alt and Lowry sorted all of the non-Southern observations by the characteristics of government type described above and ran regressions for each case described above. It is worth noting that split branch and split legislature do not take into account which party is in which position, while the unified cases were divided into Democrat and Republican, and further divided by whether or not the state has some restriction on deficit carryover. For Southern states, the only occurrences regressed were unified Democrat and split branch.

Alt and Lowry estimated equations for expenditures and revenues. Revenues are a function of previous period revenues, state personal income, federal contributions and the surplus (or deficit) from the previous period. Expenditures are explained by current revenues, the state's unemployment rate (a proxy for the business cycle) and the previous period surplus.

Their results showed that unified governments with restrictions tend to eliminate deficits more quickly; unrestricted, the deficits tend to grow. Split branch governments reacted more slowly, and split legislature likewise. Alt and Lowry also demonstrated that the Democrats are the “high demand” party, and Republicans, “low demand.”

While opinion polls suggest that voters prefer no deficit, Guido Tabellini and Alberto Alesina attempt to reconcile this with the fact that nobody clearly favors any method of deficit reduction.³⁶ The majority recognizes the fact that it will not be in power forever and that future majorities may not have the same goals (especially if a competing party is victorious). Consequently, such a majority can reap the benefits of deficit spending and avoid having to pay for it, leaving that decision to the future.

³⁶ Guido Tabellini and Alberto Alesina, “Voting on the Budget Deficit,” *The American Economic Review* (March 1990): 37-49.

This is not to suggest that voters do not care about future generations' burden: Tabellini and Alesina demonstrate that voters would be supportive of balanced budget legislation. As there is no majority that would prefer to be so bound, an effective balanced budget rule could only be suspended by some supermajority.

It is also worth noting that Tabellini and Alesina show that, in some instances, voters may favor budget deficits, in order to shift the wealth of future generations toward themselves; how much they favor deficits increases as the voters become more polarized. This is particularly relevant today, as partisan division appeared to have increased sharply from the 2000 Presidential election onward. Perhaps polarization can be introduced into the discussion by looking at how small a party's majority is in Congress. For instance, a 51-49 Senate is indicative of polarization; 70-30 would clearly be a mandate for one party.

Matthew Eshbaugh-Soha (2005) studies presidential politics and illustrates how presidents structure their agendas relative to congressional makeup and other factors from economic indicators to their approval ratings.³⁷ Presidents have three main goals, Eshbaugh-Soha explains: enacting policies, getting reelected and achieving a legacy. The latter two are largely dependent on actually achieving the policy goals, and the president's ability to set an agenda is paramount. Often, presidents are able to put most of their goals on the agenda in some capacity. They choose their agenda in some part by assessing their ability to be passed by Congress. Congressional makeup is not crystal clear when a candidate is running for office, thus some campaign promises may be unattainable come inauguration.

³⁷ Matthew Eshbaugh-Soha, "The Politics of Presidential Agendas," *Political Research Quarterly* (June 2005): 257-268.

Building on work done before, Eshbaugh-Soha devises his own spectrum of presidential policy typology, dividing by time period and importance. In his nomenclature, major and meteoric policies are long-term and short-term, respectively, but both are important. Incremental and minor policies are both unimportant, with the latter being short-term. Faced with budget deficits and an unfriendly Congress, presidents will tend to focus on short-term objectives, the minor elements of which are all but completely independent of context. The total presidential agenda (outside its makeup) is affected by deficits, Congress and the president's approval rating. Favorable values for all three variables will result in more policies being proposed.

Constitutions often dictate economic policy, as demonstrated in Person and Tabellini (2004).³⁸ Both the electoral rules and the form of government play a role. For instance, single member district plurality voting yields different results than proportional representation, just as a parliamentary form of government differs from presidentialism in its implications. Political accountability is diffused under proportional representation. Under plurality voting, representatives have a greater incentive to please voters. However, it also encourages catering to a targeted constituency or "special interest" groups. Also, under plurality, corrupt or inept officials may have an easier time gaining and keeping office—especially in small districts. Despite voters' appreciation of honesty, the honest but ideologically opposite opponent will not be preferred to the ideologically-preferred—and perhaps dishonest—incumbent. In parliamentary democracies, coalition governments are less common under that scenario, leading to more efficient economic policies (since coalitions tend to further diffuse blame).

³⁸Torsten Person and Guido Tabellini, "Constitutions and Economic Policy," *The Journal of Economic Perspectives* (2004), pp. 75-98.

There are, naturally, fiscal implications to these differences. As opposed to plurality representation, proportional representation generally leads to more spending (especially in social welfare programs) and higher deficits as a percentage of GDP. They also lead to more coalition governments, which themselves lead to higher spending as a percentage of GDP. Presidentialism leads to less spending versus parliamentary governments. Being that the United States combines presidentialism with plurality voting (of which the Senate appears to be a unique form), it stands to reason that it ought to have lower spending and deficits as a percentage of GDP than a completely proportionally representative parliament that tends toward coalitions.

Giancarlo Corsetti and Nouriel Roubini (1996) explore the differences in attitudes between United States and European policymakers when it comes to balancing budgets.³⁹ As of their writing, the prevailing goal in the United States was a balanced budget—effectively zero borrowing, with no exception for capital expenditures—by the year 2002. In Europe, the 1992 Treaty of Maastricht provided, with some exceptions, that membership in the European Monetary Union (EMU) would only be afforded to those nations whose deficit and debt did not exceed 3 percent and 60 percent, respectively, of GDP. The authors note that, at the time, the United States had a deficit below 2 percent and a debt at around 52 percent of GDP, which would have given it EMU admittance were it actually in Europe.

While the latter approach was criticized for lacking foundation in economic theory, it was lauded for at least being more flexible than the balanced budget amendment proposed in the United States, which at the time had many proponents for

³⁹Giancarlo Corsetti and Nouriel Roubini, “European versus American Perspectives on Balanced-Budget Rules,” *The American Economic Review* (May 1996): 408-413.

inclusion in the Constitution. Also, the proposed United States policy would preclude any borrowing for capital financing. Even the percentages in the Maastricht Treaty were not entirely rigid: Exceptions essentially granted admittance to countries that were showing vast improvement or that experienced only transitory excessive deficits, for instance.

Corsetti and Roubini note that the nominal budget deficit is actually an overstatement of the deficit, since some part of federal debt interest payments is nominal, not real. Therefore, a nominal deficit of zero would actually equal some real surplus. The authors call for caution when using the states' experience with budget rules as evidence that the federal government would fare as well. Such rules often include exceptions for capital, and they typically allow for "rainy-day" reserves. States also enjoy transfers from the federal government that aid them in balancing their budgets during recessions, something that clearly cannot be paralleled at the federal level. Finally, the macroeconomic ramifications of a federal balanced budget attempt during a recession would be huge compared to the state level effects.

When forced to make a choice between the Maastricht rules and the balanced budget, the authors side with Maastricht, citing its flexibility. But they liken the numerical targets described by both to "accounting alchemy," and rather suggest that institutional and procedural reforms be enacted to solve budgetary problems. They do not give specifics as to the types of policies that should be employed. I imagine, however, that one example of which they would welcome the exploration would be to tie spending and financing together with one piece of legislation. In a way, this would be along the lines of the Congressional Pay As You Go (PAYGO) rules of the 1990's.

However, such a rule could perhaps still be effective even if one of the financing options was to carry a deficit. Tying a specific spending measure to a specific increase in borrowing would likely rid some policymakers and citizens of the disconnect between our spending and financing.

James Poterba (1996) studies the budgetary rules of the states in the United States in hopes of garnering useful information to apply at the federal level.⁴⁰ He establishes that there are three general types of balanced budget rule in the states. The weakest only requires that the governor propose a balanced budget; the next type requires a balanced budget to be enacted; in the strongest form, states must not carry forward a deficit, implying that if expectations become divorced from reality, then adjustments must be made midstream.

Poterba reminds us that proposed limitations on federal deficits go further than even the strictest of state rules, which generally allow exceptions for monies such as highway or capital funds. He also observes that, for the most part, when adjustments must be made by states, it is generally spending that is reduced, rather than revenues being raised. Another byproduct of these rules is that creative accounting tricks can also be utilized to “balance” the budget. One example given is a state that moved its final payroll payments from the end of one fiscal year to the beginning of the next: Obviously something that can only be done once, it is clear that this practice is no panacea.

The author also notes that the very existence and form of the rules in states may be a reflection of those states’ voters’ preferences for deficits, thus making the rule endogenous and not exogenous. This problem is not as apparent for those states whose

⁴⁰James M. Poterba, “Budget Institutions and Fiscal Policy in the U.S. States,” *The American Economic Review* (May 1996): 395-400.

constitutions include this provision, particularly the longer that such a constitutional measure has been in effect. Poterba does not attempt to prove that 20th century voters do not share the same tastes as their 19th century counterparts in the same state, for instance, but such a conclusion would not seem terribly unsurprising.

Poterba is of the view that some modification of the federal budget process ought to have an impact on deficits, taxes and spending. His own research at the state level showed that for a \$100 deficit, spending was cut by \$17 in states with weak anti-deficit rules and by \$44 in those with stronger rules. There was nothing conclusive to be said about taxes.

Given that the federal government presently has no deficit rules, it seems likely that a strict deficit rule could have some impact—if it can be enforced. This brings me to another interesting point raised by Poterba: enforcement. The states lack any manner of enforcing the provisions, instead relying on a tradition of balanced budgets that has become ingrained in them. The federal government lacks that tradition, so it could be argued that without an enforcement mechanism, the rule would only be for show.

Alesina and Perotti (1996) discuss the roles that certain budgetary institutions and rules play in the budgets that countries develop.⁴¹ Generally, they find that budget institutions—that is, the rules, procedures and regulations that govern the introduction, approval and implementation of a budget—do indeed play a role. They identify three types of rules: numerical targets, procedural rules and transparency rules. Numerical targets include balanced budget rules, which the authors find to be onerous given that

⁴¹Alberto Alesina and Roberto Perotti, “Fiscal Discipline and the Budget Process,” *The American Economic Review* (May 1996): 401-407.

mandated balanced budgets are suboptimal, as the government's ability to smooth fluctuations through deficits and surpluses is hindered.

Procedural rules can be divided into "hierarchical" and "collegial." In the former, the finance minister wields strong power in budget preparation and the legislature often is restricted in the types of amendments it can propose. The latter is less "top-down." In focusing on checks and balances, collegial procedures promote more broadly democratic policies and do not typically restrict amendments.

Another method of distinction is between "closed" and "open" rules. Closed rules allow no amendments to the agenda setter's proposal; open rules do allow amendments. Whereas closed rules spread their benefits only over a simple majority, open rules, while tending to cause delay, spread benefits more broadly. An interesting notion within closed rules is the idea of initially voting on the total amount of the budget and *subsequently* voting on its composition. Also, some ideas for closed rules include requiring supermajorities to override an initial budget proposal.

Finally, transparency rules are critical. Without transparency, even an educated citizenry may not have a clear picture of the government's finances. As touched upon in other literature in this review, creative accounting can be employed to mask a budget's true effects. One interesting further case offered by these authors is the multi-year budget, which may have lofty plans in its latter years: plans that probably will not be implemented at all. Transparency is tied closely to the previous two types of budget rules. Restricting the budget deficit may lead to creative accounting—on paper holding to the letter of the law but going against it in spirit; on the other hand, transparency promotes fiscal discipline. Empirical evidence generally supports this hypothesis.

Alesina and Perotti conclude by offering reforms. They find that balanced budget laws should not exist at the national level, as they encourage the reduction of transparency. They do suggest that they have a place in subnational governments, however. Next, they state that nations looking to reduce deficits should consider more hierarchical methods with closed rules. Finally, they implore governments to make their budgets transparent. As difficult as making such an expansive piece of legislation transparent may be, the authors suggest that having the budget be a single unified document ought to go a long way toward achieving that goal. The use of multi-year budgets should generally be avoided, and independent organizations should verify claims made in government forecasts.

The United States is not a perfect model of all that the authors describe, but it does have some attributes of what the authors suggest. First, the United States does not have a balanced budget rule, though it does not appear to use its deficits solely for smoothing purposes. Its budget procedures tend to be more collegial, however, than hierarchical. The president sends a budget request to Congress, which acts upon it. However, the president is not an actor in this process, unlike in the parliamentary democracies that the authors mostly had in mind. As such, a member of Congress introduces the actual budget legislation, which may or may not resemble the president's proposal. The existence of "pork barrel" legislation also points to a collegial process. Finally, while the president does propose a budget to Congress (which is accessible to the public at large, as well), it does not necessarily represent all of the president's agenda items. Many of the authors' proposals would have interesting ramifications for the

United States. If Congress, for instance, were required to vote on the balance of spending independent of its composition, the budget would probably look very different.

SECTION II—DEVELOPING A THEORETICAL MODEL

Before performing an empirical study, it would be helpful to develop a simple theoretical model that attempts to explain the deficit in terms of party control of government. Perhaps at a very basic level, this macroeconomic issue could be described by equations of voter and politician utility—a microeconomic proposition.

Thomas Bräuninger developed a complex model of government spending and partisanship in a 2005 paper.⁴² At its heart, it is a model for the utility of a political actor. For the purposes of this study, a more simplified approach to his model will be sufficient. Bräuninger's model defines a Cobb-Douglas voter utility function that includes government expenditure and taxation. In his model, utility is directly related to government spending, while increases in taxes cause a decrease in utility. Given that government expenditures lead to government services and taxes translate into less income, it is reasonable to assume that one's utility might include these factors and that the relationships would be as described.

In Bräuninger's model, government expenditure is composed of a range of spending areas, with weights added to signify the importance the actor attaches to those areas. Rather than consider the composition of government spending, here we will simplify the model to look at a sole public good: the total level of government expenditure that each political actor controls. Also, his model has actors only concerned

⁴² Thomas Bräuninger, "A partisan model of government expenditure," *Public Choice* (2005) 125: 409-429.

with the portion of taxes that their respective constituencies must pay; this will be modified to have each actor concerned with the level of tax revenue over which each actor has power.

One element not present in Bräuninger's model is the deficit itself. While the deficit is simply outlays minus receipts, it is reasonable to expect an actor to be cognizant of the deficit's ramifications on the economy separately. The presence of the deficit in utility can be considered as a constraint against excessive spending coupled with low taxes. The model is designed such that the penalty imposed by deficits is the same as for surpluses, suggesting that either ought to be an instrument for smoothing.

Furthermore, the model can be simplified even more to consider two political actors, mirroring the two political parties that have traded power over the past century: the Democrats and the Republicans. For these purposes, we will consider the goals of the political actors and their respective constituencies to be one in the same.

And so, the following equation represents such a model:

$$u_i = Ag_i^{\alpha_i} t_i^{\beta_i} (1 + [d_i]^2)^{\gamma_i}$$

where i is a specific political actor;

A is an exogenous factor;

g is the portion of government outlays controlled by the actor;

α is the weight on outlays such that $\alpha \in (0,1)$;

t is tax revenue;

β is the weight on tax revenue such that $\beta \in (-1,0)$;

d is the deficit ($g-t$); and

γ is the weight on deficits such that $\gamma \in (-1,0)$.

An actor with this utility function would derive utility gains from increased government spending (g) and utility losses both from an increased tax burden (t) and increased deficit (d). The amount by which those variables have an effect depends on the

respective weights (α , β and γ). The following derivations reveal important features about weights α and β :

$$\begin{aligned}\frac{(\partial u_i)}{(\partial g_i)} &= \alpha A g_i^{(\alpha-1)} t_i^{(\beta)} (1+[g_i-t_i]^2)_i^\gamma + \gamma A g_i^{(\alpha)} t_i^{(\beta)} (1+[g_i-t_i]^2)^{(\gamma-1)} (2(g_i-t_i)) = 0 \\ \frac{(\partial u_i)}{(\partial t_i)} &= \beta A g_i^{(\alpha)} t_i^{(\beta-1)} (1+[g_i-t_i]^2)_i^\gamma - \gamma A g_i^{(\alpha)} t_i^{(\beta)} (1+[g_i-t_i]^2)^{(\gamma-1)} (2(g_i-t_i)) = 0 \\ \frac{t_i}{g_i} &= -\left(\frac{\beta_i}{\alpha_i}\right) \\ \text{Let } \eta_i &= -\left(\frac{\beta_i}{\alpha_i}\right)\end{aligned}$$

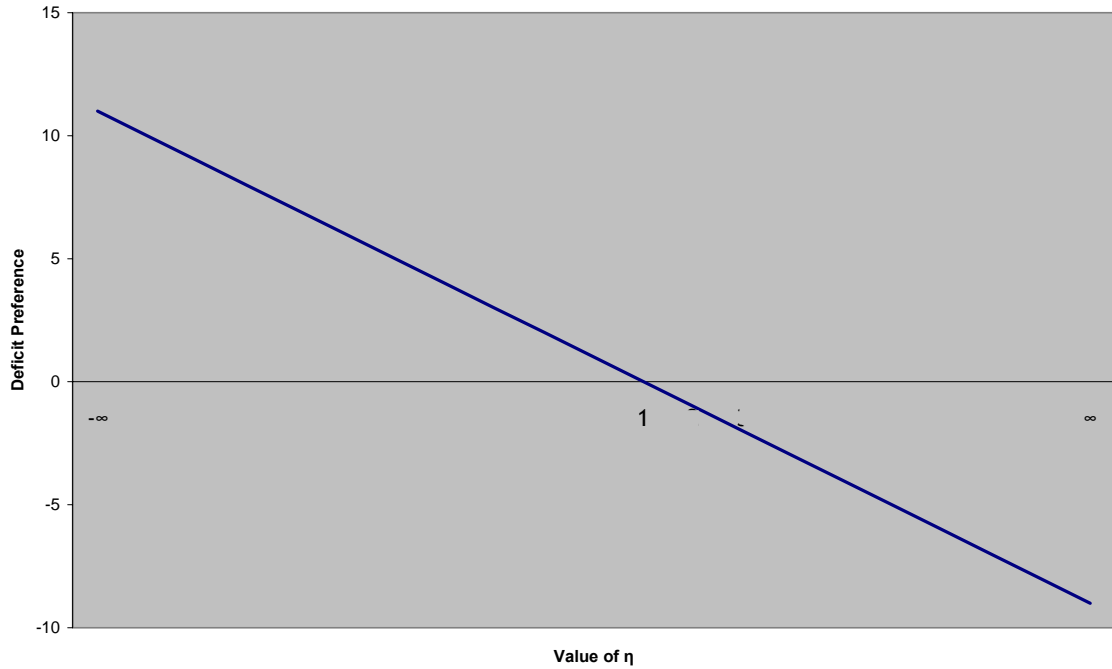
The variable η is the ratio of tax importance to spending importance for a particular actor. Using substitution in the deficit equation (spending less receipts), we find that η can be used to determine the deficit tolerance of a particular political actor.

This is demonstrated as follows:

$$\begin{aligned}\eta_i &= \frac{t_i}{g_i} \\ t_i &= g_i \eta_i \\ d_i &= g_i - t_i = g_i - g_i \eta_i \\ \eta_i &\in (-\infty, \infty) \\ \eta_i = 1 &\rightarrow d_i = 0 \\ \eta_i < 1 &\rightarrow d_i > 0 \\ \eta_i > 1 &\rightarrow d_i < 0\end{aligned}$$

Graph 3 shows the spectrum of budget deficit preference possibilities over the range of values of η . It should be noted that values of η say nothing about an actual preferred level of deficit, since it is a ratio. Comparing two values of η , one could say that the larger of the two indicates a larger ratio of taxes to spending.

GRAPH 3: Values of η and Tendencies Toward Deficit



We will let i take a value of 0 for Republicans or 1 for Democrats. The following represents the total utility of the government by combining both actors' utility:

$$\begin{aligned}
 U_{gov} &= u_0 + u_1 \\
 U_{gov} &= Ag_0^{(\alpha_0)} t_0^{(\beta_0)} (1 + [g_0 - t_0]^2)^{(\gamma_0)} + Ag_1^{(\alpha_1)} t_1^{(\beta_1)} (1 + [g_1 - t_1]^2)^{(\gamma_1)} \\
 g_0 &= \omega G \quad g_1 = (1 - \omega) T \quad G = g_0 + g_1 \\
 t_0 &= \omega T \quad t_1 = (1 - \omega) T \quad T = t_0 + t_1
 \end{aligned}$$

where G is total government spending;
 T is total government revenue; and
 ω is the amount of control exercised by actor 0 such that $\omega \in (0, 1)$.

The existence of the surplus and deficit constraint (γ) means that, unless γ equals zero, no utility maximizer will choose to run a deficit or surplus—regardless of any predisposition toward either. For the purposes of studying the actions of the two parties, it will be assumed that each party's utility function includes a γ of zero.

Traditionally, Democrats have been viewed as favoring big government whereas Republicans are said to favor small government. Again, η cannot substitute for of government size preference: Spending \$3 trillion and collecting \$2 trillion will yield the same η as spending \$3 billion and collecting \$2 billion. However, if one of the variables— g or t —remained constant, such a relationship could be demonstrated. For now, let us assume that t is constant. The following could then be stated:

$$\eta_1 < \eta_0$$

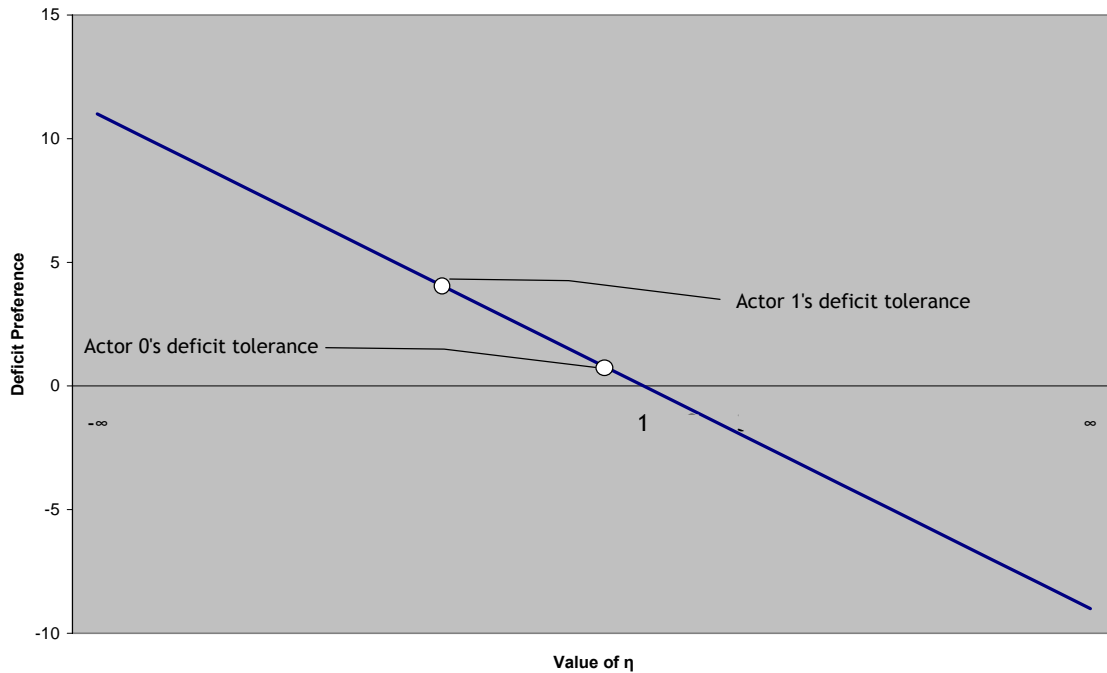
More generally, if this model were spread over multiple groups or individuals, as the value of η increases, the more the groups or persons lean toward the political right, at least on financial issues. The value of η could therefore be thought of as a measure of fiscal conservatism, so long as either g or t is held constant.

Returning to the spectrum of deficit possibilities, Graph 4 shows two hypothetical positions for political actors to take. Again, these examples demonstrate what could exist assuming that the Democrats have a penchant for higher deficits, subject to a constant tax level. The actual level of the budget deficit will depend on the weight ω , which measures the control exercised by actor zero. For a ω of 0, the deficit will be at actor one's position—in this case, a larger deficit than one with which actor zero would be comfortable. Likewise, when ω equals 1, the deficit would fall at actor zero's position. These two extreme cases can be thought of as mimicking unilateral control of the government.

For any other values of ω the deficit would fall somewhere in between the two positions. A value of 0.5 for ω might be indicative of an institutionally divided

GRAPH 4: Tolerances for the Deficit and Party Control

Tax level (t) is held constant.



government; other values of ω could suggest that the minority party is able to exert some influence in affairs for whatever reason. Regardless of the reason, this model does demonstrate that in theory, the level of deficit experienced is in part influenced by the prerogatives of the party—or, indeed, the parties—controlling the government.

SECTION III—EMPIRICAL RESEARCH

The theoretical model provided a useful starting point for thinking about the deficit, and it demonstrated a theoretical basis for showing how different preferences between the parties can potentially lead to divergent policies toward the deficit. However, empirical research using actual data should uncover more information. The first part of this section will describe the data that will be used in the empirical research,

while the second will establish hypotheses, with which to frame my goals, and empirical models, as well as test those models.

3.1—About the Data

The entire model will cover the time period of 1913 to 2003. While data exists for some variables prior to 1913, it is important to adjust monetary values for inflation, and the CPI is not available prior to then. The CPI was chosen for producing real values over the GDP deflator because that would have meant an even later starting point. The particular CPI series used is based on the CPI for the month in which the federal fiscal year starts that particular calendar year (July until 1976; 1976 and beyond, October).

Critical to the model will be representations of government spending, revenues and the surplus (revenues minus spending). The variables *gOutlays* and *gReceipts* measure the growth rates of outlays and receipts. The Appendix provides information as to why the model includes the growth rates and not the levels of these variables. The surplus is represented by *surplus/GDP*, which is the surplus as a percentage of GDP. Equally important are the representations of party control of the federal government.⁴³ This is achieved through both dummy and non-dummy variables. The dummy variable *dCong* registers a value of 1 when Democrats control both houses of Congress; likewise, *dPres* equals 1 when a Democrat is president. When both are true, *dGovt* is also 1;

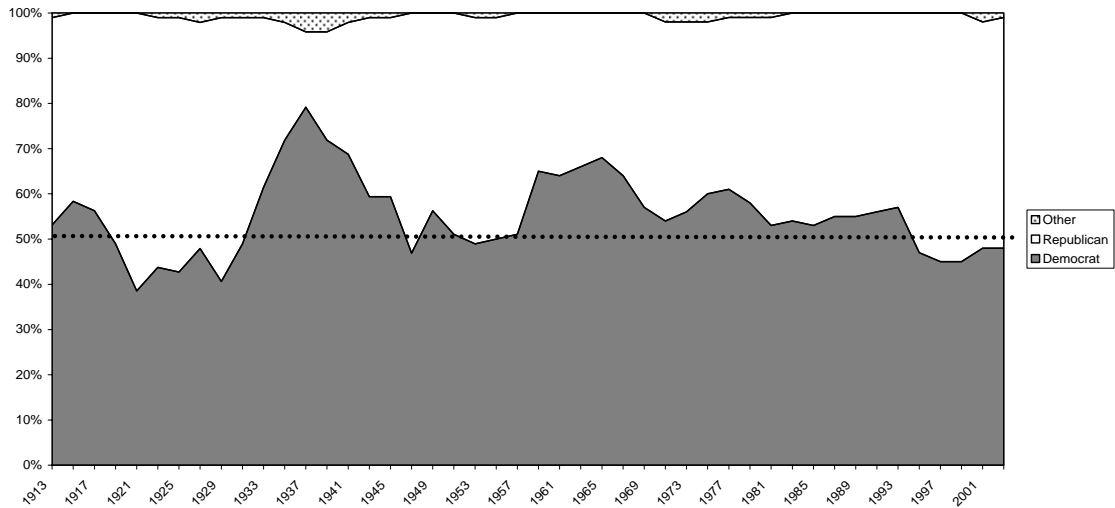
⁴³ “Party Divisions of the House of Representatives, 1789 to Present,” United States House of Representatives, Office of the Clerk, http://clerk.house.gov/art_history/house_history/partyDiv.html, accessed 1 June 2007; “Party Division in the Senate, 1789 – Present,” United States Senate, http://www.senate.gov/pagelayout/history/one_item_and_teasers/partydiv.htm, accessed 1 June 2007. “The Presidents of the United States,” The White House, <http://www.whitehouse.gov/history/presidents/>, accessed 1 June 2007.

All congressional and presidential variables are derived from data obtained by these sources.

GRAPH 5: Party Control of the House



GRAPH 6: Party Control of the Senate



GRAPH 7: Party Control of the Presidency

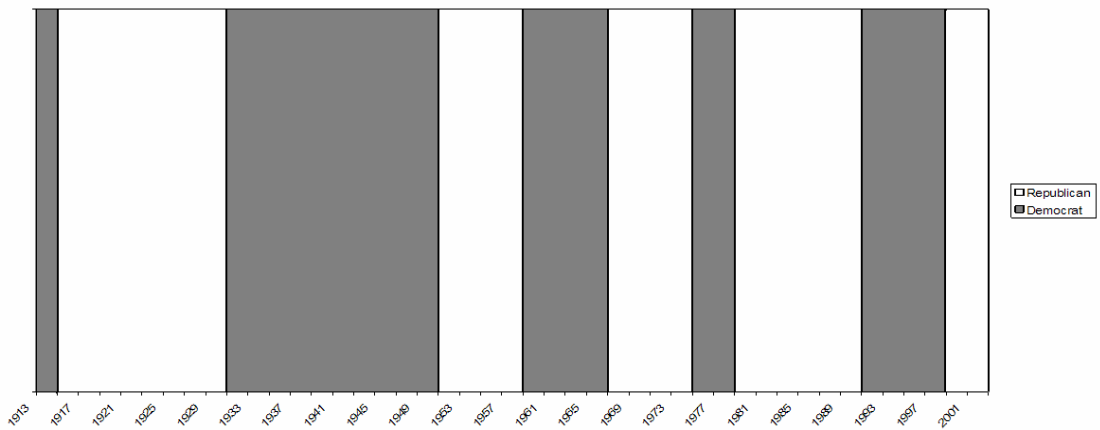


TABLE 3: Political and Economic Statistics at a Glance, 1913-2003

Variable	Mean	Minimum	Year	Maximum	Year	Standard Deviation
Senate, Percent of Democratic Seats	55.31%	38.54%	1921	79.17%	1937	8.79%
House, Percent of Democratic Seats	55.66%	30.11%	1921	76.78%	1937	9.53%
Democratic Congress ¹	67.39%					47.40%
Democratic Presidency ¹	48.35%					50.25%
Democratic Government ¹	39.13%					49.34%
Republican Government ¹	23.91%					43.13%
GDP Growth Rate	3.20%	-14.80%	1932	19.86%	1916	5.73%
Surplus, real \$bn	-52.75	-763.54	2003	397.36	1999	153.38
Surplus as a percentage of GDP	-1.26%	-12.89%	2003	7.21%	1999	3.05%
Surplus Variance ²	5,784.39	0.00	1914	206,797.03	2001	26,346.30
Surplus/GDP Variance ²	0.02%	0.00%	³	0.63%	2001	0.08%

¹The mean of this variable can be interpreted as the percent of time during this period that the specified party has controlled the specified segment(s).

²A three-period centred moving variance was calculated for 1914 to 2002 to measure volatility.

³Values less than 0.001% can be found from 1914 to 1972, with the exceptions of 1941 and 1945. They appear sporadically thereafter, the most recent of which being 1987, after which only values exceeding 0.01% appear.

the variable *rGovt* acts analogously for Republican-controlled governments. In some models, in which party identity is not taken into account, the variable *UniGov* registers whether there is unified (1) or divided government (0). Table 3 provides descriptive statistics for partisan variables as well as economic variables that are described below. Time series charts of party control can be found in Graphs 5, 6 and 7.

The variable *dCongPercent* exists to represent degrees of congressional control. It registers the percent control of Congress by Democrats by dividing Democratic seats between both houses by the total number of seats in Congress. It will not be used in the same models as *dCong*.

The variable *dGovtPercent* aggregates *dCongPercent* and *dPres*, averaging the percent of Congress controlled by Democrats with the dummy variable for whether or not the president is a Democrat. Without adjusting this average, a value of 1 for the variable would imply a 100 percent Democratic Congress and a Democrat as president; 0, the opposite. At 0.5, it would be impossible to tell if a Democratic president was in office with no Democrats in Congress or a Republican was in the White House while Democrats controlled *all* of Congress, but this is the only ambiguous case.

The actual variable is comprised of this average, adjusted downward by 0.5 so that it runs from -0.5 to 0.5, rather than 0 to 1. The reason for this is explained later, but the following are the values that *dGovtPercent* can take, accompanied by their interpretation:

<i>Value of dGovtPercent</i>	President	Congress
$-0.50 \leq dGovtPercent < -0.25$	Republican	Republican
$dGovtPercent = -0.25$	Republican	Tie
$-0.25 < dGovtPercent < 0$	Republican	Democrat
$dGovtPercent = 0$	Repub./Dem.	Dem./Repub.
$0 < dGovtPercent < 0.25$	Democrat	Republican
$dGovtPercent = 0.25$	Democrat	Tie
$0.25 < dGovtPercent \leq 0.50$	Democrat	Democrat

Recoding the variable to be bounded by -0.5 and 0.5 adds another feature to the variable. By taking the absolute value of *dGovtPercent*, the effects of divided versus single party government can be explored independent of the identity of the parties, as shown below:

<i>Value of dGovtPercent </i>	Type of Government
$0 < dGovtPercent \leq 0.25$	Divided Government
$0.25 \leq dGovtPercent < 0.50$	Single Party

TABLE 4: Threshold Model and the Data

<i>Partisan threshold data</i>				
Congressional Party and Magnitude ¹	Presidential Party			
	Democrat		Republican	
	# obs.	Variable Name ²	# obs.	Variable Name ²
Strong Democrat	11	<i>dCongS_dPres</i>	4	<i>dCongS_rPres</i>
Weak Democrat	7	<i>dCongW_dPres</i>	8	<i>dCongW_rPres</i>
Mixed	0	<i>mxCong_dPres</i>	2	<i>mxCong_rPres</i>
Weak Republican	8	<i>rCongW_dPres</i>	4	<i>rCongW_rPres</i>
Strong Republican	0	<i>rCongS_dPres</i>	2	<i>rCongS_rPres</i>

<i>Non-partisan threshold data</i>				
Magnitude of Control	Presidential Party			
	Democrat		Republican	
	# obs.	Variable Name ²	# obs.	Variable Name ²
Strong	11	<i>CongS_dPres</i>	6	<i>CongS_rPres</i>
Weak	15	<i>CongW_dPres</i>	12	<i>CongW_rPres</i>
Mixed	0	<i>mxCong_dPres</i>	2	<i>mxCong_rPres</i>

¹A weak majority is one that is less than 60 percent; a strong majority is greater than or equal thereto.

The mixed case is one in which neither party controls both branches of Congress.

²This is the variable that would equal 1 during an observation of this particular partisan mixture.

Threshold models have also been employed, which use dummy variables to test for the strength of the majority, based on *dCongPercent* and *dPres*. Similarly, a model that eschews party identification in favor of government fragmentation as its basis will be tested. Table 4 shows the variables that are used in these models, as well as the number of observations that exists for each. The strong threshold is 60 percent: That is, if Democrats have at least 60 percent control of Congress, they will be considered to have a strong majority; a lesser majority would be considered weak.

In addition to establishing political variables representative of the subject of this paper, it is necessary to control for exogenous factors: mainly, the economy and war.

The real GDP growth rate, as represented by *gGDP*, will be the economic indicator.⁴⁴

⁴⁴ Louis D. Johnston and Samuel H. Williamson, "The Annual Real and Nominal GDP for the United States, 1790 – Present," Economic History Services, <http://eh.net/hmit/gdp/>, accessed 10 October 2007; "Current and 'Real' Gross Domestic Product," United States Department of Commerce, Bureau of Economic Analysis, <http://www.bea.gov/national/xls/gdplev.xls>, accessed 1 September 2007.

High GDP growth rates will represent periods of expansion; low values, contraction.

War will be represented by the dummy variable *War*, which will register 1 during wars and 0 otherwise.⁴⁵

3.2—Empirical Analysis

In section II, I was able to demonstrate that, theoretically, the preferences of political actors who value government spending, tax revenues and the deficit in their utility functions (and who have control over those things) do have an effect on deficit spending. The goal of this paper is to determine if this is the case in reality. To more precisely articulate the goals of the empirical tests, I have devised a series of hypotheses, each of which will be tested in the different models employed.

3.2.1—Hypotheses.

HYPOTHESIS 1: Party control of the federal government matters in the formulation of budgets—including expenditures, receipts and the deficit.

Hypothesis 1 is the most general of the hypotheses: Its goal is not to determine the identity of the party most responsible for a type of behavior, but rather to simply

⁴⁵ Constitutionally speaking, there has not been a declared war since World War II. Despite this, the United States has since been involved in a number of conflicts that one might consider to be a “war.” These would include the Korean War, the Vietnam War, Desert Shield/Desert Storm, and the second Iraq War. In fact, the following Department of Veterans Affairs website from which most of this dummy variable’s values are derived refers to these conflicts as wars:

“Fact Sheet: America’s Wars,” United States Department of Veterans Affairs, Public and Intergovernmental Affairs, <http://www1.va.gov/opa/fact/amwars.asp>, accessed 8 July 2007.

determine if there is a difference in behavior at all. Likewise, institutional differences are outside the scope of this hypothesis, such as whatever behavioral differences that might exist between Republicans in Congress versus those occupying the presidency. For instance, a significant coefficient—regardless of sign—on either of the variables $dCong$ or $dPres$ in a model of spending and receipts would lend support to this hypothesis.

HYPOTHESIS 2: Democratic control of either branch of government will lead to higher deficits.

As with the first hypothesis, institutional differences are of no concern here. However, if Hypothesis 1 cannot be rejected and there exists negative coefficients on significant Democratic control variables, then Hypothesis 2 would be rejected. Positive coefficients would help build a case for this hypothesis, while conflicting coefficients (positive on $dCong$ and negative on $dPres$, for instance) would make the test inconclusive.

HYPOTHESIS 3: Deficits occurring under divided government, in which one party controls Congress and the other controls the presidency, will tend to be smaller than those occurring under unified government.

In the theoretical model, given the preferences of two parties with varying levels of government control, the actual level of the deficit was somewhere within the spectrum

of values between the two parties. The variable $dGovt$ would have to have a positive sign in order for Hypothesis 3 to gain acceptance.

HYPOTHESIS 4: Congress has a higher spending preference than the president.

On the local news, pork barrel legislation may be a great story; at the national level, this is not always the case. Much of the attention with these stories revolves around Congress' role in the spending process. This would lead one to believe that Congress, institutionally, tends to prefer higher spending levels than the president. Hypothesis 4 will test that.

3.2.2—Empirical Models.

All of the tests were performed using vector autoregressive models, which consisted of two equations. Each period t represents two years; the values of t range from 63 to 108, representing the number of the Congress for those two years. While incumbency is obviously an important factor in determining congressional makeup, it goes without saying that, in the middle of a congressional term, there will not be any major shakeups barring extreme circumstances like death or partisan defection.

TABLE 5: Variables for Empirical Models

Variable	Description	Models in which the variable appears								
		1a	1b	1c	2a	2b	2c	3a	3b	
<i>gOutlays</i>	Growth rate of government spending	X	X	X	X	X	X	X	X	X
<i>gReceipts</i>	Growth rate of government revenues	X	X	X	X	X	X	X	X	X
<i>dCong</i>	otherwise	X	X	X						
<i>dCongPercent</i>	Percentage of Democratic control of Congress formed by averaging both houses				X					
<i>dPres</i>	Dummy variable: 1 if Democratic Presidency; 0 otherwise	X		X	X				X	
<i>dGovt</i>	Dummy variable: 1 if Democratic unified government; 0 otherwise	X	X	X	X					
<i>dGovtPercent</i>	Aggregate of <i>dCongPercent</i> and <i>dPres</i>					X				
<i>GovtPercent</i>	Absolute value of <i>dGovtPercent</i>						X			
<i>gGDP</i>	GDP growth rate	X	X	X	X	X	X	X	X	X
<i>rGovt</i>	Dummy variable: 1 if Republican unified government; 0 otherwise		X		X					
<i>surplus/GDP</i>	Surplus (deficit) as percent of GDP	X	X	X	X	X	X	X	X	X
[Threshold variables]	See table 4.									
<i>UniGov</i>	Dummy variable: 1 if unified government; 0 otherwise			X						X
<i>War</i>	Dummy variable: 1 if a year of war; 0 otherwise	X	X	X	X	X	X	X	X	X

They are similar to the models tested by Alt and Lowry on state government data, in that there are equations for outlays and receipts; however, here, the dependent variables are their growth rates, represented by *gOutlays* and *gReceipts*. Variables such as *gGDP* and *War* were used to control for exogenous factors; constants and time trends will also be included. Unlike Alt and Lowry's work, lagged values of both exist in each equation. Rather than working with panel data, my tests use strictly time series data, and, rather than finding different equations for the different parties, government control is included in the models themselves as independent variables.

Therein lie the main differences between the models: The methods employed to account for party control of government differ in each. While there were varying degrees of success and, indeed, failure in several models' performance, there is still something valuable to be learnt from them. For all of the models, it was found to be the case that using a lag of one period (a period itself representing two years) was best, both based on the significance of coefficients of variables and information criterion such as the Aikake Information Criterion (AIC). Table 4 provides a summary of all explanatory variables to be used in these models.

MODEL SET 1: Dummy Models.

Tests of the dummy model will use the dummy variables *dCong*, *dPres*, *dGovt*, *rGovt* and *UniGov* in various combinations as the political explanatory variables. If there are effects due to Democratic or Republican control of government itself—saying

nothing about the *degree* of control within an institution—then this model should be able to find those. As the third model includes the *UniGov* variable, it is intended to study whether there is a common, non-partisan relationship between unified government and spending and receipt levels. Hereafter, I shall adopt the convention of referring to models that include a variable such as *UniGov* that looks at the institutional makeup sans party identification as *non-partisan* models, while referring to the others as *partisan* models. The following three systems of equations are the three dummy models that will be tested.

$$\begin{aligned} \begin{bmatrix} gOutlays_t \\ gReceipts_t \end{bmatrix} &= \begin{bmatrix} \alpha \\ \omega \end{bmatrix} + \begin{bmatrix} \beta_1 & \beta_2 \\ \gamma_1 & \gamma_2 \end{bmatrix} \begin{bmatrix} gOutlays_{(t-1)} \\ gReceipts_{(t-1)} \end{bmatrix} + \begin{bmatrix} \beta_3 \\ \gamma_3 \end{bmatrix} dCong_{(t-1)} + \begin{bmatrix} \beta_4 \\ \gamma_4 \end{bmatrix} dGovt_{(t-1)} \\ &+ \begin{bmatrix} \beta_5 \\ \gamma_5 \end{bmatrix} dPres_{(t-1)} + \begin{bmatrix} \beta_6 \\ \gamma_6 \end{bmatrix} gGDP_{(t-1)} + \begin{bmatrix} \beta_7 \\ \gamma_7 \end{bmatrix} War_{(t-1)} + \begin{bmatrix} \beta_8 \\ \gamma_8 \end{bmatrix} \left(\frac{Surplus}{GDP} \right)_{(t-1)} + \begin{bmatrix} \beta_9 \\ \gamma_9 \end{bmatrix} t \end{aligned} \quad (1a)$$

$$\begin{aligned} \begin{bmatrix} gOutlays_t \\ gReceipts_t \end{bmatrix} &= \begin{bmatrix} \alpha \\ \omega \end{bmatrix} + \begin{bmatrix} \beta_1 & \beta_2 \\ \gamma_1 & \gamma_2 \end{bmatrix} \begin{bmatrix} gOutlays_{(t-1)} \\ gReceipts_{(t-1)} \end{bmatrix} + \begin{bmatrix} \beta_3 \\ \gamma_3 \end{bmatrix} dCong_{(t-1)} + \begin{bmatrix} \beta_4 \\ \gamma_4 \end{bmatrix} dGovt_{(t-1)} \\ &+ \begin{bmatrix} \beta_5 \\ \gamma_5 \end{bmatrix} rGovt_{(t-1)} + \begin{bmatrix} \beta_6 \\ \gamma_6 \end{bmatrix} gGDP_{(t-1)} + \begin{bmatrix} \beta_7 \\ \gamma_7 \end{bmatrix} War_{(t-1)} + \begin{bmatrix} \beta_8 \\ \gamma_8 \end{bmatrix} \left(\frac{Surplus}{GDP} \right)_{(t-1)} + \begin{bmatrix} \beta_9 \\ \gamma_9 \end{bmatrix} t \end{aligned} \quad (1b)$$

$$\begin{aligned} \begin{bmatrix} gOutlays_t \\ gReceipts_t \end{bmatrix} &= \begin{bmatrix} \alpha \\ \omega \end{bmatrix} + \begin{bmatrix} \beta_1 & \beta_2 \\ \gamma_1 & \gamma_2 \end{bmatrix} \begin{bmatrix} gOutlays_{(t-1)} \\ gReceipts_{(t-1)} \end{bmatrix} + \begin{bmatrix} \beta_3 \\ \gamma_3 \end{bmatrix} dCong_{(t-1)} + \begin{bmatrix} \beta_4 \\ \gamma_4 \end{bmatrix} UniGov_{(t-1)} \\ &+ \begin{bmatrix} \beta_5 \\ \gamma_5 \end{bmatrix} gGDP_{(t-1)} + \begin{bmatrix} \beta_6 \\ \gamma_6 \end{bmatrix} War_{(t-1)} + \begin{bmatrix} \beta_7 \\ \gamma_7 \end{bmatrix} \left(\frac{Surplus}{GDP} \right)_{(t-1)} + \begin{bmatrix} \beta_8 \\ \gamma_8 \end{bmatrix} t \end{aligned} \quad (1c)$$

MODEL SET 2: Degree Models.

The degree models explore the relationship between the degree of government control and the factors of interest to this paper. One performance of the degree model test still uses *dPres*, *dGovt* and *rGovt*; however, it substitutes *dCongPercent* as the

explanatory variable of Congress. A second run will replace all of the political variables with the aggregate variable $dGovtPercent$. Finally, the third model, a non-partisan model, uses $GovtPercent$ instead of $dGovtPercent$ in a model otherwise the same as the second. Below are the three systems of equations to be tested as degree models.

$$\begin{aligned}
 \begin{bmatrix} gOutlays_t \\ gReceipts_t \end{bmatrix} &= \begin{bmatrix} \alpha \\ \omega \end{bmatrix} + \begin{bmatrix} \beta_1 & \beta_2 \\ \gamma_1 & \gamma_2 \end{bmatrix} \begin{bmatrix} gOutlays_{(t-1)} \\ gReceipts_{(t-1)} \end{bmatrix} + \begin{bmatrix} \beta_3 \\ \gamma_3 \end{bmatrix} dCongPercent_{(t-1)} \\
 &+ \begin{bmatrix} \beta_4 \\ \gamma_4 \end{bmatrix} dGovt_{(t-1)} + \begin{bmatrix} \beta_5 \\ \gamma_5 \end{bmatrix} rGovt_{(t-1)} + \begin{bmatrix} \beta_6 \\ \gamma_6 \end{bmatrix} dPres_{(t-1)} + \begin{bmatrix} \beta_7 \\ \gamma_7 \end{bmatrix} gGDP_{(t-1)} \\
 &+ \begin{bmatrix} \beta_8 \\ \gamma_8 \end{bmatrix} War_{(t-1)} + \begin{bmatrix} \beta_9 \\ \gamma_9 \end{bmatrix} \left(\frac{Surplus}{GDP} \right)_{(t-1)} + \begin{bmatrix} \beta_{10} \\ \gamma_{10} \end{bmatrix} t
 \end{aligned} \tag{2a}$$

$$\begin{aligned}
 \begin{bmatrix} gOutlays_t \\ gReceipts_t \end{bmatrix} &= \begin{bmatrix} \alpha \\ \omega \end{bmatrix} + \begin{bmatrix} \beta_1 & \beta_2 \\ \gamma_1 & \gamma_2 \end{bmatrix} \begin{bmatrix} gOutlays_{(t-1)} \\ gReceipts_{(t-1)} \end{bmatrix} + \begin{bmatrix} \beta_3 \\ \gamma_3 \end{bmatrix} dGovtPercent_{(t-1)} \\
 &+ \begin{bmatrix} \beta_4 \\ \gamma_4 \end{bmatrix} gGDP_{(t-1)} + \begin{bmatrix} \beta_5 \\ \gamma_5 \end{bmatrix} War_{(t-1)} + \begin{bmatrix} \beta_6 \\ \gamma_6 \end{bmatrix} \left(\frac{Surplus}{GDP} \right)_{(t-1)} + \begin{bmatrix} \beta_7 \\ \gamma_7 \end{bmatrix} t
 \end{aligned} \tag{2b}$$

$$\begin{aligned}
 \begin{bmatrix} gOutlays_t \\ gReceipts_t \end{bmatrix} &= \begin{bmatrix} \alpha \\ \omega \end{bmatrix} + \begin{bmatrix} \beta_1 & \beta_2 \\ \gamma_1 & \gamma_2 \end{bmatrix} \begin{bmatrix} gOutlays_{(t-1)} \\ gReceipts_{(t-1)} \end{bmatrix} + \begin{bmatrix} \beta_3 \\ \gamma_3 \end{bmatrix} GovtPercent_{(t-1)} \\
 &+ \begin{bmatrix} \beta_4 \\ \gamma_4 \end{bmatrix} gGDP_{(t-1)} + \begin{bmatrix} \beta_5 \\ \gamma_5 \end{bmatrix} War_{(t-1)} + \begin{bmatrix} \beta_6 \\ \gamma_6 \end{bmatrix} \left(\frac{Surplus}{GDP} \right)_{(t-1)} + \begin{bmatrix} \beta_7 \\ \gamma_7 \end{bmatrix} t
 \end{aligned} \tag{2c}$$

MODEL SET 3: Threshold Models.

Finally, the third model group attempted consists of threshold models. The political variables for model 3a are those described in the partisan section of Table 4. The non-partisan section of the same contains the variables for model 3b. The variables $mxCong_dPres$ and $rCongS_dPres$ will be dropped from the models since zero

observations exist for each. Also, $mxCong_rPres$ will be dropped from both models too; its effect will be captured by the constant term.

$$\begin{aligned}
 \begin{bmatrix} gOutlays_t \\ gReceipts_t \end{bmatrix} &= \begin{bmatrix} \alpha \\ \omega \end{bmatrix} + \begin{bmatrix} \beta_1 & \beta_2 \\ \gamma_1 & \gamma_2 \end{bmatrix} \begin{bmatrix} gOutlays_{(t-1)} \\ gReceipts_{(t-1)} \end{bmatrix} + \begin{bmatrix} \beta_3 \\ \gamma_3 \end{bmatrix} dCongS_dPres_{(t-1)} + \begin{bmatrix} \beta_4 \\ \gamma_4 \end{bmatrix} dCongW_dPres_{(t-1)} \\
 &+ \begin{bmatrix} \beta_5 \\ \gamma_5 \end{bmatrix} dCongS_rPres_{(t-1)} + \begin{bmatrix} \beta_6 \\ \gamma_6 \end{bmatrix} dCongW_rPres_{(t-1)} + \begin{bmatrix} \beta_7 \\ \gamma_7 \end{bmatrix} rCongW_dPres_{(t-1)} + \begin{bmatrix} \beta_8 \\ \gamma_8 \end{bmatrix} rCongS_rPres_{(t-1)} \quad (3a) \\
 &+ \begin{bmatrix} \beta_9 \\ \gamma_9 \end{bmatrix} rCongW_rPres_{(t-1)} + \begin{bmatrix} \beta_{10} \\ \gamma_{10} \end{bmatrix} gGDP_{(t-1)} + \begin{bmatrix} \beta_{11} \\ \gamma_{11} \end{bmatrix} War_{(t-1)} + \begin{bmatrix} \beta_{12} \\ \gamma_{12} \end{bmatrix} \left(\frac{Surplus}{GDP} \right)_{(t-1)} + \begin{bmatrix} \beta_{13} \\ \gamma_{13} \end{bmatrix} t
 \end{aligned}$$

$$\begin{aligned}
 \begin{bmatrix} gOutlays_t \\ gReceipts_t \end{bmatrix} &= \begin{bmatrix} \alpha \\ \omega \end{bmatrix} + \begin{bmatrix} \beta_1 & \beta_2 \\ \gamma_1 & \gamma_2 \end{bmatrix} \begin{bmatrix} gOutlays_{(t-1)} \\ gReceipts_{(t-1)} \end{bmatrix} + \begin{bmatrix} \beta_3 \\ \gamma_3 \end{bmatrix} CongS_dPres_{(t-1)} + \begin{bmatrix} \beta_4 \\ \gamma_4 \end{bmatrix} CongW_dPres_{(t-1)} \\
 &+ \begin{bmatrix} \beta_5 \\ \gamma_5 \end{bmatrix} CongS_rPres_{(t-1)} + \begin{bmatrix} \beta_6 \\ \gamma_6 \end{bmatrix} CongW_rPres_{(t-1)} + \begin{bmatrix} \beta_7 \\ \gamma_7 \end{bmatrix} gGDP_{(t-1)} + \begin{bmatrix} \beta_8 \\ \gamma_8 \end{bmatrix} War_{(t-1)} \quad (3b) \\
 &+ \begin{bmatrix} \beta_9 \\ \gamma_9 \end{bmatrix} \left(\frac{Surplus}{GDP} \right)_{(t-1)} + \begin{bmatrix} \beta_{10} \\ \gamma_{10} \end{bmatrix} t
 \end{aligned}$$

3.2.3—Putting the Models to the Test.

I will now remark on the findings of my empirical analysis. Please refer to Tables 5, 6 and 7 for the results of model sets 1, 2 and 3, respectively. Each system of equations described above has an analogue in the tables. Since there are various threshold levels employed, Table 8 summarizes all of them, while the best appear in Table 7. Although the tables contain results from both the partisan and non-partisan models together, I will initially discuss the two model types separately. Then, I will discuss the models together and determine the most appropriate one to study.

Since the dependent variables for all of the models are growth rates (displayed in decimal form), any coefficient on an independent variable implies that a value of one for the variable would increase the growth rate by the amount of the coefficient. Aside from

dummy variables, however, all of the variables are also percentages expressed as decimals. Thus, a coefficient of 3 on *gGDP* in the *gOutlays* equation would suggest that a 100 percent GDP growth rate would lead to a 300 percent growth rate in outlays. For these variables, it may be better to think in terms of 1 percent (0.01) change in the independent variable, but I will use the former method so as to maintain consistency with the examination of dummy variables' coefficients.

Each of the partisan models within model set 1 had something interesting to say. Model 1a shows statistical significance⁴⁶ in *dCong* within both equations—in both cases with positive coefficients. Plus, the coefficient on is higher in the *gOutlays* equation than in that of *gReceipts*. The positive sign implies that, *ceteris paribus*, Democrats in Congress will increase spending and taxes more than their Republican counterparts would. The higher coefficient within the *gOutlays* equation suggests that the spending increases will be at a higher rate than the revenue increases.

While an actual level of deficit—or even a deficit growth rate—cannot be extracted from this, what can be said is that if there already exists a deficit—and thus higher outlays than receipts—then a higher growth rate in outlays than in receipts will contribute to increased deficits.

Model 1b is similar to the first, except *rGovt* is included instead of *dPres*. Ideally, both would have been included, but near-perfect multicollinearity would have been introduced to the model. In this model, of the political variables, none showed statistical significance. And though they were statistically insignificant, *dCong* and *dGovt* had

⁴⁶ In the text, statistical significance is considered at the 10 percent level. Tables 5 through 7 also highlight higher levels of significance: 5 percent and 1 percent.

signs opposite to what they were previously. The constant was statistically significant in *gReceipts*, as was *gGDP* in *gOutlays*.

In both partisan models in model set 1, there was significance to the lagged values of *gOutlays* and *gReceipts* in each equation. The effect of *gOutlays* on both itself and *gReceipts* was positive; *gReceipts*, however, had negative effects on each. In the case of *gOutlays*, *gReceipts*' effect was around 1.5 times that of *gOutlays*' in absolute value terms; in the latter equation, they nearly cancel each other's effect.

Shared are positive coefficients on *gGDP*, suggesting that the government both spends and collects more money in good financial times; and negative effects for *War* on *gOutlays* and positive effects on *gReceipts*. Strong, positive and statistically significant coefficients are present on *Surplus/GDP* in each model's *gOutlays* equation: In both models, the coefficient is 3.7022, meaning that a deficit of 1 percent of GDP would cause a 3.7 percent decline in outlays the next period.

Many similarities between models 1a and 1b likewise extend to models 2a and 2b—if not in the exact magnitude, then certainly in the direction and roughly in the relations between them. In model 2a, *rGovt* takes on statistical significance in spending. With a negative coefficient, it suggests that Republicans decrease the growth of outlays. This time, multicollinearity does not pose a problem, so *dPres* is included, although its effect is not statistically significant. *Surplus/GDP* and *gGDP* retain their statistical significance.

TABLE 6: Empirical Results, Model Set 1

Independent Variable ¹	Variable Information																	
	(1a)				(1b)				(1c)									
	EQUATION 1: $gOutlays_t$		EQUATION 2: $gReceipts_t$		EQUATION 1: $gOutlays_t$		EQUATION 2: $gReceipts_t$		EQUATION 1: $gOutlays_t$		EQUATION 2: $gReceipts_t$							
	Coefficient	Standard Error	Sig.	Coefficient	Standard Error	Sig.	Coefficient	Standard Error	Sig.	Coefficient	Standard Error	Sig.						
<i>Constant</i>	0.1294	0.1594		0.0606	0.1141		0.579136	0.35566		0.4495	0.2546	*	0.2890	0.2605		0.2093	0.1865	
<i>Time Trend</i>	-0.0099	0.0093		-0.0080	0.0050		-0.009917	0.00705		-0.0080	0.0050		-0.0099	0.0071		-0.0080	0.0050	
<i>gOutlays</i>	0.6714	0.2087	***	0.5873	0.1494	***	0.671357	0.20872	***	0.5873	0.1494	***	0.6714	0.2087	***	0.5873	0.1494	***
<i>gReceipts</i>	-0.9208	0.2800	***	-0.5456	0.2005	**	-0.920802	0.28005	***	-0.5456	0.2005	**	-0.9208	0.2800	***	-0.5456	0.2005	**
<i>dCong</i>	0.5375	0.2331	**	0.3915	0.1668	**	0.0878225	0.25538		0.0026	0.1828		0.3780	0.1591	**	0.2428	0.1139	**
<i>dGovt</i>	-0.3192	0.4003		-0.2973	0.2865		0.130567	0.17267		0.0916	0.1236		n/a			n/a		
<i>dPres</i>	0.4497	0.3270		0.3889	0.2340		n/a			n/a			0.2901	0.1682	*	0.2402	0.1204	*
<i>gGDP</i>	3.0386	1.6298	*	1.4340	1.1666		3.03855	1.62977	*	1.4340	1.1666		3.0386	1.6298	*	1.4340	1.1666	
<i>rGovt</i>	n/a			n/a			-0.449726	0.32696		-0.3889	0.2340		n/a			n/a		
<i>Surplus/GDP</i>	3.7022	1.7321	**	0.7527	1.2398		3.7022	1.73206	**	0.7527	1.2398		3.7022	1.7321	**	0.7527	1.2398	
<i>UniGov</i>	n/a			n/a			n/a			n/a			-0.1596	0.2001		-0.1486	0.1433	
<i>War</i>	-0.1084	0.1469		0.0041	0.1051		-0.108413	0.14685		0.0041	0.1051		-0.1084	0.1469		0.0041	0.1051	

Model Information

AIC	0.9738	0.9738
SBC	1.7848	1.7848
Log-likelihood	-1.4228	-1.4228
Normality of Residuals ²	No	No

¹ The period for each is $t-1$ except for the constant and time trend.

² Doornik-Hansen Test for Normality was performed.

*: The coefficient is significant at the 10 percent level.

**: The coefficient is significant at the 5 percent level.

***: The coefficient is significant at the 1 percent level.

n/a: The variable was not included in the model.

TABLE 7: Empirical Results, Model Set 2

Independent Variable ¹	Variable Information																	
	(2a)				(2b)				(2c)									
	EQUATION 1: $gOutlays_t =$		EQUATION 2: $gReceipts_t =$		EQUATION 1: $gOutlays_t =$		EQUATION 2: $gReceipts_t =$		EQUATION 1: $gOutlays_t =$		EQUATION 2: $gReceipts_t =$							
	Coefficient	Standard Error	Sig.	Coefficient	Standard Error	Sig.	Coefficient	Standard Error	Sig.	Coefficient	Standard Error	Sig.						
<i>Constant</i>	0.9253	0.7307		0.1625	0.5213		0.3513	0.1621 **		0.2215	0.1147 *		0.2489	0.5150		0.1954	0.3686	
<i>Time Trend</i>	-0.0094	0.0073		-0.0086	0.0052		-0.0029	0.0054		-0.0025	0.0038		-0.0015	0.0063		-0.0017	0.0045	
<i>gOutlays</i>	0.6811	0.2129 ***		0.5764	0.1519 ***		0.5912	0.2179 **		0.5343	0.1541 ***		0.5187	0.2291 **		0.4739	0.1640 ***	
<i>gReceipts</i>	-0.9064	0.2862 ***		-0.5618	0.2042 ***		-0.8527	0.2893 ***		-0.4922	0.2046 **		-0.7216	0.2981 **		-0.3883	0.2133 *	
<i>dCongPercent</i>	-0.4673	1.2282		0.5239	0.8763		n/a			n/a			n/a			n/a		
<i>dGovt</i>	0.3052	0.3612		-0.0031	0.2577		n/a			n/a			n/a			n/a		
<i>dGovtPercent</i>	n/a			n/a			n/a			n/a			n/a			n/a		
<i>dPres</i>	-0.1509	0.3073		0.0682	0.2193		n/a			0.4341	0.1916 **		n/a			n/a		
<i>gGDP</i>	2.9892	1.6558 *		1.4893	1.1814		n/a			n/a			n/a			n/a		
<i>GovtPercent</i>	n/a			n/a			n/a			n/a			n/a			n/a		
<i>rGovt</i>	-0.5922	0.2763 **		-0.3302	0.1971		n/a			n/a			n/a			n/a		
<i>Surplus/GDP</i>	3.7714	1.7637 **		0.6751	1.2584		n/a			n/a			n/a			n/a		
<i>War</i>	-0.1175	0.1506		0.0143	0.1075		-0.0789	0.1482		0.0157	0.1048		-0.0919	0.1571		0.0039	0.1124	
Model Information																		
AIC													1.0004		0.9711		1.1063	
SBC													1.8925		1.6199		1.7551	
Log-likelihood													-0.0973		-5.3645		-8.3385	
Normality of Residuals ²													No.		No.		No.	

¹ The period for each is $t-1$ except for the constant and time trend.

² Doornik-Hansen Test for Normality was performed.

*: The coefficient is significant at the 10 percent level.

**: The coefficient is significant at the 5 percent level.

***: The coefficient is significant at the 1 percent level.

n/a: The variable was not included in the model.

TABLE 8: Empirical Results, Model Set 3

Variable Information															
Independent Variable ¹	(3a)				(3b)										
	EQUATION 1: $gOutlays_t =$				EQUATION 2: $gReceipts_t =$				EQUATION 1: $gOutlays_t =$				EQUATION 2: $gReceipts_t =$		
	Coefficient	Standard Error	Sig.		Coefficient	Standard Error	Sig.	Coefficient	Standard Error	Sig.		Coefficient	Standard Error	Sig.	
<i>Constant</i>	-0.0213	0.4226		0.3301	0.2773			-0.3614	0.4157			-0.0547	0.3011		
<i>Time Trend</i>	-0.0100	0.0074		-0.0103	0.0048	**		-0.0037	0.0067			-0.0018	0.0049		
<i>gOutlays</i>	0.7143	0.2290	***	0.5613	0.1503	***		0.6747	0.2416	***		0.5361	0.1750	***	
<i>gReceipts</i>	-0.8859	0.3117	***	-0.6722	0.2045	***		-0.6616	0.3044	**		-0.4061	0.2205	*	
<i>CongS_dPres</i>	n/a			n/a				0.8100	0.4112	*		0.3306	0.2978		
<i>CongW_dPres</i>	n/a			n/a				0.7104	0.4255			0.2711	0.3082		
<i>CongS_rPres</i>	n/a			n/a				0.5919	0.4575			0.0606	0.3313		
<i>CongW_rPres</i>	n/a			n/a				0.7250	0.4289			0.2564	0.3107		
<i>dCongS_dPres</i>	0.7633	0.3892	*	0.2746	0.2554			n/a				n/a			
<i>dCongW_dPres</i>	0.8821	0.4156	**	0.3417	0.2727			n/a				n/a			
<i>dCongS_rPres</i>	0.6966	0.4463		0.2519	0.2929			n/a				n/a			
<i>dCongW_rPres</i>	0.7503	0.4143	*	0.2555	0.2719			n/a				n/a			
<i>rCongW_dPres</i>	0.2744	0.4405		-0.1164	0.2891			n/a				n/a			
<i>rCongS_rPres</i>	0.0162	0.5515		-0.7170	0.3619	*		n/a				n/a			
<i>rCongW_rPres</i>	0.5797	0.4516		0.2285	0.2964			n/a				n/a			
<i>gGDP</i>	3.5373	1.6558	**	1.7813	1.0866			4.6442	1.6777	***		2.7317	1.2151	**	
<i>Surplus/GDP</i>	4.1260	1.8614	**	0.5056	1.2215			4.2520	1.9267	**		0.8719	1.3954		
<i>War</i>	-0.1659	0.1609		-0.0319	0.1056			-0.0940	0.1626			0.0037	0.1177		
Model Information															
AIC	0.8919											1.1562			
SBC	2.0273											2.0483			
Log-likelihood	8.3773											-3.4370			
Normality of Residuals ²	No.											No.			

¹ The period for each is $t-1$ except for the constant and time trend.

² Doornik-Hansen Test for Normality was performed.

*: The coefficient is significant at the 10 percent level.

** : The coefficient is significant at the 5 percent level.

***: The coefficient is significant at the 1 percent level.

n/a: The variable was not included in the model.

Model 2b, however, represents a divergence from the previous models that have been discussed. There is statistical significance to *dGovtPercent*, which herein is the only political variable, as well as to *gGDP* and *Surplus/GDP*. The constant is also significant in both equations.

Of most interest is the effect of *dGovtPercent*: 0.5535 and 0.4341 on *gOutlays* and *gReceipts*, respectively. The coefficient in *gOutlays* is, at this point, unsurprising as it is consistent with most of the models previously discussed in which Democratic control was in some way statistically significant. As previously discussed in section IV, *dGovtPercent* is bounded by -0.5, representing a unified Republican government, and 0.5, a unified Democratic government. Therefore, the two extremes have the exact opposite effect according to this model: more spending and more revenue thanks to Democrats; or less of each thanks to Republicans.

In model 3a, similar relationships to those in previous models are found with many of the non-political variables. In fact, there is still significance to the past values of *gOutlays* and *gReceipts*, as well. The time trend is also significant in *gReceipts*. However, no government control variable shows statistical significance in both equations. Three—*dCongS_dPres*, *dCongW_dPres* and *dCongW_rPres*—show statistical significance in *gOutlays*; in *gReceipts*, *rCongS_rPres* does. The three that are statistically significant in the former equation have positive coefficients; *dCongW_dPres*' coefficient is higher than the other two. A negative coefficient is found on *rCongS_rPres* in the *gReceipts* equation.

Discussion of models 1c, 2c and 3b—the non-partisan models—is warranted at this time, having discussed all of the partisan models. It should be noted that, while nominally they are non-partisan models for their inclusion of variables such as *GovtPercent* and *UniGov*, some vestige of partisanship does exist in models 1c and 3b.

Model 1c only has two statistically significant political variables: *dCong* and *dPres*. Both are positive, with *dCong* outweighing *dPres*. *UniGov*, the actual non-partisan political variable, has no statistical significance. In the case of model 2c, *GovtPercent*, the sole political variable, is not found to be statistically significant. Due to the fact that *dGovtPercent* was found to be statistically significant, this makes sense, as *dGovtPercent* is a partisan variable. One should not expect both the partisan and non-partisan tests performed in the same manner to yield significance, especially since *dGovtPercent*'s significance implied opposite effects for the two parties.

Finally, model 3b is the non-partisan threshold model. Statistical significance existed for lagged *gOutlays* and *gReceipts*; *gGDP*; and *Surplus/GDP* in both equations. *CongS_dPres* showed statistical significance in *gOutlays*. However, this cannot be interpreted as a strictly non-partisan effect: This non-partisan variable is made up solely of observations of strong Democratic majorities in Congress coupled with Democratic presidencies. As shown in Table 4, there have been no instances during the period covered by this paper in which Republicans have enjoyed strong Congressional majorities during a Democrat's tenure as president.

SECTION IV—CONCLUSIONS & IMPLICATIONS

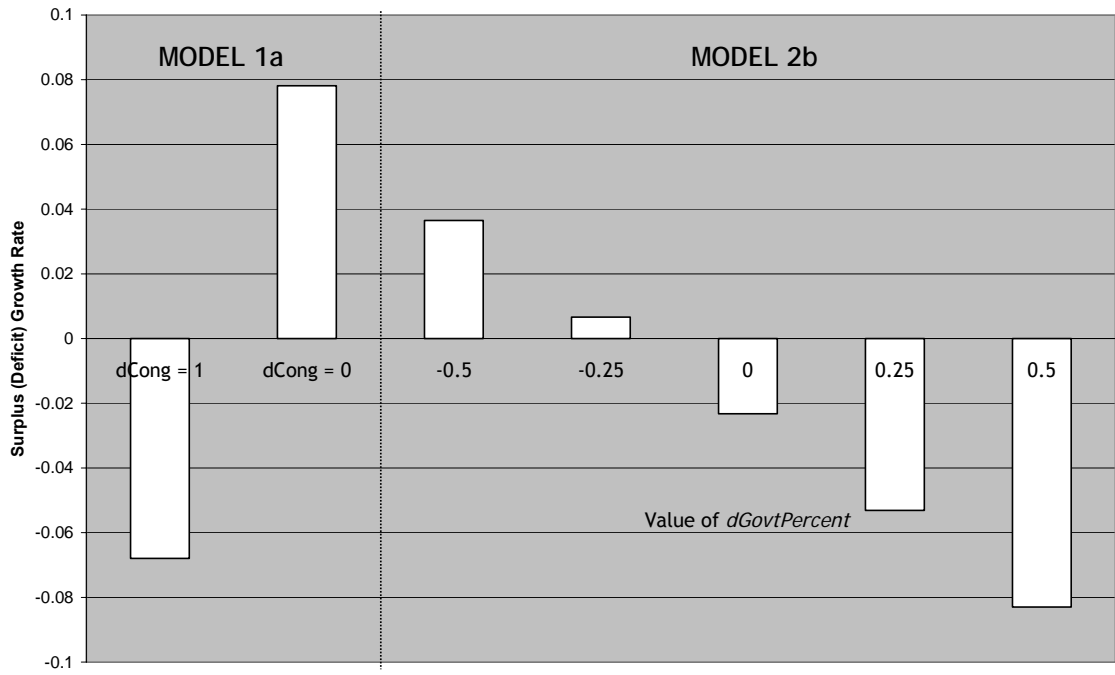
Many of the models tested had interesting and perhaps useful qualities. Graphs 8 and 9 show the average effects on the deficit growth rate under models 1a, 2b and 3a.⁴⁷ This is done by using the mean values of non-dummy variables (that have statistical significance in the respective models) as period $t-1$ to extrapolate values for period t based on different assumptions of party configuration.

While model 3a is notable for having the best overall fit using the AIC and Log-likelihood methods, it does not have the same explanatory power in *gReceipts* that it does in *gOutlays*. I found that model 2b was the best model in terms of using the partisan control of government to explain both *gOutlays* and *gReceipts*. It also ranked second with AIC, first using SBC and third using Log-likelihood.

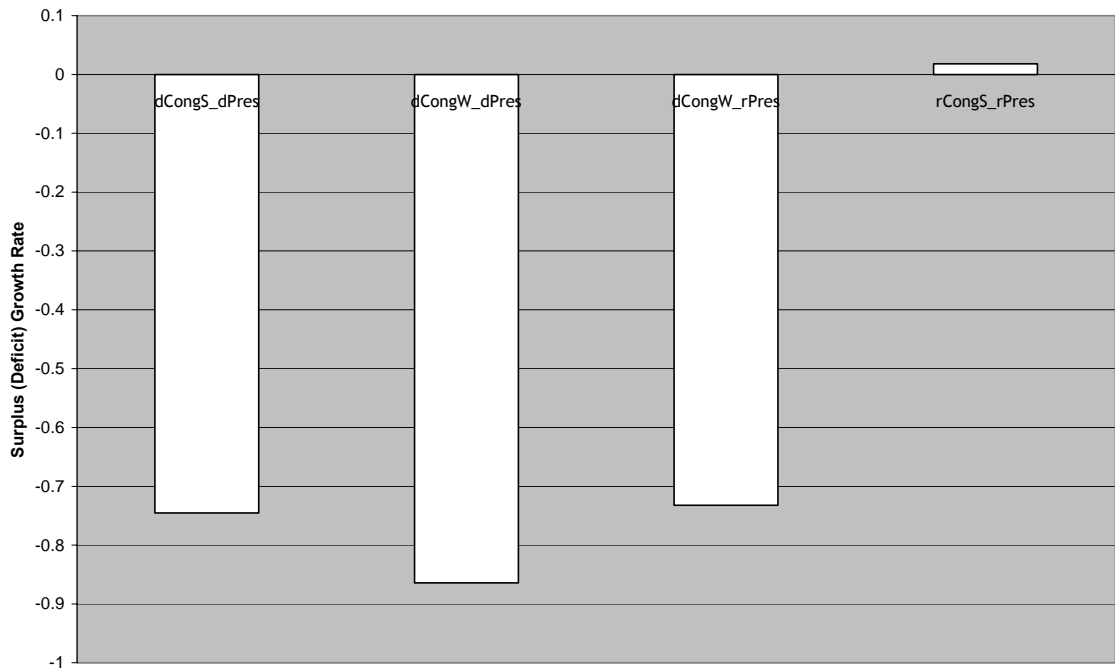
Having chosen a model, it may be necessary to make some refinements to it. The predominant statistical significance of *Surplus/GDP* (and the particularly large coefficients thereof) among all the models may be due to the extreme values that variable took during World War I and World War II. Therefore, new dummy variables—*WorldWar* (1 during WWI and WWII; 0 otherwise) and *War-NonWW* (1 when *War* would have been 1 except when *WorldWar* is; 0 otherwise)—were constructed to test this. The side-by-side comparison of the new (“adjusted war”) model 2b and the old (“unadjusted war”) one can be found in Table 9.

⁴⁷ Due to the use of biennial data, these can be interpreted as two year deficit growth rates.

GRAPH 8: Deficit Implications of Models 1a & 2b



GRAPH 9: Deficit Implications of Model 3a



While the new war variables are not statistically significant, just as *War* was not, they do appear to have the effect of dissipating the importance of *Surplus/GDP*. Everything else retains its statistical significance or lack thereof; the directional relationships between variables remain the same, although the magnitude of some have adjusted. For instance, the coefficient on *dGovtPercent* is now higher in each equation: only minutely in *gReceipts* but by 8.9 percent in *gOutlays*.

Graph 10 shows the two models side-by-side in a manner similar to Graphs 8 and 9. Generally, the adjusted war model shows that both party configurations will lead to increased deficits, whereas the unadjusted war model shows some values on the surplus growth (essentially deficit reduction) side. Again, the overall relationship remains the same. It is the war adjusted model 2b that will be used to discuss the hypotheses (hereafter, it shall be labeled as “model 2b*”).

TABLE 9: Empirical Results, Model 2b—Adjusted War and Unadjusted War

Variable Information												
Adjusted War						Unadjusted War						
Independent Variable ¹	EQUATION 1: $gOutlays_t$		EQUATION 2: $gReceipts_t$		EQUATION 1: $gOutlays_t$		EQUATION 2: $gReceipts_t$		EQUATION 2: $gReceipts_t$			
	Coefficient	Standard Error	Sig.	Coefficient	Standard Error	Sig.	Coefficient	Standard Error	Sig.	Standard Error	Sig.	
<i>Constant</i>	0.3852	0.1660	**	0.2244	0.1189	*	0.3513	0.1621	**	0.2215	0.1147	*
<i>Time Trend</i>	-0.0052	0.0058		-0.0027	0.0042		-0.0029	0.0054		-0.0025	0.0038	
<i>gOutlays</i>	0.5533	0.2216	**	0.5310	0.1588	***	0.5912	0.2179	**	0.5343	0.1541	***
<i>gReceipts</i>	-0.7927	0.2962	**	-0.4871	0.2122	**	-0.8527	0.2893	***	-0.4922	0.2046	**
<i>dGovtPercent</i>	0.6029	0.2759	**	0.4383	0.1977	**	0.5535	0.2709	**	0.4341	0.1916	**
<i>gGDP</i>	3.7040	1.7222	**	2.1279	1.2339	*	4.1588	1.6554	**	2.1669	1.1707	*
<i>Surplus/GDP</i>	1.6434	2.5334		0.4495	1.8151		3.3764	1.7915	*	0.5983	1.2669	
<i>War</i>	n/a			n/a			-0.0789	0.1482		0.0157	0.1048	
<i>War-NonWW</i>	-0.0313	0.1563		0.0198	0.1120		n/a			n/a		
<i>WorldWar</i>	-0.4645	0.4250		-0.0174	0.3045		n/a			n/a		
Model Information												
AIC	1.0007											
SBC	1.7306											
Log-likelihood	-4.0149											
Normality of Residuals ²	No.											

¹ The period for each is $t-1$ except for the constant and time trend.

² Doornik-Hansen Test for Normality was performed.

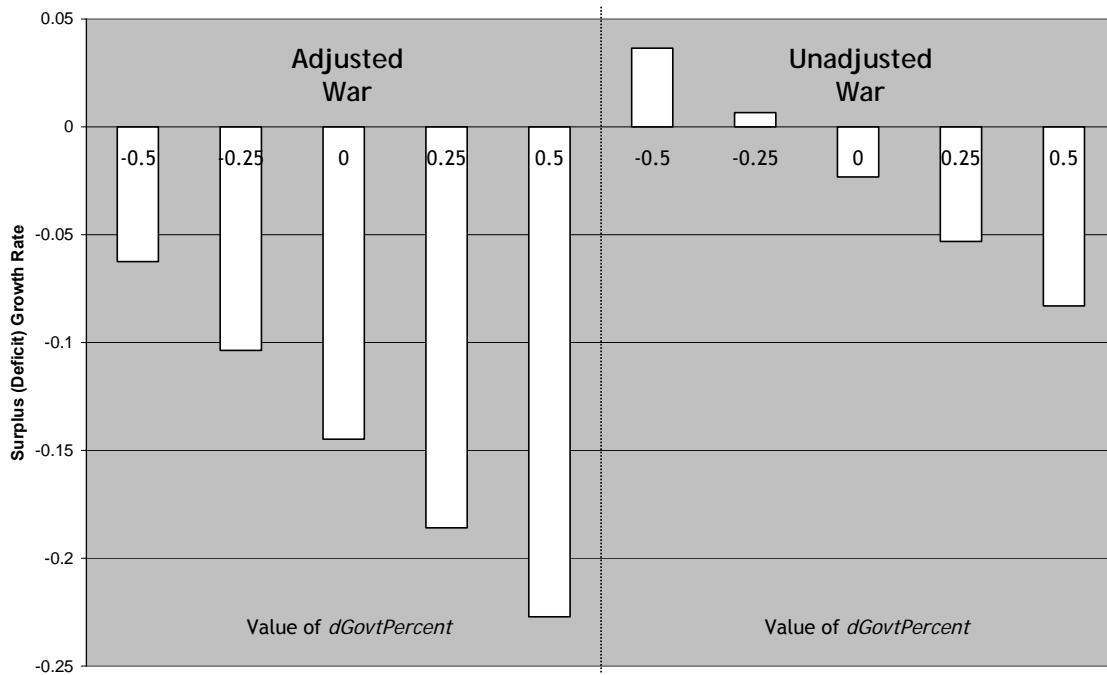
*: The coefficient is significant at the 10 percent level.

**: The coefficient is significant at the 5 percent level.

***: The coefficient is significant at the 1 percent level.

n/a: The variable was not included in the model.

GRAPH 10: Deficit Implications of Model 2b, adjusted vs. unadjusted war



4.1—Examining the Hypotheses

We return now to the hypotheses first posited in section V to see what proof model 2b* offers for them.

HYPOTHESIS 1: Party control of the federal government matters in the formulation of budgets—including expenditures, receipts and the deficit. **Supported.**

The statistical significance of $dGovtPercent$ demonstrates that there is a role played by partisanship in preparation of expenditures and receipts. Graph 10 has shown

that, based on mean conditions, party identity of government has an effect on deficit growth.

HYPOTHESIS 2: Democratic control of either branch of government will lead to higher deficits. **Supported.**

The model does show that Democrats increase *gOutlays* and *gReceipts*, the former of which with 37.6 percent more influence. As Democrats gain more control of government, the gap between their effect on *gOutlays* and *gReceipts* expands as well, increasing the likelihood that the deficit will grow. Similarly, increases in Republican control may contribute to deficit reduction, according to the model. Returning to the mean conditions prescribed by Graph 10, while both parties appear to cause increases in the deficit, it is the Democrats who increase it by a higher degree.

HYPOTHESIS 3: Deficits occurring under divided government, in which one party controls Congress and the other controls the presidency, will tend to be smaller than those occurring under unified government. **Not supported.**

It is true that, according to the model, any mixed Republican-Democrat government will have a smaller tendency toward deficits than unified Democratic governments. However, unified Republican governments have an even smaller tendency toward deficits than the divided governments.

HYPOTHESIS 4: Congress has a higher spending preference than the president.

Inconclusive.

Because *dGovtPercent* is an aggregate of congressional and presidential control, the effects of the two cannot be separated. Plus, most of the other models cannot provide evidence for or against this hypothesis. The exception to this is model 1c, wherein the *gOutlays* equations has a coefficient on *dCong* of 0.3780 and 0.2901 on *dPres*. This does suggest, at least, that Democrats in Congress will contribute to higher growth rates in spending than Democratic presidents. However, it does not say anything about Republicans.

4.2—Discussion

One shortcoming of the models employed is their static nature. They assume that the parties' relative ideologies remain constant. Perhaps, future models in this area of research could improve upon this by accounting for changes in party leanings over time. Plus, data for military spending or military casualties was not readily available for much of the tested period. Either of these could have acted as another method of controlling for war besides the dummy approaches.

While chosen as the best model, one problem with model 2b (and 2b* as well) is the nature of *dGovtPercent* as an aggregate of different governmental units. It is conceivable, for instance, that two different combinations of House and Senate control

could lead to the same Congressional component. Compare a 335/435 House and a 60/100 Senate versus a 340/435 House and a 55/100 Senate, for instance.

Furthermore, the theoretical model, while useful, was limited because in order to demonstrate how the parties' deficit or surplus preferences mattered, many additional assumptions had to be added to the model. Perhaps a multi-stage model could be built off of this one, wherein utility was affected by deficits and surpluses during some periods (an election year, perhaps) but not during others.

Future research could branch out into other nations, combining this research with works that concern themselves with institutional differences. It would be interesting to see if the models that I tested could be applied to the United Kingdom, for instance. Would the Labour and Conservative parties show similar preferences to the Democrats and Republicans, respectively? The presence of the Liberal Democrats as a third party might pose an obstacle to directly adapting the model to British Parliament, but the fact that the prime minister and the Government are a part of parliament itself means that a variable analogous to *dCong* would capture the party identity of the party in power of both the legislative and executive branches. The problems posed by my aggregate variable would not be present for nations with unicameral legislatures. Extending this research to another nation or a body of nations (for panel research) would open opportunities to further explore the research performed by Alesina and Perotti; and Person and Tabellini.

Having said that, this paper has done what was sought: It has been demonstrated that a difference exists between Democrats and Republicans. While the questions posed by hypotheses 3 and 4 warrant further examination, they were ancillary to the main goal

of this paper. By using model 2b to prove hypotheses 1 and 2, it was shown that Democrats have higher tendencies toward deficit growth than Republicans. Neither, objectively, can be taken to be good or bad. Rather, during periods of surplus, we would want the government to rein in the surplus just as much as we would expect it to control a burgeoning deficit. It is my hope that this work can serve as a starting point for future research, both in the areas of examining similar relationships that may exist in other nations' governments and studying party preferences in a more dynamic manner.

APPENDIX—Unit Root Testing on Outlays, Receipts and the Surplus (Deficit)

Before determining the type of model to use and how the variables would be represented, it was important to perform unit root tests. Tests were performed on the outlay, receipt and surplus (deficit) data for the federal government from 1913 to 2005. Unit roots could potentially comprise their viability in a vector autoregressive (VAR) model. If neither variable was integrated, a VAR in logs could be modeled; otherwise, a VAR in growth rates would be more appropriate.

The surplus is an important variable to test as well, especially if outlays and receipts would prove to be integrated. In such a case, the surplus *not* being integrated would indicate that outlays and receipts are *cointegrated* with a cointegrating vector of (1, -1). That is, the surplus would show that there exists a stable relationship between outlays and receipts. This would be cause for producing a Vector Error Correction Model (VECM).

I performed a battery of Augmented Dickey-Fuller (ADF) tests for integration with constant and trend, up to and including ten lags, for each of the three variables. The case 4 ADF test was performed for outlays and receipts due to the clear upward trend in the data. As there is no directional trend apparent in the surplus data, the case 2 test, which includes a constant but no trend, was chosen. Table A1 shows results for all variables, each optimized by the Aikake Information Criterion (AIC) and the Schwartz-Bayesian Information Criterion (SBC). For all variables and under both forms of optimization, the same result is revealed: Each variable is integrated.

Due to the presence of a unit root for all three variables, a VAR in growth rates would be an appropriate model, and a VECM is not necessary.

TABLE A1: Augmented Dickey-Fuller Tests

Aikake Information Criterion (AIC) Optimization				
Variable	Number of Lags	AIC	τ -test statistic	Sig.
<i>Outlays</i>	7	610.9998	3.2640	*
<i>Receipts</i>	4	742.7903	5.6538	*
<i>Surplus</i>	8	725.6176	-0.5702	*
Schwartz-Bayesian Information Criterion (SBC) Optimization				
Variable	Number of Lags	AIC	τ -test statistic	Sig.
<i>Outlays</i>	1	615.3990	3.1423	*
<i>Receipts</i>	3	750.4798	5.7224	*
<i>Surplus</i>	3	736.3400	-2.5686	*

Augmented Dickey-Fuller Tests were performed for all variables, up to and including ten lags. Results were then optimized for AIC and SBC minimization. *Outlays* and *Receipts* were tested under case 4 (constant and time trend), while *Surplus* was tested under case 2 (constant).

Rejecting the null hypothesis implies that a unit root does not exist.

*: The null hypothesis cannot be rejected at the 1, 5 or 10 percent levels.

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